

Black Spot Determination For NH-169 Between Mijar And Mangalore

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Abstract- Accidental studies is a term used in Road safety management to determine rate of traffic, amount of traffic, and also previous accidental data collection and calculation. The present work intended in Accidental studies between Mijar and Mangalore by collecting past four years data from commissioner office mangalore. The past four year data regarding accidents occurred between mijar and mangalore is analysed to find the major cause for accidents by through study of FIR copies and the data are collected depending upon that locations. The keen observation of trend in accident growth rate from past to future using curve fitting technique .The curve fitting technique is used to monitor the growth rate of accidents. The traffic details are collected by conducting traffic detail survey between mijar and mangalore NH road .The traffic volume and traffic density area studied to analyse the reasons for accident severity at prone areas due to heavy traffic movements.The present project work deals with determination of black spot and analysis of various accidental data and prioritizing the causes for the occurrence of accidents between mijar and mangalore .And mitigating measures are proposed to reduce and resolve number of accidents between mijar and mangalore .

Keywords- Accidental Data, Black Spots, Traffic Volume Count ,Visual Survey, Remedial Measures.

I. INTRODUCTION

Transport is responsible for the development of civilizations from ancient times by meeting people's travel requirements and goods transportation requirements. National highways form the country's economic backbone and have frequently facilitated development along their routes.

1.1 BLACK SPOT

There is no universal definition of accident locations on roads, commonly termed Black spots, which means that the definition of Black spot is open to much speculation. The traditional definition considered that the Black spot as a place where a high number of accidents are found or the locations where the accidents are occurring more frequently had to be

identified and were marked as the Black spots. It may have occurred for a variety of reasons, such as a sharp drop or corner in a straight road, so oncoming traffic is concealed, a hidden junction on a fast road, poor or concealed warning signs at cross-roads.

According to The Bureau of Transport and Regional Economics of Australia (2001) locations are in general classified as black spots after an assessment of the level of risk and the likelihood of a crash occurring at each location. At certain sites, the level of risk will be higher than the general level of risk in surrounding areas. Crashes will tend to be concentrated at these relatively high-risk locations. Locations that have an abnormally high number of crashes are described as crash concentrated, high hazard, hazardous, black spot sites. Sites with potentially hazardous features are sometimes described as grey spots. In general, the number of crashes is affected by four factors i.e. the road condition, condition of vehicles, skills, concentration and physical state of road users and environmental condition are also causes for the road accidents.

II. IDENTIFICATION OF BLACK SPOTS

Accident data for Mijar to Mangalore is obtained from Mangalore city Commissioner Office and chart prepared for the same is shown in Chart-1. Black spot locations are identified based on the accident data collected from Commissioner Office and general interviewing with local people. From the accident data it was found that the road stretch between Mijar to Mangalore is an accident prone area as it contains a many blackspots.

The data was incorporated into MS excel and the trends of accident growth are obtained from the same which revealed the importance of accident study in the identified black spots. Also forecasting of the collected data was done in order to know the future predictions.

The following tables show the accident scenario of Mangalore city. total no. of accidents in the year 2016 is 51 while in 2018 it has been increased to 66 which is increasing

in no, of accidents in 2018. The death rate caused in the accidents itself shows the severity of accidents in the city. From the below it can be observed that the death rate has been increased from the year 2016 to 2019. The trends in accidents can be well understood by referring to the charts shown below.

Table2.1 : Accident rate in Mangalore city

YEAR	NO. OF ACCIDENTS	FATAL	NON-FATAL
2016	51	11	40
2017	65	9	56
2018	66	6	60
2019	10	1	9

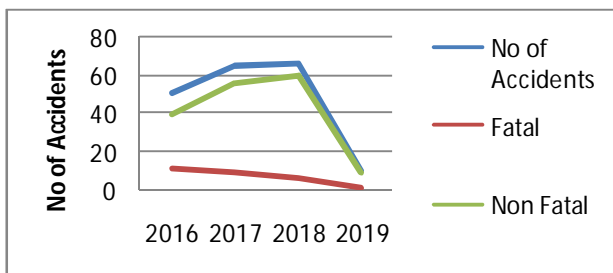


Chart 2.1: Severity of accidents in Mangalore city

III. OBJECTIVES

- To determine the black spots between the Mijar and Mangalore on NH-169.
- Collection of primary data by visiting the black spots.
- To analyze the reasons causing accidents in black spots.
- To carry out traffic volume survey at selected black spots.
- To study the causes of accidents and to suggest corrective measures at selected black spots.

