

Abstract

The purpose of the dissertation was to develop a map of selected railway occurrences and their prediction model, which, within the framework of the operating safety management systems (SMS) of railway undertakings, will allow improvements to levels of safety in rail transport.

Analysis of data obtained from regional passenger railway undertakings on dangerous situations on the rail network shows a high number of recorded cases of wildlife collisions compared to other events. Yet, based on an analysis of the literature, it can be concluded that any existing prediction models are primarily concerned with events within level crossings. The few prediction models for animal collisions that do exist are characterized by the high complexity of the training data necessary to get a meaningful picture. As part of the dissertation, a prediction model for the occurrence of wildlife collisions by rail vehicles was developed, which is based exclusively on training data already recorded by railway undertakings. The results obtained indicating the probability of occurrence of wildlife collisions situations, were verified and confirmed by subsequent data . Satisfactory results were obtained both in terms of the location and time of occurrences, noting that the model has been designed to be constantly updated with up to date data, making it more precise. In order to present the results of the algorithm on the map developed as part of the work, geo-information software was used, which allows, in particular, train drivers to be provided with warnings about particularly dangerous sections of railway lines. The described solutions have a potential for further development in, among other things, the use of the model results directly in the driver's cab by issuing warnings correlated with the current GPS location of the rail vehicle. In addition, the model and consequently the warning map can be extended to include other types of railway occurrences.

Keywords: rail occurrence prediction, safety management system, railway undertakings, map of railway occurrences