

## Investigation of Accident Causes and Black Spots on NH-152

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Published: 12/04/2024

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### Abstract:

In India, roads are the least expensive mode of transportation, but they are also the riskiest, affecting the lives and health of other drivers in addition to causing damage to cars and other property. Identifying accident hotspots on different roads and putting remedial measures in place is essential to lowering the number of traffic accidents. It is occasionally not feasible to implement countermeasures simultaneously at every recognized black spot site owing to budgetary constraints. In these situations, it is essential to make a list of the black spots' priorities and progressively implement countermeasures in that order of importance. This study includes a detailed examination of accident data for a 28.05-kilometer section of Punjab, India's National Highway 152. Accident blackspots have been identified on the highway portion that passes through the Punjabi districts of S.A.S. Nagar. The NH-205, that covers 28.05 km (10.950 to 39.00) and is located in the state of Punjab, is the subject of this research. To identify probable accident reasons, detailed analysis and additional research have been conducted at the top 25 blackspot sites. Countermeasures targeted at lowering traffic accidents on these designated locations have been proposed in light of the study's findings.

**Keywords-** NH-152, Accidents Sites, Blackspots, Automobiles,

### 1. Introduction:

Roads assist the world's transportation network. Over 60% of India's freight and 85% of its population travel by road, making it the most economical mode of transportation for both people and commodities. Of all the means of transportation, driving has the highest danger of both serious injury and fatalities from accidents, as well as the highest likelihood of destroying automobiles. According to official figures, there were 151,113 fatalities, or 11.6 deaths per 100,000 people. 221.2 million MTW and 36.5 million cars were registered in 2019. The official registration data overstates the true number of vehicles in use since automobiles that are taken off the road for wear and tear or other



reasons are not removed from the database. Between 50% and 60% of the registered number of personal automobiles on the road are believed to exist. India's national highways, occupying only 3.42% of the country's road network, transport 40% of the country's traffic. With India's economic growth since independence, the number of cars on the road has increased, causing traffic accidents and injuries, leading to the country's reputation for high-traffic deaths. It also considers that these frequencies would vary dramatically based on modifications to the road environment, such as variations in the geometry of the road, the surroundings, and the existence of road signs and markers. However, only road segments with homogenous characteristics—defined by traffic volumes, roadway design features, and traffic control elements—are covered by the manual. An indigenous model has to be developed to anticipate crash rates in emerging countries where variability in traffic composition is widespread. The study provides data on traffic accidents from many different countries, showing a global trend toward an increase in the number of traffic crashes. Numerous studies show that as speeds increase, the incidence of these incidents increases considerably. Moreover, a robust association has been seen between the imposed speed restriction and heightened severity of injuries.

## 2. India's Road Accident Rate

India's roads, the most affordable and crucial mode of transportation, are prone to high accidents, fatalities, and injuries due to inadequate maintenance and lack of traffic regulations. Men are more likely to die or be injured, with the 30- to 59-year-old age group being most vulnerable. India experienced 1,51,113 deaths in 2019 and 3,66,138 in 2020, with 1,31,714 fatalities and 3,48,279 injuries, with 20,900 non-injury accidents, 1,20,806 fatalities, 96,302 badly injured accidents, and 1,28,130 mild injury accidents.

