

# Identification and Improvement of Accident Black Spots on Kanpur-Lucknow & Lucknow-Faizabad including Shaheed Path (NH-25, NH-28 and NH-56A&B) Uttar Pradesh

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**Abstract:** National Highways and expressways are considered as main veins for the development of states in the country. On the other hand it has been observed that more than 13 people are dying in the road accidents per hour all over the world. Government of India formulated Accidental Prevention Committee (A.P.C.) in the year 1997 for identifying accidental prone spots on the rural highways of the state and suggested the suitable remedial measures for reducing the accidents. The Kanpur-Ayodhya Section i.e. from Kanpur- Lucknow & Lucknow-Faizabad including Shaheed Path (NH-25, NH-28 and NH-56A&B) of National Highways has witnessed large no. of accidents since it became fully operational in July-2012. According to monthly accidental report from June-2014 to September-2019. There were 6075 persons affected in accidents on Kanpur-Ayodhya Section, out of which Fatal Accident is 530 Nos. (As per NHA Records). Government of India Ministry of Road Transport & Highways, Road Safety Cell (Engineering) had made taken it very seriously The Lucknow Unit of National Highway has undertaken the improvement of such accidental prone spots which generally designated as the black spot on highways. This study of such black spot is being done for current period on prevention of accidents. It deals with study, identification & suggestion of remedial measures that have been suggested, their repercussion shall be observed after a certain period, and then conclusion of this study shall be made.

**Keywords:** Accidental Prevention, black spot, remedial measures, accidental prone

## I. Introduction:

Accident is termed as an unexpected, unintentionally incident resulting in damage or injury or both to people, vehicle and road infrastructure. It was observed in the year 2014 that more than 1.2 million people were killed in road accidents world-wide, every year and 3 to 4% of Gross National Product is lost in road accidents. In India during the year 2014; 1,69,107 people were killed in road accidents, where as in Uttar Pradesh death account was 20,653 Nos. In terms of Annual Economic loss of India due to road accidents in more than Rs. 3,80,000.00 Crores

i.e. more than annual defense budget Rs. 2,24,000.00 Crores for financial year 2014-15. The portion under consideration, Kanpur-Lucknow-Ayodhya Section of NH-25 & NH-28, total number of accidents, in the year 2015 were 1137, in the year 2016 were 1058, in the year 2017 were 1073, in the year 2018 were 1158 and in year 2019 upto September were 996. This section connects Industrial City Kanpur to Pilgrim City of Ayodhya via Airport of Lucknow, the State Capital of Uttar Pradesh. This is part of NH-25 and NH-28 and also carries the transport from Delhi, the National Capital of India with remote eastern states of India. Therefore, it is essential to identify accidental prone areas, find cause of accidents and remedy for minimizing the accidents. Method of accident Density Method has been used to identify accident black spots.

## II. Significance of Study

As per MoRT&H Circular dated 26th August 2019, "Road Accident Black Spot is a stretch of National Highway of about 500m in length in which either 5 road accidents (in all three years put together involving fatalities/ grievous injuries) took place during the last 3 calendar years or 10 fatalities (in all three years put together) took place during the last 3 calendar years"

The road parameters such as road width, width of one shoulder, deficiency in super elevation, deficiency in sight distance, radius of horizontal curve are responsible for occurrence of accidents. Whereas human errors such as speed control of vehicles, violation of traffic rules by drinking alcohol and driving vehicle, lack of sleep etc. are causing fatal accidents on roads. Apart from other, condition of vehicle and vehicle coming from wrong direction on National Highway is also reason of accidents.

Therefore it is essential to study the cause of accidents for the parameters responsible for occurrence of accidents according to their severity also i.e. Fatal, Major or Minor and finally identify the accidental black spot with higher value of percentage of occurrence of accident on Kanpur-Lucknow-Ayodhya Section.

## III. Aim and Objectives

This paper deals with study of accidental prone areas i.e. black spot by considering parameters such as location and considering the various factors responsible for occurrence of accidents using method of Accident Density Method. The objectives the study were:

- To identify black spots on Kanpur-Lucknow-Ayodhya Section.
- To improve accident data collection system.
- To suggest remedial measures for minimizing the accidents.

