



Study of Government Agencies and Stakeholders in Enhancing Traffic Safety at NH-10 Intersections

Ankur Narwal* , Dr. Sumesh Jain**, Dr. N. P. Kaushik***

*Research Scholar, **Professor, ***Professor
Dept. of Civil Engineering, School of Engg. and Technology,
Om Sterling Global
University, Hisar, Haryana

Abstract

Traffic safety at intersections along national highways, such as NH-10, is of paramount importance to ensure the well-being of road users and the efficiency of transportation systems. This research paper investigates the crucial role played by government agencies and stakeholders in improving traffic safety at NH-10 intersections. Through a comprehensive literature review, case studies, and analysis of initiatives, this study sheds light on the multifaceted efforts undertaken to enhance intersection safety.

Key words: Traffic, National highways, NH-10, Government agencies etc.

Introduction

Road intersections are critical junctures within transportation networks, where the paths of numerous vehicles and pedestrians intersect. The safety of these intersections is paramount, as they are often hotspots for accidents and collisions. This research paper explores the vital role that government agencies and stakeholders play in enhancing traffic safety at intersections along National Highway 10 (NH-10) and similar arterial roadways. NH-10, a significant national highway in India, serves as a representative case study to investigate the multifaceted efforts and collaborations that contribute to safer intersections.

Traffic safety at intersections is a global concern, and NH-10 is no exception. The efficient flow of goods and people relies heavily on the uninterrupted operation of this critical transportation artery. However, intersections on NH-10, like many others worldwide, face numerous challenges, including congestion, inadequate infrastructure, and a higher propensity for accidents. These challenges necessitate a comprehensive approach involving government agencies and stakeholders to address the complexities of intersection safety.

Government agencies, such as the Ministry of Road Transport and Highways in India, bear the primary responsibility for the planning, development, and maintenance of transportation infrastructure. They are entrusted with the task of ensuring that intersections on NH-10 are designed, managed, and regulated in a manner that prioritizes safety. This includes the formulation of traffic policies, the allocation of resources for infrastructure improvements, and the enforcement of traffic regulations.

Stakeholders, encompassing local communities, transportation associations, and advocacy groups, represent a diverse set of actors who hold a stake in intersection safety. Their involvement is pivotal in fostering a holistic and inclusive approach to safety initiatives. Stakeholders not only contribute local insights but also play a crucial role in raising awareness, advocating for change, and collaborating with government agencies to implement safety measures effectively.

Role of Government Agencies:

Policy Formulation and Legislation:

Government agencies are responsible for developing and implementing policies and regulations related to road safety at intersections. This includes setting speed limits, defining right-of-way rules, and establishing safety standards for road design.



Infrastructure Planning and Development:

Government agencies oversee the planning, design, and construction of intersections on national highways like NH-10. They ensure that intersections are built with safety features such as proper signage, lighting, and pedestrian facilities.

Maintenance and Repairs:

Regular maintenance of intersection infrastructure is crucial for safety. Government agencies are responsible for ensuring that road surfaces, traffic signals, road markings, and signage are in good condition.

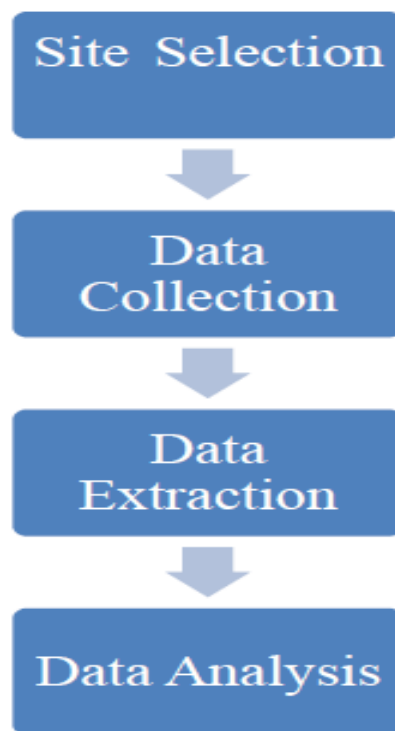
Traffic Control and Enforcement:

Government agencies, often in collaboration with law enforcement agencies, enforce traffic rules and regulations at intersections. This includes monitoring speed limits, traffic signal compliance, and safe driving behaviors.

