BLACK SPOT STUDY

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ABSTRACT
India is one of the fastest developing nations in the world, thus resulting in more buying capacity for its citizens. There is explosion of vehicles on Indian highways which has surged by more than 400 percent from 2001 to 2013 i.e., in 12 years comparing it to National highways which merely has grown by 133 percent, thus resulting in congestion and increase of accident rates in India. Black spots are being declared throughout the country in countries own about 52 percent of the world's vehicle but they account for more than 88 percent of the world's road traffic fatalities. By this rate of growth, the fatal accidents are going to be the 5th largest cause of accident in the world by 2020. Pedestrians, Cyclist and Motorbikes together form around 57 percent of death rates happening on the roads of the world, out of which persons in the age group of 15 to 44 years account for more than 60 percent of world's total fatal accident rates. Literature Review has been carried out showing the scenario of accidents happening on different highways of India along with its causes and solutions.

Keywords: - Black Spots, Number of Accident, Present Condition.

INTRODUTION

The flow of people and products from one place to another is the essence of traffic. Every town or city's everyday activities depend heavily on traffic. We all commute utilising either private, public, or a combination of the two modes of transportation, including cars, buses, boats, and rail systems. Infrastructures related to city transportation are currently under stress. Future population growth and rising mobility needs will place an even greater pressure on existing systems and infrastructures. Cities may learn more about the current transportation system and traffic problems through Smarter Traffic. By gathering pertinent data, analysing it, and offering insight, this understanding is achieved. Cities can enhance their traffic flow and make smarter traffic a reality by using real-time data, the right tools, and technology.

The transportation system is essential in every society because it links people, goods, and services. Any city's economic activity and productivity are directly impacted by the efficient operation of this crucial system. Additionally, it affects the general level of living and life quality. Significant improvements in the transportation infrastructure and new forms of transportation have been achieved throughout history (for example, paved roads, railways, and freeway systems). Each development has brought about a time of increased economic activity. A city's ability to grow further is made possible by improved transportation networks, which also minimise the cost of transferring people, commodities, and services.
Using traffic artery capacity, lowering traffic emissions, and enhancing traffic safety are the goals of traffic management strategies.

Making increases in the following ways has always been a conventional strategy for addressing traffic issues:
1. Build new roads and bridges to expand the capacity of the underlying infrastructure.
2. Increase the number of transportation-related vehicles, like public buses and railways.
In existing cities, these strategies have obviously reached their limits. Cities need a new strategy to tackle these issues that makes the best use of the money already invested in infrastructure and promotes safer, cleaner, and more effective travel.
The following components make up traffic management: fleet and transport management, incident management, demand management, driver support and monitoring, and traffic information. It also needs accurate, current status data on the transportation system.
Pandharpur features an excessive number of crossroads and traffic lights. The issue of urban traffic is a significant aspect that influences the growth and limits the economic development of cities. Drivers may experience discomfort as a result of improper signal timing strategies, which can also result in higher emissions and fuel usage. There have been 1347 accidents in the past four years in Pandharpur. We therefore considered employing AutoCAD, a developed plan, and signal optimization to overcome this issue.

These changes can be made by improving the efficiency of traffic control by changing the timings of the traffic signals. This study focuses on identifying potential solutions for the problem at hand by optimising traffic signal timing simulations under oversaturated situations. Our culture places a great value on an effective road traffic system. Due to the continual growth in traffic on the roads, which causes congestion and lengthier travel times, many local authorities are faced with difficult circumstances. This is true despite efforts to lessen congestion, such as better traffic management, the implementation of road charge schemes, and encouraging the use of public transportation and other options. Congestion causes gasoline usage to rise and corresponding emissions to rise. The emissions detected in cities frequently exceed the permissible municipal, national, and especially at peak and European limits.