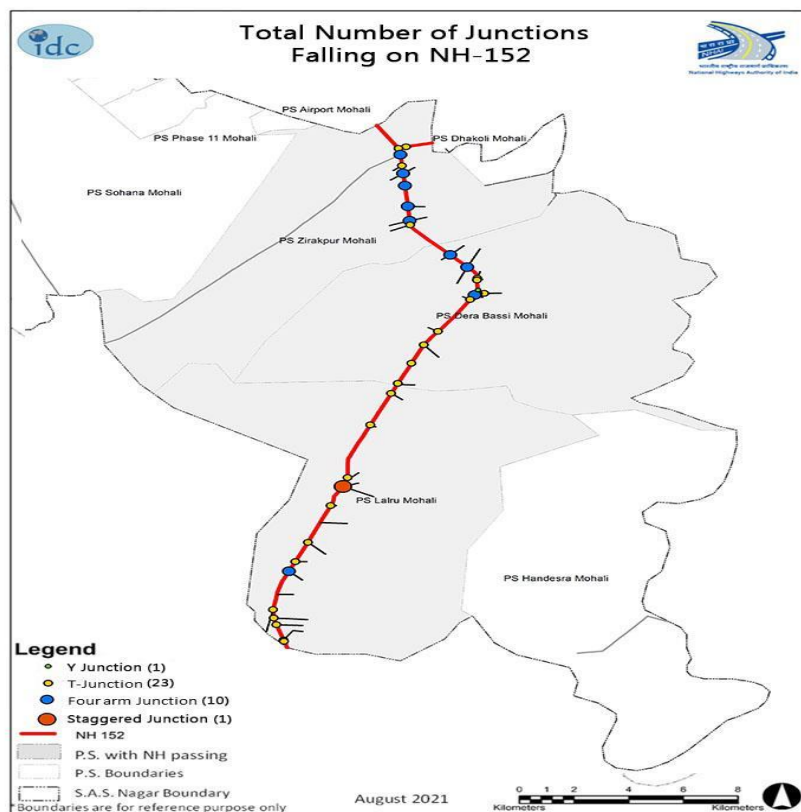
**Table:1. Year wise Road Accidents during 2016 to 2022**

<b>Year</b>	<b>Accidents</b>	<b>Killed</b>	<b>Injured</b>
<b>2016</b>	480652	150785	494624
<b>2017</b>	464910	147913	470975
<b>2018</b>	470403	157593	464715
<b>2019</b>	456959	158984	449360
<b>2020</b>	372181	138383	346747
<b>2021</b>	412432	153972	384448
<b>2022</b>	461312	168491	443366

### 2.1 STUDY AREA :

This report is a detail of the Road Accident scenario of NH-152, which crosses through the districts of S.A.S. Nagar of Punjab. The NH-152 is a total length of 29.1 km (10.950 to 39.00) falling in the state of Punjab under PIU Chandigarh The National Highways-152, which are toll roads, have been considered in the scope of the study.





**Fig.1: Location of Study Sagement NH-152.**

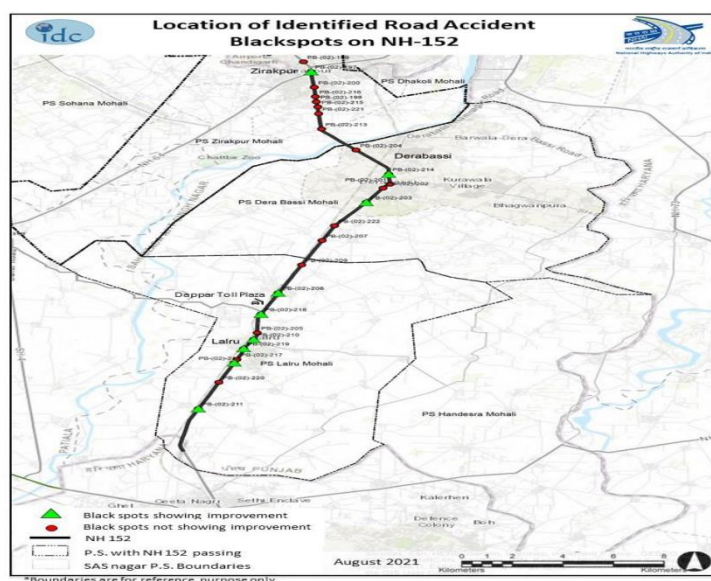
The major national highway in Punjab, NH-152, connects Ambala (Haryana) to Zirakpur (Punjab). The 29.1 kilometer National Highway under research links S.A.S Nagar with Ambala . the section of the planned corridor that runs from Village Jharmari to Chandigarh Barrier, Zirakpur. The project has a single 450 m long 12-lane toll plaza at Km 28+080 close to the village/town of Dappar.