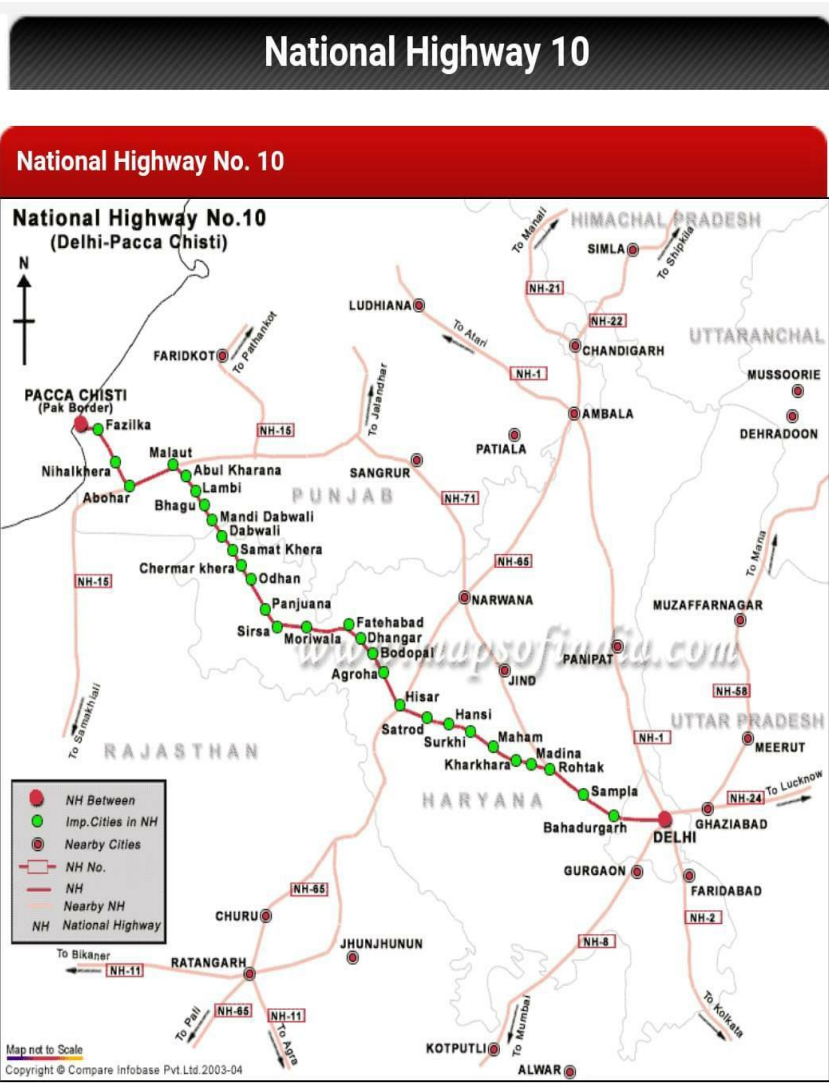
Safety Audits and Assessments:

Conducting safety audits and assessments to identify potential hazards at intersections. These audits help in determining necessary safety improvements and addressing issues promptly.

Methodology

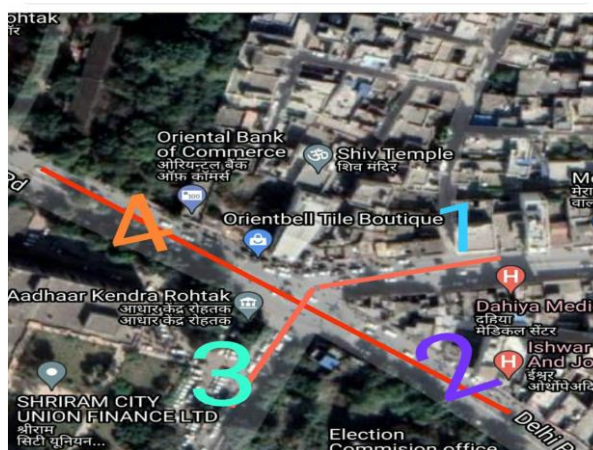


Site selection



The first site is to be selected for doing the research work and then the area and the selected location are to be marked. The site selected should have a good footfall and it should be on an urban road or a road with a good flow of traffic so that the pedestrians are affected by the movement of vehicles. We will be selecting 6 locations, naming them Location 1 to Location 6.

Location 1 is Sonipat Stand, a chowk in Rohtak of which one road goes to Sonipat marked as 1, one road joins to Delhi Road marked as 2, one road goes towards Rohtak Courts marked as 3 and one road goes towards Hissar, Bhiwani marked as 4. The flow of traffic is in all the directions and a lot of pedestrians cross the road as towards road no 4 there is I C College of girls and on its opposite side, there is Mini Secretariat of Rohtak city. On-road no 4 there is one entry point for Mini Secretariat for pedestrians and nearly 150 m there is Rohtak court.