1.1 TYPES OF ACCIDENTS

Distracted Driving Accidents: -

The most commonly cited cause of vehicle accidents throughout the US is distracted driving. All drivers must pay attention to the road while operating their vehicles and refrain from any activities that diminish their ability to control their vehicle safely. Distracted driving can take many forms, including smoking, eating while driving, talking with passengers, and more, but the most commonly identified form of distracted driving in the US is cell phone use.

DUI Accidents: -

Driving under the influence (DUI) of alcohol or drugs is illegal and extremely dangerous for both the intoxicated driver and all others around them. In California, it is illegal to drive with a blood-alcohol concentration of .08% or higher or while under the influence of many different types of drugs. This includes both illicit drugs like cocaine and methamphetamine as well as prescription drugs that diminish driving ability, such as anti-anxiety drugs and barbiturates. Driving under the influence of alcohol or drugs can impair special awareness, slow down reaction time, and impair hand-eye coordination. Intoxicated drivers are also more easily distracted than sober drivers. Any driver who causes an accident from DUI is liable for victims' civil damages and will face criminal prosecution as well.

Accidents Caused by Speeding and Other Moving Violations: -

There are countless traffic signals and signs all over the roads of the US. These traffic indicators exist to help drivers anticipate the actions of other drivers. There are two main components to safe driving: physical ability to operate the vehicle safely and the ability to anticipate how other drivers around you will move based on nearby signs and signals. Unfortunately, some drivers do not heed posted traffic signs and commit moving violations. Speeding, failure to stop at red lights and stop signs, turning without using a turn signal, or improperly changing lanes are just a few examples of moving violations that can potentially cause devastating accidents.

Accidents Involving Trucks and Large Commercial Vehicles: -

Tractor-trailers, delivery trucks, and many other commercial vehicles are essential components of the American economy. These vehicles are also some of the largest on US roads, and when they cause accidents, the damage can be astronomical. The average tractor-trailer, when fully loaded with cargo, stands about 13 feet off the ground and can weigh as much as 80,000 pounds, making it significantly larger than even the largest passenger vehicles. Truck accidents can happen due to driver inattention, driver inexperience, mechanical problems, and simple negligence.

Motorcycle Accidents: -

Many people in California enjoy riding motorcycles. They are smaller, lighter, and more manoeuvrable than most passenger vehicles, but they afford virtually no physical protection to their riders and passengers when accidents occur. Motorcycles are also smaller and harder to see than passenger vehicles. All motorcyclists must remember that they have the same rights and responsibilities as all other drivers. This includes adhering to posted traffic signals, driving at reasonable speeds within posted speed limits, signalling for turns and lane changes, and refraining from driving under the influence.

Black Spot 1.2

An accident blackspot, sometimes known as a "black spot," is a location where there have historically been a lot of traffic accidents. Due to a variety of factors, such as: • Commissions and omissions in development projects, short segments of the road network are designated as "black spots," where accidents and fatalities occur often.

• Alterations to the ecology along the road.

• Variations in the area's growth scenario.

• Unauthorized constructions and unplanned developments, such as advertisements, close and on the highways. Buildings, statues, trees, shrubs, boards, poles, etc..

1.3 Reasons and Factors:

A. Vehicle design; B. Road environment; C. Road geometry
d. Alignment: The road's route is described as a collection of horizontal curves and tangents.
A vertical aspect with crest and sag curves called the profile.
f. Cross section—This shows the road's cross slope and banking information.

We shall proceed to comprehending the code recommendations in case of geometric design flaws after studying the causes and contributing factors of accidents. We are referring to IS codes IRC86:1983 and IRC99:1988. IRC62:1976 and IRC93:1985 IRC67:2010, IRC35:1997, IRC38:1988, and IRC73:1980. In light of this, we plan to investigate the factors that lead to accidents that occur within the jurisdiction of the Mysuru City Police Commission and offer solutions to lessen the frequency of collisions at places with a history of crashes, lessening the significant trauma and suffering experienced by crash victims, their loved ones, and friends.

