

Road safety-related determining of time and space braking under different travel conditions

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<https://doi.org/10.1088/1757-899x/1220/1/012053>

Abstract

The present paper aims to determine the vehicle kinematic parameters during braking, namely the braking time and space needed. Considering different travel conditions, dry and wet roads, we put forward two methods to determine the braking capability. First, we resort to the analytical method; hence the total braking time needs to be considered as obtained from the necessary braking time until the vehicle stops, or the braking process is completed, i.e. the sum of the time due to physiological delays, the time due to involuntary delays and the actual braking time until the vehicle stops. Next, through the Virtual Crash software platform, we carried out a case study to determine the kinematic parameters of a braking vehicle under different travel conditions. The virtual modelling developed for our case study features braking analyses on a track in alignment. The initial parameters of the vehicle and the travel conditions, i.e. the adhesion coefficient value, are similar as in the analytical method. By processing the numerical results, we developed a comparative analysis of the vehicle kinematic parameters for the two methods used, focusing on validating the performance and effectiveness of the modelling method in terms of the time needed to set new initial parameters.

Keywords: braking, vehicles

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**The XXXI-st SIAR International Congress of Automotive and Transport
Engineering
"Automotive and Integrated Transport Systems" (AITS 2021),
28th-30th October 2021, Chisinau, Republic of Moldova
Conference Series: Materials Science and Engineering, 2022, Vol. 1220, Nr. 1**

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