IV. METHODOLOGY

1. To collect accident data of past 4 years between Mijar to Mangalore from Commissioner Office to identify the major black spots. The data which are collected are called as secondary data.
2. Incorporation of Data to MS Excel for the identification of Black Spots.
3. Visual survey is determined at the black spot to identify the causes for the accident.
4. Traffic volume survey is done at the identified black spot in order to know the number of vehicle crossing a section of road per unit time at any selected period.
5. The analysis of identified black spot is done to check the severity in future.
6. After identifying the black spot suitable remedial measures were proposed.

V. VARIOUS BLACKSPOTS BETWEEN MIJAR TO MANGALORE AND THEIR DETAILS

1 Ganjimata

Ganjimata is a circle which locates outside of Mangalore city where huge no. of traffic meet at this point due to which there is a lot of traffic congestion which consumes lot of time and energy. It is observed from the study that there have been no proper traffic signals, improper pedestrian crossing. Due to the congestion at the round about it is confusion for the road users regarding the moving direction of the adjacent vehicles. Insufficient setback distance at the circle has been again a reason for traffic congestion. Even the road condition is also not as good as it contains pot holes, rutting, cracking, etc. the picture of Ganjimata circle is shown in below fig 5.1



Fig 5.1: Present scenario of Ganjimata

5.1.1 Accident data

The past four year data of Ganjimata circle is collected from Mangalore Commissioner Office. The collected accident data of Ganjimata circle authorized from respective police station. The collected accident data is incorporated into MS Excel sheet in order to find the impact in 2025 at Ganjimata circle by forecasting method. Rate of accidents at day and night is calculated using those graphs and the incremental of accidents as per year wise is shown in Chart.

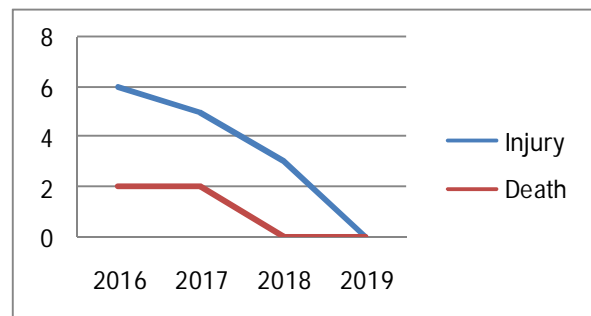


Chart 5.1: Ganjimata circle accident rate (2016-2019)

5.2 Traffic Volume Survey Data

Traffic volume is the number of vehicles crossing a section of road per unit time at any selected period. Traffic volume count is the total traffic which the pavement to be designed is expected to experience. Below fig shows the total number of vehicle at respective time intervals in Ganjimata spot.

Table5.1: Traffic volume survey data at Ganjimata.

TIME	BUS	CAR	MOTOR CYCLE	TEMPO	AUTO	LORRY	MULTI AXE CYCLE	TRACTOR	TATA ACE	TOTAL	
7:30 - 8:30	28	144	419	22	42	55	5	6	3	23	747
8:30 - 9:30	44	172	532	20	47	68	3	8	4	28	926
9:30 - 10:00	20	104	179	15	34	23	0	0	0	14	389
10:00 - 11:00	35	255	393	18	73	65	1	1	0	33	874
11:00 - 12:00	31	250	338	0	101	85	1	3	0	43	852
12:00 - 1:00	36	268	396	3	96	86	0	5	0	49	939
1:00 - 2:00	33	261	350	0	91	89	5	3	0	62	894
2:00 - 2:30	15	130	163	0	32	44	0	0	0	31	415
2:30 - 3:00	18	125	148	9	41	38	1	5	0	27	412
3:00 - 4:30	50	402	458	1	77	117	0	4	0	81	1190
4:30 - 5:30	43	279	445	0	85	61	0	5	3	55	976

2 Suralpadi

Accidents are happening in this places because of meeting of one National Highway (NH-169) and major district road, Because of this condition maximum number of vehicles moment takes place and there is no traffic signal at the place. The radius of round about is very less which causes traffic problems and led to the accidents. Set back distance at the place is insufficient. Even the road condition is also not as good as it contains pot holes, rutting etc.as shown in fig below fig



Fig 5.2 Present scenario of Suralpadi

Accident data

To identify the Black spot, accident data is collected. The past four year data of Suralpadi is collected from Mangalore Commissioner Office. The analysis of these data is useful to find the severity of Suralpadi and it is also useful in prediction of future accidents. The collected accident data of Suralpadi authorized from respective Commissioner Office.The collected accident data are incorporated into MS

Excel sheet in order to find the impact in 2025 at Suralpadiby forecasting method.