METHODOLOGY AND DATA ANALYSIS

1.1

1. **To identify the blackspots.**
2. **To suggest preventive measure to avoid the Accident in the blackspot.**
3. **To suggest the appropriate design modification to avoid the Accidents.**
4. **To provide the various design approaches for the fluctuated population.**

To identify the blackspot:
Road accident "black spots" are areas that experience more collisions than other, comparable areas on the road system, or areas where the number and/or frequency of collisions exceeds a predetermined minimum. Black patches can be bridges, lengthy stretches of road, or very brief parts of road with elements like them. In order to develop a systematic and logical basis for recognising any need for safety changes involving the building, operation, or maintenance of road facilities, accident black spots must be identified. This essay reviews numerous accident black spot identification approaches and suggests suitable actions in a variety of situations.

To suggest preventive measure to avoid the incident in the blackspot:

An accident blackspot is a location where crashes happen frequently due to a number of factors, such as sharp drops or corners that conceal oncoming traffic, hidden junctions on fast roads, the lack of traffic lights, subpar or obfuscated warning signs at crossroads, high-speed merging traffic, and others.

To suggest the appropriate design modification to avoid the incidents:

After thorough study of black spots in the selected region, we will provide proactive design to the concerned department. This will help to avoid the accidents in future**.**

To provide the various design approaches for the fluctuated population:

Pandharpur is the pilgrimage place where, pilgrims use to visit very randomly with very high flow and hence transportation density is very high. This is one of the causes for major accidents in the region. We will collect the data from the concerned department regarding the rate of fluctuation of people and accordingly we will suggest the preventive measures.

1.2 Accident Record of Pandharpur City:

Following data are the accident data of Pandharpur city collected from R.T.O office,Pandharpur.

April2021-March 2022

Month	**Two-wheeler**	**Light weight vehicle**	**Heavy weight vehicle**	**Bus**	**Other vehicle**	**Total**
April	8	6	5	1	3	23
May	5	9	9	1	4	28
June	12	9	10	3	1	35
July	5	4	4	1	2	16
August	8	8	6	6	6	34
September	10	5	9	4	2	21
October	15	6	2	2	10	35
November	20	6	7	1	8	42
December	11	3	5	1	3	23
January	15	12	7	5	6	45
February	6	13	9	1	3	32
March	10	8	8	3	6	35
Total	**125**	**89**	**81**	**29**	**54**	**369**

Table No.01Accident Record for April2021-March 2022
Table

No.02Accident Record for April2021-March 2022

Month	**Two wheeler**	**Light weight vehicle**	**Heavy weight vehicle**	**Bus**	**Another vehicle**	**Total**
April	6	6	4	9	4	29
May	10	7	7	3	2	29
June	12	10	10	4	5	41
July	6	2	6	5	10	31
August	5	5	4	4	6	24
September	6	6	2	3	1	18
October	9	8	4	2	4	27
November	7	10	5	8	3	32
December	11	8	6	3	5	33
January	16	6	4	6	4	36
February	14	5	5	2	2	28
March	10	10	3	7	6	36
Total	**112**	**83**	**60**	**56**	**52**	**364**