Location 1

Location 2 is Court chowk, where road marked with 1 show the road in front of court complex and opposite to Mini Secretariat and the road marked as 2 comes from location 1 i.e. Sonipat stand and the road marked as 3 goes toward Delhi and nearby buildings are State Bank Of India main branch of Rohtak and opposite of that is Election Commission of India office.



Location 2

Location:-3

Location 3 is of sukhapura chowk and the road marked as number 1 is the road coming from the new bus stand rohtak .The road marked as number 2 is the road which goes towards the markets of rotak city such as Quila Road, Shori cloth market. The road marked as number 3 goes toward the Jind Chowk and Hissar by Pass. The road marked as number 4 is Gohana road. It is an entry point of rohtak from various nearby places and nearby there are eating places like restaurants, different stalls.



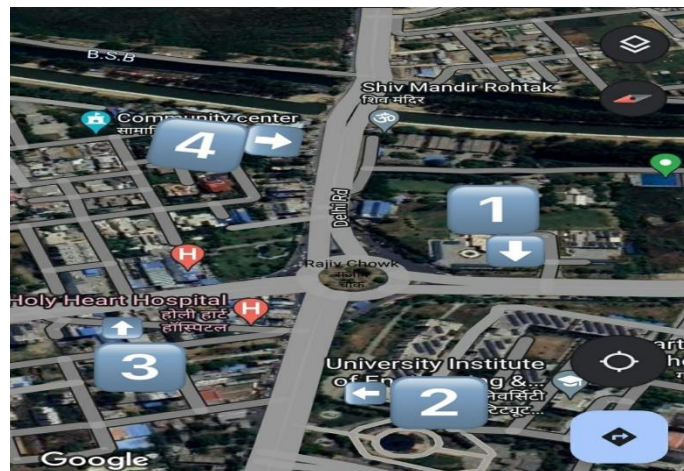
Location: 4

The location 4 is called as ambedkar chowk and the road number 1 is the subash talkies road and there is police line rohtak on this road. The road number 2 is coming from sonipat road rohtak and there is I.C College for girls. The road number 3 is the church road and there is entrance and exit of model school and next to it there is municipal co-operation office of rohtak. The road number 4 is going towards the bhiwani chungli and the hisar road bridge and on this road there is canteen of bsf and showroom of hero motocorp and entrance of Tehsil of rohtak district.



Location: 5

The location 5 is of Rajiv Chowk or Delhi by Pass chowk. The road marked as number goes towards jhajjar and Omaxe city. The road marked as number 2 goes towards the location number 6, Medical mod, PGIMS Rohtak. The road marked as number 3 goes towards Sheila by Pass chowk and various hospitals such as Holy heart Hospital, Noble Care Hospital and Mahindra 4 wheeler agency is on this road. The road marked as number 4 goes towards Delhi and Baba Mastnath University is situated on this road and IMT Rohtak is also on this road.