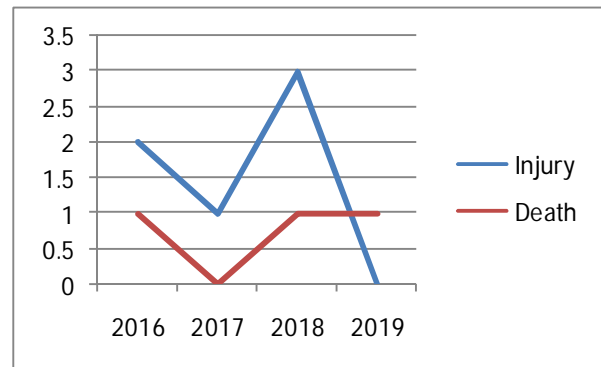


Chart: 5.2 Suralpadi Accident Rate (2012-2016)

5.1.2Traffic Volume Survey Data

Traffic volume count is the total traffic which the pavement to be designed is expected to experience. Below fig shows the total number of vehicle at respective time intervals in Suralpadi spot.

TIMINGS	BUS	CAR	TWO WHEELER	TEMPO	AUTO	LORRY	MULTI AXE	TRACTOR	TATA ACE	TOTAL
7:30 - 8:30	32	152	390	53	49	17	3	2	19	717
8:30 - 9:30	44	170	510	101	70	15	1	1	35	947
9:30 - 10:00	17	148	240	43	50	25	0	0	12	535
10:00 - 11:00	40	252	400	64	110	70	2	0	48	986
11:00 - 12:00	34	279	325	92	107	65	0	0	21	923
12:00 - 1:00	29	286	315	88	100	64	0	0	9	891
1:00 - 2:00	25	132	195	55	62	48	1	0	8	526
2:00 - 2:30	20	100	140	29	42	33	0	0	12	376
2:30 - 3:00	22	112	150	30	50	36	1	0	13	414
3:00 - 4:00	30	250	320	55	90	55	1	0	35	836
4:00 - 4:30	19	126	169	32	50	32	0	0	7	435
4:30 - 5:30	35	198	300	54	95	50	0	0	25	757

Table 5.2: Traffic volume survey data at Suralpadi

3 Kaikamba Junction

Kaikamba Junction is a selected point on NH-169. The road user moves in wrong direction to change the track direction and has resulted in increased accident rate as shown in fig 5.2.1



Fig 5.3: Present Scenario of Kaikamba Junction

5.3.1Accident data

The collected accident data of Kaikamba Junction authorized from respective Commissioner Office. The collected accident data are incorporated into MS Excel sheet in order to find the impact in 2025 at Kaikamba Junction by forecasting method. . Rate of accidents at day and night is calculated using those graphs and the incremental of accidents as per year wise is shown in Chart 5.3.1

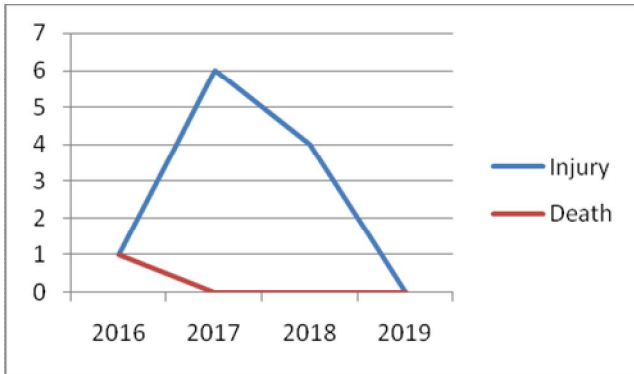


Chart: 5.3 Kaikamba Junction Accident Rate (2016-2019)

Traffic Volume Survey Data

Traffic volume count is the total traffic which the pavement to be designed is expected to experience. Below fig shows the total number of vehicle at respective time intervals in Kaikamba Junction spot.

