**Accident Locations on Indian Roads: Blackspot Identification for Gujarat**

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**Abstract**

The Indian National highway network, despite constituting only 2% of the overall road network, bears a significant traffic load of 40%, which potentially contributes to road accidents on National Highways. Even newly constructed toll-based National highways are not immune to accidents. NH 8, a prominent highway running from Delhi to Mumbai through Gujarat, has experienced a surge in accidents over the years, likely due to increased conflict points resulting from high access density. Identifying black spots, areas with a high incidence of accidents, is crucial for effective traffic management and improving road safety. This report aims to present a comprehensive analysis of black spot identification in Gujarat, specifically focusing on this issue within the state. It delves into the motivation behind black spot identification, and underscores the significance of this research for Gujarat's transportation system. Additionally, the report highlights the presence of existing hospitals situated around these identified black spots, acknowledging the importance of prompt medical assistance in case of accidents. The black spot identification process utilized the criteria set by the Ministry of Road Transport and Highways (MoRTH), resulting in the identification of twenty-five black spots in Gujarat

**Introduction**

India ranks first in the world for the number of accidents and lives lost on the roads. The country has only 1% of the vehicles in the world but has 11% of the accidents in the world. Ministry of Road Transport (MoRTH) uses the concept of a Blackspot <https://morth.nic.in/black-spot> to mark these locations to improve road safety on national highways in the country. Moreover, States and local authorities also maintain a similar list of accident locations on road networks – typically with location names. Road traffic accidents pose a significant threat to public safety and result in numerous fatalities and injuries every year. In the context of Gujarat, a populous state with extensive road networks, the identification of black spots becomes crucial to mitigate accidents and enhance road safety measures. Black spots are locations where accidents frequently occur, and their identification allows transportation authorities to allocate resources effectively for remedial actions. By analysing and understanding the factors contributing to accidents at these spots, targeted interventions can be implemented to minimize risks and improve overall road safety.

For the identification of black spots, it is necessary to locate the place where accidents took place. An accident blackspot is a location where road traffic accidents have historically been concentrated. It may have occurred for various reasons, such as a sharp drop or corner in a straight road, so oncoming traffic is concerned, a hidden junction on a fast road, poor or concealed warning signs at a cross-road. In other words, the blackspot is that particular place at which maximum accidents take place, or there are more likely chances of more accidents at these locations.

**Related Work**

BLACK SPOT IDENTIFICATION FOR NATIONAL HIGHWAY- 47: A CASE STUDY OF GODHRA – GUJARAT MP BORDER STRETCH

The main objective of the paper is to determine the exact location details of all the accidents, which are in the form of FIRs recorded for each Accident in the local language, and subsequently, find blackspots for the stretch. The accident FIR data for five calendar years from 2012 to 2017 was collected from concerned police stations and their location. From the video graphic field survey of the stretch, the location for each Accident according to toll road project chainage for the stretch determined. These accident data were then arranged according to chainage, and MORT&H criteria for identification of black spots will be used to determine black spots on the stretch. From such refined data filtered according to location for three calendar years 2015, 2016, and 2017, sixteen black spots were identified. The methodology has been suggested to determine the exact location from the accident records available with police through Accident FIRs.

**Data Source**

The data sources for the report on black spot identification in Gujarat were primarily derived from the Ministry of Road Transport and Highways (MoRTH). MoRTH plays a pivotal role in managing and monitoring road infrastructure and transportation systems across India, including the state of Gujarat. The data obtained from MoRTH consisted of comprehensive records encompassing accident data, road characteristics, traffic flow, and other relevant parameters. This rich dataset enabled a detailed analysis of black spots in Gujarat, providing valuable insights into accident patterns, contributing factors, and potential areas for safety improvements. By utilizing data from MoRTH, this report ensures the accuracy and reliability of the black spot identification process, laying the foundation for evidence-based strategies to mitigate accidents and enhance road safety throughout Gujarat.

By leveraging the data available on data.gov.in, the report was able to extract and analyse the specific data related to fatal road accidents in Gujarat, contributing to a more accurate assessment of the road safety situation in the state and facilitating evidence-based recommendations for enhancing road safety measures.

To gather information about hospitals located around black spots in Gujarat, the report relied on the use of Google Maps. The integration of Google Maps into the data collection process enhanced the efficiency and accuracy of identifying hospitals near black spots in Gujarat.

**Work – Blackspot Identification in Gujarat**

This project uses Leaflet JS as GIS tool for mapping through follium library of Python.

By analyzing the data obtained from the Ministry of Road Transport and Highways (MoRTH) reports, the blackspot location information for Gujarat is extracted. The data consists of various details, including the Name of the District, Location of accidents (specifying the chainage from kilometer to kilometer), NH No. (National Highway number), No. of fatalities, and Reasons for frequent accidents.

Once the Name of the District and Location of accidents have been analyzed, the latitude, longitude, and location of the black spots in Gujarat are determined. To assist in this process, Google Maps is utilized, which provides mapping and geolocation services.

Upon obtaining the coordinates (latitude and longitude) of these accident locations, it is structured into an Excel file. The Excel file includes column headers for latitude, longitude, location, and description, allowing for a systematic arrangement of the extracted data. This organized format enables easy reference and analysis of the blackspot locations in Gujarat and aids in implementing appropriate measures to address the identified issues.

The district and locations of the 25 black spots were finalized according to MoRTH, which are shown in table 1 as under:

**Excel data**

|  |  |  |
| --- | --- | --- |
| Sr. no | Location | Reason |
| 1 | Jethipura | Six lane to two lane |
| 2 | Shamlaji | Sharp curve |
| 3 | Hariyana bypass | On Y point overtaking |
| 4 | Vasad | Cross road |
| 5 | Chandisar | Over speed and cross road |
| 6 | Shapar - veraval | Residential and industrial area |
| 7 | Pardi board | Sharp curve and residential area |
| 8 | Pardi sim | Residential and industrial area |
| 9 | Maliya - halvad | Cross road without speed breaker |
| 10 | Gadu to santipara village | Long bridge and curve road |
| 11 | Vadal board | Connecting State Highway to National Highway |
| 12 | Budhel board | Narrow road |
| 13 | Talaja to velavadar | Sharp curve |
| 14 | Ankleshwar | 3 lane to 1 lane |
| 15 | Kim cross road | Residential area near highway |
| 16 | Kamrej sugar factory | Without opening cut |
| 17 | Dhoran pardi | Cross road |
| 18 | Kholvad cross road | Without opening cut and service road |
| 19 | Vav – umbhel road | Residential area near highway |
| 20 | Kadodara bridge to chalthan | Residential area near highway and cross road |
| 21 | Khadak pardi board | Curve road |
| 22 | Sonvada board | Wrong side transportation |
| 23 | Bajipura T joint | Small divider and without zebra crossing |
| 24 | Bajipura near sumul dairy | Without divider and pedestrian crossing |
| 25 | Mayapur | Without speed breaker, barricading, pedestrian crossing |

**Map**



*Figure 1 Blackspots*

Information collection about hospitals around black spots in Gujarat on Indian roads :

After the specific black spot area in Gujarat has been identified, online mapping services or GPS navigation apps like Google Maps can be utilized to locate the nearby hospitals in that specific area. Alternatively, hospital directories or healthcare websites can also be used.

The names, addresses, and contact details of the hospitals in the vicinity of the black spot should be noted down.

An Excel file is created to structure this data, similar to the black spot file, enabling a systematic arrangement and analysis of nearby hospitals around accident spots for prompt accessibility.



*Figure 2 Blackspots and nearest hospitals*

**References**

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