DELHI ROAD CRASH REPORT 2022

ACCIDENT RESEARCH CELL-TRAFFIC

Safe Sustainable Streets

Your necessity, Our priority.

FOREWORD

Every life lost on our roads is an avoidable tragedy that shakes our collective conscience.

Road Safety is not an abstract concept; it is a dynamic, living manifestation of our commitment towards its five constituent principals, which are creating awareness, providing education, use of technology, strict enforcement of traffic rules and providing emergency care.

The objective behind annual publication of Delhi Road Crash Reports is to analyze road crashes comprehensively with evidence-based data to reduce crashes, injuries and deaths on the roads of Delhi. Reports of 2020 and 2021 focused on identification of critical stretches and hot spots having concentration of fatal crashes. To follow up the findings and recommendations, Delhi Traffic Police coordinated with civic agencies and citizen groups to expedite and improve traffic infrastructure. These interventions have resulted in coordination and synergy with various stakeholders and creation of necessary infrastructure and road engineering interventions at various places.

The Delhi Police developed the Delhi Road Safety Action Plan (DRSAP) with system-based approach emphasizing upon 4 E's - Education, Engineering, Enforcement and Emergency Care to ease out Delhi-NCR traffic concerns. The strategic goal is to reduce the crash fatalities by one- third every year on Delhi Roads. In the year 2022, the Delhi Traffic Police conducted workshops and joint field visits with concerned civic agencies/ experts from IIT Delhi, DTU, SPA, CRRI, WRI, Raahgiri Foundation and Save Life Foundation etc.

I extend my heartfelt appreciation to the personnel of Delhi Traffic Police for their commendable efforts in maintaining discipline on the roads, even in challenging conditions, extreme weather and alarming pollution levels. The Accident Research Cell of Delhi Traffic Police has embraced a scientific and evidence-based approach, coordinating with concerned civic agencies to address faulty road engineering and mitigate accidents. Their dedication deserves due praise.

Sanjay Arora, IPS
Commissioner of Police: Delhi

FOREWORD

Road crash deaths are globally recognized as a serious public health issue and it is of much serious concern in our country. Systematic analysis of road crashes data plays a vital role for effective enforcement and taking advanced road safety measures.

Road traffic fatalities are preventable, making it the responsibility of all stakeholders and citizens to contribute to reducing road accidents. Even small steps holders towards this goal have socio-economic benefits, as road accidents cause significant financial losses and emotional trauma to victims' families and the nation. Safe road infrastructure is a necessity for every country, and proper planning, design, construction, and operation are crucial for multimodal transportation.

The Delhi Traffic Police, based on the Accident Research Cell's analysis, implements strategies such as speed calming strips, nose protection at flyovers, increased deployment and enforcement, improved road engineering, and digital camera installations to reduce crashes.

The "Delhi Road Crash Report 2022" will be valuable resource available on the website, aiding in understanding accident scenarios and road safety status to take site, concerted action for safer roads. By adopting a safe systems approach and improving road infrastructure design, especially for vulnerable road users, such as pedestrians, cyclists and motorcyclists, we can significantly reduce deaths on the roads. Road crashes have long-term impacts on victims' families and the economy, costing around 3-5% of the GDP annually. To prevent these crashes, a smooth traffic management and surveillance system, such as the Intelligent Traffic Monitoring System, is essential, especially with the growing number of vehicles on the roads.

This annual report will be beneficial to administrators, policymakers, and civil society organizations involved in road safety, helping them work towards preventing road accidents.

Virender Singh, IPS
Special Commissioner of Police
Traffic Management Division/ Zone-I

PREFACE

The primary responsibility of the Delhi Traffic Police is to reduce road crash fatalities and safeguard lives. We work towards this through an efficient traffic management system that encompasses regulation, enforcement, engineering, education, and emergency services. However, despite these sustained efforts, the glaring number of road crash fatalities remains unacceptably high. In the year 2022 alone, we lost the lives of 1461 people; each one was a devastating tragedy.

Road crashes are preventable calamities requiring the combination of robust infrastructure and concerted action from various stakeholders in order for resolution. Analyzing the annual data of accidents helps identify causes and develop smart, sustainable solutions. The Intelligent Traffic Monitoring System is one such solution that will act as a game changer, enhancing surveillance and deterring dangerous violations like over speeding and red light jumping, thereby ensuring road safety.

A problem of this scale requires the close collaboration of several stakeholders and partners. Delhi Traffic Police has been coordinating with various civic agencies and other stake holders to make safety of pedestrians and smooth flow of traffic a priority. Despite various challenges, the Delhi Police remains determined to work closely with various agencies, civic interest groups, and the public to achieve the global goal of road safety, making Delhi one of the safest places for road users in India.

In this report, we outline a Road Safety Action Plan which involves the joint effort of multiple departments to improve education, engineering, enforcement, and emergency care. The focus is on designing forgiving infrastructure to reduce the chance of crashes occurring in the first place and then reducing the deadliness in the cases where they do occur. Let us unite in our commitment to creating a safe and sustainable environment for all, minimizing tragic road crashes, and safeguarding lives. The report is also available in PDF format on Delhi Traffic Police's website at www.traffic.delhipolice.gov.in

Surender Singh Yadav, IPS
Special Commissioner of Police
Traffic Management Division/ Zone-II

CONTENTS

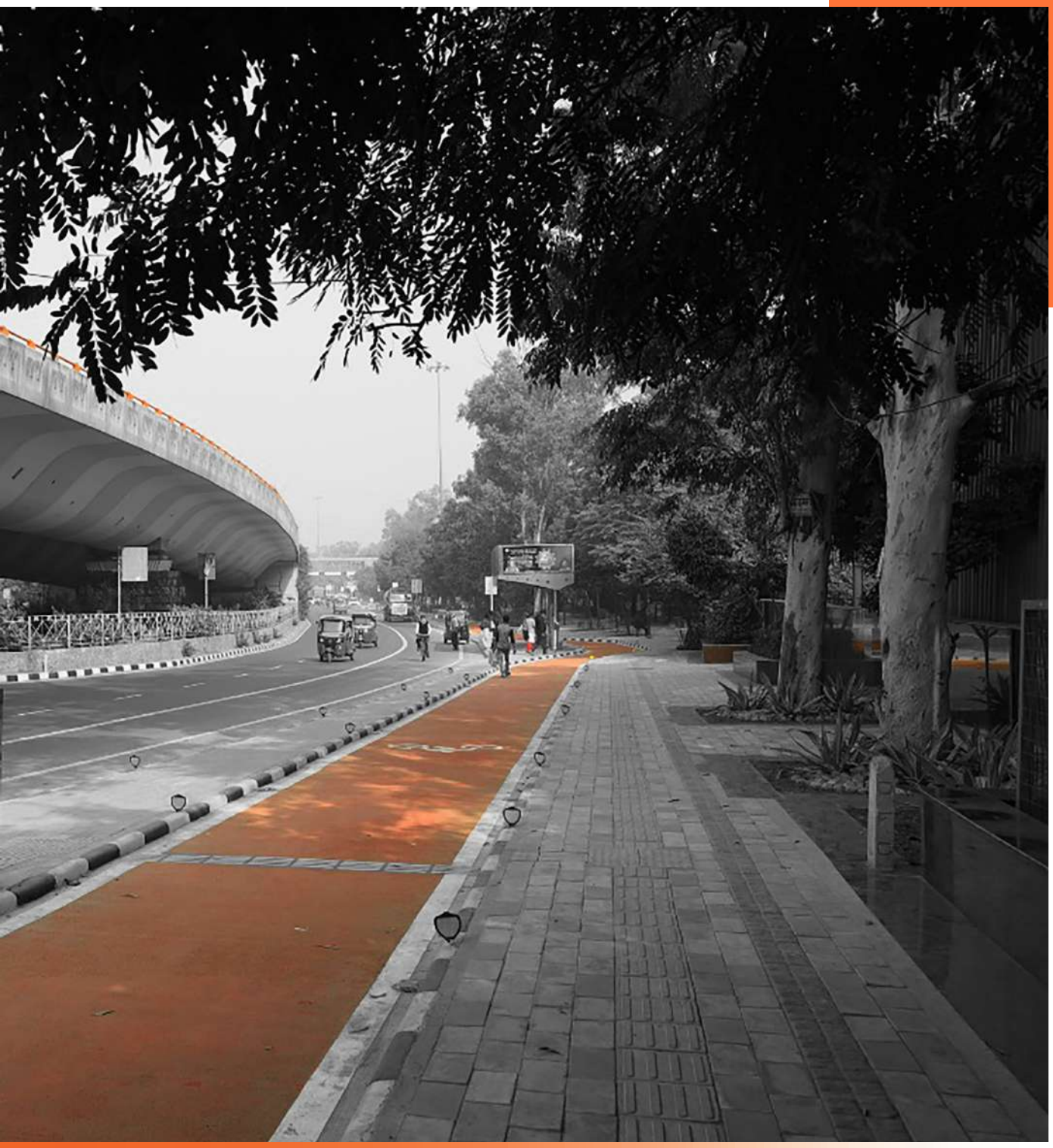
LIST OF FIGURES

LIST OF MAPS

LIST OF TABLES

01

INTRODUCTION



The Road to Zero Fatalities

Starts here

1.1 DEFINITIONS

- **Road Accident:** An unintended or unplanned event on the road resulting in damage, injury, or loss of human life.
- **Road Crashes:** A road crash involving vehicles, pedestrians, or cyclists that results in injury or death (as per WHO), often suggesting that human actions or errors played a significant role in causing the incident.
- **Road Crash Victims:** Road crash victims are individuals affected by road crashes and can suffer a range of consequences, from minor injuries to severe disabilities or even loss of life.
- **Road Traffic Injuries:** Any harm or damage sustained by a person due to a road traffic crash. Road traffic injuries can lead to disabilities or fatalities.
- **Blackspots:** Ministry of Road Transport and Highways (MoRTH) in India defines blackspots as specific road locations with a history of many accidents resulting in fatalities or serious injuries.
- **Road safety infrastructure:**Comprises the physical components and features incorporated on roads and highways to improve safety for all individuals using the road. These elements are designed per standards to reduce the likelihood of road accidents, mitigate their severity and create a safer environment for pedestrians, cyclists, and motorized vehicles.
- **Vehicle safety:** Refers to measures and technologies implemented in a vehicle to minimize the risk of road accidents, protect the occupant and reduce the severity of injuries in the event of a crash.
- **Motor Vehicles:** It is a self-propelled vehicle designed and used for transportation on roads. It typically has an internal combustion engine, electric motor, and other propulsion systems.

