

# Case Study on Accidents And Its Solitions

Ashwini Amashi Shubham kumar<sup>1</sup>, Kaushal mishra<sup>2</sup>, Immad Balroo<sup>3</sup>, Gaurav chaudhri<sup>4</sup>, Vidya sagar<sup>5</sup>  
<sup>1,2,3,4,5</sup> Dr.D Y PATIL COLLOEGE OF ENGINEERING, AMBI

**Abstract-** Road Traffic Accidents (RTAs) are the major cause of worry around the world as more than 1.2 million people die in road accidents each year. An additional of 20 to 50 millions is injured or permanently disabled . Moreover, in low-and middle income countries, the rate of Road Traffic Incidents is twice as high as in developed nations. Road Traffic Accidents (RTAs) had consumed about 140000 invaluable lives in India in the year 2011. An average there is one road accident every minute and as per the statistics there is one death on the Indian road every four minutes and this is expected to escalate to one death every three minutes by 2020, an alarming figure that is really hard to digest. This paper analyse the application of latest technologies on Road Safety Management in India. Road safety refers to measures and methods for reducing the risk of a person using the road network being killed or seriously injured. In this model We have studied how road accident gets affected due to road factors. Road factors generally refers to the Geometric features of the road(Horizontal radius,Vertical curve and super elevation), and the manmade features. Manmade features refers to the features made by man (Roadway obstacles, Adjacent structures which are present very nearer to the road and the posters present along the road).The questionnaires survey is done at last to justify our work.

## I. INTRODUCTION

### 1.1 General:

Vision Zero is the image of a future in which no one will be killed or serious injured. Vision Zero is also the basis for the work conducted on road safety in Sweden. This was ratified by Parliament, which has resulted in changes in road safety policy and the work approach taken. Vision Zero is both an attitude to life and a strategy for designing a safe road transport system. It establishes that the loss of human life in traffic is unacceptable.

Road safety in the spirit of Vision Zero means that roads, streets and vehicles must be much more adapted to human capacity and tolerance. The responsibility for safety is shared between those who design and those who use the road transport system.

Since Vision Zero was established in Sweden there have been fewer people killed on roads. The ideas behind Vision Zero have also made an international breakthrough.

Vision Zero emphasizes that the road transport system is an entity in which the different components such as roads, vehicles and road users must interact in order to ensure safety. Never before has there been this kind of overall perspective. Vision Zero alters the view on response- ability. Those who design the road transport system bear the ultimate responsibility for safety: road managers, vehicle manufacturers, road transport carriers, politicians, public employees, legislative authorities and the police. It is the responsibility of the individual person to abide by laws and regulations. Prior to this, practically all the responsibility had been put on the individual road user. Vision Zero is composed of several basic elements, each of which affects safety in road traffic. These concerns ethics, human capability and tolerance, responsibility, scientific facts and a realization that the different components in the road transport system interact and are interdependent.

### 1.2 BASED ON ETHICS

Vision Zero is based on the ethical standpoint that no one should be killed or seriously injured for life in road traffic. The only

Acceptable figure for the number of fatalities and serious injuries in traffic is zero. The moral basis of Vision Zero means that views on safety within the road transport system must correspond to safety values in society at large. For example, it is obvious that nobody should die through an accident at work or in connection with rail, sea or air travel.

### 1.3 MISTAKES SHOULD NOT BE PUNISHABLE BY DEATH

The road transport system is not adapted to the fact that people sometimes make mistakes. There is no perfect human being. In road traffic it is all too often a case of simple mistakes being punished by death. The work conducted on road safety in compliance with Vision Zero is based on doing everything to prevent road deaths or serious traffic injuries. While effort is being made to prevent accidents, the road transport system must be designed from the realisation that

people do make mistakes and that traffic accidents can therefore not be avoided completely. Vision Zero can accept that accidents occur, but not that they result in serious human injury.

#### 1.4 A SYSTEM WHERE EVERYTHING IS INTERRELATED

An accident that results in serious human injury means that the components in the road transport system were not functioning well together. Vision Zero emphasises the fact that all elements in the system are interrelated and affect one another. This system perspective has changed the direction of the work on road safety. It has pointed out the importance of harmonizing such things as the development and design of vehicles and road environments, and that this must be done on the basis of human limitations.