Table No.03Accident Record for April2021-March 2022

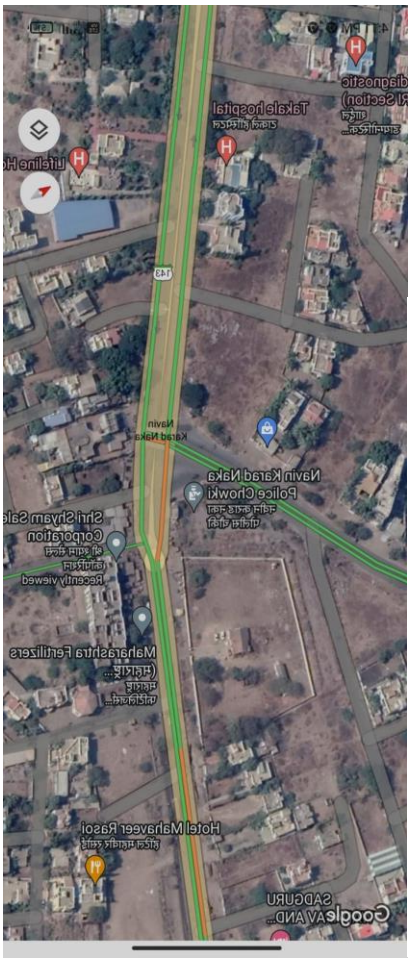
2.3Field Data: -

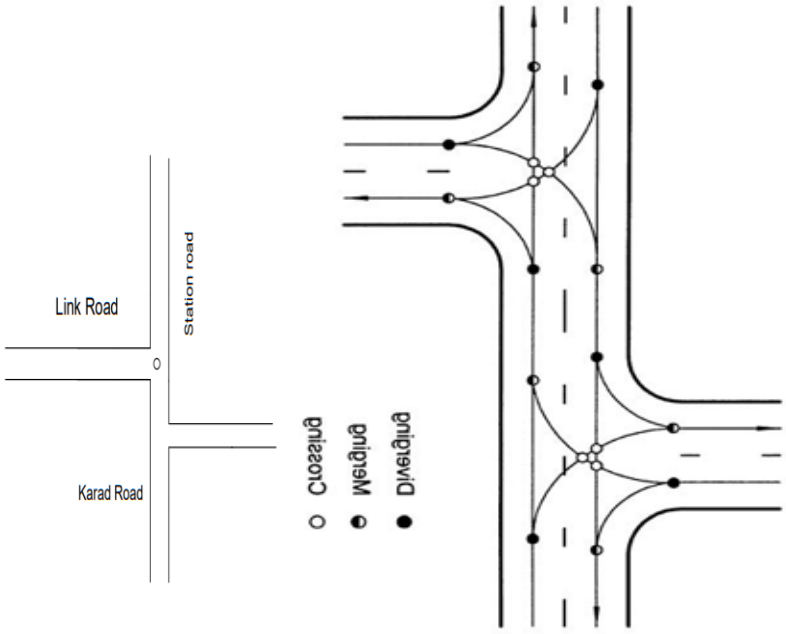
2.3.1 Field Data Sheet for Traffic Census

Date & day of the week-25/02/2022 -Monday Road classification-MDR
Direction of traffic - Left to right Route -Thakare chowk

Type of vehicle / Hours Of Count (1)	2-Wheeler (2)	3-Wheeler (3)	4-Wheeler (4)	Cycles (5)	Remarks, Including Vehicle Condition (6)
From-9.00 am To-10.00 am	1069	264	153	26	
Hourly total	1069	264	153	26	

Table no. 04Field Data Sheet for Traffic Census for Thakare Chowk



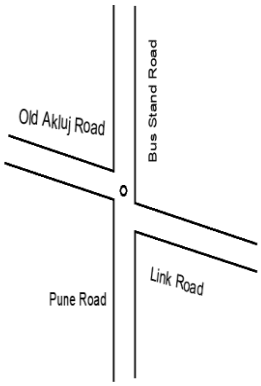


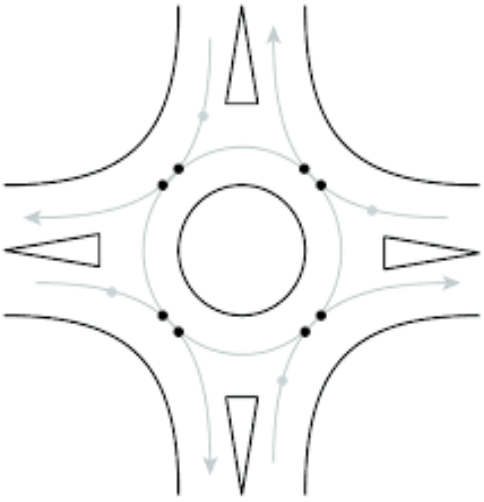
2.3.2 Field Data Sheet for Traffic Census

