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A Review on Improvement of Road Accident Black spots Using Weighted Severity Index (WSI) on the Stretch of NH-48 (Kadodara-Kosamba)

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ABSTRACT: This research paper is about the development of sustainable transport systems heavily depends on traffic safety. Accident-related injuries and fatalities are a drawback of contemporary road transport systems. In India, the number of traffic accidents is steadily rising. Along with causing property damage, it also results in road user fatalities. Black patches are areas of a road where accidents frequently occur or which car accidents cause fatal injuries. As a result, one of the best methods for preventing traffic accidents is the identification and investigation of "black spots" for accidents. Using the Weighted Severity Index Method, this article seeks to pinpoint the accident-prone areas along the Kadodara to Kosamba Stretch of NH-48. The three most recent years' road accident data—2019, 2020 and 2021 were used for this purpose.

KEYWORDS: Weighted Severity Index, Black Spot, Traffic crashes, Transportation.

1. INTRODUCTION

In this paperThe country's economic backbone, highways frequently supported development along their itineraries. Corrective actions have been implemented globally after being made aware of the severity of the problem. The National Road Safety Council (NRSC), which oversees all aspects of road safety in India, has urged all States and Union Territories to establish State Road Safety Councils and District Road Safety Committees.hold their meetings, reduce the risk of traffic accidents, and emphasise road safety..

Although aBlack spots are areas where several incidents happen frequently. Road users, cars, road conditions, road geometry, environmental factors, etc., are the essential components in traffic accidents. Road features including road width, a lack of super elevation, a lack of site distance, the radius of a horizontal curve, etc. are the primary causes of traffic accidents. utilised severity index approach

to locate the hotspots. According to this procedure, a severity value is calculated for each collision site based on the number of fatalities, seriously injured individuals, minor injury recipients, etc. As a result, the definition of Weighted Severity Index (WSI) is a dimensionless value that indicates how dangerous a certain location on the road .

2. PROPOSED METHODOLOGY

The following are some of the several techniques used for black spot analysis.
The methodology utilised mostly entails gathering existing data from police stations, conducting an experimental inquiry on the highways, and analysing existing data.

- Existing Data Collection
- Experimental Investigation
- Analysis of Existing Data

3. Weighted Severity Index

- Based on the quantity and seriousness of accidents at that specific area, scores are assigned.
- Accident severity is divided into three categories: fatal (K), grave injuries (GI), and minor injuries (MI).
- WSI is calculated by formula, WSI = (41 x K) + (4 x GI) + (1 x MI)
- Accident black spots are places with WSI values greater than or equal to 41, and they should be taken into account when designing new spaces.
- criteria for selecting the WSI limit The WSI formula gives a fatal accident 10.02 times more weight than a severe accident (4 41), and it also gives a unit coefficient to minor accidents. (1 << 41). More data

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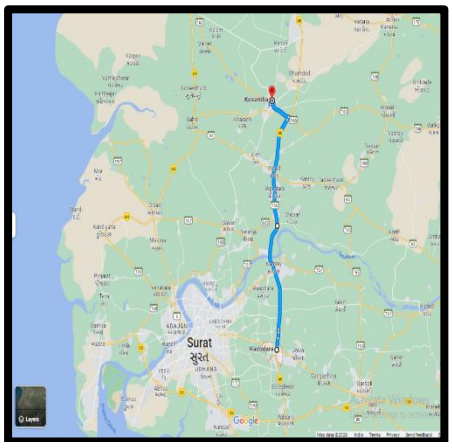
is necessary for grievous and minor accidents to be comparable with fatal accidents when calculating WSI, hence in this particular research, the WSI limit is chosen as 41, or the K coefficient.

4. PRACTICAL WORK

Study Area:

Selected stretch is located in India's Gujarat state, in the city of Surat. The location of the study area is shown in the chart below.The stretch of NH-48 (Kadodara - Kosamba portion) in Surat city has been chosen for the study. After gathering accident data from the police station, the length of land chosen for the study was chosen.



Data collection:

Information on recent traffic accidents (from 2019 to 2021) gathered from local police files. The locations with the highest accident rates were found. The information gathered from the police stations is as follows: Accident specifics.

LOCATION	2019			2020			2021		
	DEATH	SI	MI	DEATH	SI	MI	DEATH	SI	MI
Palsana	5	1	1	5	1	0	7	0	4
Palod	5	5	2	4	2	7	7	0	2
Kosamba	0	2	1	1	1	4	7	1	2
Dhamroad	3	0	2	7	0	1	6	0	1
Neelam hotel	0	0	0	2	0	2	1	0	4
Dhoranparadi	8	1	2	5	1	4	3	3	1
Navi paradi	6	2	2	2	0	3	7	0	2
Umbhel	6	3	0	1	0	0	2	1	1
Kholwad	5	1	1	3	0	2	1	2	5
Udyoug nagar	2	1	0	1	1	1	1	2	1
Vav gam	6	2	0	8	0	3	4	0	1
Motabor	4	3	2	0	2	4	3	3	5
Masama	1	0	1	1	3	1	2	1	1

5. CALCULATIONS

Using Weighted Severity Index (WSI);

Place of Accident	Weighted Severity Index
Neelam hotel	217
Dhamroad	232
Kholwad	241
Choryasi	241
Pipodara	259
Dhamdod	259
Umbhel	264
Kosamba flyover	279
Vav gam	280

Dhoran pardi	340
Navi pardi	344
Palod	366

6. Ranking of black spot

For each location, the equation applied and calculated. After obtaining those severity values, the Blackspots were ranked according to these values. The places are arranged in ascending order of the severity value.

Place	Rank
Palod	1
Navi pardi	2
Dhoran pardi	3
Vav gam	4
Kosamba flyover	5
Umbhel	6
Dhamdod	7
Pipodara	8
Kholwad	9
Choryasi	10
Dhamroad	11
Neelam hotel	12

CONCLUSION

The study was an attempt to find out the black spots in Hyderabad area. To rank the accidents spots or locations, the Weighted Severity Index (ASI) method is used. This method found to be effective in identifying the black spots. As the result given in mapformat, it is easy to interpret result. Based on the analysis, Rethibowli signal was identified as most vulnerable accident prone areaand Road Site safety analysis was conducted at all the hotspots to know the condition of the road. Road Safety analysis is used tofind out factors influencing crashes and hence to give remedial measures..

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