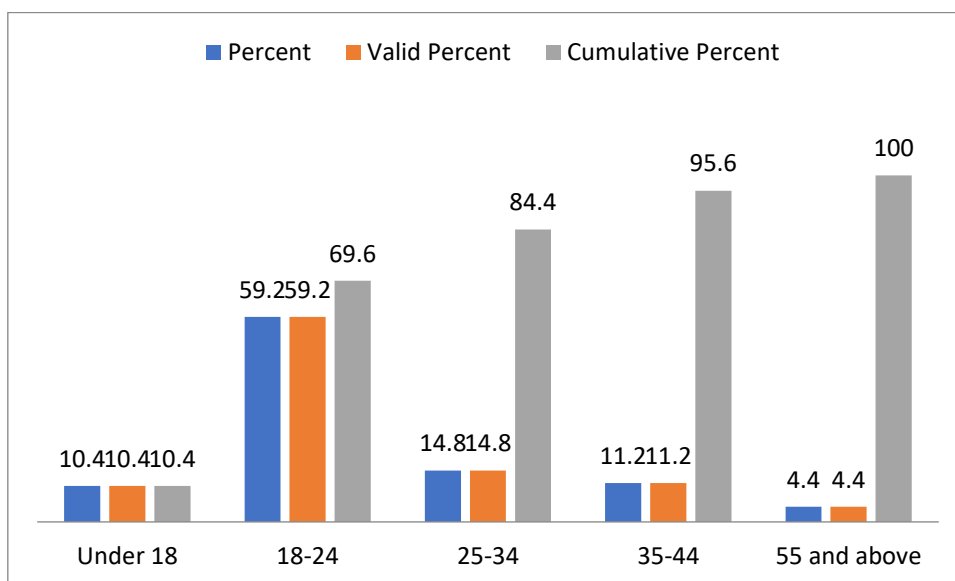
Location:-6

The location 6 is the power house chowk or Pt.Nekiram college chowk. The road marked as 1 goes towards the Nekiram College. The road marked as number 2 goes towards the Medical mod or PGIMS Rohtak and towards D-Park rohtak. There are eating places and UHBVN Office on this road. The road marked as number 3 goes towards the Vatican Institute, Kota Classes and some restaurants are there on this road. The road marked as number 4 goes towards the Delhi By-pass and Agro mall, Maturam College is also situated on this road and it comes from the location number 5.



Demographic figures

Age				
	Frequency	Percent	Valid Percent	Cumulative Percent
Under 18	52	10.4	10.4	10.4
18-24	296	59.2	59.2	69.6
25-34	74	14.8	14.8	84.4
35-44	56	11.2	11.2	95.6
55 and above	22	4.4	4.4	100.0
Total	500	100.0	100.0	



Mean (Average) Formula:

$$\text{Mean (Average)} = \sum_{i=1}^n x_i / n$$

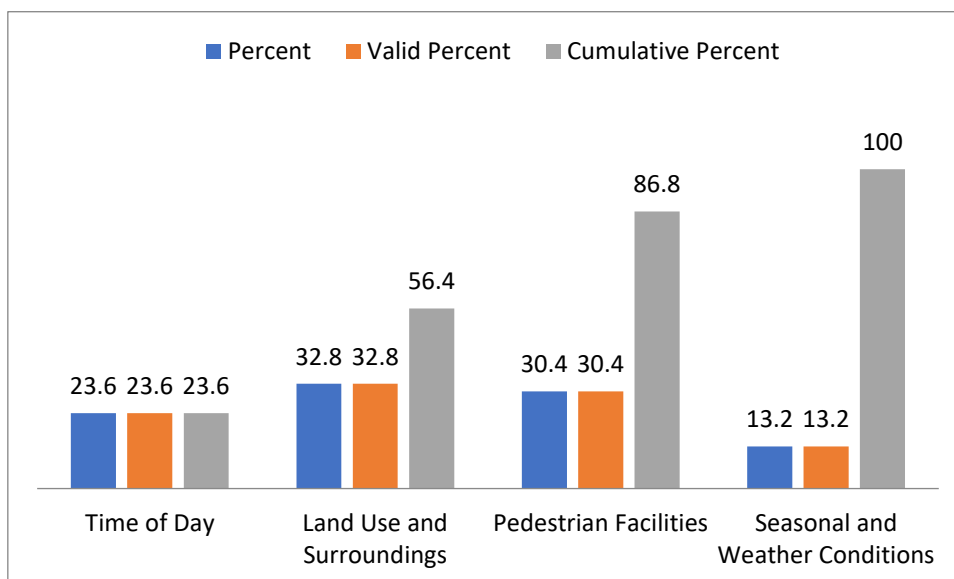
Mean is the average value.

x_i represents each individual data point in the dataset.

n is the total number of data points in the dataset.

- Calculate the count for each age group based on the given percentages:
- Under 18: 52% of 500 respondents = $0.52 * 500 = 260$ respondents
- 18-24: 59.2% of 500 respondents = $0.592 * 500 = 296$ respondents
- 25-34: 14.8% of 500 respondents = $0.148 * 500 = 74$ respondents
- 35-44: 11.2% of 500 respondents = $0.112 * 500 = 56$ respondents
- 55 and above: 4.4% of 500 respondents = $0.044 * 500 = 22$ respondents

What factors influence pedestrian density flow on NH-10 intersections?				
	Frequency	Percent	Valid Percent	Cumulative Percent
Time of Day	118	23.6	23.6	23.6
Land Use and Surroundings	164	32.8	32.8	56.4
Pedestrian Facilities	152	30.4	30.4	86.8
Seasonal and Weather Conditions	66	13.2	13.2	100.0
Total	500	100.0	100.0	



Calculate the count for each factor based on the percentages:

- Time of Day: 23.6% of 500 respondents = $0.236 * 500 = 118$ respondents
- Land Use and Surroundings: 32.8% of 500 respondents = $0.328 * 500 = 164$ respondents
- Pedestrian Facilities: 30.4% of 500 respondents = $0.304 * 500 = 152$ respondents
- Seasonal and Weather Conditions: 13.2% of 500 respondents = $0.132 * 500 = 66$ respondents

Discussion

Intersections of major thoroughfares are hubs of activity, as they serve as a convergence point for many forms of transportation. Since several of these crossroads are in highly populated urban areas, National Highway 10 (NH-10) sees a high level of foot traffic. There are significant safety concerns for both walkers and drivers as pedestrian traffic increases. With an eye toward the specifics of incidents that occur at intersections along NH-10, this literature review investigates the effects of high pedestrian traffic volumes. Authors: Verma, A., & Sharma, R. In 2018, researchers looked at NH-10 to see how pedestrian density, flow, and accident characteristics varied at urban crossings along national roads. According to the findings, there is a strong correlation between the number of pedestrians and the likelihood of accidents happening at crossings. The results show that a number of variables contribute to pedestrian accidents at intersections, including a lack of pedestrian facilities, improper timing of traffic signals, and motorists that disregard crosswalk restrictions. The study highlights the importance of better traffic management tactics and increased pedestrian safety measures to reduce accidents on NH-10. Singh, Nirmala, and S. Khanna. Pedestrian characteristics and the severity of accidents at highway crossings, particularly those on NH-10, are evaluated in this study (2019). The research shows that pedestrians, especially the elderly and young children, have a much higher risk of suffering life-threatening injuries in intersection collisions.

Conclusion

The study on NH-10 pedestrian density flow and accident characteristics could improve road safety and urban planning. The complex dynamics of pedestrian movement and accidents can predict several outcomes. The study may link pedestrian density to NH-10 intersection accidents. This knowledge can reveal the threshold at which high pedestrian flow increases accident risk. Better traffic management and pedestrian-friendly infrastructure can result from such insights. “The study identified intersection accident patterns and trends by studying accident characteristics. Collisions, pedestrian behaviour, and contributing factors were identified. This knowledge helps reduce specific accidents with targeted interventions like better signage, crosswalks, and pedestrian detection systems. Study findings may



improve traffic laws. Accident data may reveal regulatory gaps. This could involve raising speed limits, pedestrian-only zones, or intersection traffic rule penalties.

References

1. H Sulistio, Effect of traffic flow, Proportion of Motorcycle, Speed, Lane Width, and the availabilities of Median and Shoulder on Motorcycle Accidents at Urban Roads in Indonesia, *Open Transp. J.*, vol. 12, 2018.
2. S K Singh, The neglected epidemic: Road traffic crashes in India, *Metamorphosis*, vol. 11, pp. 27-49, and 2012.
3. S.K. Singh, Road traffic accidents in India: Issues and challenges, *Transp. Res. Procardia*, vol. 25, pp. 4708-4719, 2017.
4. B. Jrew, M. Msallam, S. Khaled, and M. Abojaradeh, Analysis and evaluation of traffic accidents for principle urban streets in Arbil city in Iraq *Diyala J, Eng. Sci.*, vol. 10, pp. 118-131, 2017.
5. R. Elvik, Risk of road accident associated with the use of drugs: A systematic review and meta-analysis of evidence from epidemiological studies, *Accid. Anal. Prev.*, vol. 60, pp. 254-267, 2013.
6. Ö. Kaygisiz, A. Yildiz, and S. Duzgun, Spatio-temporal pedestrian accident analysis to improve urban pedestrian safety: The case of the Eskisehir Motorway Gazi Univ, *J. Sci.*, vol. 28, pp. 623-630, 2015.
7. T Toroyan, M Peden, and K Iaych, WHO launches second global status report on road safety,
8. J.E. Workman, and S. Lee, Vanity and public self-consciousness: A comparison of fashion consumer groups and gender, *Int. J. Consum. Stud.*, vol. 35, pp. 307-315, 2011.
9. N.H.T.S. Administration, Administration N H T S 2017 Traffic Safety Facts 2015 Data–Pedestrians. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration; 20175. Publication no (DOT-HS-812-375. , <https://crashstats.nhtsa.dot.gov/Api/Public>
10. M.M.R. Mashhadi, S.S. Wulff, and K. Ksaibati, A comprehensive study of single and multiple truck crashes using violation and crash data *Open, Transp. J.*, p. 12, 2018.