Date & day of the week-26/02/2022 -Tuesday Road classification-MDR
Direction of traffic - Left Route. -KBP chowk District- Pandharpur,
State-Maharashtra
From-9.00 AM To 10.00 AM

Type of Vehicle / Hours Of Count (1)	2-Wheeler (2)	3-Wheeler (3)	4-Wheeler (4)	Cycles (5)	Remarks, Including Vehicle Condition (6)
From-9.00a.m. To-10.00a.m.	1092	463	307	76	
Hourly total	1092	463	307	76	

Table.05Field Data Sheet for Traffic Census for KBP Chowk



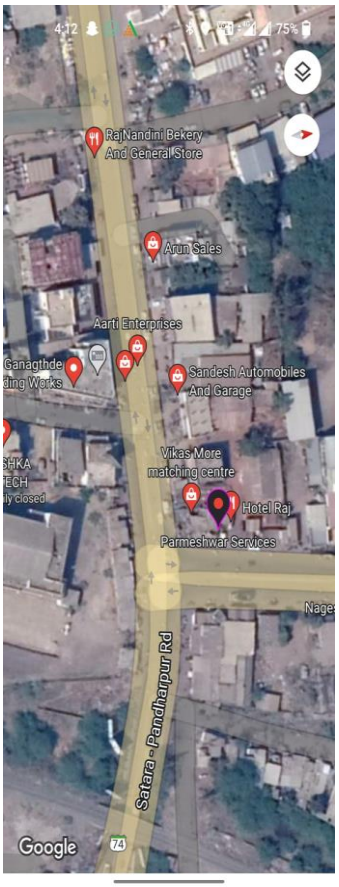


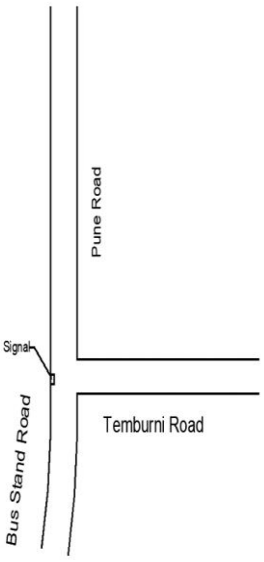
2.3.3 Field Data Sheet for Traffic Census

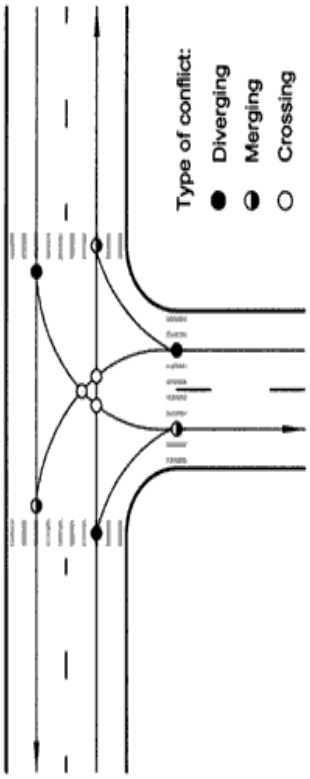
Date & day of the week-05/03/2022 –Tuesday Road classification-MDR
Direction of traffic- Left Route. -Sargam chowk
District- Pandharpur, State-Maharashtra
From-9.00 AM To 10.00 AM

Type of Vehicle / Hours Of Count (1)	2-Wheeler (2)	3-Wheeler (3)	4-Wheeler (4)	Cycles (5)	Remarks, Including Vehicle Condition (6)
From-9 a.m. To-10 Am	750	352	145	50	
Hourly total	750	352	145	50	