- **Critical stretches:** A specific segment of the road having a high frequency of crashes or an increased risk of crashes compared to the other parts of the road network.

- **Vulnerable road users:** Refers to individuals at higher risk of getting involved in road crashes or experiencing more severe consequences when an accident occurs.

- **Overspeeding:** Overspeeding is driving a vehicle above the designated speed limit or driving too fast for the prevailing road traffic conditions.

- **Pedestrian Safety:** Refers to the measures and practices aimed at protecting individuals walking on roads. It focuses on minimizing the risk of crashes and injuries involving pedestrians and creating a safe environment for walking and mobility.

- **Pedestrian safety infrastructure:** Includes the physical elements and features implemented in the built environment to enhance the safety of pedestrians. These elements are Sidewalks and footpaths, Crosswalks, Pedestrian signals, pedestrian overpasses, underpasses, traffic calming measures, refuge islands, Visibility enhancement, and signages.

- **Non-motorized Vehicles:** NMT does not rely on a motor or engine for propulsion. These vehicles are powered by human efforts to operate. NMT includes Bicycles, tricycles, skateboards, Roller skates, wheelchairs, and pedestrians.

- **Dangerous Driving:** the act of driving a motor vehicle in a manner that falls far below that expected of a competent and careful driver and hence puts the life of the driver and the lives of other road users at risk.

- **Distracted Driving:** Use of handheld communication devices while driving.

1.2 URBANIZATION AND ROAD CRASHES

Urbanization often leads to a rise in population density and economic activities, increasing demand for transport facilities. The increase in motor vehicles leads to the construction of new roads, bridges, flyovers, highways, and tunnels, but often poor road design, insufficient road infrastructure, and public facilities lead to the risk of road crashes. Factors such as lack of pedestrian facilities, insufficient signages, and inadequate lighting also contribute to the higher crash rate.

The road space is shared by multi modes of transport like private vehicles, public transportation, shared vehicles, non-motorized vehicles, slow-moving vehicles, cycles, and pedestrians. Each mode of transport has its specific behaviours, speed, and vulnerabilities. Our roads should respect the space for all road users, especially vulnerable ones.
Several risk factors contribute to crashes and pose dangers to road users. These risk factors may include human factors, road infrastructure, vehicle factors, environmental conditions, speeding, vulnerable road users, and non-compliance with traffic rules. If these risk factors are not mitigated effectively, several negative consequences arise, leading to road traffic injuries that cause considerable economic losses to individuals, their families, and nations. These losses occur from the cost of treatment and lost productivity for those killed or disabled by their injuries.

Today road traffic injuries are one of the leading causes of deaths, disabilities, and hospitalizations, with severe socio-economic costs worldwide.

Deaths and injuries resulting from road traffic crashes remain a serious problem globally, and current trends suggest that this will continue to be the case in the foreseeable future.

The number of road traffic deaths on the world's roads remains unacceptably high. Every year the lives of approximately 1.3 million people are cut short due to road traffic crashes. Between 20 and 50 million more people suffer non-fatal injuries, with many incurring a disability due to their injury. And the fact is, every one of those deaths and injuries is preventable.

Road traffic injuries place a heavy burden not only on global and national economies but also on household finances. Road traffic crashes cost most countries 3% of their gross domestic product. Many families are driven deeper into poverty by the loss of breadwinners and the added responsibility of caring for members disabled by road traffic injuries.

Everyone killed, injured, or disabled by a road traffic crash has a network of others, including family and friends, who are deeply affected. Globally, millions of people are coping with the death or disability of family members from road traffic injury. It would be impossible to attach a value to each case of human sacrifice and suffering, add up the weights, and produce a figure that captures the global social cost of road crashes and injuries.

Equal protection for all road users should be the guiding principle to avoid an unfair burden of injury and death for poorer and vulnerable road users. This equity issue is central to reducing the global burden of road crash death and injury.

Effective interventions include designing safer infrastructure and incorporating road safety features into land-use and transport planning, improving the safety features of vehicles; enhancing post-crash care for victims of road traffic crashes; setting and enforcing laws relating to key risks, and raising public awareness.

Road safety is an issue that does not receive the attention it deserves and is one of our great opportunities to save lives worldwide.

The safe system approach to road safety aims to ensure a secure transport system for all road users. Such an approach considers people's vulnerability to severe injuries in road traffic crashes and recognises that the system should be designed to forgive human error.

Road safety improvements included safer public transport, improved sidewalks and cycle lanes, regulations and their enforcement of seat-belt wearing and drink-driving penalties, public transport improvement reducing the rate of mode shift to private cars and motorcycles, and avoiding

risk exposure. If we want to achieve the goals of sustainable development, prosperity, and growth, we must uphold road safety. Road safety is imperative for a happy, healthy, and prosperous life of an individual and that of the nation.

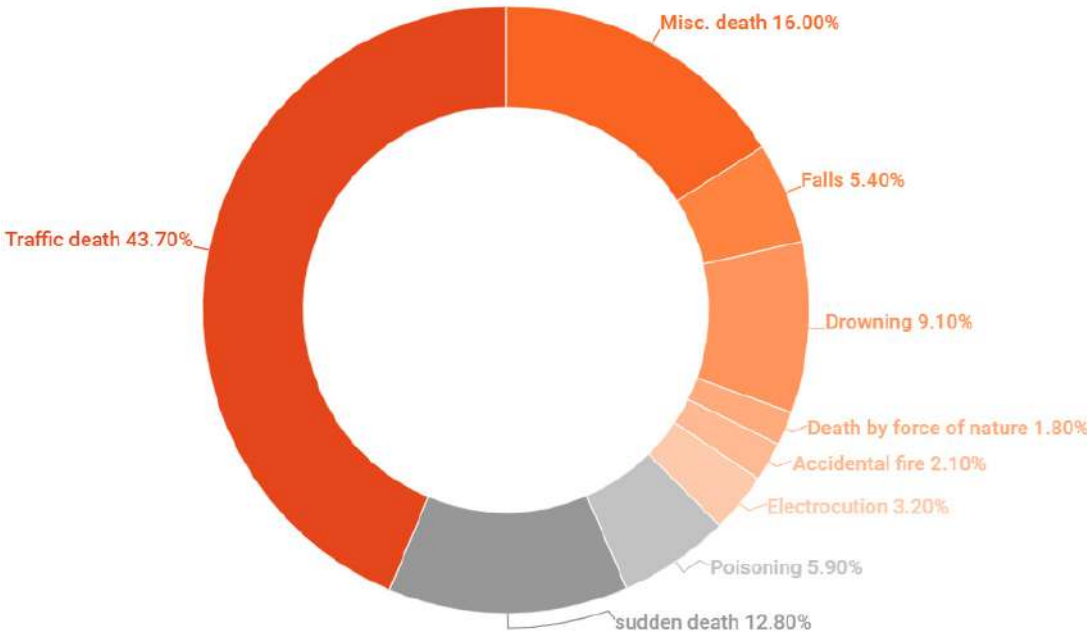
1.3 WORLD TREND ON ROAD CRASHES

Regions bear the burden of road traffic crashes unevenly. Low and middle-income countries suffer from almost 93% of global road traffic deaths, even though these countries have 60% of the world's vehicles. (*Source W.H.O Road traffic inguries ,2022*) These countries face challenges like rapid urbanization, inadequate road infrastructure, limited exposure and skills for road safety initiatives, lack of enforcement, and post-crash healthcare system, therefore contributing to high road fatalities. According to the World Health Organisation, more than half of all road traffic deaths are among vulnerable road users like pedestrians, cyclists, and motorcyclists.

1.4 NATIONAL TREND ON ROAD CRASHES

Based on the 2021 data from the National Crime Records Bureau (NCRB), traffic crashes accounted for the highest proportion of fatalities, representing 43.7% of the total deaths. This figure surpassed other causes such as drowning, fire-related incidents, and natural causes, among others. The national data shows a clear picture of the severity of the crashes in India.

According to the World Health Organisation, at least 1 out of ten people killed on roads across the world is from India. The cost of road crashes is borne not only by the victims and their families but by the economy as a whole in terms of untimely deaths, injuries, disabilities, and loss of potential income.



