

Jishnu Narayan

Delft University of Technology

Category: Road

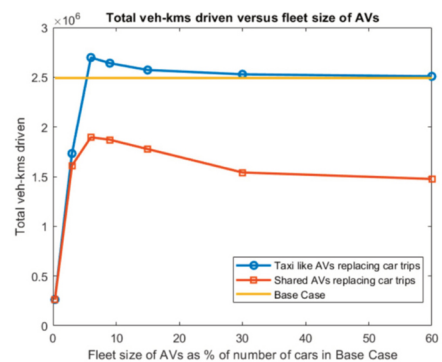
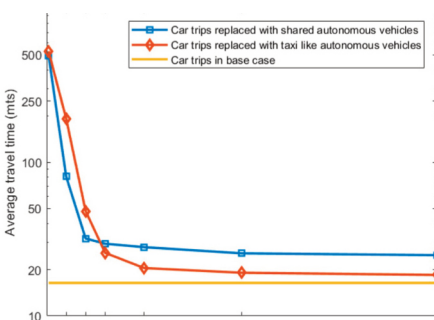
Country: The Netherlands

Research Area 3: Automation and Robotisation

Idea Number: 48

Potential of autonomous vehicles replacing car trips in Amsterdam

The increasing urbanization around the world caused by rapid economic growth has produced an ever increasing need for efficient mobility systems for users in urban areas. The recent advancements in various ICT platforms have facilitated the emergence of autonomous vehicles (AVs). Such services could effectively operate as on-demand service (door-to-door or stop-to-stop, individual or shared). In addition to providing flexible services to passengers, such services could effectively absorb the demand for private cars thereby reducing network congestion and demand for parking. In this context it is timely to assess the impact of such a service on the mobility of users and its potential to replace privately owned car trips. This study investigates the potential of a fleet of autonomous vehicles to replace the demand for private cars for the city of Amsterdam. We developed an agent-based simulation model with day-to-day learning of users for Amsterdam. Results indicated that the fleet of AVs could effectively replace the trips performed by private cars while achieving considerable reduction in the total number of cars used in the network. This could substantially reduce the high levels of on-street parking, thus freeing up public spaces. While AVs operating as taxi-like service produce a marginal increase in the total vehicle-km travelled, use of shared AVs substantially reduce the number of vehicle-km travelled. This could reduce the environmental impact from vehicle emissions in the city.



Key Characteristics

Autonomous vehicles • On-demand service • Door-to-door • Stop-to-stop