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A Review Study on Decongestion of Hebbal and Devenahalli Road, Bangalore, Karnataka

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ABSTRACT

Roads are the backbone of any nation, serving as a gauge for its level of economic development. Because of this, transportation is extremely important in emerging nations like India. Accidents can happen accidentally and even at random, but they typically happen around certain dangerous areas known as "black spots." In transportation lingo, the region encompassing these dark regions is referred to as a "black area." At this level, the investigation may be constrained to certain districts, taluks, or blocks. Based on this argument and the current number of road fatalities, Bangalore should be renamed "BLACK CITY" to highlight its inadequate safety infrastructure. Improvement and decongestion measures on NH-7 stretch between Hebbal & Devanahalli Road, Bangalore, Karnataka is 80 km. Population growth, vehicle population, finding the Black spots, data collected from different police stations etc.

KEYWORDS-Traffic, Black Spots, Accidents, Population, WSI

I.INTRODUCTION

Roads are the backbone of any nation, serving as a gauge for its level of economic development. Because of this, transportation is extremely important in emerging nations like India. The nation is more prosperous when its roads are longer. However, these improvements to the roads are increasing the number of vehicles on the road, which is leading to more accidents and traffic jams. Up to 140,000 people are hurt on the world's highways each day. Over 3000 people pass away, and 15,000 are permanently disabled. Currently, our nation's traffic growth is revolutionised. This directly causes traffic to grow and accident rates to rise, especially in urban intersections and major cities like Mumbai, Kolkata, Bangalore, Pune, Hyderabad, and Chennai, among others. As a result, society bears a heavy cost in terms of fatalities, injuries, lost productivity, fuel consumption, delays, discomfort,

and property damage. Therefore, it is now crucial to analyse and analyse traffic incidents in order to come up with ways to lower the accident rate. However, determining the efficacy of certain intersection modifications designed to lower accident frequency is exceedingly complex & challenging.

Every community suffers from the most pervasive myth, with Bangalore serving as the poster child. Accidents can happen accidentally and even at random, but they typically happen around certain dangerous areas known as "black spots." In transportation lingo, the region encompassing these dark regions is referred to as a "black area." At this level, the investigation may be constrained to certain districts, taluks, or blocks. Based on this argument and the current number of road fatalities, Bangalore should be renamed "BLACK CITY" to highlight its inadequate safety infrastructure. Bangalore is one ofthe cities with high annual traffic growth rates, which causes severe traffic congestion and unreliable traffic flow on Bangalore roads, both of which ultimately contribute to an increase in conflict spots, accidents, and a decline in service quality [1].

POPULATION GROWTH

Bangalore (Bengaluru) is Karnataka's capital & largest city. With a metro population of over 8 million & total population of about 11 million, it is the third most populous city & fifth most populous urban agglomeration in India. Bangalore has an urban area of 709 square kilometers& 8.4 million people, according to the 2011 census [2]. The population is anticipated to reach 12 million in 2020 & 12.7 million (1.27 Crore) in 2021. According to the 2001 census, the rising employment opportunities in the IT sector are the reason Bangalore, UA, received 0.3 million in-migrants from other states. 4,01,932 people from within the state, 3,53,156 people from other Indian states, and 6,397 people from other countries. Bangalore had a population of

8,443,675 in 2011, according to preliminary Census India figures, with4,391,723menand4,051,952women. Bangalore has an urban/metropolitan population of 8,520,435 persons, 4,433,855 of whom are men & 4,086,580 of whom are women, despite having a city population of 8,443,675.

VEHICULAR POPULATION

The overall number of registered motor vehicles (transport and non-transport) climbed to 296 million in 2018–19, registering a CAGR of 9.91 percent, according to the most recent MPRTH Annual Report 2021–22. While 8.8% of all registered cars fall under the category of "Transport" vehicles, the remaining 91.2% are Non Transport cars. The majority of registered vehicles (74.8%) are two-wheelers, indicating a preference for individualized modesoftransportation.Comparingcountries internationally demonstrates that whereas poor countriestendtohavehigher two-wheelerpenetration, wealthier countries tend to have higher car penetration ratios. As per the information released by the Karnataka state transport department, the total number of cars registered in Bengaluru as of January 2021 has nearly topped 10 million, despite the epidemic & lockdown. 6.4 million Of these are two-wheelers, while 2.3 million are personal vehicles. Bengaluru increased the number of automobiles by about 1.1 million in 2020–21, more than doubling the annual average of roughly 600,000 since 2018. Both intracity & interstate transportation alternatives are available in Bangalore, including BMTC buses, Namma Metro rail services, taxis, and autorickshaws. The government-run KSRTC, NWKRTC, & KKRTC also operate buses.