Source: Accidental deaths and Suicide in India 2021, National Crime Record Bureau, MHA

FIGURE 1.1 CRASHES AND FATALITIES ON INDIAN ROAD

According to MORTH report In 2021, 4,12,432 road crashes were reported in the country, claiming 1,53,972 lives and causing injuries to 3,84,448 persons. Unfortunately, the worst affected age group in road crashes is 18-45 years, which accounts for about 67 % of total road crash deaths.

Every year, approximately 1.5 lakh people die on Indian roads, translating, on average, into 1130 accidents and 422 deaths daily or 47 accidents and 18 deaths every hour.

The number of road crashes in 2021 increased by 12.6 % on average compared to the previous year, 2020. Similarly, the number of death and injuries on account of road crashes increased by 16.9 % and 10.39 %, respectively.

KEY FACTS W.H.O: ROAD TRAFFIC INJURIES

The United Nations General Assembly has set an ambitious target of halving the global number of deaths and injuries from road traffic crashes by 2030.

Road traffic injuries are the leading cause of death for children and young adults aged 5-29 years.

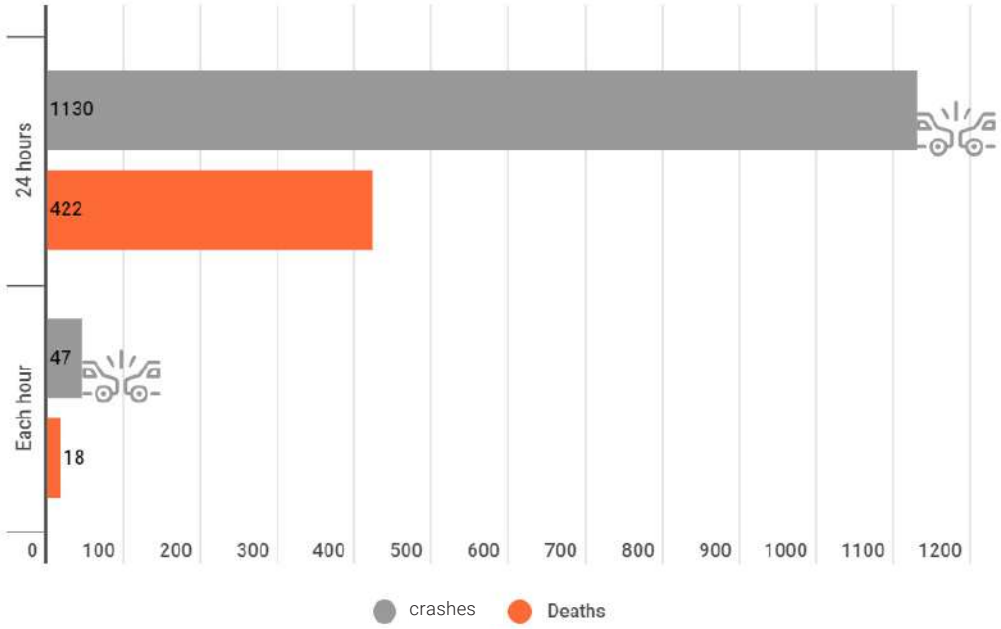


FIGURE 1.2 CRASHES AND FATALITIES ON INDIAN ROAD

TABLE 1.1 TOTAL NO. OF ROAD CRASHES FATALITIES & PERSONS INJURED DURING 2016 TO 2021

Year	Road Crashes	% Change	Fatalities	% Change	Persons Injured	% Change
2016	4,80,652	-	1,50,785	-	4,94,624	-
2017	4,64,910	-3.28	1,47,913	-1.9	4,70,975	-4.78
2018	4,67,044	0.46	1,51,417	2.37	4,69,418	-0.33
2019	4,49,002	-3.86	1,51,113	-0.2	4,51,361	-3.85
2020	3,66,138	-18.46	1,31,714	-12.84	3,48,279	-22.84
2021	4,12,432	12.64	1,53,972	16.9	3,84,448	10.39

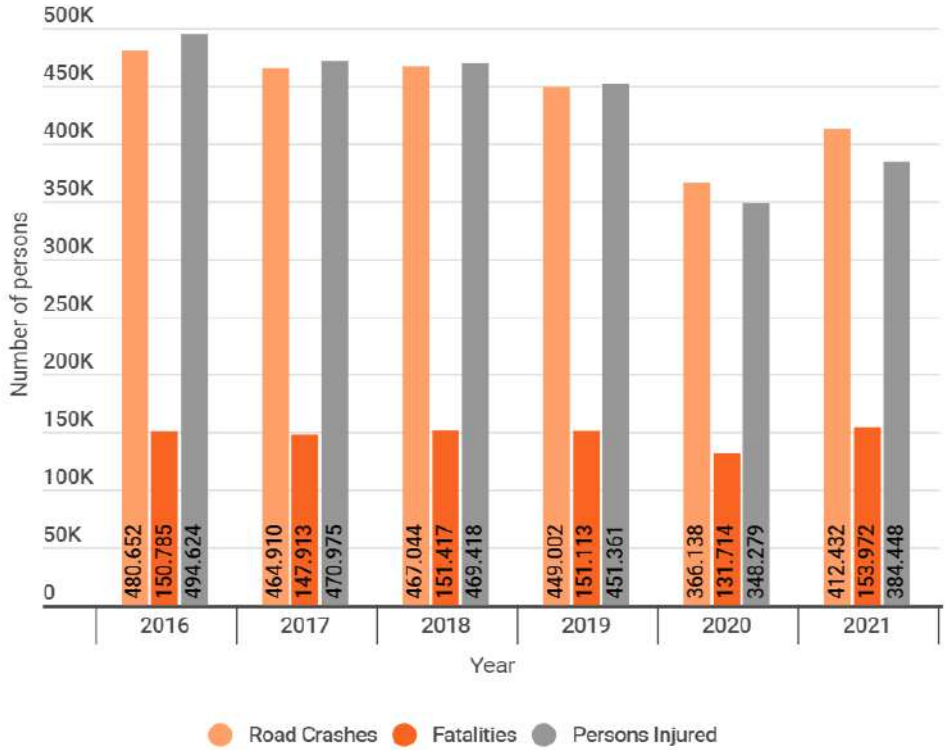
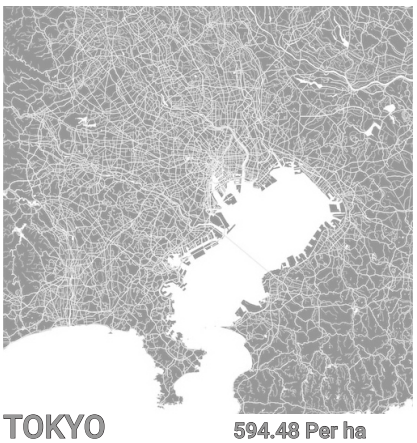


FIGURE 1.3 TREND OF ROAD CRASHES IN INDIA (2016-2021)

1.5 ROAD CRASHES IN MILLION- PLUS CITIES

In 2021 50 million-plus cities accounted for 67,301 crashes (16.3%) of the crashes and 15,350 deaths (10%) of total death in the India.



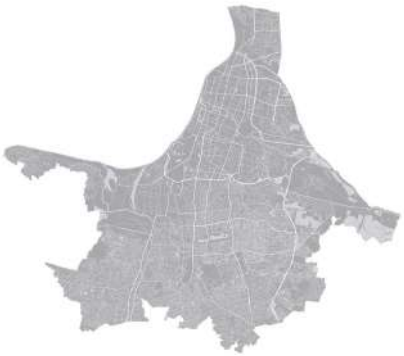
TOKYO 594.48 Per ha

NEW YORK 249.40 Per ha

BEIJING 13.3 Per ha

SHANGAI 39 Per ha

NEW DELHI 139.7 Per ha



KOLKATA 738.34 Per ha

CHENNAI 241.65 Per ha

MUMBAI 347.38 Per ha

FIGURE 1.4 MAPS OF MILLION PLUS CITIES WITH DENSITIES

TABLE 1.2: COMPARISON OF ROAD CRASHES IN MILLION PLUS CITIES

Cities	Population (lakhs)	Area (sqkm)	Density per ha	Road length (km)	Motor Vehicle Registration (lakhs)	Road crashes	Fatal crashes (1 year)	Travel time per 10km
New York	196.8	789.4	249.30	10139	31.12	8668	273	11 min
Tokyo	372.7	627	594.48	24730	30.90	7854	133	25 min
Shanghai	247.6	6340	39	5844	50	930	812	-
Beijing	218.4	16410.54	13.3	8431.5	55	5363	964	-
Delhi	207.23	1483	139.7	33198	77.39	5652	1428	22 min
Chennai	115.03	476	241.65	2780	60	5034	998	15 min
Greater Mumbai	209.61	603.4	347.38	2055	31	2230	387	21 min
Kokata	151.34	205	738.24	1850	8	1717	196	-

Source: Statista, MorTH report on Road Accidents in India 2021, Tomtom website

Among significant million plus cities, Delhi has recorded the highest fatal crashes followed by Chennai, Beijing and Shanghai. However, other cities with similar demographic and geographical characteristics experience many road crashes, but their fatality rates are comparatively lower than that of Delhi. The cities like Tokyo and New York, having higher population than Delhi, still record the lowest road fatalities.

