

Implementation of an Autonomous Driving, On-Demand Bus System for Public Transportation

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Abstract : A well-functioning public transport system that is accepted and used by the general population contributes a lot to a sustainable city. Especially young and elderly people rely on public transport to get to work, go shopping, visit a doctor, and take advantage of entertainment options. The sustainability of a public transport system can be considered from different points of view. In urban areas, acceptance is particularly important. As many people as possible should use public transport and not their private vehicle. This reduces traffic jams and increases air quality. In rural areas, the cost efficiency of public transport is especially important. Longer distances and a low population density mean that these modes of transportation can rarely be used cost-effectively. It is crucial to avoid a low utilization, because empty rides are neither sustainable nor cost-effective. With a demand-oriented approach, we try to both improve flexibility and therefore attractiveness for the user and improve cost- efficiency. The vehicles only operate when they are needed and only where they are needed. Empty rides are avoided to improve sustainability. In the subproject "Autonomous public driving" of the project RealLabHH, such a system was implemented and tested in Hamburg-Bergedorf, a suburb of Hamburg. In this paper, some of the steps necessary for this are considered from a technical point of view, and problems that arose in real-life use are addressed.

Keywords : public transport, demand-oriented, autonomous driving, RealLabHH

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