**Fig.2: 12 Lane Dappar Toll Plaza on NH-152.**

**2.2 Models of the study's Produce**

The 29.1 km length of NH-152 accident blackspots in the current study have been identified using the criteria of a blackspot provided by the Ministry of Road Transport and Highways (MoRTH). This section of NH-152 has an average fatality rate per kilometer of 2.3 per year, the rate has gone up in the year 2020 from 0.13 to 0.19. The probability of being killed against per million vehicles travelled on NH-152 increased by 45% in 2020, compared with 2019.



**Fig.3: Location of Blackspot on NH-152.**

**3. Accident Data Analysis:**

Data collection: FIR and Department of Drivers Licenses (DDRs) for a period of four years from the concerned police stations in the area were collected. A total of 412 road accidents reported between the years 2017 to 2020 were collected from 3 police stations falling on this 28.05 km long study area stretch. The roads FIR data for four years, i.e. 2017, 2018, 2019 and 2020, has been collected and coded. Year-wise details of road crash data collected are given in Table (3).

**Table 2: Year Wise Road Accidents on NH-152**

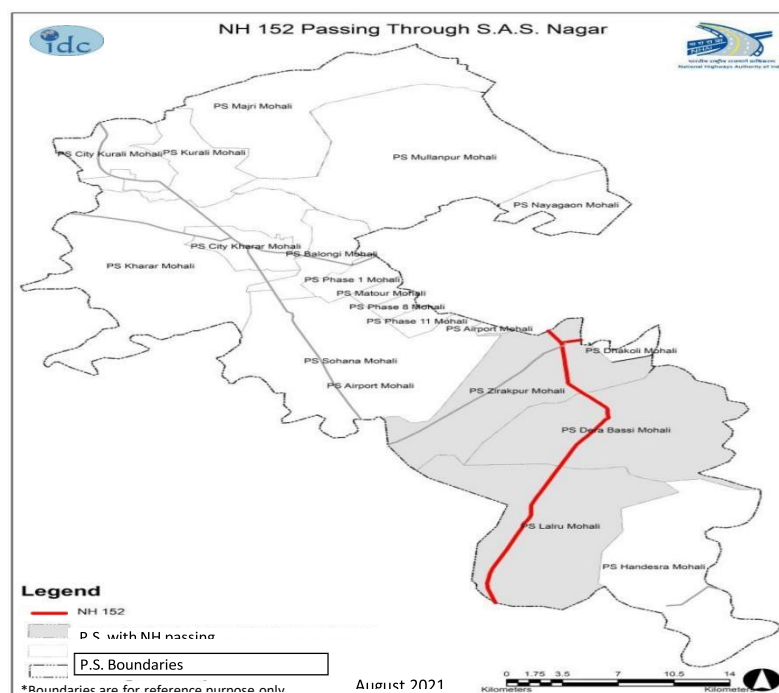
Year	Cases	Fatalities	Serious Injured	Minor Injured
2017	128	83	77	14
2018	122	64	70	11



<b>2019</b>	97	61	57	16
<b>2020</b>	65	49	27	15
<b>Total</b>	<b>412</b>	<b>257</b>	<b>231</b>	<b>56</b>

### 3.1 Police station-wise Road Accidents:

Police station-wise Spatio-temporal investigations were carried out to gain a better understanding of collision patterns and the degree of enforcement on roadways. The entire stretch falls within the jurisdiction of three police stations of S.A.S. Nagar (Mohali) district of Punjab.