Delhi has a motor vehicle registration proportion of 37.3% compared to its population, ranking it as the second-highest after Chennai, which has 52.16%. Tokyo's registration proportion stands at 8.3%, while New York has 15.81%, Shanghai has 20%, Beijing has 25.4%, Mumbai has 14.7%, and Kolkata has 5.2% of the motor vehicle registration recorded in the city.

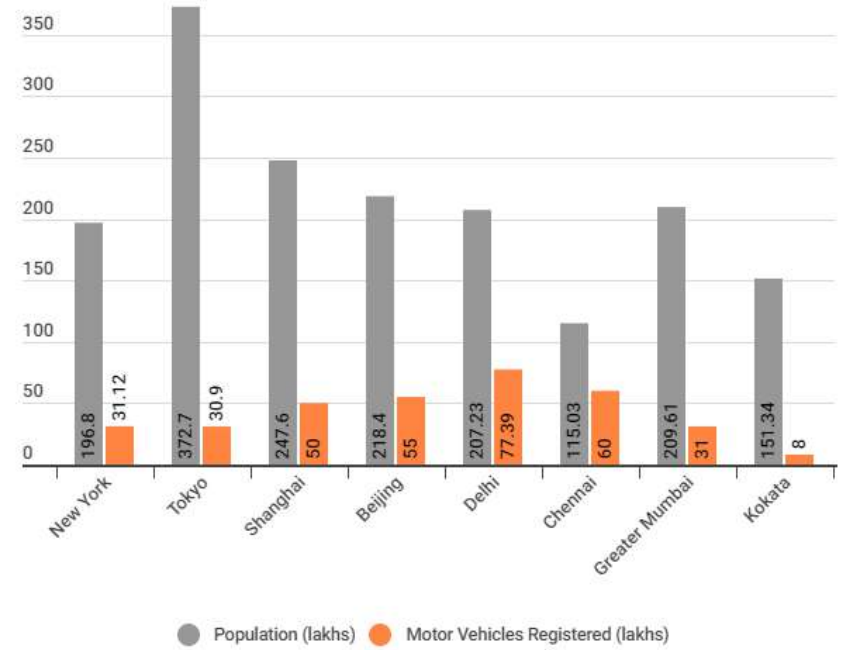


FIGURE 1.5 COMPARISON OF MVR IN MILLION PLUS CITIES

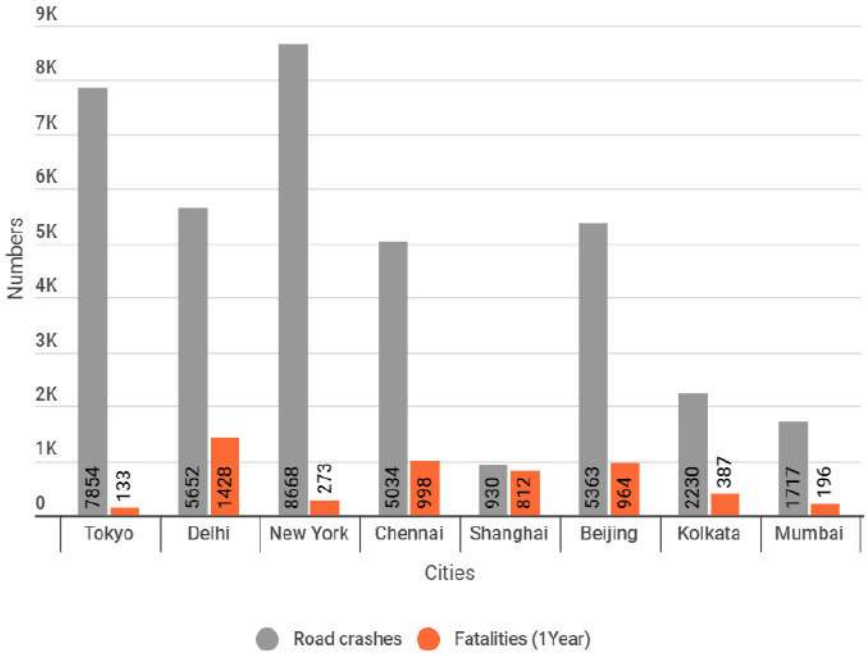


FIGURE 1.6 COMPARISON OF FATALITIES AND ROAD CRASHES IN MILLION PLUS CITIES

1.6 ROAD CRASHES IN DELHI

Road traffic crashes are amenable to remedial actions, and the Delhi Traffic Police has been implementing multi-pronged road safety strategies for safe and smooth traffic on Delhi roads based on enforcement action, regulation, education, and engineering.Economic development in the city and an increase in population have created pressure on supporting systems like housing, infrastructure, and transportation. It has also led to increased demand for transport and, thus, subsequently, to a phenomenal increase in the number of motor vehicles.The heterogeneity and magnitude of vehicle population, the unpredictability of human behavior, economic constraints, poor road markings and signages, defective road design, and deficiencies in vehicle design are some factors leading to road accidents in Delhi. In addition, Drunken Driving, Over Speeding, Overloading, and Violation of Traffic Rules are the common causes of traffic accidents In 2022, a total number of 5652 road crashes have been reported in Delhi, claiming 1428 lives and causing injuries to 5201 persons.

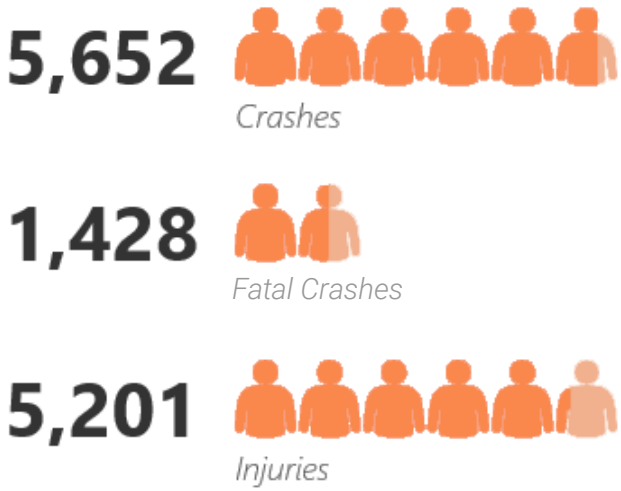


FIGURE 1.7 DELHI CRASH DATA 2022

The number of road crashes in Delhi in 2022 increased by 19.7 % on average compared to the previous year, 2021. Similarly, the number of deaths and injuries in road crashes increased by 17.9 % and 21.7 %, respectively. On average, 15 road crashes and four deaths happen every day in Delhi.

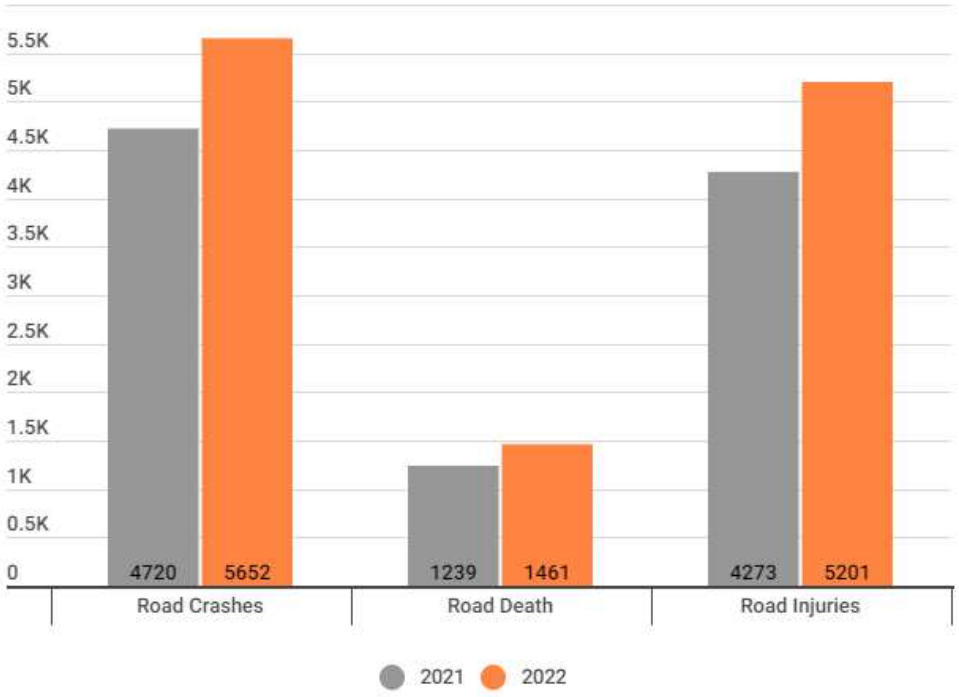


FIGURE 1.8 DELHI CRASH DATA 2022

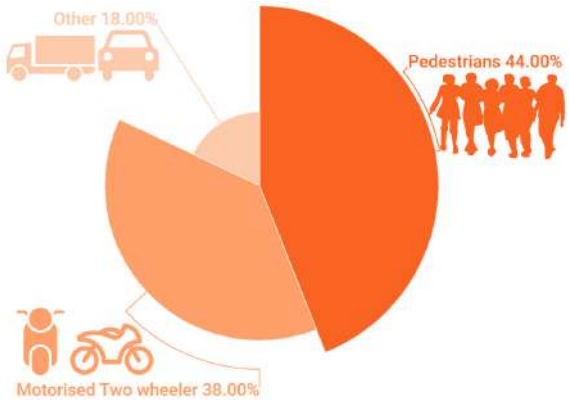


FIGURE 1.9 COMPOSITION OF VULNERABLE VICTIMS IN ROAD CRASHES

Pedestrians are the most vulnerable victims in road crashes. In 2022, the share of pedestrian deaths in road crashes was 44 %, and motorized two-wheeler riders were the second most vulnerable victims, accounting for 38 % victims of the total share in total road crash deaths.

