Forschungsprojekt: Towards Extending Autonomous Intersection Management by Vehicle-Pedestrian Interaction

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Next generation cooperative traffic management schemes need to be able dealing with a wide range of traffic participants including autonomous vehicles. Vehicle-to-X communication offers the possibility for vehicles to interact with other vehicles and traffic management infrastructure, enabling new approaches for urban traffic control. One prominent example of such a research approach is the Autonomous Intersection Management (AIM) project which basically studies how traditional light signal-controlled intersection could be replaced by V2X-based co-operative control schemes. However, the current work on AIM suppose the use of traffic light models to handle participants such as pedestrians or cyclists. Improving interaction between autonomous vehicles, infrastructure, and humans is a difficult but important task to increase traffic safety and the acceptance of cooperative traffic management. In this paper, we look at integrating some support for considering pedestrians within the AIM system, by extending its architecture with a new mechanism model "Broker" as a protocol that solicits interaction between vehicles and pedestrians. We analyze the AIM system, propose a system architecture for the extended system, as well as a first simple proof-of-concept prototype implementation. Finally, we propose evaluation criteria to assess the potential benefit of such an extension, mainly in terms of traffic safety.