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Prevention Of Accident At GhatSection By Roller Barrier

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ABSTRACT

In India, the transportation system is expanded fatly or rapidly. In India, the Government and Ministry of Road Transport and Highway is looking for the latest techniques for the safety of the roads and to reduce the accidents. Rolling Barriers consists of continuous pipe with urethane rings invented by the Korean company. The study of Rolling Barriers are carried out to evaluate the effectiveness of RB (Rolling Barrier) and to understand the characteristics of crash cushioning and to evaluate the required strength of barriers. In 2016, 4.8 lakhs accidents are recorded in India, leading 1.5 lakhs deaths. The Rolling Barrier are very useful to reduce the accidents in future. These barriers are used in curved roads, hilly areas, on expressways etc. Thetotal study of Rolling Barriers Systems are elaborated in this paper.

India is a developing country. The growth of traffic increases rapidly day by day. The Government is looking for the new technologies in order to reduce the accidents on the roads and improve the safety of the road user. In 2015,501423 road accident happens in which 146133 people were died . In 2016 road accidents decreases by 4.1% in which near about 480652 road accident occur and 150785 people were died . In 2017 road crash fatalities increases by 3% in last 2 years . A small korean company develops a new product in order to reduce the harsh impact of guardrails and hopefully save lives. The product is Rolling barrier or longitudinal barrier which had continuous pipes covered with urethane rings .A study is carried out to explain its need in India for using Rolling Barrier which will minimise the accident rate. The guardrail can operate to deflect a vehicle back to the road and slow the vehicle down to a complete stop . The size and speed can affect the guardrails performance. The roller barrier are extremely effective and its implementation has given signified result in reduce accident at flat roads, raps, entrances, exit ramps in the parking garage etc and also used in mountainous terrain.

Key Word: Accident Prevention , Arduino board , Curved roads, Ghat Areas.

INTRODUCTION

The Road accidents are an outcome of the interplay of various factors, some of which are length of road networks, vehicle population, human population adherence/enforcement of road safety regulations etc. Road accidents cause injuries, fatalities and hospitalization with serve socioeconomic costs across the country. Consequently, road safety has become an issue of concernbothat national and international levels.

It is expected to be increased 47% of 2021 to 60% in 2022 and even more in future wherethe number of vehicles manufacturing is increasing and also the vehicles on road are increasing. India is one of the highest motorization growths in the world accompanied by rapid expansion in road network and urbanization over the years and is facing with serious impacts on road safety levels. The analysis of road accident data 2017 reveals that about 1324 accidents takes place in Maharashtra road in which 191 accident are take place at the curve section in hilly region. To prevent vehicles from driving off the road, strong metal bars, commonly referred to asguardrails, run along a road's edge. There giving RCC barrier to prevent the head crashes. Sometimes this barriers can't give guarantee a driver's' safety. Sometimes provides some RCC round pillar nearly height in hilly areas to prevent the vehicles would not fall from hill but it cannotgive guarantee the safety of vehicles as well as passengers.

1) To study various types of accident.

OBJECTIVE

2) To study the various method for minimize the accident on road site
3) To select the best method of mimimize the accident on road by using Roller Barrier.
4) To identify locations which have both high risk of crash losses and justifiable opportunity for reducing the risk.
5) To make cost analysis of road widening in Manjarkhind ghat section for improvement purpose.

HISTORY OF BARRIERS:-

CONCEPT

One Korean company developed a product to reduce the harsh impacts of guardrails, and hopefully save lives.

Every year, approximately 1.25 million people die as a result of a road traffic crash. To prevent vehicles from driving off theroad, strong metal bars, commonly referred to as guardrails,run along a road's edge.

According to Federal Highway Administration, the guardrail can operate to deflect a vehicle back to the roadway, slow the vehicle down to a complete stop, or let it proceed past the guardrail. But the guardrails cannot completely protect against the situations drivers may find themselves in. The size and speed of the vehicle can affect guardrail performance.

Typical guardrails composed of steel plates cannot guarantee a driver's' safety. Softer guardrails protect drivers from shock and provide opportunities to save more drivers' lives.