**Fig.4: Location of Police station under NH-152.**  
**Table 3: Police Station Wise Road Accidents on NH-152**

Police Stations	IPC (Cognizable)				CrPC (Non-Cognizable)			
	Cases	Fatalities	Serious	Minor	Cases	Fatalities	Serious	Minor
<b>Zirakpur</b>	104	56	65	15	3	3	1	1

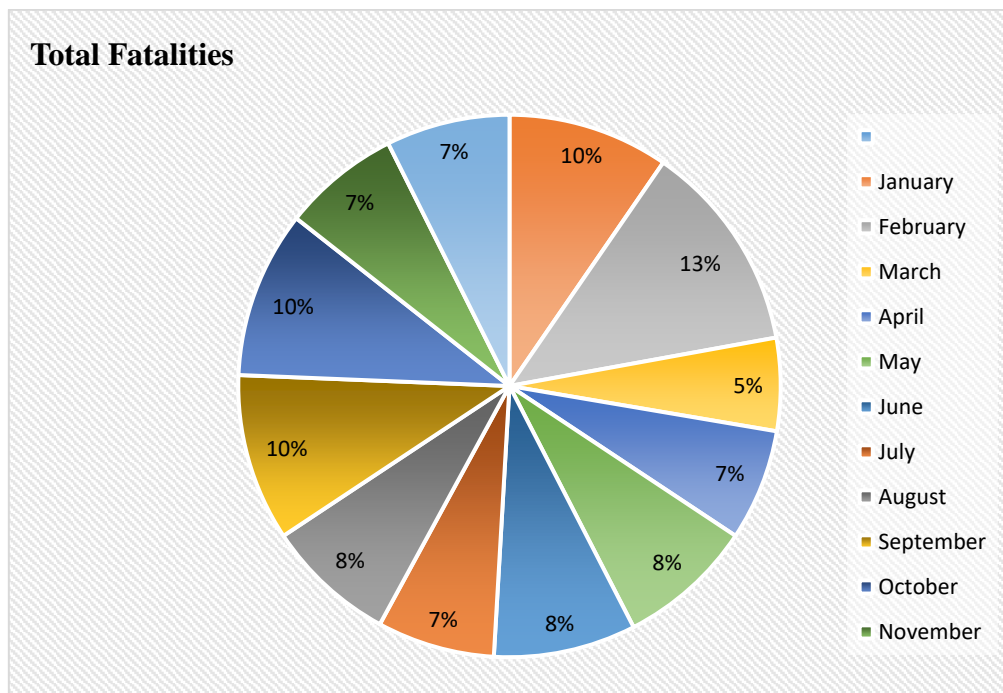
<b>Dera Bassi</b>	119	76	59	23	6	6	1	0
<b>Lalru</b>	174	110	104	16	6	6	1	1
<b>Total</b>	<b>397</b>	<b>242</b>	<b>228</b>	<b>54</b>	<b>15</b>	<b>15</b>	<b>3</b>	<b>2</b>

### 3.2 Classification of Accidents by Month of Incident:

According to the data, Month wise, if we look into the data, mainly January, February and October are the most critical months for NH-152 Punjab stretch.

**Table 4: Road Accidents on NH-152 by Month**

<b>Months</b>	<b>Total Fatalities</b>	<b>Total Serious Injuries</b>	<b>Total Minor Injuries</b>
<b>January</b>	26	24	2
<b>February</b>	34	37	3
<b>March</b>	15	13	5
<b>April</b>	18	19	4
<b>May</b>	22	15	3
<b>June</b>	23	24	7
<b>July</b>	19	17	6
<b>August</b>	21	13	4
<b>September</b>	27	11	2
<b>October</b>	27	14	11
<b>November</b>	19	16	8
<b>December</b>	20	18	1
<b>Total</b>	<b>257</b>	<b>231</b>	<b>56</b>