TIMING	BUS	CAR	TWO WHELLER	TEMPO	AUTO	LORRY	MULTI AXE	TRACTOR	TATA ACE	TOTAL
7:30-8:30	35	154	400	58	52	20	3	2	20	744
8:30-9:30	48	175	520	104	75	16	1	1	35	975
9:30-10:00	20	152	245	45	50	27	0	0	15	554
10:00-11:00	44	260	420	65	110	79	2	0	49	1029
11:00-12:00	39	290	340	96	110	68	0	0	25	968
12:00-1:00	35	290	320	90	105	50	0	0	10	900
1:00-2:00	25	140	200	60	65	33	1	0	9	533
2:00-2:30	24	100	140	30	45	39	0	0	15	393
2:30-3:00	22	120	150	35	50	57	1	0	16	451
3:00-4:00	35	260	350	55	90	58	1	0	35	884
4:00-4:30	24	130	200	35	50	35	0	0	8	482
4:30-5:30	37	200	350	57	98	50	0	0	28	820

Table 5.3: Traffic volume survey data atKaikamba junction

4 Nantoor Circle

Accidents are happening in this places because of meeting of one National Highway (NH-169) and major district road, Because of this condition maximum number of vehicles moment takes place. The radius of round about is very less which causes traffic problems and led to the accidents. Set back distance at the place is insufficient.



Fig: 5.4 Present Scenario of Nantoor Circle

Accident data

The past four year data of is collected fromMangalore Commissioner Office The analysis of these data is useful to find the severity of Nantoor Circle.The collected accident data of Nantoor Circle authorized from respective Commissioner Office.The collected accident data are incorporated into MS Excel sheet in order to find the impact in 2025 at Nantoor Circle by forecasting method. . Rate of accidents at day and night is calculated using those graphs and the incremental of accidents as per year wise.

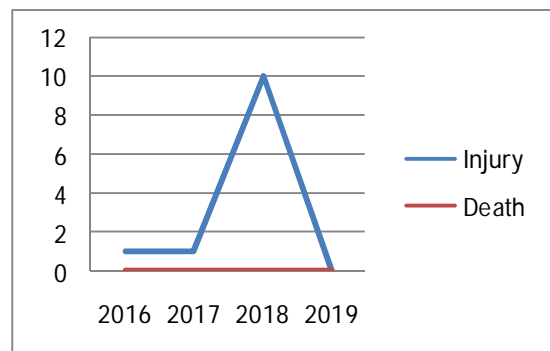


Chart 5.4: Nantoor Circle Accident Rate (2016-2019)

5 Gurupura

Accidents are happening in this places because of meeting of one National Highway (NH-169) and major district road, Because of this condition maximum number of vehicles moment takes place and there is no traffic signal at the place. The radius of round about is very less which causes traffic problems and led to the accidents. Set back distance at the place is insufficient. Even the road condition is also not as good as it contains pot holes, rutting etc.as shown in fig below fig 5.5.1



Fig: 5.5 Present Scenario of Gurupura

Accident data

The past four year data of Gurupura is collected from Mangalore Commissioner Office. The analysis of these data is useful to find the severity of Gurupura. It is experienced from the study of data the accident rates in the Gurupura is been increasing yearly. The collected accident data of Mijar to Mangalore authorized from respective Commissioner Office. The collected accident data are incorporated into MS Excel sheet in order to find the impact in year 2025 at Gurupura by forecasting method. Rate of accidents at day and night is calculated using those graphs and the incremental of accidents as per year wise is shown in Chart 6.6

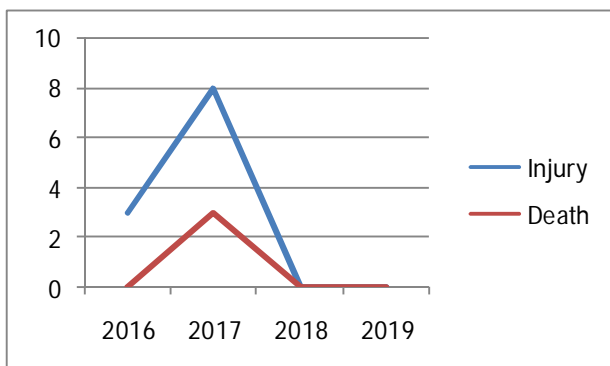


Chart 5.5:Gurupura Accident Rate (2016-2019)

Traffic Volume Survey Data

Traffic volume count is the total traffic which the pavement to be designed is expected to experience. Below fig shows the total number of vehicle at respective time intervals in Gurupura spot.

