Modeling Acceleration Characteristics of Motorized Three-Wheeler

Bharat Kumar Pathivada [1], P Vedagiri[2]

Abstract

Modeling acceleration characteristics of vehicles is one of the important aspect in traffic engineering which has a significant impact on various design elements such as Length of acceleration lanes, ramp way design, vehicular emission and fuel consumption models, etc. Most of the acceleration models in the literature have been developed for passenger car but vehicles differ in performance to accelerate due to their varying physical dimensions and dynamic characteristics. Motorized three-wheeler is one of the most commonly found vehicle type in developing countries like India, which is used as an Intermediate public transport. The entire acceleration process of the motorized three wheelers have been captured using a GPS based performance box at near free flow conditions. Acceleration rates of the motorized three wheelers were found higher at lower speeds and lower at higher speeds and the maximum acceleration was in range of 1.88 m/s^2 to 2.08 m/s^2. This study has proposed an exponential model to describe the acceleration behaviour of a motorized three-wheeler. The application of the developed model can help in better traffic operation and management and will yield realistic vehicle behavior in simulations, when used in micro-simulation software's.

Keywords: Acceleration behaviour, Motorized three-wheeler.

---

1. Research Scholar, Department of civil Engineering, Indian Institute of Technology (IIT) Bombay, Mumbai 400076, India; E-mail: pathivada.bharathkumar@gmail.com
2. Associate Professor, Department of civil Engineering, Indian Institute of Technology (IIT) Bombay, Mumbai 400076, India; E-mail: vedagiri@civil.iitb.ac.in