Effect of In-Vehicle Traffic Signal on Driving Behavior

K. Nakano Lab

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Introduction
Emerging vehicular communication makes it possible to transfer information among vehicles and traffic lights. An in-vehicle traffic signal system was therefore proposed to assist drivers at signalized and unsignalized intersections, displaying virtual traffic light information inside with head-up displays. Experiments were performed to analyze its influences on driver behaviors.

In-vehicle traffic signal for signalized intersection

Current mode
The real time information of ground traffic lights of the upcoming intersection is displayed directly to drivers by in-vehicle devices.

Predicted mode
This mode provides predicted ground traffic light information of the upcoming intersection based on the current driving speed of the vehicle.

In-vehicle traffic signal for unsignalized intersection

1. Major-road vehicles will confront a green signal after entering the range of in-vehicle traffic signal; For minor-road vehicles within the range but have not yet arrived at the intersection, a red light will be presented.

2. If the major-road gap is less than 6.5 seconds, a green light will be displayed to major-road vehicles, and a red light will be offered to the minor-road vehicle.

3. If a gap greater or equal to 6.5 seconds appears, the red light displayed to the minor-road vehicle will turn green, and the green light presented to major-road vehicles will turn to a blinking yellow light.

Results at signalized intersection

Number of braking operations
Number of accelerating operations
Post-encroachment time
Maximum brake stroke

Publications