#### 1.5 THE SYSTEM DESIGNERS HAVE THE MAJOR RESPONSIBILITY

Since we can never escape the fact that human beings are not infallible, the road transport system must be designed so that any mistakes will not cause serious or fatal injury. This approach means shifting a major share of the safety responsibility from road users to those who design the road transport system. System designers primarily include road managers, the automotive industry, the police, politicians and legislative bodies. These are the ones responsible for providing a system that can deal with the mistakes that road users will undoubtedly be making. However, there are also many other players who have a responsibility for road safety: transport carriers, health services, the judicial system, schools and road safety organisations such as NTF (National Society for Road Safety). It is the responsibility of individual road users to abide by laws and regulations

## II. CASE STUDY

### 2.1 Wagholi

PMRDA plans extra lanes on Wagholi-Shikrapur road

PUNE: The Pune Metropolitan Regional Development Authority (PMRDA) and district administration are working on a plan to mitigate frequent traffic congestion on the stretch connecting Pune, Wagholi and Shikrapur. The plan involves the addition of a lane on each side of the road, two bypasses and improvement of crucial junctions.



Fig 1: PMRDA plans extra lanes on Wagholi-Shikrapur road

This stretch has increasingly witnessed traffic congestion on a daily basis for the last few years, due to an increase in daily travellers. As per official estimates, more than one lakh people travel daily on the Pune-Wagholi-Shikrapur-Ranjangaon-Ahmednagar stretch, in private as well as commercial vehicles and buses.

Traffic snarls in peak hours are commonplace, regular commuters said. “The entire road has gaps in many places and vehicles turn abruptly, leading to a pile-up,” said Vishal Ladkat, who travels to Ranjangaon regularly. Others blame roadside encroachments and a lack of additional lanes. The junctions earmarked for improvement are at Kesnand, Wagholi and Lonikand, while lanes will be added to the road between Wagholi and Shikrapur. Work on the two planned bypasses is expected to begin in the next six months and is estimated to cost Rs7.5 crore. As a long-term solution, the district administration and the state government have planned flyovers for a hurdle-free journey. Last year, the government approved Rs650 crore in this regard. Recently, the road was included under the Union government’s ‘Bharatmala’ project, under which Rs1,260 crore will be spent on road improvement. PMRDA officials said they are working on three proposals on a priority basis. “Provision of additional lanes on each side of the road at Wagholi and Shikrapur, improvement of junctions and construction of two bypasses are of top priority. These will be short term measures and can be executed without too many hurdles,” an official said.



Fig 2

2.2 Pune-Nagar road accidents:

Encroachments, lack of dividers are serious safety issues. The accident on July 2 that took lives of seven techies and injured seven others near Lonikand on Pune-Nagar

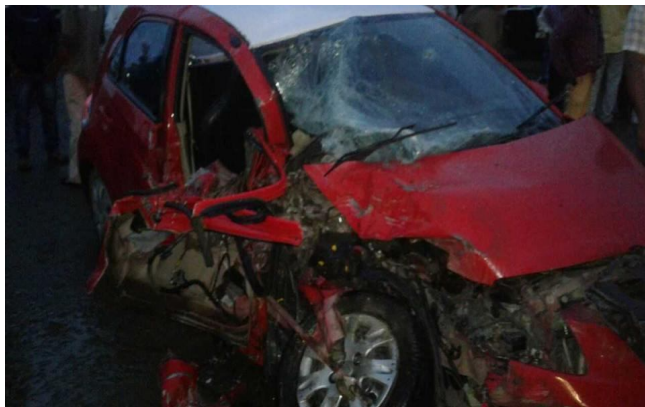


Fig 3

The steep inclination of the road at the accident spot has led to many accidents in the past, said a police official. (HT Photo) The Ahmednagar accident on July 2, that took lives of seven techies and injured seven others near Lonikand on Pune-Ahmednagar road has raised some serious concerns about road safety. Lonikand is 25-km away from Pune city. Daily huge number of people commutes from Tulapur, Lonikand, Koregaon-Bhima, Perane Fata, Theur and Bakori village to Pune city. Katkewadi chowk in Wagholi is also facing similar problems. Increasing number of two wheelers passing through the road dividers are also a serious concern.



