DEVELOPMENT OF PEDESTRIAN ACCIDENT PREDICTION MODEL IN URBAN CONTEXT

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Abstract

The research aims to identify the contributing factors to pedestrian accident distribution which are fatal in nature and recommend measures that shall be instrumental in assessing the future accidents and curb the possibility of such mishaps in upcoming urban developmental growth. The achievement of the goal was realized by developing an accident prediction model in urban arterials by using Multiple Linear Regression Method considering the factors aggravating the occurrence of such accidents. The major work of the author pertains to the development of the pedestrian accident prediction model by accounting pedestrian experiences in the urban roads through an extensive and elaborate interview questionnaire and through reports generated by various government agencies and social organizations associated with pedestrian safety. Least work is done on the behavior of the drivers and their reaction time in urban context and also the black spot presence in many corridors. The main contribution of this research work is to assess the effect of the factors such as the educational qualification, time and vehicles involved in an accident with pedestrian over urban arterials and identify the possible preventive measures to bring down the pedestrian death toll in the city. Based on the reports of the Hyderabad City Police and Institute of Road Traffic Education, four corridors were identified notorious for the highest death toll of pedestrians which includes Mehdipatnam to Tolichowki, Gachibowli to Miyapur, Nampally to Lakdikapul and Malakpet to Dilsukhnagar. The accident data was collected from the respective police stations and National and State accident records issued by National Crime Records Bureau which included the number of pedestrian volume, reported pedestrian deaths related to accidents, most vulnerable age group and most obvious days of the week and the factors that lead to each accident. The physical observation was also conducted to counter-check the correctness of the value and simultaneous pedestrian data was collected through printed questionnaire from over 5000 participants from all age groups. The collected data was then analyzed and depicted in the form and charts and graphs and histograms. A multiple linear regression model was developed to estimate the gravity of the different factors that set flame to the

frequency of pedestrian accident at the various urban locations. As per the mathematical model developed for the corridors, it is evident that the climate, speed and lighting are minor contributors to the accident occurrence, however, the age of the pedestrian, his qualification, misjudgment of speeds and violation of traffic signals combined with driving under influence of alcohol are the major factors that cause pedestrian accidents in Hyderabad. One of the vital findings of the research is that the accidents are quite predominant in the late mornings and early evenings when the LoS falls to the B-D category and events usually are such that the victim on foot is crushed between the vehicles or thrown away from a moving vehicle by a brush collision and unfortunately the victims are usually declared brought dead by most hospital reports. The research could be further explored and elaborated incorporating the gullible pedestrians under various traffic conditions and also by studying geometric conditions of the pavement.