

Establishing Speed-Flow-Density relationships for exclusive motorcycle lanes.

ABSTRACT

The motorcycle is a popular mode of transport in Malaysia and developing Asian countries, but its significant representation in the traffic mix results in high rates of motorcycle accidents. As a result, the Malaysian Government decided to segregate motorcycle traffic along its new federal roads as an engineering approach to reduce accidents. However, traffic engineers needed to know the maximum traffic a motorcycle lane could accommodate. Despite substantial literature related to speed–flow–density relationships and capacities of various transport facilities, there is a knowledge gap regarding motorcycle lanes. This paper establishes motorcycle speed–flow–density relationships and capacities of exclusive motorcycle lanes in Malaysia. Observations of motorcycle flows and speeds were conducted along existing and experimental motorcycle lanes. Motorcycle speed–density data were aggregated and plotted for two types of observable motorcycle riding behaviour patterns that were influenced by the widths of a motorcycle lane: the headway pattern (lane width ≤ 1.7 m) and the space pattern (lane width > 1.7 m). For both riding patterns, regression analysis of motorcycle speed–density data best fits the logarithmic model and consequently the motorcycle flow–density and speed–flow models are derived. Motorcycle lane capacities for headway and space riding patterns are estimated as 3300 mc/hr/lane and 2200 mc/hr/m, respectively.

Keyword: Motorcycle accidents; Motorcycle lane facility; Motorcycle speed-flow-density relationships; Motorcycle lane capacity.