
Chapter 16

Connected and automated road transport from the perspective of cities

Suzanne Hoadley¹, Ondřej Příbyl² and Jaap Vreeswijk³

16.1 Review of impacts of automated driving: the big picture

Automated driving developments are experiencing a boom. They are not only driven by advances in technology but also have a strong link with the Smart Cities agenda, where automated vehicles, the shared economy and electro-mobility will play an essential role. This section provides a review of automated vehicle literature from research projects completed in recent years.

Before the year 2016, most researchers expected mainly positive impacts from automated vehicles. A selection of such expected impacts adopted from Chan [1] is provided in Table 16.1.

This was supported by several researchers as well as results from a survey focusing on expectations from the general public as well as policymakers [2] (see Figure 16.1).

Even some early simulation research suggested a similar trend. Atkins [3] developed a simulation model and tested different penetration rates to demonstrate its impact on road performance. The simulation confirmed the potential for significant benefits to network performance, particularly in high-speed, high-flow, congested situations. This is a reasonable assumption as at low penetration rates, the automated vehicles are limited by the behaviour of other vehicles. The results indicated improvements in delay of 7% for a 50% penetration of cooperative and automated vehicles (CAVs), increasing to 17% for a 75% penetration and as high as 40% for a fully automated vehicle fleet. This is certainly a very ambitious conclusion.

To summarise, it was expected that automated vehicles would improve safety, reduce congestion, harmonise traffic, reduce the number of vehicles on the road, allow for savings in infrastructure including parking and making mobility services more affordable. Only a few factors were typically named by experts as a possible

¹Polis, Brussels, Belgium

²Department of Applied Mathematics, Czech Technical University in Prague, Prague, Czechia

³MAP Traffic Management B.V., Utrecht, the Netherlands