

The study of whole-body vibration effects on the passenger's comfort commuting in Tehran metro system

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Abstract

Introduction: Whole-body vibration is one of the factors which may have adverse effects on the comfort of passengers and crew of rail transportation vehicles. In this study, the probable impacts of whole-body vibration were explored on the convenience of the passengers of Tehran metro.

Material and Method: Planning, measurement, and pre-analysis calculations were mainly done based on ISO guidelines No. 2631-1, 4. Moreover, measurements and calculations were done using SVAN 958 sound & vibration analysis and Microsoft Excel software, respectively.

Result: Average calculated RMS acceleration values on the levels of seat cushion, seat back, and legs were 0.57, 0.44, and 0.64 m/s² on the dominant axes, and total r.m.s acceleration in all these three levels equaled to 1.02 with the standard deviation of 0.11 m/s². Mean Vibration Dose Value (VDV) of total exposure in the minimum and maximum exposure durations were 6.44 and 9.63 m/s^{1.75}, respectively.

Conclusion: Calculated amounts of dominant axes were mainly ranked as “relatively unpleasant” in the convenience limits of ISO 2631-1, but the total calculated amount of exposure based on WRMS was at “unpleasant level”. The measured VDV amounts were mostly on the z axis, as the dominant one.

Keywords: *Vibration, Whole Body Vibration, Passengers Comfort, Metro Vibration*

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