To minimize the number of accidents, a company called ETI (Evolution in TrafficInnovation) designed "Rolling Barrier System".

BARRIERS

Rolling Barriers are also known as guardrails, longitudinal barriers. RB retain vehicles on their check vehicles from hitting with hazardous obstacles and roadway such as rocks, traffic sign posts, bridge supports, trees and construction walls. Rolling Barriers are characterized in two types, by the functions they serve and conferring to the degree that how much they can deflect a vehicle when it hits into the RB.

CURRENT SCENARIO OF ROAD BARRIERS:-

There are mainly two types of barriers:

a) Types of barrier (Category)
b) Types of barrier (Materials)

a) **Types of barrier (Category)**

There have some different types of barrier by category. It does mainly identify where it is situated. If it situated at the side termed as roadside barrier, when it is situated at the middle or I land known as median barrier. When it use in bridge then it called as bridge barrier. Here's the brief description of barriers by category.

b) **Types of barrier (Materials)**

There have many types of barrier using many types of materials. Day by day new theory or ideas are coming for barriers. A new type of barrier means obviously better form old theory. It will be cost efficient than older. Now a days, introducing new types of materials use also in barrier like plastic, foam etc. Here discussed briefly about the material of barrier can be used andabout their behaviour.

METHDOLOGY

Process of Installation of roller barrier at site:

1) **SETTING OUT THE CURVE ON THE GROUND.**

After completion of the survey at selected location the next part is to mark the Roller Barriers position over the ground. For this purpose measuring tape is used & positions of main post are carefully marked on the ground by using chalk pit.

2) **DRILLING OF BORED HOLES.**

Holes of suitable diameter up to depth 2.5 m is drilled over the ground by using bore drilling machines. The excavated materialis dumped nearer to the site.

3) **INSTALLATION OF MAIN POST.**

By using the mechanical crane the main post of length (2.2 m) are lifted and then carefully inserted into the bored holes. The clear span between two main posts is kept around 1.4 m. These post are kept exactly

vertical and then hammering is done so that these poles will get firmly fixed into the bored holes. The bore holes are then filled with the excavated material and concreting is done. These posts are inserted up to the depth of 1.2 m below ground level & 0.9 m of length is available for fixation of side rails (Guard rails)

4) **INSTALLATION OF GUARD RAIL:**

The guard rails are fixed at the bottom of the main post by using nuts, bolts, washers & post caps. This fixing of the guard railsis done properly into the pre drilled holes of the main post.

5) **ASSEMBLE OF SUB POST:**

The various sub post are installed between the mains posts and fastening is done with the help of bolts.

6) **IMPACT ABSORBING ROLLERS INSERTION :**

Impact absorbing rollers are slowly placed around the sub post and made sure of its working**.**

7) **UPPER GUARD RAIL INSTALLATION:**

Bolting of upper rail at top level of the sub post & main post is carried oit by using different impact drills.

8) **ROUND RAIL ASSEMBLY & CAP FIXATION.**

Finally at the corner, to adjoin two side rails round rail assembly is fixed .Also fixation of the cap over the top ends of the postis done.

CASE STUDY

SITE DETAILED:-

According to available data the prone accident area on Kolhapur- Radhanagari Road, at Manjarkhind Ghat, Kolhapur is selected

DATA COLLECTION:-

First we have visited to RTO office for collection of information about rate of accident then we have visited to Radhanagaripolice station to calculate count of accident occur and select the road the we have visited to Pudhari and Lokamat office to collect the information about accident occur on selected road.

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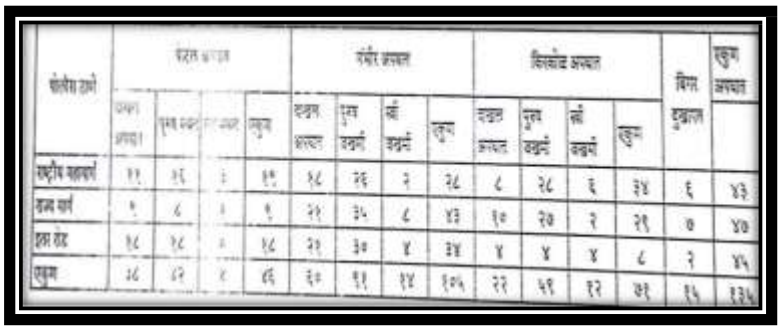