MOTORIZATION OF BANGALORE

Bangalore has rapidly transformed from a "Garden City" to a "Black City" in recent years. Bangalore's population has more than doubled in the last two decades [3]. The rising demand for basic & service occupations brought on by the thriving software, biotech, & industrial sectors has led to an alarming rise in urban sprawl. A combination of rising living standards and inadequate public transportation has caused the number of private autos to skyrocket. Accidents are a direct effect of the government's supply-intensive policies and such a high car growth rate. The author's motorization index, which estimates that almost every third person has a private vehicle, best captures the high intensity of vehicular growth (vehicles per 1000 people). Within a decade, the motorization index nearly doubled. This assessment is quite cautious since it ignores the substantial movement ofpeopleandtheir automobiles from other regions of the state to Bangalore. Simple area analysis might reveal the high intensity of the development in the number of vehicles. Karnataka State covers 1,91,791 square kms, while Bangalore's built area, according to updated estimates, is 1,000 square kms, or 0.29 percent of the state's total size. Nearly 39–40% of the cars registered in the state of Karnataka are from Bangalore. 4.8% of Karnataka's entire road length is taken up by this enormous number of automobiles. Due to the availability of such a large number of vehicles, individual spaces are violated, which increases the risk of accidents. Bangalore has a total area of 1,000 square kilometers, 4,500 kilometers of roads,40,000intersections,330 signalized intersections, and 600 manned intersections.

ACCIDENT- Accidents, sometimes known as unintentional injuries, are unwelcome, incidental, and unexpected events that could have been avoided had the factors that led to them been identified and addressed in advance of the accident.

Types of road accidents: An accident on the road is defined as any occurrence that occurred on a public road, whether it was the initial or final location of the incident.

1.Fatal Accident

2.Non-Fatal Accident

- Minor injury
- Major injury

Road Accidents in India: According to the statistics on road accidents in India for the calendar year 2019, there were 4,49,002 road accidents overall, resulting in4,51,361injuriesand 1,51113 fatalities nationwide. The trends in the number of traffic accidents, injuries, and fatalities for the years 2005 to 2017 are shown in Appendix 13. In 2019, there were 3.86 percent fewer traffic accidents, 0.20 percent fewer fatalities, and 3.85 percent less injuries than there were in 2018. However, the number of fatalities per 100 incidents, a measure of accident severity, increased from 32.4 in 2018 to 33.7 in 2019. The youth of the age range 18 to 60 made up 84.3 percent (1,38,518) of the road accident victims for the calendar year 2019 [4]. The majority of fatalities from road accidents in 2019 were caused by two-wheelers (37%) followed by cars, taxis, vans, and other light-duty vehicles (16%), pedestrians (17%), trucks/lorries (9%), buses (4%), auto rickshaws (4%), and other motor vehicles (7%). Overspeeding, which accounted for a share of 71.1 percent in road accidents and 67.3 percent of traffic law violations, is the single most significant cause of road accidents.

Fig.1: Accident Statistics – Fatal Accident

Table 1: Accident Statistics

ACCIDENT STATISTICS					
YEAR	Fatal	Killed	Non-Fatal	Injured	Total
2011	727	757	5297	4976	6024
2012	740	760	4767	4471	5502
2013	737	771	4493	4289	5230
2014	711	737	4293	4096	5004
2015	714	740	4114	4047	4828
2016	754	793	6752	4193	7506
2017	609	642	4455	4256	5064
2018	661	684	3950	4133	4611
2019	744	766	3944	4253	4688
2020	622	647	2,614	2,760	3,236
2021(Nov)	555 /td>	587	2369	2577	2924

