

Controlling a real-world intersection with connected vehicle information provided by CAMs (Cooperative Awareness Messages)

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The project MAVEN, funded by the European Commission, aims at developing a system for infrastructure-assisted platoon organization and green phase negotiation for automated connected vehicles (ACVs). Car2X (C2X) communication protocols are hereby used for the insertion of vehicles into a traffic simulation of a real-world intersection. Until now, simulated traffic demand could be detected through magnet field sensors or induction loops. The downside of this detection method is that only momentary information can be obtained and e.g. the behavior of the vehicles approaching an intersection can only be approximated. ACVs however continuously broadcast their positions and speeds via CAMs. Detecting vehicles through these messages leads to a more realistic representation of the vehicle's driving behavior. The current paper describes how CAMs are used to place and move ACVs inside the simulation of a real-world intersection in Braunschweig with the traffic simulation SUMO (Simulation of Urban Mobility). Furthermore, it describes an approach to how these continuously detected vehicles could be further used as control units. Since the positions and speeds of ACVs are synchronized with the real-world behavior, they can be used to adjust the upstream vehicle movements to make them more realistic. Until all vehicles are equipped with C2X technology, this approach could enable more realistic simulated traffic flow behavior.