Fig 4

2.3 Narhe

Third accident on same spot in past week, 3 killed. Sources said major construction work is underway on this patch of the road. In the third major accident on a patch of road on Pune-Bangalore highway bypass at Narhe in the past one week, three persons were killed and two injured on Thursday afternoon after a truck driver lost control of the vehicle and hit seven bikes and one tempo. The driver Ajitkumar Yadav has been arrested.

The accident took place when the container carrying heavy metal plates from Chennai to Wapi in Gujarat went out of control near Vadgaon bridge at 3.15 pm. Dayanand Shendkar (33) of Narhe, Sunny Odel (25) of Narayan Peth and Vijay Bhaskar Saravade (60) of Narhe were killed on the spot. The injured have been identified as Sandeep Lokhande (24) of Bibwewadi and Megharani Nikam (32) of Vishrantwadi. Dattawadi police said the truck was carrying metal plates weighing over 25 tonnes, which fell on the ground after the accident. Senior inspector S S Nimbalkar said, "The front tyre of the truck was found burst. We are trying to find out whether this caused the accident or it was the other way round." As the driver lost control, he allegedly rammed the truck into the divider, then went on to hit metal barricades, and seven bikes and a tempo. Three bikes were parked on the roadside. Nimbalkar said, "This is the third accident on the same patch of the bypass in the past one week. We believe this is happening because of some structural flaw. We will only be able to confirm the cause of the accident after we receive observations from the Regional Transport Officer."

Sources said major construction work is underway on this patch of the road. Around three months ago, Pune traffic police had conducted a detailed survey of the bypass, which has seen 110 deaths in the past three years. This patch of the road was identified as a major accident-prone spot and



suggestions of improvement were also sent to the National Highway Authority of India.



Fig 5

2.4 Cement tanker mows down techie , ploughs into sweets shop in Narhe PUNE: A 29-year-old woman software engineer was killed on the spot and two men suffered severe injuries on Friday afternoon after a cement-laden tanker ploughed into a sweets shop at Narhe under Navale Bridge.



Fig 6

The deceased software engineer, Swati Madhukar Orke, was having juice with her four colleagues sitting on the steps of Sirvi Bandhu Mithaiwale shop. Swati's peers had a narrow escape because they ran inside the shop noticing the speeding tanker hurtling towards them. "The woman was not lucky as her colleagues. While climbing up the steps she lost balance and fell. Before she could get up, she was trapped between the steps and the tanker," said an eyewitness of the accident.

The Pune fire brigade and Sinhgad Road police removed Swati, stuck under the tanker. "She was rushed to a nearby hospital, where the doctors declared her dead," said Vishnu Jagtap, senior inspector of the Sinhgad Road police. The injured persons, Sunil Balasaheb Salunke (41) and Sandip Santosh Patil (30), are being treated at a private hospital. Their condition was critical, Jagtap said. "The driver

of the tanker fled after the accident. Prima facie, failure of brakes could be the reason behind the accident," said the senior inspector. The crowd near the accident spot created problems for the traffic movement on Katraj-Dehu Road bypass. The police had a tough time in streamlining the traffic. Assistant commissioner of police (traffic) Prabhakar Dhamale told TOI that the accident occurred around 1.30pm. The tanker carrying cement was heading towards Chandani Chowk from Katraj. "While taking a left turn under the Navale Bridge, the driver must have realized that the vehicle's brakes were not functioning. The tanker was at speed because of the slope," he said.

Fig 7

Dhamale said after taking the left turn under the bridge, the tanker went straight towards the Vishwa Arcade, housing Sirvi Bandhu Mithaiwale shop, instead of turning to the right. "The tanker dashed a person, two vehicles and an eatery at the entrance of the arcade and stopped after almost ploughing into the shop," he said. Dinesh Panavkar, who runs a snacks stall in front of the sweet shop, said, "I was standing near my stall as I was about to have lunch. I was shocked to see the tanker coming towards our stalls in a high speed. When it dashed a person, I screamed and alerted people," he said. "I jumped on the steps and ran inside. The tanker crashed into the steps and stopped. I saw a woman having juice trapped between the steps of the shop and the tanker," he said. An owner of Sirvi Bandhu Mithaiwale shop said there were no customers inside when the accident occurred.