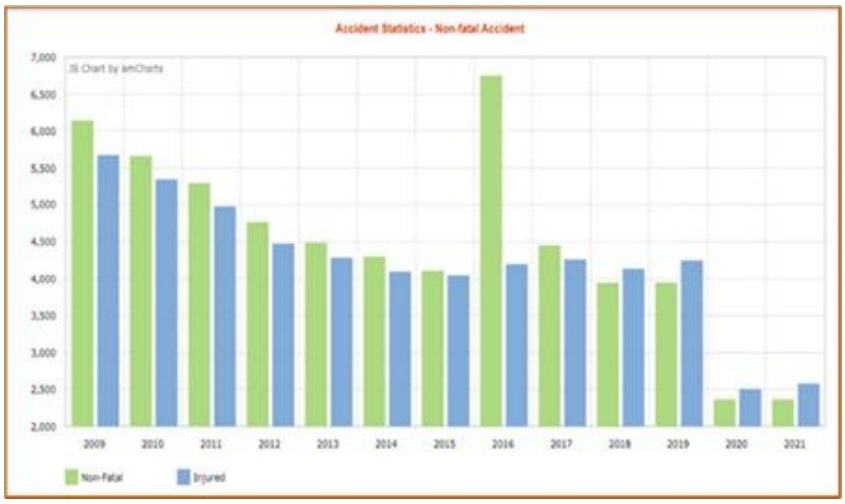

Fig.2: Accident Statistics – Non-fatal Accident

CAUSES OF ACCIDENTS

There are four primary factors that can lead to a traffic collision:

i.The road users

ii.The vehicles

iii.The road and its condition,

iv.Environment factors- traffic, weather etc.

The driver of one or more of the involved vehicles, pedestrians, or passengers could all be held accountable as the negligent road user. The vehicles that were in the collision can also have flaws. Accidents may occur because the state of the road surface, other geometric elements already present, or environmental conditions along the route are not as expected. In conclusion, a variety of factors may combine to create an accident, rather than usually just one specific factor. Consequently, it is usually not possible to pin down a single root reason for an occurrence [6].

BLACK SPOT

When two or more vehicles collide, it is almost invariably the result of one or more drivers' inability to properly respond to changing road conditions.

It was a terrible accident a "black spot" is an area where there has been a high number of accidents in the past.

A black patch is defined as a place or region with inherent problems. In terms of road safety, a "black spot" refers to a location along the road where accidents and other forms of traffic disruption tend to cluster.

Definition of Road Accident Blackspot on NationalHighways: Highway Accident The term "black spot" refers to a 500-meter stretch of a national highway where either five or ten fatalities occurred in the last three calendar years, depending on how the last three years were combined, in road accidents involving fatalities or serious injuries [6]..

A "black spot," or accident black spot, is an area where there has been a high number of accidents in the past [3]. Many factors could have contributed to the accident, such as inadequate or concealed warning signs at a crossroads, a secret junction on a busy route, or a sharp turn or drop in an otherwise straight section of road that conceals oncoming traffic [4].

BLACKSPOT TREATMENT PROCESS

Black spot improvement programs involve long-term (often 3–5 years) spatial analysis of traffic accidents. Clusters of accidents on a stretch of road are an indicator that something is wrong with that section of road. Identifying such issues is critical if the high crash rate is due to glaring design problems in the roadway [5]. Then, appropriate corrective actions should be developed and implemented to address the flaws in order to lessen the frequency of car accidents and the number of fatalities on the designated road stretch. Particular "Black spots" can often be remedied by engineering methods, and the organization responsible for maintaining the road should make this a top priority [7]. There are five basic stages that make up the important stages of investigating and correcting black spots:

- Crash data analysis & identification of potential "black spot" locations;
- Ranking of potential locations based on crash severity at "black spots";
- Analysis of accident data for each site, identification ofrootcauses,and prioritization of corrective measures;
- The precise planning and execution of suggested therapies; and
- Monitoring and evaluation.

II.CONCLUSIONS

Black spot research can reveal the locations along a road where accidents are more common, which can then be used to improve safety measures. A black patch is an area of the road where accidents are common. When ordering the places where accidents had occurred, the WSI method was utilized. The top-rated options were chosen, and several alternate approaches to enhancing the transportation system were proposed. Roadside clearance,

adequate maintenance of shoulders, illumination, and junction enhancement-meant can all help lower the accident rate. Putting speed bumps in strategic locations around potential collision zones is a good idea. There should be no obstacles in the line of sight to the neighboring curves.

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