The Research of Departure Characteristics of Motorcycles in Mixed Traffic Flow at Signalized Intersections

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ABSTRACT

Riders have to mention the acceleration, deceleration and changes of the displacement directions of themselves when they enter the approach of general signalized intersections. Because there is no exact rule of moving direction on the middle of intersection, and the high mobility of motorcycles, and riders usually try to find the shortest path, motorcycles become the cause of the disorder on the intersections and approaches. The basic solution of this problem is to dredge the flow of motorcycles across the intersection smoothly. In this study, we proceed to analyze the departure characteristics of the motorcycles and derive the departure rate of motorcycles and its model, then discuss the reason why motorcycles become the cause of disorders on the intersections from the outcome of the model and the effect of factors, and bring up the suggestion of improvement.

In this study, we proceed to video investigation, models construction, and the outcome of variables and models comparison. We confirm that the departure rate of motorcycles would rise to the top from 2 to 4 seconds after the beginning of green light. After that, it would fall down until 20 to 40 seconds after the beginning of green. When the motorcycles upstream arrive, the departure rate would rise a little until the green light ends. We can also separate the three parts from the 2-second departure rate figures.

We proceed to construct the departure rate model and separate the queue of motorcycle to two parts—front-queue and back-queue. There are three final models at both intersections, including the motorcycle departure rate model of front-queue, the model of back-queue at SinYi - FuSing intersection, and the model of back-queue at ZhongSiao - Fusing intersection. Those can be useful to predict the motorcycle queue departure rate at similar intersections. We continue to analyze the application of effective factors. And consider that management enhancing and preventing drivers against traffic regulations in crossing are the first thing we should do to improve the traffic at rush hours on Zhong - Siao intersection.

Key Words   motorcycle, mixed traffic flow, signalized intersection, departure characteristic.