Comparative analysis of different non-rigid crash barriers: A case study of Nepal

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Crash barriers are one of the most important parts of traffic safety. Despite their importance, there are no advancements in their tests in Nepal. As a result, the design standards for crash barriers are yet to be updated and further fails to include wire rope barrier system. This study aims to test three different types of non-rigid barriers namely, W beam, thrie beam and wire rope barrier in context of Nepal analytically using finite element tool Abaqus FEA. The developed analytical model is validated with a full-scale test namely from NCHRP report 350 test 3-11. The simulation of crash is performed using Abaqus/Explicit for each type of barrier system. The behavior of the crash barriers is compared in terms of parameters like stress, displacement and acceleration severity index. Based on the comparison, the effectiveness of the crash barriers is evaluated. Wire rope barrier undergo largest deformation but incur smallest acceleration severity index ensuring comparatively higher safety to the passengers. The comparative analysis of the barriers further assists in formulation of revised design standards. Furthermore, the study supports in evaluating the appropriateness of wire rope barrier which has been strictly limited to pilot application in Nepal.