Crash classifications according to day and night show that in 2022, 806 fatal crashes occurred during the night, whereas 622 occurred during the day.

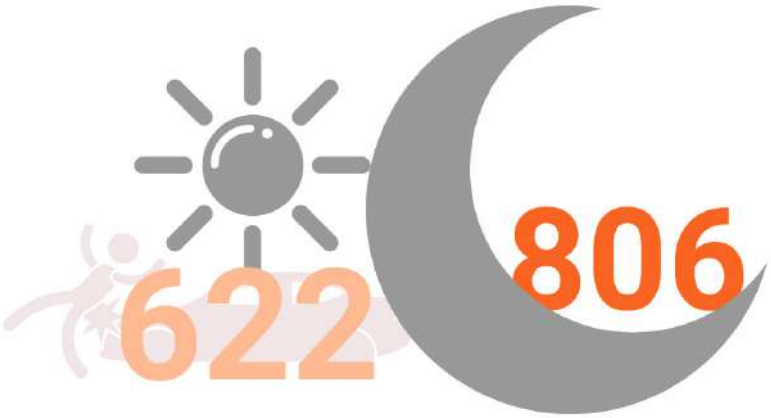


FIGURE 1.10 Comparison of fatal crashes during day and night

The Delhi Traffic Police has spatially analyzed accident spots for 2022 to identify the clustering points or accident-prone zones in Delhi. 117 crash-prone zones have been identified in 2022 according to the criteria of three or more fatal crashes within a diameter of 500 meters or ten or more total road crashes in the same region. The top ten spots with the maximum number of fatal crashes are termed Black spots.

The Ring Road (25), GT Karnal Road (17), and Outer Ring Road (15) have the maximum number of dangerous stretches.Consequently, reducing the occurrence of crashes and fatalities poses a significant challenge. By analyzing the data from 2013 to 2022, we can identify patterns of growth and decline, allowing us to develop timely interventions to address vulnerabilities on the road.

The possible high risk factors for increased road crashes and fatalities is shown in the table below.

SPEEDING

- An increase in average speed is directly related both to the likelihood of a crash occurring and to the severity of the consequences of the crash. For example, every 1% increase in mean speed produces a 4% increase in the fatal crash risk and a 3% increase in the serious crash risk.
- The death risk for pedestrians hit by car fronts rises rapidly (4.5 times from 50 km/h to 65 km/h).
- In car-to-car side impacts the fatality risk for car occupants is 85% at 65 km/h.

Source: Key Facts WHO: road traffic injuries, June,2022

USE OF MOTORCYCLE HELMETS, SEAT-BELTS, AND CHILD RESTRAINTS

- Correct helmet use can lead to a 42% reduction in the risk of fatal injuries and a 69% reduction in the risk of head injuries.
- Wearing a seat-belt reduces the risk of death among drivers and front seat occupants by 45 - 50%, and the risk of death and serious injuries among rear seat occupants by 25%.
- The use of child restraints can lead to a 60% reduction in deaths.

Source: Key Facts WHO: road traffic injuries, June,2022

DISTRACTED DRIVING

- Drivers using mobile phones are approximately 4 times more likely to be involved in a crash than drivers not using a mobile phone. Using a phone while driving slows reaction times (notably braking reaction time, but also reaction to traffic signals), and makes it difficult to keep in the correct lane, and to keep the correct following distances.
- Hands-free phones are not much safer than hand-held phone sets and texting considerably increases the risk of a crash.

Source: Key Facts WHO: road traffic injuries, June,2022

02

DELHI AT A GLANCE

Delhi officially known as National Capital Territory (NCT) is a city and union territory of India housing India's Capital New Delhi. Delhi shares its geographical boundary with Uttar Pradesh on the East and Haryana on the west. The National Capital Territory of Delhi covers an area of 1483 sq. km. and has a population of around 207.23 lakhs (Projected population of Delhi, 2022).

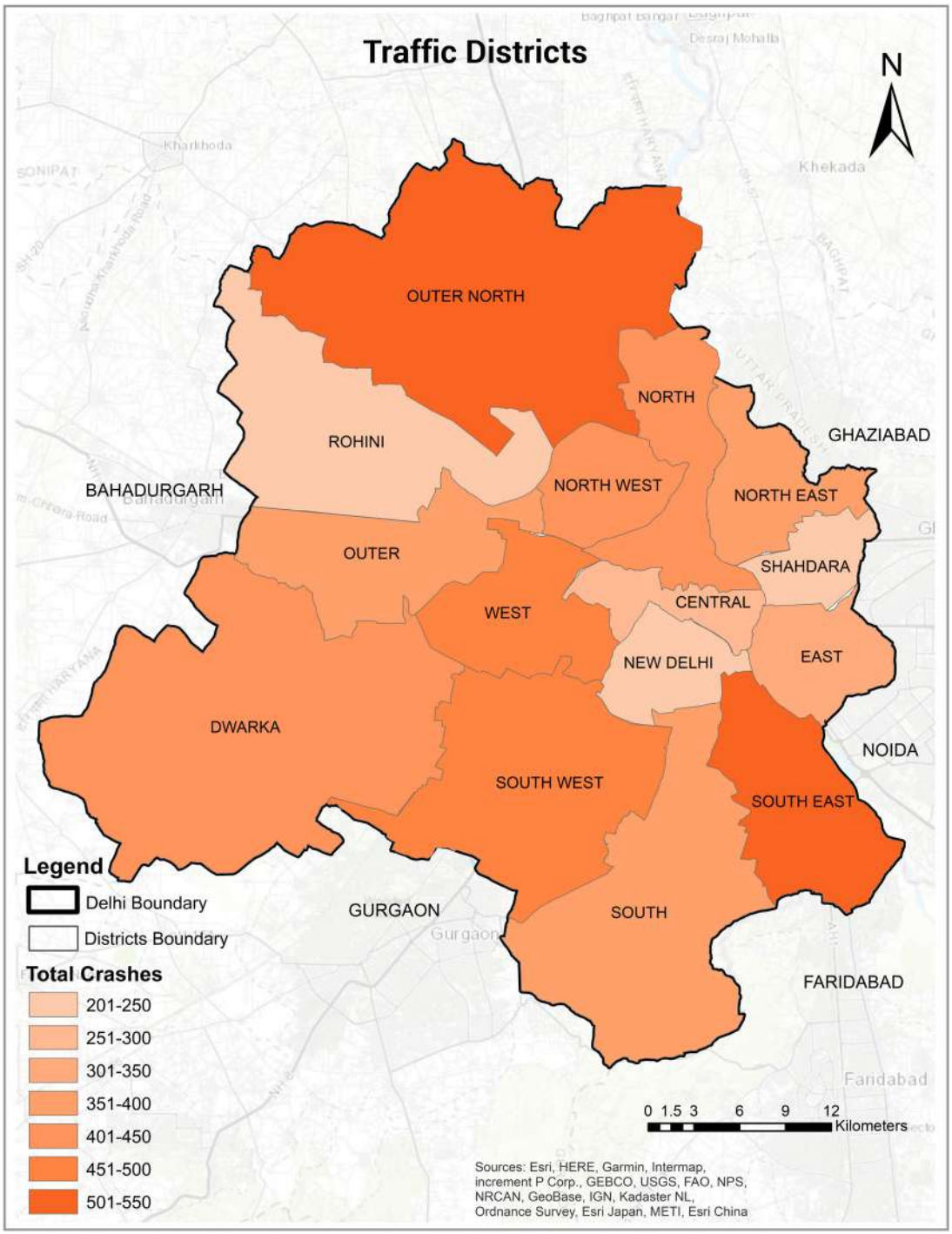
2.1 DEMOGRAPHY

Over the years Delhi has witnessed massive/ huge growth of population due to constant influx of people from neighboring states in search of employment and business attributing to rapid growth in vehicle volume. This has brought problems of traffic congestion, delays, improper parking, and pollution caused by vehicular emissions. The human population, which was 62.20 lakhs in 1981 increased to 93.7 lakhs in 1991, 137.8 lakhs in 2001 to 207.23 lakhs (approx.) in 2022, showing more than two-fold increase in the last three decades. Economic development in the city along with an increase in population has created pressure on the supporting systems like housing, infrastructure, and transportation. It has also led to an increased demand for transportation, and thus, subsequently, to a phenomenal increase in the number of motor vehicles.

2.2 ADMINISTRATIVES BOUNDARIES IN DELHI

This report presents the crash data of Delhi, categorized into six traffic ranges, 15 districts, and 69 traffic circles. Such segregation is significant as it allows for a comprehensive understanding of the city's spatial and administrative distribution of traffic crash data.The visualization of data, when segregated department-wise regarding traffic districts, circles, and ranges, provides valuable insights for effective decision-making and resource allocation. It allows for a better understanding of the distribution patterns, trends, and hotspots of traffic crashes in different areas of Delhi. This visual representation assists in identifying high-risk zones, determining the effectiveness of existing road safety measures, and prioritizing interventions based on the specific needs of each administrative unit.

