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## Traffic flow simulation of bi-lane systems through the two positions of traffic light signal

In this work, we investigated traffic flow simulation of bi-lane systems through the two traffic light signal positions based on the Nagel–Schreckenberg (NS) model, which is well-known as a Cellular Automata (CA) traffic flow model. In the CA model, time, position, speed and acceleration of vehicle are discrete variables. The speed of vehicle is defined as the discrete lattice (cell) number of movements in each time step. The road is divided into unit cells. The driving behaviors, which are randomly defined in different maximum vehicle speeds without lane-changing were used in our model. The effect of time duration management between two positions of traffic light signal on vehicle density and average speed were explored and discussed. The results show that the consistency of the two positions of traffic light signal affects the traffic flow. We found that turning on the overlap traffic signals cause better traffic conditions than that of two traffic lights simultaneously. In addition, our model can be used to illustrate a traffic situation of the bi-lane systems through the two traffic light signal positions.

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