

Slot-Based Co-operative Driver Guidance System for Public Events

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Abstract

Public events in urban environments often suffer from large amounts of congestion and unpredictable journey times due to the high volume of drivers in the surrounding road network e.g. concerts. To address this problem, the co-operative slot-based driver guidance system is proposed. This system applies traffic shaping measures in an attempt to organise the flow of traffic, leading to more accurate journey time predictions and alleviating congestion.

This project explores whether this slot-based system is a more beneficial form of driving, rather than the current unco-operative approach. The system that was developed focused on analysing the feasibility and potential benefits gained from incorporating this driver guidance into event management plans. The potential benefits include more accurate journey time predictions and an overall better-organised flow of traffic. Existing research has been completed for slot-based driving scenarios for highway on-ramp merging and intersections. However, this project will specifically target public events in an urban environment, particularly around the entry and exit routes to parking lots.

The slot-based solution is similar to time division multiple access (TDMA) in computer networking. In this instance, the road is the channel to be divided up and drivers are allocated time slots on demand to travel within towards their destination. Each driver is provided with real-time guidance information in order to maintain their position within the slot.

An implementation of this system has been developed and tested using PTV Vissim, a traffic simulation software. Initial results indicate that the overall throughput of vehicles in the vicinity of the event is increased and journey times are significantly more consistent during varying traffic volume levels. These slot-based results are in comparison to the results generated from the simulations run using the Wiedemann 74 human driver model within Vissim.