Fig 8: A car in which a man and woman crashed on the Forrest Highway is towed away from the scene (Forrest Highway crash still)

### III. RESULT AND DISCUSSION

#### 3.1 Solution on Case study :

PUNE RING ROAD (PMRDA, Pune connectivity hub)

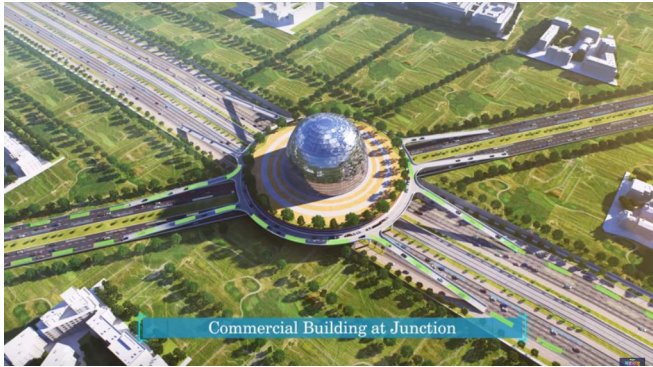


Fig 10: 3<sup>rd</sup> eye view of actual site

3.2 Revit model:

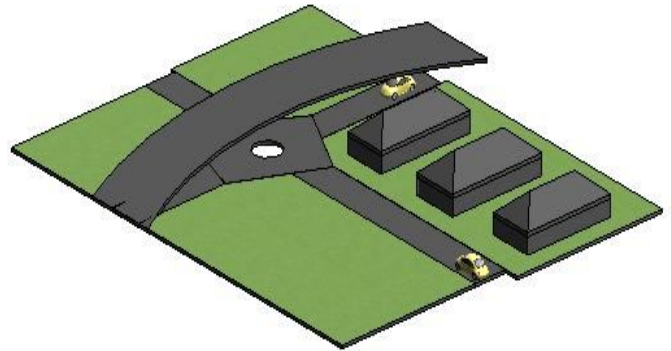


Fig 24 Revit Model

SITE DETAILS

- Name of site : PUNE RING ROAD (Pune connectivity hub)
- Location Of Site : Deccan, Pune
- A proposed site is taken for case study location is inDeccan,Pune.
- Design Team: PMRDA
- Builder :PMRDA,Mygov Maharashtra

PMRDA, Pune connectivity hub

Pune is a historic city and PimpriChinchwad Township, which was initially considered a satellite town, has gained importance as a twin city owing to rapid industrial growth and IT hubs. The population of Pune Metropolitan Region is ~73 lakhs as per the 2011 Census of India. The proposed Pune Ring Road, as notified in the year 1997, passes through the Pune Metropolitan Region connecting the above mentioned automobile, IT and educational hubs. The total length of the proposed Ring Road is 128.66 km with width of 110 metres. It will have 3 lanes as service roads on both sides for local traffic needs, 4 lanes of access control intercity road for through traffic on both sides and a 33.5 metre-wide Metro corridor for mass transit. Suitable space is kept for beautification and landscaping so that this Ring Road becomes a tourist destination by itself. It is proposed to execute 46 Town Planning Schemes along the Ring Road to ensure planned development of the areas adjoining the road. Truck terminus, developed marketplaces for agricultural products such as fruits, vegetables, flowers, fish and meat, multi-level car parking at all major highway junctions are also proposed. In short, the proposed Ring Road will not merely remain a transport project, but will be an infrastructure-driven development project for Pune Metropolitan Region.