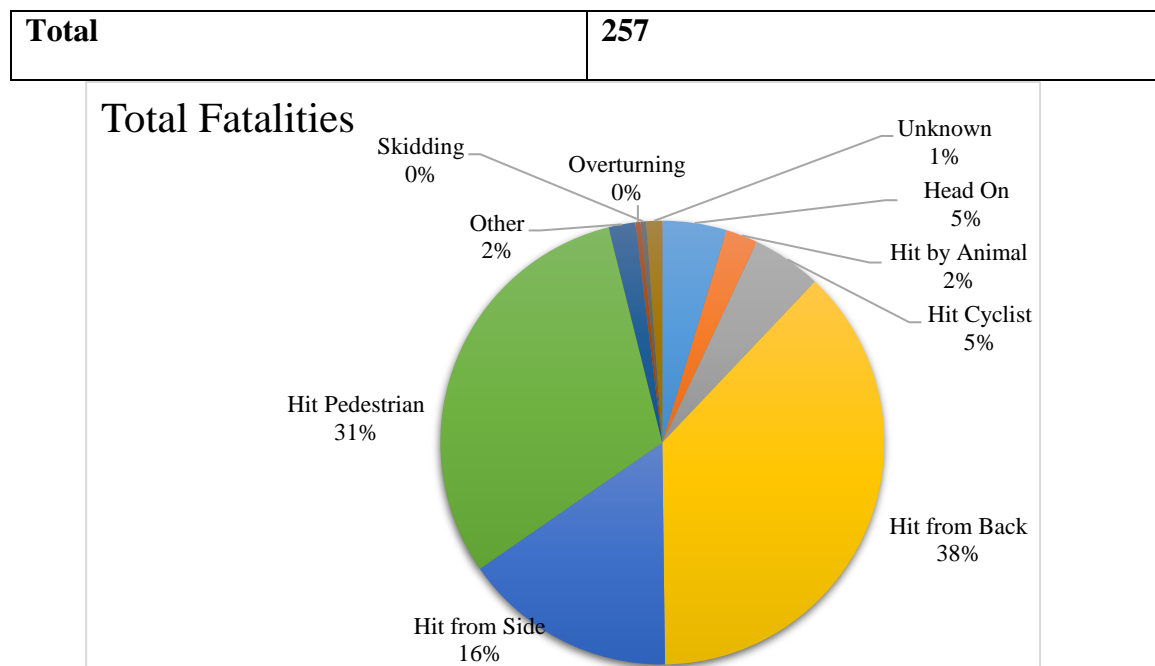
**Fig.6: Month-By-Month Analysis Of Traffic Accidents On Nh-152 From 2017 To 2020.**

**3.3 Types of Road Accidents: Collisions**

Hit-from-back accounts for 38% of all traffic accidents, which is a frequent finding on split highways. Pedestrians are involved in 31% of all incidents.

**Table 5: Types Of Fatal Traffic Accidents: Collisions**

Type Of Collision	Total Fatalities
Head On	12
Hit by Animal	6
Hit Cyclist	13
Hit from Back	97
Hit from Side	40
Hit Pedestrian	79
Other	5
Overturning	1
Skidding	1
Unknown	3



**Fig.7: Analysis of Collision Types in NH-205 Road Accidents**

**4. Conclusion:**

- This section of NH-152 has an average fatality rate per kilometer of 2.3 per year, while the national average for Indian national highways is 0.4 per year (MoRTH 2020). This difference makes this stretch of NH-152 the most accident-prone and vulnerable overall.
- There are 35 major and minor intersections throughout the whole project roadway. Of the fatal traffic collisions recorded in the last four years (2017-2020), five percent happened at or near these junctions, with the remaining forty-five percent occurring at mid-blocks. Of the 35 intersections, 16 are dangerous ones where most fatalities occurred; these are all considered Accidental Black Spots.
- Based on the data, the most crucial months for the NH-152 Punjab segment are January, February, and October. When comparing Saturdays to other days of the week, Saturdays are reported to have 19% of all traffic accidents.
- Hit-from-back collisions, which are common on divided roads, account for 38% of all traffic accidents. A third of all events involve pedestrians.

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