Table 5.4 :Traffic volume survey data at Gurupura

TIMING	BUS	CAR	TWO WHELLER	TEMPO	AUTO	LORRY	MULTI AXEL	CYCLE	TRACTOR	TATA ACE	TOTAL
7:30 to 8:30	40	244	398	13	56	79	4	11	2	35	882
8:30 to 9:30	62	262	590	32	61	82	5	13	5	39	1151
9:30 to 10:00	21	152	209	18	42	35	1	0	0	34	512
10:00 to 11:00	45	301	423	25	83	79	2	2	0	29	989
11:00 to 12:00	48	388	460	24	84	32	4	0	0	36	1076
12:00 to 1:00	36	268	399	5	106	99	2	2	0	51	968
1:00 to 2:00	32	290	344	9	96	82	0	5	2	52	912
2:00 to 2:30	24	159	195	6	41	39	0	2	0	31	497
2:30 to 3:00	26	161	185	3	48	28	2	0	0	29	482
3:00 to 4:00	42	263	379	16	41	68	0	2	1	39	851
4:00 to 4:30	26	163	191	5	51	32	0	2	0	29	499
4:30 to 5:30	49	398	472	29	95	39	5	0	0	45	1132

VI. REMEDIAL MEASURES

1. Providing proper traffic signals and proper pedestrian crossing.
2. The improvement of roads is done to mitigate the accidents by providing road markings, road lightings.
3. Widening of roads.
4. Solar red blinking signals.
5. Provision of Road humps before the pedestrian signals.
6. Installation of proper sign posts aside the roads.
7. Improving the sight distance at the intersection by increasing the set back distances in the curves.
8. Repairs of cracked surface and filling up of pot holes to reduce the accidents.

VII. RESULTS AND DISCUSSION

This result in increased number of trips, increased journey time, travel cost, mental agony and reduced accessibility. Widening of roads is not possible due to the intense developments on either side of the road. This work gives an insight into the present scenario of the traffic condition of the area and shows out the most accident prone roads in the district. The study was an attempt to find out the most vulnerable accident locations or the black spots between Mijar to Mangalore.

The black spots Between Mijar to Mangalore were identified based on the data collected from the Commissioner Office, Traffic surveys, road inventory data collection, alignment surveys and local enquiries were carried out to identify the major causes of accidents. The parameters causing accidents were selected by referring international journal papers, preliminary survey, interviewing local commuters. Heavy traffic, poor road geometrics, over speed, limited sight distances and lack of traffic discipline are the important causes of accidents. A few short term measures include providing adequate road furniture, speed breakers, lane markings, pedestrian crossings and good pavement maintenance. The long term measures involve widening of the pavement and shoulders, provision of road humps and signalised intersections at few locations. In our study, amongst the types

of offending vehicle involved in road traffic accidents, four wheelers are observed to be the culprit. It is clear from the study that the human factor is the most potent contributor to motor vehicle accidents in India.

The identified black spots were investigated in detail to assess the causes of accidents and appropriate remedial measures were suggested to implement the same so that the accidents and severity of accidents are reduced at these locations. Once the proposed measures are implemented, the after studies may be carried out to assess the impact of improvement measures on number and type of accidents and their severity.

VIII. CONCLUSION

- Road Safety Audit is very important for controlling accidents and for the proper design and maintenance of the Highways.
- The black spots are identified based on Commissioner Office record, deficiencies of geometric like Non availability of footpath, Non Availability of speed breaker, Advertisement board at intersection, improper zebra crossing or not availability of zebra crossing, other parameter like absence of traffic police, not working traffic signal, unauthorized parking at intersection etc.
- Road safety is a major public health concern, so attention must be given to road safety measures. Strict implementation of road safety measures reduces the road accidents injuries and fatality.
- Road traffic accidents are complicated to analyze as they cross the boundaries of engineering, geography, and human behavior. Road safety requires taking into account the general problem posed by the heterogeneity of the traffic mix different categories of vehicles.
- The ultimate goal is to develop certain improvement measures to mitigate the circumstances leading to the accidents. By providing necessary information reducing the causalities. Awareness in people is generated about accidents.

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