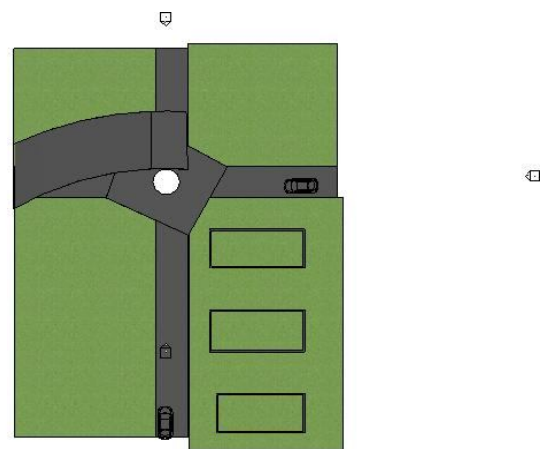


Fig 25 Top View Of Model

3.4 Ring road introduction:

A ring road (also known as beltline, beltway, circumferential (high)way, loop or orbital ) is a road or a series of connected roads encircling a town, city, or country. The most common purpose of a ring road is to assist in reducing traffic volumes in the urban centre, such as by offering an alternate route around the city for drivers who do not need to stop in the city core .he name "ring road" is used for the majority of metropolitan circumferential routes in the European Union, such as the Berliner Ring, the Brussels Ring, the Amsterdam Ring, the Boulevard Périphérique around Paris and the Leeds Inner and Outer ringroads. Australia, Pakistan and India also use the term ring road, as in Melbourne's Western Ring Road, Lahore's Lahore Ring Road and Hyderabad's Outer Ring Road. In Canada the term is the most commonly used, with "orbital" also used, but to a much lesser extent. In Europe, some ring roads, particularly those of motorway standard which are longer in length, are often known as "orbital motorways". Examples include the London Orbital (188 km) and Rome Orbital (68 km).





enlarged and professionalized. By war's end a diverse body of urban actors rallied behind redevelopment, housing construction and highway buildings. Planners, housing reformers, mayors, labor leaders, bankers, home builders, developers, and the heads of major universities, hospitals and other city institutions, seemed to agree with this three-part approach as the best way to rescue the city from decay and decline.<sup>2</sup> In order to carry out the postwar vision of urban renaissance, organizations positioned in the van of what political scientist John Mollenkopf labels the "pro-growth coalition" touted urban redevelopment, housing, and highway building as the solution for urban problems, especially for the deteriorating downtown economy.

##### 5. 'Link' and 'Place'

As a Link, a street provides a conduit for through movement; it forms an integral part of the whole urban street network and other, more specialised, urban transport networks (e.g. on-street light rail network, or cycle network). Link users may travel by a variety of modes, from private car or truck to bus, bicycle or on foot.

In contrast, as a Place, a street is a destination in its own right: a location where activities occur on or adjacent to the street. A Place user is someone wishing to make use of certain facilities that are provided on or alongside that particular street, and will usually access them on foot.

##### 6. smart glowing highway tech:



Fig 29 glowing highway

From the country that gave the world wooden shoes comes a much slicker way to travel: A Dutch design firm is creating a "smart highway" that glows in the dark, charges electric vehicles and displays weather and road conditions on its illuminated surface.

As eco-friendly as it is innovative, the first stretch of this experimental highway will be built in mid-2013 in the

Netherlands. Daan Roosegaarde, founder of design lab Studio Roosegaarde, expects the road to be "the Route 66 of the future," according to Popular Science.

The highway will feature lane dividers made from photoluminescent paint that recharges during daylight, then glows throughout the night. And temperature-sensitive paints on the roadway will display ice crystals in below-freezing weather to warn drivers of possible icy conditions, according to Wired.

Some of the designers' other ideas remain in the conceptual stage, however, and will be implemented over the next five years as more "smart highways" are constructed, according to Wired.

In one example of the roadway's innovations, the designers will save energy by creating lights that shine only when cars are on the road and switch off when there's no traffic, according to the Telegraph. Other electricity-saving ideas include roadside "pinwheel lights" that are powered by the wind created when a fast-moving car drives past them.

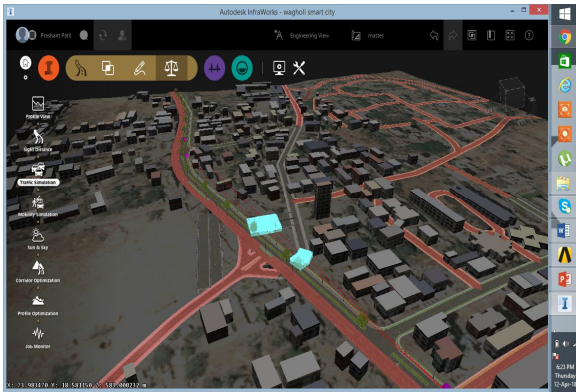
Perhaps the most futuristic concept devised by Studio Roosegaarde is the "induction priority lane," reserved exclusively for the use of electric cars. Magnetic fields under the road's surface would charge an electric car "the same as charging your electric toothbrush," Emina Sendjarevic of Studio Roosegaarde told Popular Science.

The road design, which has attracted inquiries from India, the United Kingdom and other countries, was born partly out of frustration with the slow pace of infrastructure improvements.

