

ROLLING BARRIER SYSTEM FOR REDUCTION OF ROAD ACCIDENT ON HORIZONTAL CURVE

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ABSTRACT

The road accident are the major problem in India. Lacks of the people expire every year because of the accident. To reduce the accident and the deprivation occur on the road and vehicles. A small Korean company in BUSAN develops product which resist the ascendancy of guard rails and saves lacks of lives. Every year more than billions of lives died during accident. According to federal highway administration the guardrail can operate to pushes back the vehicle to the roadway decrease the speed of vehicle or let it proceed pasta the guardrail. The guardrail cannot completely product the situation driver may find themselves. In order to reduce the number of accident a company called ETI (evolution in traffic innovation) design a barrier called rolling barrier. Road accident area increased by 5% in 2022 as compared to the 2021. To minimize the road accident, rolling barrier system is newly concept invented with structure consists of urethane rings by Korean company. These rolling barriers are used in hilly areas, curved roads etc. when the vehicles hit the barrier, rolling barrier decrease the speed of vehicles and prevent if from accident. Roller absorb the shock energy, when vehicle collapse on barrier and shock energy converted into rotational energy to minimum the number of accidents , a company called ETI (evolution in traffic innovation) designed rolling barrier system . Here our target is to save the lives of passengers after clashing. For this we are introduce an idea rolling barrier to save the human body.

Keywords :- rolling barrier,guardrail,urethane, evolution.

I. INTRODUCTION

The India is developing country for many highway and roads are connected in this country. But serious problem in accident are major in country Due to vehicles. Lack of peoples are death in every year. World largest accident in India and death ratio large in India. Indian people do not rules follow due to driving vehicles on roads. To reduce of accident a company ETI (evolution in traffic innovation) design a barrier called Rolling barrier. The rolling barrier is good in curve and hilly roads due to shock energy converts to rotational energy. The accident rates in India 2021 as compared to 2022 increase it. Rolling Barrier install on due reduce accidents and save the lives.

	Year 2021	Year 2022	% in increase
Total accident	4,12,432	4,25,159	2.5%
Persons Killed	1,53,972	1,55,622	4.6%
Accident on highway	3,12,052	3,01,542	3.2%



Fig.1 Rolling Barrier system

1.1 Advantages:-

- 1) Safety of the roads increased.
- 2) Maintenance is low.
- 3) Easy to install.
- 4) Decrease the accident on highway, expressways etc.
- 5) Rolling barrier save the vehicles from crashing on objects.

1.2 Working :-

- 1) Rolling Barrier made on urethane rubber.
- 2) It Converts the shock energy to rotational energy.
- 3) Radium are Provided are useful in night.
- 4) Rolling Barrier have flexibility and elasticity do not damage easily vehicles.

1.3 Objective:-

- 1) Rolling Barrier Install to reduce accident rate.
- 2) Decrease the death of people.
- 3) Vehicle damage on road decreasing level.
- 4) In every roller there is reflective tape to alert the drivers.

II. CASE STUDY ON NH 907 A

- With blind curves and absence of crash barrier being attributed to 3 per cent of the accidents in Himachal, the focus has shifted to installation of crash barrier.
- 2,633 died in last 5 years, 6,792 sustain injury in 3,028 roll down incidents.
- Rolling Barrier System install due to accident percentage rate decrease in it.
- Died person rate also decrease it.

III. EXPERIMENTAL METHODOLOGY

S The rolling barriers do more than absorb impact energy. They convert impact energy into rotational energy to propel the vehicle forward rather than potentially breaking through an immovable barrier. The ETI product has a rotating barrel made of EVA with excellent shock absorption power, 3D buffering frames & dense props supporting the frames. Rotating barrels comes with attached reflective sheeting for good visibility. EVA has a better flexibility & elasticity compared to other polyethylene resins & has most similar features to rubber. In fact it's lighter than rubber & most elastic than urethane. In shorts it is not easily damaged. When a car hits the guardrail, the rotating barrel converts shock from the vehicle to rotational energy. Upper & lower frames adjust tires of large & small vehicles to prevent the steering system from a functional loss. Rails & liquid props absorb shock from accidents vehicles & frames with the smooth surface adjust tires of large & small vehicles to prevent the steering system from a functional loss. Railways rails & liquid props absorb shock from accidents vehicles & frames with the smooth surface adjust tires of the vehicles & guide them in the moving direction to prevent second rear – end collisions.

