

ANALYSIS OF THE EFFECTS OF PAVEMENT DEFECTS ON SAFETY OF POWERED TWO WHEELERS

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ABSTRACT

Degradation of the pavement has a significant impact on road safety and, in particular, potholes turns out to be very hazardous for powered two wheelers. This type of degradation is often due to incorrect maintenance. The paper reports the results of a study aimed to analyze the effects of localised degradation of pavements on the dynamic behaviour of motorcycles. A dynamic simulation code was used. Several scenarios in terms of depth and length of the potholes were implemented in the simulation code. The dynamic response of a motorcycle was evaluated when it hit the different potholes located on curve with different radii at several values of speeds. Based on the outcomes of these simulations: a) four predicting models of the most significant variables (lateral acceleration, front tire lateral force, rear tire lateral force and destabilizing moment on the front tire) of the dynamic behaviour of motorcycle are defined; b) two useful tools for planning maintenance interventions are proposed: the "falling schedules" predict whether or not the different potholes determine the fall of the vehicle; the "operating safety schedules" identify six different classes of hazard induced by the damage of pavement, as a function of severity of the pothole, radius of the curve and speed of motorcycle. These tools can allow the managing agency the identifying of the priorities of the maintenance interventions in relation to the hazard associated to the damage of the pavement.

KEY WORDS: Motorcycles, dynamic effects, potholes, maintenance.