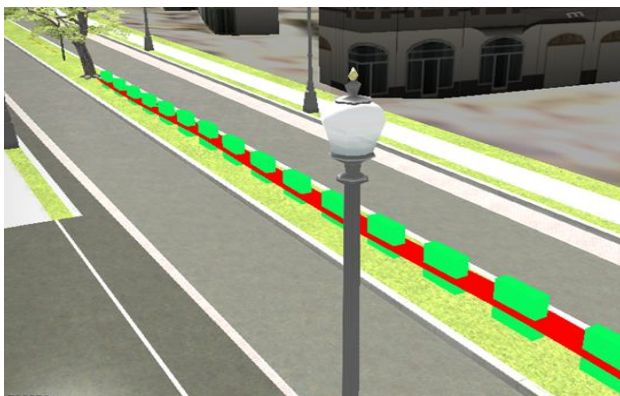
"Research on smart transportation systems and smart roads has existed for over 30 years," Sendjarevic told Wired, and designers "are not going to wait any longer for innovations to find their way through the political system, but will start building this highway now."

### III.SOLUTION FOR WAGOLI CASE SUDY

#### TRAFFIC SIMULATION IN INFRAWORKS 360

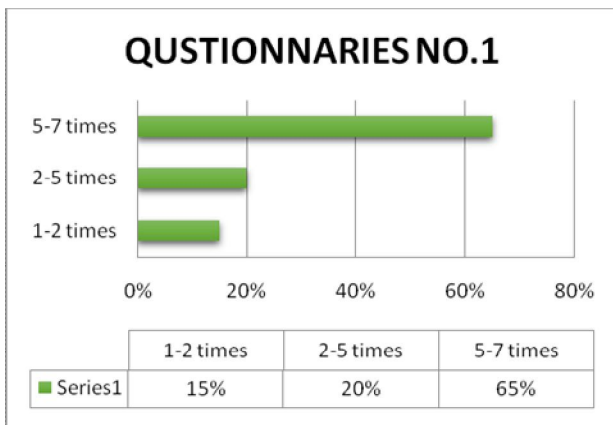


movable BARRIERS with 2+1 approach

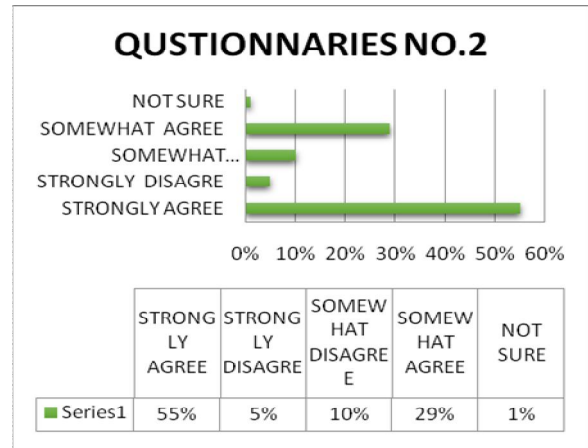


SEPRATE LANES TO AVOID WRONG SIDE ENTRY

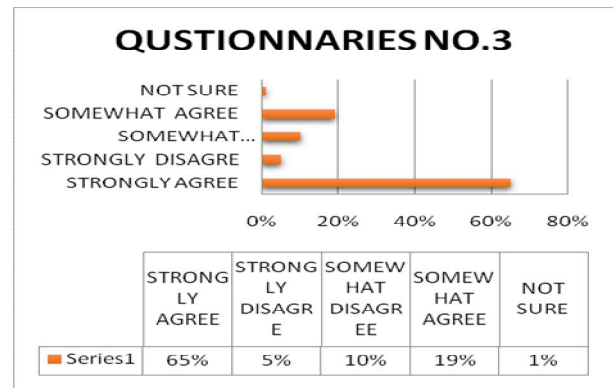
How many times you face traffic congestion in a week



Do you think different planning should be done region wise to avoid accidents?



Do you think our planning technique is effective?



#### IV. CONCLUSION

In our project we have study accidents pattern and also carry out accidents analysis of area Wagholi,Narhe at different period of time to provide best accidents solution to that areas. We also used infrawork 360 and naviswork for our project. Infrawork 360 use existing data to create the model of project by using infrawork 360 we can design the model and also make the visualized videos of structure.

The accidents studies shows most accidents occurs due to insufficient space and heavy accidents at peak time the solutions are given for different cases, for wagholi model ring road is proposed.

The work is justified by questinnaries survey conducted in particular area

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