DISTRICTS OF DELHI

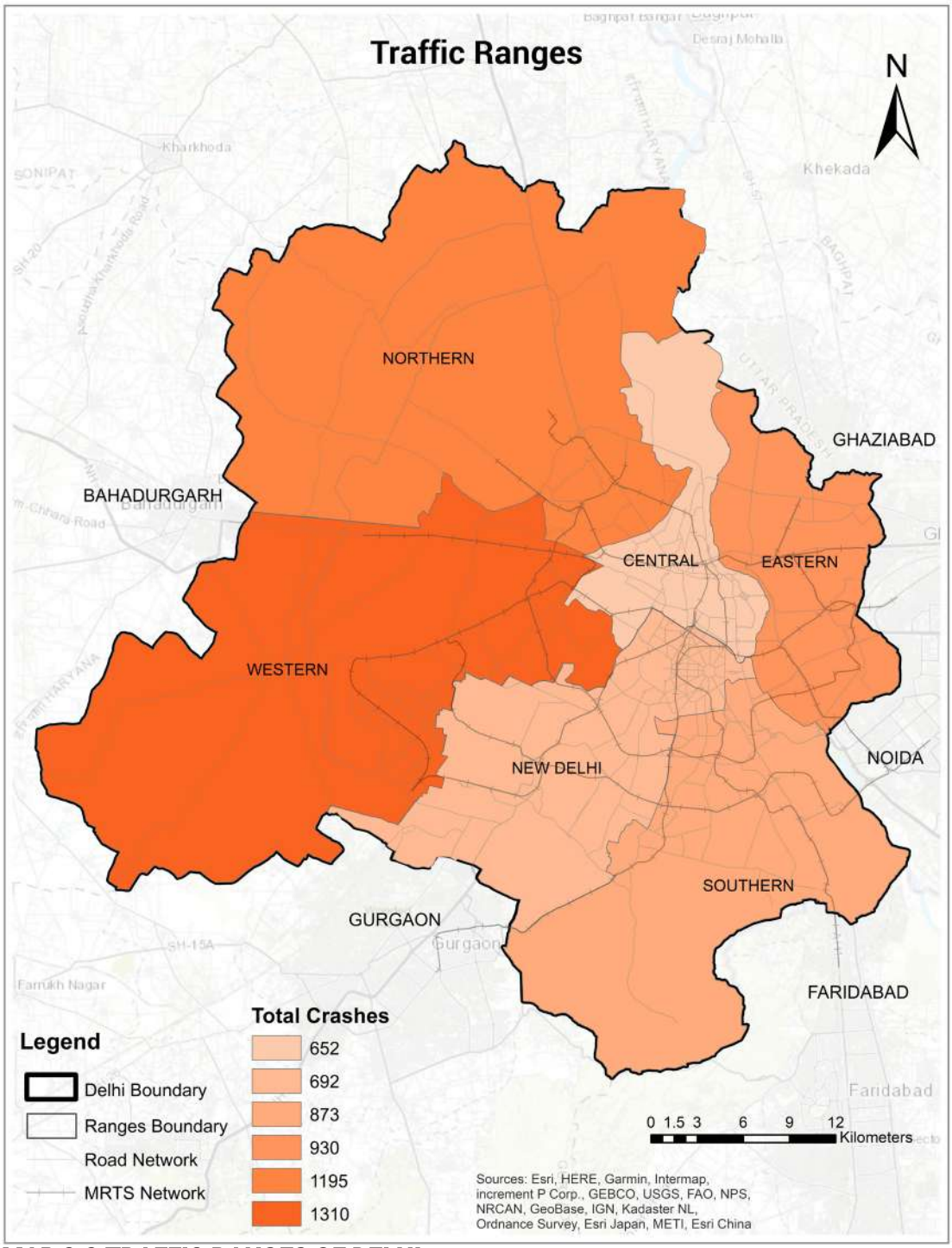


MAP 2.1 TRAFFIC DISTRICTS OF DELHI

Traffic Unit of Delhi police was created in Year 1975 with the mandate of traffic regulations and enforcement of traffic rules. The unit started with 16 traffic circles, 04 ACsP, 1DCP. Police Personnel of Traffic Unit are deployed round the clock across the city for ensuring effective traffic management and enforcement of traffic rules.

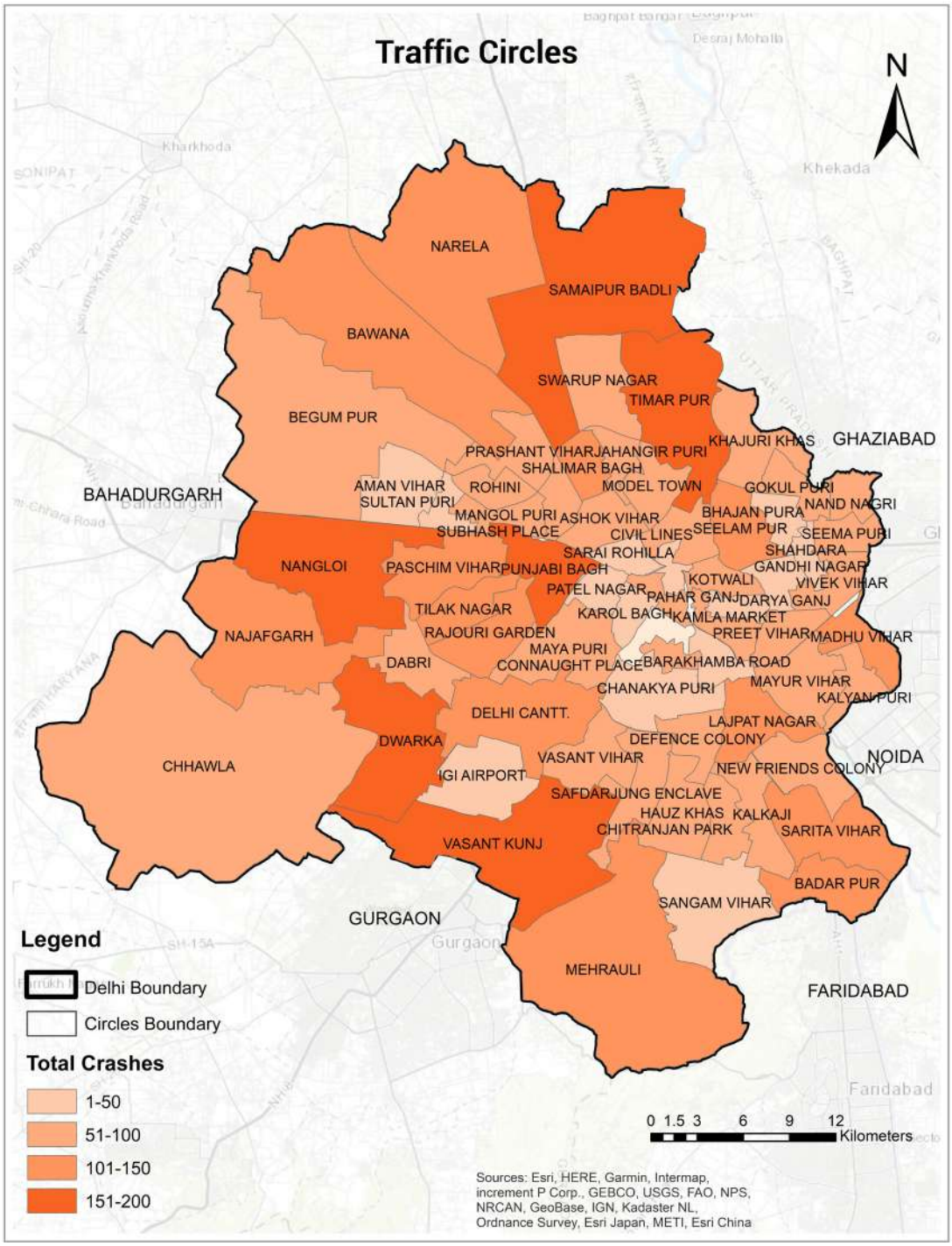
To ensure smooth traffic flow in the city with minimum inconvenience to the general public Traffic Management Division was administratively designed in the year 2021 with 02 Special Commissioners of Police supervising the operations of the Delhi Traffic Police divided into Traffic Management Division of Zones-I and Zones-II. 02 Additional commissioners of Police (Zone-I and Zone-II) co-extensive the Special Commissioners Zone-I and Zone-II, respectively. These Additional Commissioners of Police supervise the activities of 15 Deputy Commissioners of Police (Traffic), whose areas of authority are similar to those of district level Deputy Commissioners of Police. 69 Traffic Inspectors were responsible for specific areas at par with the Sub-Divisional Assistant Commissioners of Police under the immediate supervision of ACsP concerned of the Traffic Unit.

Recently, the Traffic administration was further restructured. Presently, it has 06 Deputy Commissioners of Police (Traffic) in 06 Traffic Ranges and 15 ACsP in 15 Districts, whose areas of authority are similar to those of district level Deputy Commissioners. These Districts are further divided into 50 Circles that are being supervised by Traffic Inspectors.



