

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.