#### IV. Methodology of the study

The methodology adopted for the study was as follows :

- To collect accident data on Kanpur-Lucknow-Ayodhya Section of NH-25 & NH-28 from various Police Stations in the vicinity.
- To collect data from Route Petrol Vehicle.
- Comparison of real time data with records available in the Police Stations and Route Petrol Vehicle.
- To find out priorities for hazardous location.
- To identify various traffic & road related factors causing accidents.
- To carryout analysis of black spots by using statistical models.
- Detailed analysis of top ranked spots.

#### V. Experimental Investigation

For the investigation, Kanpur-Lucknow-Ayodhya Section of NH-25 & NH-28 was selected for study. According to the data collected for the period June-2014 to August-2018 year, accidents 6042. The observations are taken by considering following factors responsible for occurrence of accidents and making them Black Sports :

- At merger point of NH-56A&B and NH-25, huge traffic and location of bus-stop.
- Joining of link road from Industrial area to NH-25.
- Joining of link road from Sainik School to NH-25.
- In dense populated and market area, parking of vehicle in unauthorized area.
- Existing of unauthorized median openings.
- Vehicle are joining the corridor on wrongly manner/wrong side.
- Unauthorized tempo stands and temporary encroachments.
- Non adherence of traffic rules by the drivers and public.

#### VI. Measures taken on black spot

Depending upon the site condition/requirement the corrective measures may require Short Term Measures only, and in some cases Long Term Measures including Cautionary Measures &/or Short Term Measures. The suggestive items/measures and guidelines to be followed for rectification of black spots are as under:

- A. Short Term Measures (The suggestive items/measures):
- Pedestrian facilities like Zebra crossing.
  - Crash barrier/ railings.
  - Solar light.
  - Junctions improvement.
  - Road signs inter0alia speed limits sign, pavement/road markings, delineators, study/ cats eye.
  - Traffic calming measures including rumble strip.
  - Repairing/maintenance of unsafe road/appurtenance including filling of berms/should on National Highways.
  - Restriction of certain types of vehicles, one way streets, reversible lanes, bus lanes, restriction on movement of different types of vehicles by time/ by lane etc. specially in urban areas.
- B. Long Term Permanent Measures:
- Based on inspection, survey etc. if it is concluded that the spot require long term measures, a detailed estimate may have to be prepared for the same. In such situations some of the short term measures as mentioned in above para and following cautionary measures may also be carried out.
  - Cautionary accident black spot signs at both ends.
  - Solar red blinking signals at both the ends.
  - Rumble strips together with rumble strip sign.
  - “Restriction ends” sign.
  - Traffic Calming Measures.

Based on Black Spot locations Long Term Measures includes construction of Flyover, Underpass, and Junction Improvement including Crash Barrier also has been taken in Long Term Measures.

#### V. Suggestion & Recommendation:

To nullify the above factors and to minimize the accidents at black points following suggestions are recommended for adhere. The details are as per following tables:

**Table-1 Observation table for minimizing accidents at Black Spots on Kanpur-Lucknow Section on NH-25.**

S. No.	Chainage	Physical details of Black Spot	Pedestrian Road marking	Hazard marker & Caution/ Information Board	Median Marker	Street Lighting	Solar Blinkers	M.S. Railing/ M.B.C.B.
1.	11+005	Three leg type Junction near Bus stop	Y	Y	Y	Y	Y	N
2.	12+400	"T" Junction	Y	Y	Y	N	Y	N
3.	14+000	Three leg type junction	Y	Y	Y	N	Y	N
4.	16+000	Four leg type junction and Densely populate market	Y	Y	Y	N	Y	Y
5.	22+500	Unauthorized median opening and encroached service road	Y	Y	Y	N	Y	Y
6.	26+400	"T" Type Junction	Y	Y	Y	N	Y	Y
7.	70+700	Four leg type junction	Y	Y	Y	N	Y	Y
8.	71+850	Unauthorized median opening	Y	Y	Y	N	Y	Y
9.	68+400	"T" Type Junction	Y	Y	Y	N	Y	Y
10.	65+000	Four leg type junction	Y	Y	Y	N	Y	Y
11.	63+400	Four leg type junction	Y	Y	Y	N	Y	Y
13.	55+850	Temporary encroachment, unauthorized tempo stand	Y	Y	Y	N	Y	Y
14.	61+250	"T" type junction and unauthorized median opening	Y	Y	Y	N	Y	Y
14.	71+750	"T" type junction and unauthorized median opening	Y	Y	Y	N	Y	Y
15.	35+000	"T" type junction and unauthorized median opening	Y	Y	Y	N	Y	Y
16.	36+350	"T" type junction and unauthorized median opening	Y	Y	Y	N	Y	Y
17.	30+700	Unauthorized median opening at IOCL Petrol pump	Y	Y	Y	N	Y	Y

