

Recommendations to Improve Classification of Grade Crossings in Urban Areas of Mexico

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Abstract : In North America, more than 2,000 people annually die in accidents related to railroad tracks. In 2020, collisions at grade crossings were the main cause of deaths related to railway accidents in Mexico. Railway networks have constant interaction with motor transport users, cyclists, and pedestrians, mainly in grade crossings, where is the greatest vulnerability and risk of accidents. Usually, accidents at grade crossings are directly related to risky behavior and non-compliance with regulations by motorists, cyclists, and pedestrians, especially in developing countries. Around the world, countries classify these crossings in different ways. In Mexico, according to their dangerousness (high, medium, or low), types A, B and C have been established, recommending for each one different type of auditive and visual signaling and gates, as well as horizontal and vertical signaling. This classification is based in a weighting, but regrettably, it is not explained how the weight values were obtained. A review of the variables and the current approach for the grade crossing classification is required, since it is inadequate for some crossings. In contrast, North America (USA and Canada) and European countries consider a broader classification so that attention to each crossing is addressed more precisely and equipment costs are adjusted. Lack of a proper classification, could lead to cost overruns in the equipment and a deficient operation. To exemplify the lack of a good classification, six crossings are studied, three located in the rural area of Mexico and three in Mexico City. These cases show the need of: improving the current regulations, improving the existing infrastructure, and implementing technological systems, including informative signals with nomenclature of the involved crossing and direct telephone line for reporting emergencies. This implementation is unaffordable for most municipal governments. Also, an inventory of the most dangerous grade crossings in urban and rural areas must be obtained. Then, an approach for improving the classification of grade crossings is suggested. This approach must be based on criteria design, characteristics of adjacent roads or intersections which can influence traffic flow through the crossing, accidents related to motorized and non-motorized vehicles, land use and land management, type of area, and services and economic activities in the zone where the grade crossings is located. An expanded classification of grade crossing in Mexico could reduce accidents and improve the efficiency of the railroad.

Keywords : accidents, grade crossing, railroad, traffic safety

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