

**SAFETY OF METROS AGAINST TERRORIST ATTACKS -
PERFORMANCE OF DIFFERENT TRAIN DESIGNS
SUBJECTED TO EXPLOSIONS**

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In the last decades, the number of terrorist attacks in public transport systems has risen. In many of these attacks, explosive devices were used. Therefore, the focus of this study is to compare numerically the performance of different train geometries in order to give recommendations for wagon designs. The numerical simulations were conducted in Europlexus. The complex structures of the train geometries and the passengers were modelled using finite elements. The peak overpressure and the positive impulse were used to predict the probabilities of eardrum rupture and death of the passengers. Numerical simulation results are presented, where three different train geometries (short wagon without glass intersections, short wagon with glass intersections, long wagon) and three explosive amounts (5kg TNT, 10kg TNT, 20kg TNT) were varied. The number of passengers with eardrum rupture and their risk of death were compared. The number of affected passengers is the lowest in the long wagon, followed by the short wagon with glass intersections and then by the short wagon without glass intersections. This trend is independent of the explosive amount.