18.	53+050	Median opening is unauthorized and village road	Y	Y	Y	N	Y	Y
19.	48+750	Unauthorized median opening and village road	Y	Y	Y	N	Y	Y
20.	41+000	Unauthorized median opening and village road	Y	Y	Y	N	Y	Y

**Table-2 Observation table for minimizing accidents at Black Spots on Lucknow-Ayodhya Section on NH-28.**

S. No.	Chainage	Physical details of Black Spot	Pedestrian Road marking	Hazard marker & Caution/ Information Board	Median Marker	Solar Blinkers	M.S. Railing/ M.B.C.B.	Underpass
1.	70+800	Unauthorized median opening and village road	Y	Y	Y	Y	Y	
2.	79+200	"T" Type Junction and village road	Y	Y	Y	Y		
3.	77+650	"T" Type Junction and village road	Y	Y	Y	Y		
4.	105+000	"T" Type Junction and village road	Y	Y	Y	Y		
5.	134+200	"T" Type Junction and village road	Y	Y	Y	Y		
6.	133+850	Median opening	N	N	N	N		Y
7.	137+900	Village road	Y	Y	Y	Y		
8.	63+000	Median opening	Y	Y	Y	Y		
9.	60+000	Median opening	Y	Y	Y	Y		
10.	51+000	Intersection of village road	Y	Y	Y	Y		
11.	63+200	Intersection of village road	Y	Y	Y	Y		
12.	14+000	Median opening Heavily populated area	Y	Y	Y	Y		

## VI. Conclusion:

Based on the analysis of accident data top Two locations are discussed here: Location 1 :-

Black Spot ID	-	NH No	25	Location/Chainage	Km 11+005
Chainage	Km 08+000	Police Station	Sarojni Nagar	RO	UP East
Latitude	26.777059	Longitude	80.88222	PIU	Lucknow

Location of Black Spot: This Black Spot is 3 leg type of location of NH 56 A & B and NH 25. It is a 4 lane express highway for the traffic from Kanpur to Lucknow via Alambagh and Kanpur Road or Faizabad Road vice versa to go to other highways coming along the bypass. This merger point has huge traffic in this area due bus stop near this location. Heavy vehicle comes from the Kanpur to Lucknow or Faizabad.



The following measures have been provided in the location-

1. Pedestrian road marking should be done in the location.
2. Hazard marker and cautionary / inforamatory sign boards should be erected on the stretch
3. Median marker along with the kerb painting should be provided.
4. Street lighting should provide in the location.

Location 2: -

Black Spot ID	-	NH No	28	Location/Chainage	Km 63+200
PWD Chainage	Km 62+900	Police Station	R.S. Ghat	RO	UP East
Latitude	26.8121	Longitude	81.51392	PIU	Lucknow

Location of Black Spot: - This Black Spot is a intersection, a village road joins the high speed corridor in hafahazard way. Traffic towards the village road joins the NH in wrongly manner and this merger points turns as frequent accident spot.



The following measures should provided in the location-

1. Pedestrian road marking in the location.
2. Hazard marker and median marker should be erected on location.
3. Advance Cautionary and Informatory Sign board must be installed on the location.
4. Median marker along with the kerb painting..
5. Solar blinker should be provided

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