Methodology to Prioritize Road Safety Improvements for Low Volume Roads

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Abstract

Low volume roads (LVRs) play a crucial role in providing mobility and accessibility to people to perform their economic activities and satisfy their social needs. However, safety in low volume roads is not given adequate importance as in the case of highways. Funding is generally allocated to improving road safety in highways as they are considered more prone to road crashes. Road crashes in LVRs in Sri Lanka have significantly increased lately with an increase in vehicle volume. Currently in Sri Lanka, there is no formal road safety treatment prioritization tool available for the use of relevant authorities. Prioritization is done based on budget availability and other political and social factors. Therefore, it is vital to address the safety issues on LVRs by evaluating the risk at hazardous locations and proposing the appropriate safety treatment for those locations. The six main road safety treatments proposed in this study are providing road safety barriers, installing sign boards, providing pedestrian crossings, vegetation clearing, providing street lighting, and providing speed humps. This study aims to identify the relevant risk parameters addressed by the above road safety treatments, define the road and operational characteristics and finally ranking the hazardous locations based on risk rating. High risk locations will be identified using safety performance index called the Cumulative Safety Index (CSI), which is derived from the exposure, likelihood, and severity of road crashes. The CSI is an indicator of the safety performance of road. The objective of the study is to prioritize high risk locations to implement the road safety treatments based on their risk rating. The safety performance rating derived from the model will be validated by conducting user response surveys. These surveys will be conducted among experienced engineers in several highway agencies and the experts will be asked to give a performance rating for the locations based on perceived risk. These performance rating values will be compared against the CSI values obtained for the purpose of validation. The cost of implementation of a given road safety treatment is considered a constant, therefore prioritization of locations for safety treatment projects will be based on the risk rating only. The effectiveness of the road safety countermeasures will be evaluated by calculating the CSI values again after the implementation of a given road safety treatment. Since the risk factors related to exposure, likelihood and severity of crashes will change after the implementation of a safety countermeasure, a significant change can be observed in the CSI values. This change can be termed as the safety effectiveness in this study.

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