Table.06 Field Data Sheet for Traffic Census for Sargam chowk





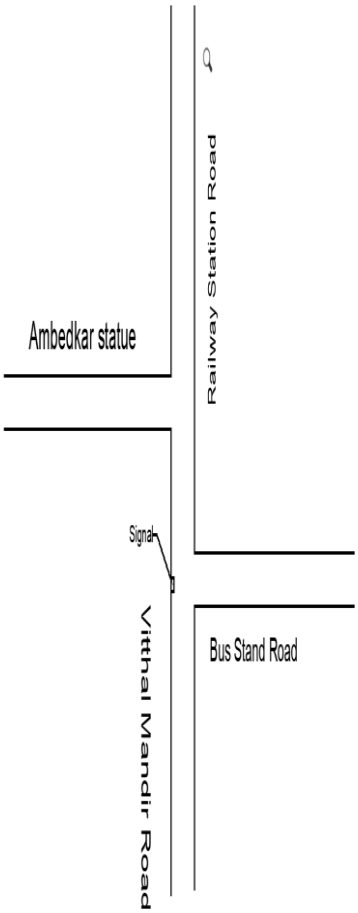


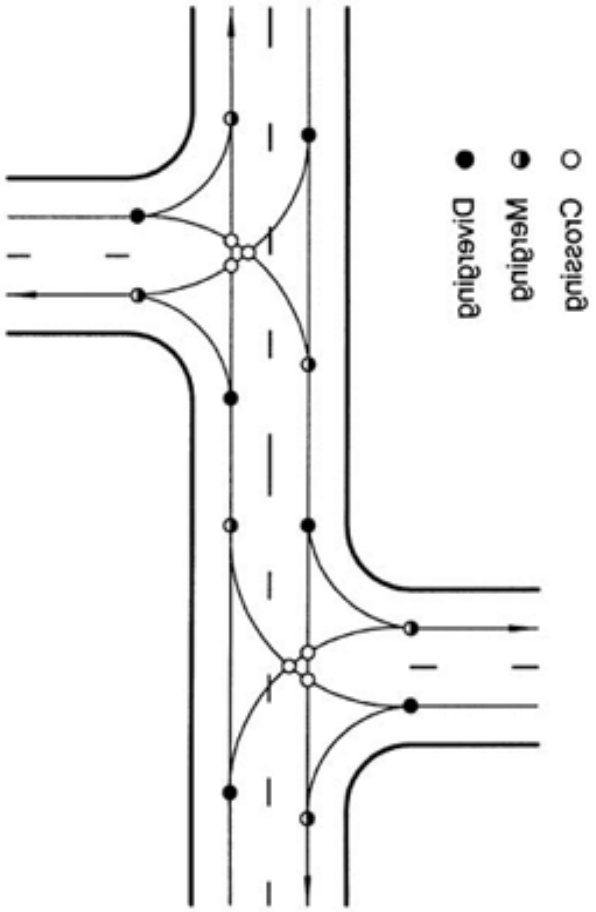
2.3.4 Field Data Sheet for Traffic Census

Date & day of the week-11/3/2022 -MondayRoad classification-MDR
Direction of traffic- Left Route -Sarachek District- Pandharpur, State: -Maharashtra From-9.00 AM To 10.00 AM

Type of Vehicle / Hours Of Count (1)	2-Wheeler (2)	3-Wheeler (3)	4-Wheeler (4)	Cycles (5)	Remarks, Including Vehicle Condition (6)
From-9.00 a.m. To-10.00 a.m.	956	169	432	16	
Hourly total	956	169	432	16	

Table.07 Field Data Sheet for Traffic Census for Swarkar chowk





CONCLUSION: -

Following major Causes of Accidents are being identified by various researchers i.e.

01. Non-existence of pedestrian and cyclist paths along the road.
02. Absence of essential road furniture like lane marking, hazardous lights, warning sign boards, delineators on valleyside, zebra crossing, speed breakers.
03. Absence of service lane in the built-up areas.
04. Substandard road geometrics like absence of shoulders, improper design of horizontal and vertical curves.
05.Drivers not following the traffic rules.
06. Overspending.

Remedial Measures Suggested:

01.Use of ITS i.e., Intelligent transportation system e.g.at every 800 meters a digital board should be installed along withspeed camera, alternative routes should be provided.
02.Making and enforcing the strict laws against drunken driving, over speeding, using mobile phone while driving,breaking the traffic rules.

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