

Car following behaviours on multilane highways in Kuwait: A case study on road 40 during winter season

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ABSTRACT

The car following behaviour of a driver is the process of following the drivers' creation of an adjustment in the leading vehicle behaviour. In a condition, where the traffic volume is in a free-flowing situation, the selection of vehicles speed is typically limited by some factors such as weather conditions, lighting, and road geometry features. This study aims to investigate the effects of climates on driver's car following behaviour and speed flow relationships for highways in Kuwait. The case study was conducted at Road 40 in Kuwait using RTMS Sx-300 device, which is known as a radar device particularly used for monitoring traffic. The data was gathered in the period from 29th December 2018 to 5th January 2019 in winter. MATLAB code was written to analyse and classify the gathered data. Then, the models were built using R-software. The study depicts that nearly 24.87% of the vehicles move between 60 km/h and 69 km/hour. Additionally, the vehicles were segmented according to their types, i.e., Truck, Small-, Medium-, and Large-Sized Cars, in order to find the impact of following pattern on the vehicle average. It has been found that no significant association remains amidst the type of following pattern and the headway. Ultimately, a liner regression of data was developed to calculate a liner equation that shows the average headway as an element of speed for sixteen diverse following patterns. It has been recognized that an association could be supposed in medium-sized and small-sized vehicles. It has been observed that headway average could be placed in a linear equation for large, medium, and small as well as truck vehicles. It is worthy denoting that when data is bigger, the exactitude of a study is enhanced. Findings from each model of liner regression have more than 80% confidence level. The models of regression are deliberated as statistically significant, where the R (square) figures lie amidst 0.99 till 0.6. As per the findings, speed is the key influencing factor for headway value. The type of car does affect headway with drivers behind Heavy Good Vehicles and cars at the similar speed. According to the data, cars are identified to keep more headway when behind Heavy Good Vehicles in contrast with when behind other cars. These results will help the drivers understand their behaviour associated with car crashes, thus, increasing road safety awareness and reducing traffic congestion in Kuwait.

KEYWORDS

Car following; Driver behaviour; Headway; Multilane highway

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