

Evaluation of Roadway-Railway Level Crossings in Main Line from Colombo to Polgahawela

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Abstract

When a railway line crosses a road or a path at the same level, it is called a Level Crossing (LC). The total length of the railway lines in Sri Lanka is approximately 1930 km (SLR, 2011). 1047 crossings have been reported. Out of these, 128 crossings are protected by electrical barriers and 139 are protected by mechanized barriers. A great amount (758) is manned by barriers while an amount as low as 17 are manned by farm type gates. About 151 gates have a bell and flash light system. There are about 457 unprotected gates in the country, accounting for 37%. The main objective of this study is to evaluate the railway-roadway LC safety, because a significant number of rail crashes are being reported in Sri Lanka at LC.

Four years of railway crash data, LC characteristics, rail line characteristics, and highway characteristics, were collected at the main rail line from Colombo to Polgahawela. Special attention was paid to different types of LCs, focusing on their methods and their functional capacity. Furthermore, the shortcomings found in the system were analysed using data pertaining to the 62 LCs found between Colombo to Polgahawela. The details regarding these LCs, their nature, construction, location, and intermittent distances were obtained directly from the Railway department. Then linear regression models were used to identify whether these predictor variables, which successfully predict an outcome, crashes.

The locations which had appalling shortcomings such as the unavailability of barriers found in the LC, the prolonging of the bell sound for a considerable time, the elderly being employed in unprotected LCs without their basic facilities or wages being ensured, LCs and roadways running parallel and road traffic getting entangled in the LC, and the view of approaching trains getting blocked by towering buildings and trees, were successfully identified. Based on the data collected, the locations that needed immediate attention were pointed out. Statistical analysis further showed that the distance to the nearest curvature from the direction of Colombo and Polgahawela, the sight distance from the upside and the bottom, availability of a passive protection system, have a significant influence on the occurrence of crashes.

The main intention of this research is to minimize the number of accidents that occur at the crossing of main line. The sample taken for the study is convenient, due to the fact that the population can be accessed appropriately. The results can be considered as general, though there might be slight variations that could arise, as some of the LCs, especially in the rural areas of the country, have less trains and vehicles on roads. Furthermore, some solutions and recommendations have been put forward, taking into consideration the modern methods utilized in this field.

Reference:

Sri Lanka Railways, 2011, Overview. Available from: <http://www.railway.gov.lk/>, Accessed on 12th Nov. 2017

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