

## Current situation<sup>3</sup>

It is currently assumed that there will be a very long transition phase from non-automated to fully automated driving. During this time, the fleet penetration levels of the SAE levels will appear in different constellations. Level 4<sup>4</sup> (full automation in defined operational design domains) is just reaching the market. It is likely to be significant for a very long period, whereas there are still no concrete timelines for the availability of Level 5<sup>4</sup> (full automation). Particularly due to motorcycles and other single-track vehicles, vintage cars, vehicles from third countries, etc., a complete L5 scenario is unrealistic in the short and medium term.

This is particularly relevant for strategies of cities and their administrations, as L4 vehicles, which are limited to a few operational design domains (ODDs<sup>5</sup>) have completely different effects than L5<sup>4</sup>-vehicles. In summary:

L4 with few ODDs makes driving more attractive without fundamentally changing the rules. A traditional driver is still needed for the remaining, non-automated ODDs. Unregulated, the mileage would increase, while the need for parking would remain similar to the current situation. Traffic safety per vehicle kilometer travelled<sup>4</sup> would improve.

L5, on the other hand, could mark a turning point in mobility and lead to profound changes. There would no longer be a traditional driver, parking at the end of the trip would no longer be necessary and automated Demand Responsive Transport (DRT)<sup>4</sup> would be possible. As empty trips would become possible, travel time would not be tied to the driving task, and an extended user group would be addressed (no driving license required, alcohol, medication, or fatigue less problematic), the mileage would increase *ceteris paribus*.

Since L5 favors both car sharing and ride sharing, fleet size decreases while the mileage remains constant. For this reason, many studies predict significantly less overall parking demand. In any case, parking demand decreases in zones where parking is unattractive because parking is no longer necessary at the destination.

Traffic safety per vehicle kilometer travelled would improve. Since L5 vehicles behave strictly compliant and defensive in mixed traffic with non-automated road users without accompanying measures, the throughput on the roads may suffer.

Social acceptance is likely to increase further over time due to the co-evolution of technology and society without any special measures, as people increasingly come into contact with automation technologies in many areas of their lives.

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<sup>3</sup> In accordance with, among others:

- „Räumlich-differenzierte Auswirkungen des automatisierten Fahrens“, Planungsdachverband Region Zürich, TU Wien, Austria Tech im Auftrag des Bundesamts für Strassen, Schweiz, 2023
- Modellierung der Wirkungen des automatisierten Fahrens in der Stadt, Metastudie, Deutsches Zentrum für Luft- und Raumfahrt im Auftrag der MA 18, 2018

<sup>4</sup> See appendix for definition