
Owning or sharing autonomous vehicles: comparing different ownership and usage scenarios

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Abstract

Emerging challenges, such as finite oil supplies, rising gas prices and traffic congestion, going in hand with environmental concerns are the reason for new transport innovations, like autonomous vehicles, which will play a major role in future mobility systems. Regarding autonomous vehicles (AVs), two ownership models are being considered for future transportation systems. These are: autonomous vehicles as a public service or privately owning them. Furthermore, they can be used in a private or shared mode. As such, we study the different cases of using autonomous vehicles and the potential use of such vehicles in a ride-sharing application. In the first case, AVs can be used as a public service. In such case, we consider that there is a fleet of such vehicles located on specific locations (depots). AVs are invoked from their stations to satisfy mobility demands appearing in an urban area such that one single AV can serve multiple demands before getting back to a depot. On the other hand, privately owned AVs cannot just bring their owners from their homes to their work locations in the morning and bring them back in the evening while providing ride-sharing opportunities to other users, but they can also serve other users when their owners do not need them (e.g. while they are at work). Extending work on vehicle sharing by [Stiglic et al., 2015], we propose different approaches for planning AV trips aiming at studying and comparing the different ownership and usage scenarios for autonomous vehicles in an urban context.

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