MAP 2.2 TRAFFIC RANGES OF DELHI

TRAFFIC CIRCLES OF DELHI



MAP 2.3 TRAFFIC CIRCLES OF DELHI

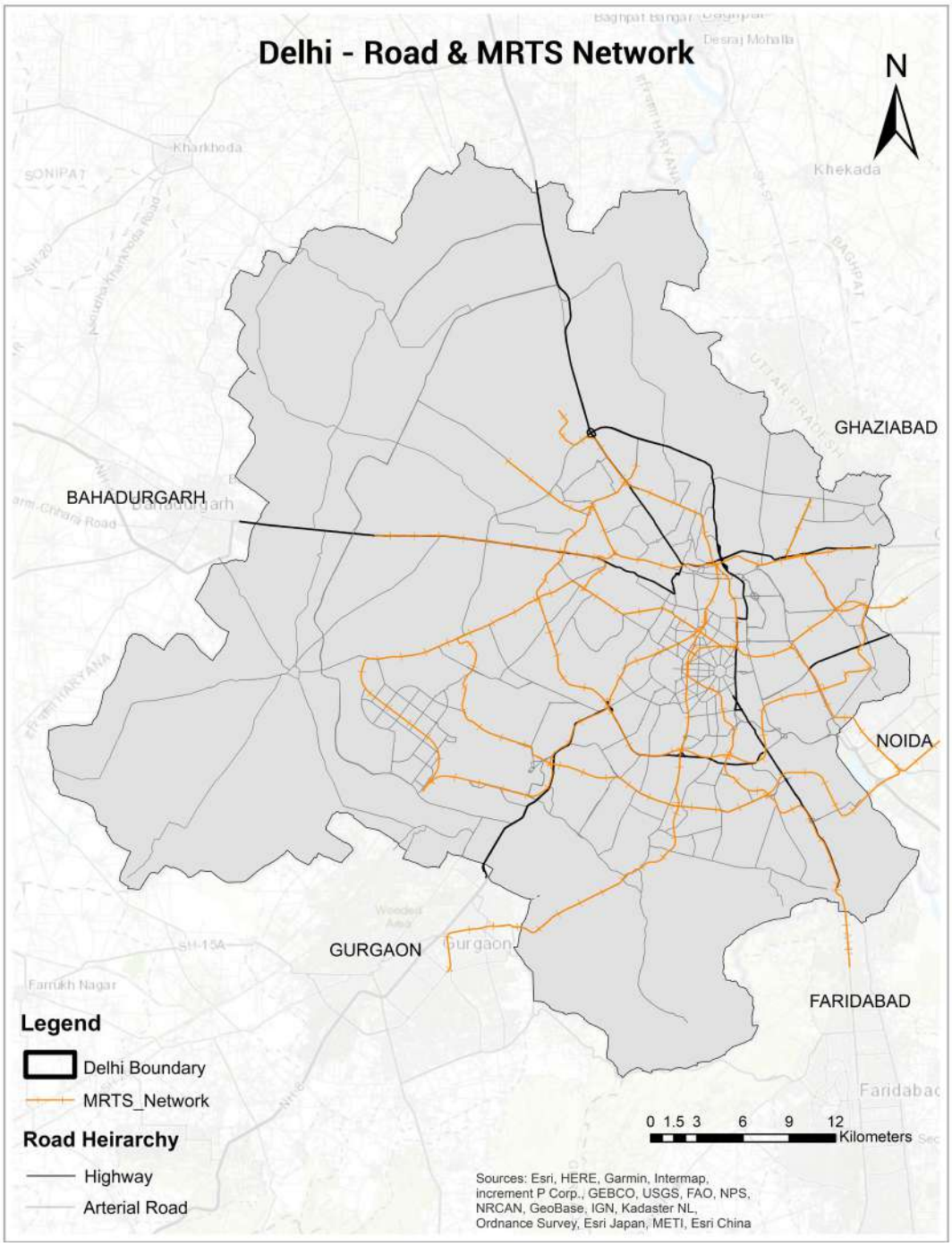
2.3 ROAD INFRASTRUCTURE IN DELHI

The transportation network in the National Capital Region (NCR) is in a radial pattern. It consists of a well-connected system of expressways, national highways, state highways, major district roads (MDRs), and other district roads. Various governmental bodies such as NHAI (National Highways Authority of India), PWD (Public Works Department), MCD (Municipal Corporation of Delhi), NDMC (New Delhi Municipal Council), Delhi Cantonment Board, and DDA (Delhi Development Authority) are responsible for the development and maintenance of this road network.

The Ring Road of Delhi serves as a convergence point for five National Highways: NH-1, NH-2, NH-8, NH-10, and NH-24. Additionally, NH-58 intersects with NH-24 at Ghaziabad. The region is also traversed by NH-71, NH-71-A, NH-71-B, NH-91, and NH-119, further strengthening the interconnectivity of the road network. State highways and other major roads are vital in enhancing the regional transportation system, linking various highways, and facilitating smoother movement within the NCR.

Due to rapid development and urbanization in the National Capital Region, satellite towns surrounding Delhi, such as Noida, Gurgaon, Rohtak, Manesar, Sonipat, and others, have experienced significant growth. However, this growth has increased traffic volume, leading to congestion on important interstate roads and highways connecting the city. The Capital City faces the challenge of managing this influx of traffic and ensuring efficient movement of vehicles.

All National Highways i.e. NH-44 (Earlier NH-1), NH-2, NH-48 (Earlier NH-8), NH-9 (Earlier NH-10) & NH-9 (Earlier NH-24) carry a high volume of traffic. The traffic so discharged on Ring Road and Outer Ring Road further blocks the circular roads of the city. Hence, the actual traffic volume in Delhi is much higher and increasing steadily. Post Covid Pandemic, since 2022, Delhi Traffic Police has followed multi-pronged strategies based on enforcement action, regulation, education and engineering for managing traffic on Delhi roads.



MAP 2.4 ROAD & MRTS NETWORK DELHI

2.4 VEHICLES IN DELHI

There were over 77.39 Lakh registered vehicles of all categories in Delhi in the year 2022. The yearly compounding growth of vehicular population for the year 2022 was -36.83%. The estimated total population of Delhi is 207.23 Lakhs at the end of the year 2022. Hence, the population density in Delhi is more than 139.7 persons per sq. Km. Likewise, the per capita registered vehicles in Delhi comes close to having 1 vehicle for every 2 persons in the city (1: 2.7).

Although, the number of motor vehicles on Delhi roads has increased by approx. 21 times between 1981 to 2022, the road length has only doubled, from 15,487 KMs to 33,198 KMs, during the period. Thus, the vehicle density per Sq. Km has increased manifold.

Private transport viz. private cars and two wheelers constitute 93% of all registered vehicles in Delhi. Buses of all categories, which are the major source of public transportation, form less than 0.5% of the total vehicular population.

This increase in traffic volume has manifested itself into numerous transportation problems. The traffic volume on the main corridors of the city has almost crossed the threshold of carrying capacity of the roads.

TABLE 2.1 MOTOR VEHICLES REGISTERED IN DELHI, 2013-2022

Year	Private Cars	M/Cycles Scooters	Taxis	TSRs	Goods Vehicles Delivery Vans and Others	Buses (Mini, Pvt. And others)	Total Motor Vehicles
2013	2,474,087	4,962,507	70,335	86,838	140,942	39,694	7,774,403
2014	2,629,343	5,297,697	78,686	91,840	154,654	40,947	8,293,167
2015	2,790,566	5,681,265	79,606	81,633	161,821	32,540	8,827,431

2016	2,986,579	6,104,070	91,073	1,98,137	281,159	43,723	9,704,741
2017	3,152,710	6,707,891	1,48,434	1,74,000	2,31,767	38,265	10,482,757
2018	3,334,298	7,185,033	1,56,793	1,88,173	2,71,017	39,273	11,204,277
2019	3,249,670	7,556,002	1,09,780	1,13,240	3,30,641	32,218	11,391,551
2020	3,311,579	7,959,753	1,22,476	1,14,891	3,50,876	33,302	11,892,877
2021	3,384,736	8,239,550	1,12,401	1,14,869	3,68,500	33,294	12,253,350
2022	2,057,657	5,135,821	85,079	92,149	351,381	17,282	7,739,369

