

**Method for Evaluating Crashworthiness of Railway Vehicles Based on Correlation
with Injury Severity of Passengers Occupying Longitudinal Seats**

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It is important to enhance the safety of passengers on board railway vehicles in the event of a collision. The railway vehicle standard in European countries and the U.S. provides a framework for structural crashworthiness design. On the other hand, there is still no established method for evaluating the crashworthiness design of railway vehicles in Japan. The aim of this study is to propose a safety index for railway vehicles with longitudinal seats. The severity of passenger's head injury in a level crossing accident was estimated using numerical simulation. The correlation between the injury severity of an Anthropomorphic Test Device (ATD) model and the safety indices of vehicles, that is, the integral of the deceleration waveforms, the mean deceleration waveforms and the maximum waveforms, was compared. It was found that the integral of the deceleration values had the highest correlation with the injury values of ATD. We proposed the integral of the deceleration as a method for evaluating the crashworthiness design of railway vehicles with longitudinal seats.