

Using microsimulation to evaluate the determinants of low commercial speed in urban bus lines.

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Abstract

Although road public transport is environmentally more efficient than private transportation, it has the reputation of being slower and unreliable. This is more obvious for modes that share the infrastructure with private cars. Thus, achieving higher and less variable commercial speeds is an important objective for bus operators, which increases the efficiency of bus operations and at the same time can create a more competitive and desirable alternative to private cars, reducing their use and the high energy consumption and pollution associated with them.

This paper has as its main objective to study the aspects that could reduce commercial speed in order to devise measures which could be applied to maximize commercial speed. With this objective and with help from Rodoviária de Lisboa, Avenida de Moscavide in Moscavide was chosen as a case study. A Microsimulation model was built to simulate Avenida de Moscavide, the bus services, traffic, pedestrian's crossings, second lane parking and loading/unloading operations. Afterwards several changes were tested in this model. They included reduction in distance between stops, variation of stops duration, variation of traffic volumes, variation of pedestrian crossings, incidence of second lane parking and loading/unloading operations. The results obtained showed that pedestrian crossing volumes, second lane parking and loading/unloading operations impact strongly on the commercial speed. Strongly reducing or eliminating these constraints imply changes of up to 42% in the commercial speeds. On the other hand reducing the distance between stops from 500m to 250m reduces the commercial speed in 14%. These results and the implications that they can have on the design of measures and policies aimed at increasing the commercial speed of buses are discussed.

Keywords: Microsimulation, microscopic model, AIMSUN, Commercial Speed.