

Time Duration of a Driving Cycle and its Representativeness

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Abstract

There is an interest in representing properly the driving patterns, energy consumption and vehicle emissions of a region. Driving pattern is understood as the way that people drive their vehicles. One of the ways to represent the driving patterns is through time series of speed, denominated driving cycles (DC). The duration of the DC is an important factor to define a DC. Short DCs tend to generate high fuel consumption and emissions results due to the vehicle operates primarily in its warm-up phase. Long DCs represent higher costs in the type approval tests. The time duration of each DC is unique since it represents local and particular operating conditions. However, there is no defined methodology to establish the duration of DCs based on the driving characteristics of a specific region. This study aims to study the effect of different time durations of the DCs on their representativeness. We used data of speed, time, fuel consumption and emissions of travels monitored for two months from a fleet of 15 buses operating in a flat and high traffic region. Using Micro-trips method, we built DCs with a time length of 5, 10, 15, 20, 25, 30, 45, 60 and 120 minutes. The results indicate that for having DCs with relative difference equal or less than 10% respect to the driving patterns, the DCs must have a duration of more than 25 minutes. This time length also guarantees the representativeness, in terms of energy consumption and tailpipe emissions.

Keywords

Representative driving cycles, Time duration of driving cycle, Driving patterns, Characteristic parameters, Micro-trips methods.

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Biographies

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