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Survey Paper on Rolling Barrier System

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Abstract: India is emerging country in all sector India's transport sector is large and diverse. The latest emerging technologies for road safety working on ways to avoid or reduced road accidents to road users with special concern by minimizing the causes of road accidents. So in this paper study is carried out to minimize or reduce adverse effects of road accidents with the help of rolling barrier system. The roller barriers are extremely effective and it's implementation has given manifested results in minimizing the road accidents. Rolling barriers provides cushioning effect during crash and reduces the high speed effect constitutes material resilience with stiffness and have other performance characteristics that reduces injury to individuals and damage to their vehicles.

Keywords: Accidents, Rolling Barrier, Stiffness, Resilience, Crash Cushioning

I. INTRODUCTION

In Stockholm the third global ministerial conference on road safety was held, Sweden on 19 and 20 February, 2020. At this conference, all the participants including India, reaffirmed their strong commitment for achieving the goals of reducing road accident related deaths by at least 50% by 2030. To achieve this goal rolling barrier system is one of the best way. The Rolling Barriers are the barrier that absorbs impact energy and converts that impact energy into rotational energy and directs the vehicles forward rather than potentially breaking through an immovable barrier.

A. Objective

- 1) To reduce the risk level during median divider accidents and reduces injury severity.
- 2) Provides cushioning effect during crash.
- 3) It converts impact energy into rotational energy to propel the vehicle forward.
- 4) In every roller there is reflective tape to alert the drivers.

B. Related Work

India's first rolling barrier guardrail system has been successfully installed on the Nahan to kumarhatti section of NH 907A in Himachal Pradesh as a pilot project. There are plans to install the barriers on several other section of national highways across India or in the areas frequently exposed to accidents. Also roller crash barriers installed for first time in Tamil Nadu along Kalhatti Ghat road in Ooty. It is being fitted with special crash barriers to make the 19km stretch connecting Thalakundah in Udhamandalam to the Mudumalai Tiger Reserve safe.

C. Problem Statement

Compare to other type of barriers like reinforced concrete, this rolling barrier which is made of urethane which resource availability is less compare to reinforced concrete. At high temperature in summer season the rubber characteristics features is that it tends to low resistance property. So that plays major role in rolling barrier system but can be restricted or maintain by proper inspection.

D. Scope

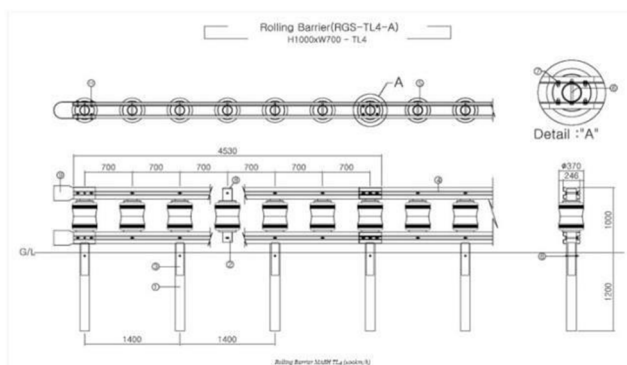
It should be implemented at highways where accidents occurs repeatedly in India like Mumbai Pune Expressway, Mumbai-Agra highway (Kasara ghat), Mumbai-Kolhapur highway where vehicles are at high.

II. PROPOSED SYSTEM

Site selection: NH 48 Mumbai Pune expressway Data available on NH 48 has been selected on basis of small section of curve which is selected as a project site which is having speed of 60kmph vehicle designing the rolling barrier. Movement on the NH 48 were very high and frequently all sort of vehicles passes through it. However many accidents do occur at curve therefore using roller barrier will reduce the risk of accident. South Korean company named "KSI", has designed the rolling barrier.

In this design all dimensions are in mm. Here given the name of roller is A. 370mm is the total diameter of the roller, and the rounded stainless steel's diameter is 246mm. the distance between one post to another post below the soil is 1400mm. A spans distance is 4200mm. One roller to a different roller center to center distance is 700mm. the vertical distance from ground level (GL) to further is 1200mm and therefore the height of top is 1000mm. There have inner post, sub-post, w rail style stainless steel, muffler roller, post cap etc. Performance test has been allotted by KSI global to match normal and rolling barrier to live the degree of harm imparted to the barrier during a vehicle impact of the crash test (test 1). It had been observed that the traditional barriers experienced more damage as compared to rolling barrier. in a very similar crash test (test 2) a comparison is finished between railroad car and heavy vehicle impact to rolling barrier. it absolutely was seen that impact of carriage delivered no damage to the rolling barrier, while slight damage is recorded just in case of heavy vehicle.

III. SYSTEM ARCHITECTURE



A. Advantages

- 1) Made of special chemical compound like hard rubber.
- 2) Easy to maintain due to separated barrels (recyclable).
- 3) Stopper boards installed on the top and the lower part of the barrels to guide objects back to the road.
- 4) Easy to adjust height, noticeable to drivers due to noticeable coloration and self-luminescence.
- 5) Noticeable to drivers due to noticeable coloration and self-luminescence.
- 6) Less costs to install (less post- 1 unit per 2m)

IV. CONCLUSION AND FUTURE WORK

In India, accidents are increasing day by day. As per the info mentioned above, an outsized number of accidents occurs on horizontal curves. 42% of collision is with barriers. the traditional barriers protect other objects from collision, but it damages the vehicle heavily and it's going to even cause death of passenger of the vehicles. The use of rolling barriers can prevent the damage and loss of lives. It absorbs the shock energy and converts it into rotational energy. The rolling barriers, made of Urethane rubber, possess both flexible and rigid property. LED light and reflective tape gives better visibility at the hours of darkness. So, the utilization of rolling barrier system can reduce the damage due to accidents. Its initial cost is higher but it doesn't need much maintenance as compared to concrete and steel barriers. Rolling barriers are used currently in many countries. It should be implemented in India seeing current situations to cut back the damage and loss of lives due to accident.

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