पोलीस ठाणे	घेतला आढावा				गंभीर अपघात				किरकोळ अपघात				विना दुखापत	एकुण अपघात
	उपस्थित अधिकारी	पुरुष कर्मचारी	स्त्री कर्मचारी	एकुण	दाखल अपघात	पुरुष वाहनचालक	स्त्री वाहनचालक	एकुण	दाखल अपघात	पुरुष वाहनचालक	स्त्री वाहनचालक	एकुण		
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SITE SURVEY FOR ROLLING BARRIER:-

Site Selection:-

First collected all the maps and study the maps at that point where Rolling Barriers are installed. Visited the site for thechecking the visibility of project. And following stapes are conducted at site.

Site Clearance:-

First we clear the site where Roller Barrier is installed. To remove all obstacles such as stone, grass, small plant, etc. areremoved. The surface is clean and fairly levelled it.

Taking Measurement :-

After the site clearance taking a measurement such as width of road, length of the curve, sight distance, etc. by using Tape. Outter curve of road is 64m.

Inner curve of road is 32.7m.

Measuring the Ground Slope:-

After measurement reduced level of ground are measured by using the Auto Level and Measuring Staff. The R.L. are measurefor the levelling the ground for installing roller barriers.

CONCLUSION

These barriers are of different types and have their own characteristic features but the new idea is about the installations ofthe rolling barrier systems which will stop the accidents occurring to surpass the road to gravel or steep hill down or other part of the road, and also saves life of the people present inside the vehicle.

As above explanations of barriers and their proofs tells us that the rolling barrier systems are a high priority towards safety,better than other types of barriers in terms of stiffness and strength, high positive results in the crash test performances, etc. Ultimately life is more precious than vehicles but when it comes to rolling barrier system usage, it safes life and also prevents maximum damage level of the vehicles. The rolling barrier systems are the future technology in Civil Engineering or Transportation Engineering.

REFERENCE

1. **C. P. Kumar :** With case studies and success stories from around the world, this book serves as an indispensableresource for anyone committed to making our roads safer.
2. **Graham P. Bartley · 2008** This examines a wide range of issues related to traffic accidents including prevention,safety, prediction, precipitation, mitigation, and related law enforcement issues.
3. **SS Deshmukh · 2022** — Efforts to minimize road ***accidents*** and enhance safety on highways have been a toppriority for governments, transportation authorities, and researchers alike.
4. **Akshay Wadekar, Neeraj Tilekar, Chinway sawalkar Maravia** (February 2017), An Alternative Method forBarriers: Rolling Barrier system, (IJLEMR), ISSN: 2455 - 4847, vol 02 - issue 02, PP.37-41.
5. **Singh, A.P, Agarwal P.K, Sharma** A. (June, 2011), "Road Safety Improvement: A Challenging Issue on IndianRoads", International Journal of Advanced Engineering Technology, Vol 2, Issue 2, Pp 363-369.
6. **Kyung- Whan Kim and Bu-Yong Shin** (January 2004), A study on the characteristics of rolling barriers, KSCEJournal of Civil Engineering, vol 8, no.1, pp.135-139.
7. **Pawan Deshpande**. " road safety and accident prevention in India: A review". Director, lotus white conceptrealization Private Limited, new Delhi, india.
8. **Chitransh Srivastava, nikhil Acharya, fervez Jaffer, Sachin Bhatt**." limitation of Collision avoidance system forhair pin bends in Ghats using proximity sensors". Manipal University.
9. **Singh, S. K. (2017)** 'Road Traffic Accidents in India: Issues and Challenges', Transportation Research Procedia.Elsevier B.V., 25, pp. 4708–4719. doi: 10.1016/j.trpro.2017.05.484.
10. **Sanjeev Kumar Singh, ashish Mishra.** " road accident analysis: A case of Patna city". Department of Humanitiesand social science Indian Institute of Technology Kanpur-208016.