IV. FUNDAMENTAL OF THE PROJECT

4.1 Introduction of Barrier :-

Barrier is type of obstruction that tries to keep vehicle within their road lanes and prevent them from collision with obstacles or other vehicles. The barrier are type due to roadside barrier, median barrier, bridge side barrier or work zone barrier. The main use barrier is prevent collision of vehicles with other obstacles or vehicles.

4.2 TYPES OF BARRIER:-

- 1) **Road side barrier:** Road side barrier is used to secure the traffic from roadside hazards.
- 2) **Median barrier:** - It is used to prevent vehicles from crossing over a median and striking an oncoming vehicle in a head on crash.
- 3) **Flexible barrier:** - Flexible barrier made of cable supported nets are used to protect against gravity driven natural hazards such as rock fills, debris flow, snow avalanches, shallow landside, and woody debris.

4) Rigid Barrier:- Rigid barrier are typically concrete, steel or a combination of both. As rigid barrier have limited movement yield or deformation during impacts they are generally able to sustain multiple impacts without repair.

4.3 USES OF ROLLING BARRIER:-

- 1) Indian drivers drive vehicles in large speed. such they loss control they keep accident an death of humans, the road side rolling barrier are install due to shock energy converts rotational energy.
- 2) Rolling barrier are good barrier in road side due to decrease accident rate and save life ,night time will be used in visibility good for driver on road curve.



Fig.2 night showing barrier

4.4 Components of Rolling Barrier System:-

- 1) **Top Rail :-** There are two rails in rolling barrier system which connects and supports the rollers horizontally. The upper rail is known as Top rail.
- 2) **Bottom Rail :** - The two rails, the lower rail is called bottom rail. It also connects and support the rollers horizontally.
- 3) **PVC Pipe:** - The rollers are installed on PVC pipes which allow the rollers to rotate or roll freely.
- 4) **Stopper Board:** - It is disc like board, which is installed between rollers and rails at both upper and lower sides.
- 5) **LED guide lamp:** - A small LED guide lamp is installed on PVC pipe. It is installed on top of PVC pipe.
- 6) **Shock Absorbing Roller:** - The main part of rolling barrier system. The rollers are usually made up of Urethane or recycled hard rubber. It is converts the energy.
- 7) **Reflective Band:** - Reflective band is attached to the rollers to give better visibility at night. Yellow coloured reflective band tape is use increase visibility at night.

SAFETY ROLLER BARRIER
TECHNICAL HIGHLIGHTS

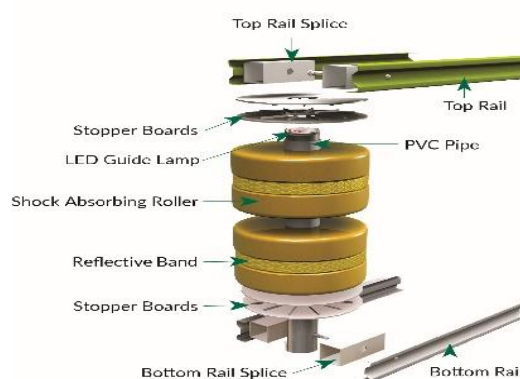


Fig3, Rolling Barrier components.

V. PROBLEM IDENTIFICATION

The rolling barrier system is compare the other type of barrier like reinforced concrete, this rolling barrier is made of urethane which resource availability. Is less compare to reinforced concrete. At high temperature in summer season the rubber characteristics feature is that it tends to low resistance property. Rolling barrier install on hilly areas due to risk on workman they carefully install it. The vehicle collides with barrier it large damage of vehicle injury to human body or even death.

VI. CONCLUSION

Accident in India is also increases, the large amount of accident in horizontal curve. In rainy season due to slippery roads they life is very precious than vehicles. The rolling barrier installs to reduce impact of collision but also help to turning in factual path by converts energy shock to rotational. At night due to LED reflective band are visible to driver they slow in speed due to large amount of accident decrease and save in life. The other highway on night visibility is good for rolling barrier system. In hilly areas night travelling to support barrier in curve side to good in save the life.

VII. FUTURE SCOPE

- It should be implemented at highway where accidents occurs repeatedly in India Mumbai Pune Expressways, Mumbai- Agra.
- Highway (kasara ghat) Mumbai-Kolhapur Highway where vehicles are at high.
- Bamboo barrier install it and comparison with rolling and bamboo barrie

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