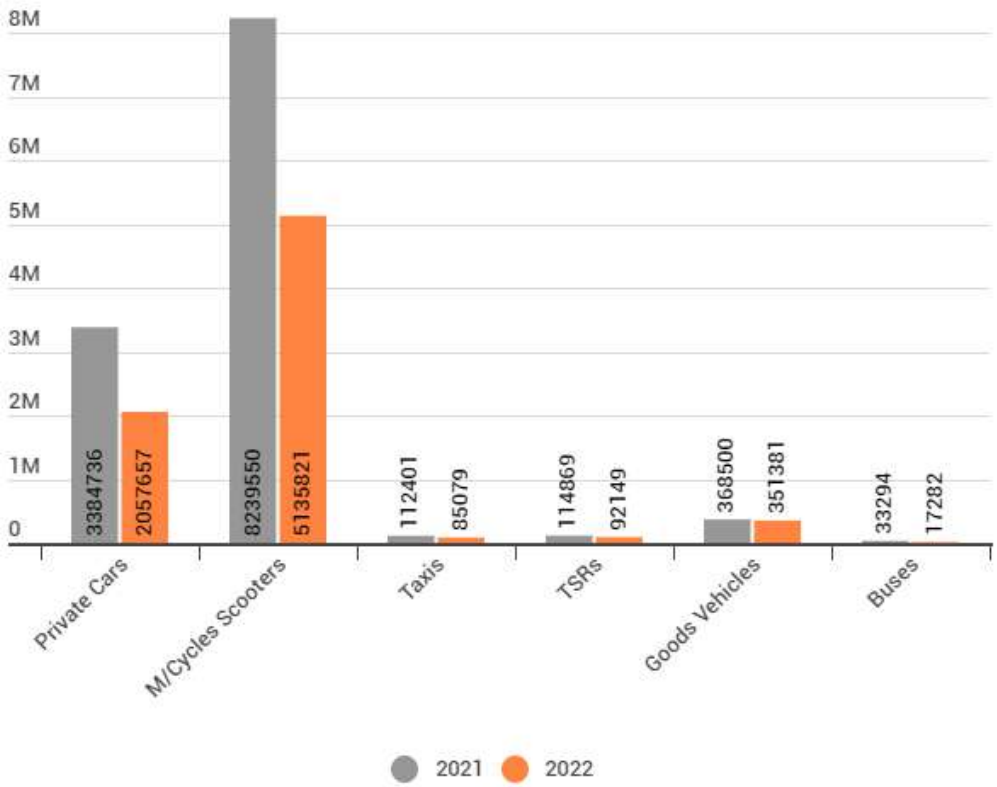


FIGURE 2.1 TOTAL MOTOR VEHICLES REGISTERED IN DELHI 2021-2022

Capturing 66 % vehicle share on Delhi roads, two-wheelers constitute a bulk of the vehicular traffic in the city. The private cars/jeeps constitute 27 % share of total registered motorized vehicles. In other words, private vehicles constitute around 93 % of total registered vehicles in Delhi.In contrast, buses and TSRs constitute only 0.22% and 1.1 % of the total vehicles respectively. In the year 2022, there is a diminishing trend in all types of vehicles registered in Delhi. The percentage of total registered vehicles has reduced to -36.83% in the year 2022.This decrease in vehicles is due to deregistration (48,77,646), scraping (4,923) and vehicles taking NOC (83,240).

TABLE 2.2 GROWTH/DECLINE IN MOTOR VEHICLE REGISTRATION, 2013-2022

Year	Private Cars	M/Cycles Scooters	Taxis	TSRs	Goods Vehicles Delivery Vans and Others	Buses (Mini, Pvt. And others)	Total Motor Vehicles	Yearly Growth (%)
2013	130,974	318,361	555	(-)1359	(-)87944	(-)24339	336,248	4.52
2014	155,256	335,190	8351	5002	13712	1253	518,764	6.67
2015	161,223	383,568	920	(-)10207	7167	(-)8407	534,264	6.44
2016	196,013	422,805	11467	116504	119338	11183	877,310	9.93
2017	166,131	603,821	57361	(-) 24137	(-) 49392	(-) 5458	778,016	8.01
2018	181,588	477,142	8359	14173	39250	1008	721,520	6.88
2019	-84628	370,969	-47013	-74933	59,624	-7055	187,274	1.67
2020	61,909	403,751	12,696	1651	20235	1084	501,326	4.40
2021	73,157	279,797	-10,075	-22	17624	-8	360,473	3.03
2022	-1,327,079	-3,103,729	-27,322	-22,720	-17,119	-16,012	-4,513,981	-36.83

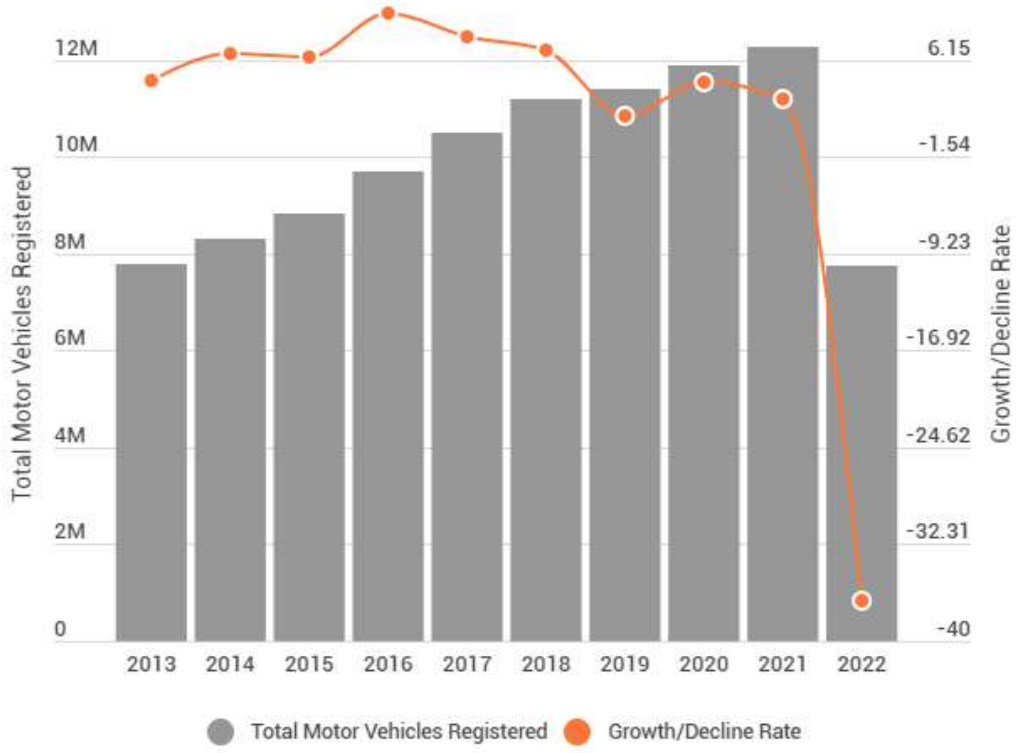


FIGURE 2.2 TOTAL MOTOR VEHICLES REGISTERED IN DELHI 2021-2022

MODAL SHARE IN DELHI

It is estimated that 48 different types of vehicles ply on Delhi's roads. Delhi Metro has a network covering more than 391 kms. (Source: DMRC) In spite of this, Delhi faces huge congestion issues. This has inevitable consequences in terms of crashes, pollution, rising commuting time, and wasteful energy/fuel consumption.

Delhi has lost the air quality gains achieved earlier through actions like large scale conversion of public transport buses and three wheelers to natural gas, relocation of polluting industries, and improvement in emission standards for vehicles among others. The loss is primarily owing to exponential growth in vehicle numbers due to increased dependence

on personal vehicles in absence of adequate, comfortable and efficient public transport services, walking and cycling facilities. Inadequate cycling facilities is slowly pushing the population to depend on the use of motorized private vehicles, thereby causing loss to clean environment, health and life in far greater numbers than was the case two decades earlier. Though 35% of the population of Delhi owns cycles, only 4.5 % uses them for commuting due to lack of safe cycling facilities or cycle-parking facilities. With inadequate cycling infrastructure, people tend to spend comparatively more money to reach the bus/metro station than the actual bus/metro fare.

Public transport systems such as buses, metro and commuter trains carry more people compared to private cars and are generally more affordable. They reduce exposure to crashes and are a key avenue to improve safety.

2.5 POPULATION, VEHICLES AND ROAD CRASH TRENDS

The table presents the correlation between population, motor vehicle registration, and road crash data. Over the past decade, the population has exhibited a consistent upward trend. Similarly, the number of registered motor vehicles on the road has also witnessed a steady increase, except in the year 2022. Regarding road crashes, there has been a declining pattern since 2013, indicating a positive trend in road safety.

However, it is noteworthy that the curve started to rise again in 2021, suggesting a potential reversal of the previous downward trend. These trends highlight the need for continued attention and proactive measures to ensure the safety of road users. As the population and number of vehicles on the road continue to grow, it becomes imperative to implement effective road safety initiatives, improve infrastructure, enforce traffic regulations, and raise awareness among motorists and pedestrians.

TABLE 2.3 ROAD CRASH TRENDS 2022

Year	Population (Cumulative)	Motor Vehicles (Cumulative)	Fatal Crashes	Total Crashes (All Types)	Road Deaths (Per Year)	Death Rate		Crash Severity*
						Per one lakh population	Per 10,000 vehicles	
2013	17,499,502	7,774,403	1778	7566	1820	10.40	2.34	24.05
2014	17,830,242	8,293,167	1629	8623	1671	9.37	2.01	19.37
2015	18,167,233	8,827,431	1582	8085	1622	8.93	1.84	20.06
2016	18,510,594	9,704,741	1548	7375	1591	8.59	1.63	21.57
2017	18,860,444	10,482,757	1565	6673	1584	8.39	1.51	23.73
2018	19,216,906	11,204,277	1657	6515	1690	8.79	1.50	25.94
2019	19,580,105	11,391,551	1433	5610	1463	7.47	1.28	26.07
2020	19,952,126	11,892,877	1163	4178	1196	5.99	1.00	28.62
2021	20,341,192	12,253,350	1206	4720	1239	6.09	1.01	26.25
2022	20,723,606	7,739,369	1428	5652	1461	7.04	1.88	25.84

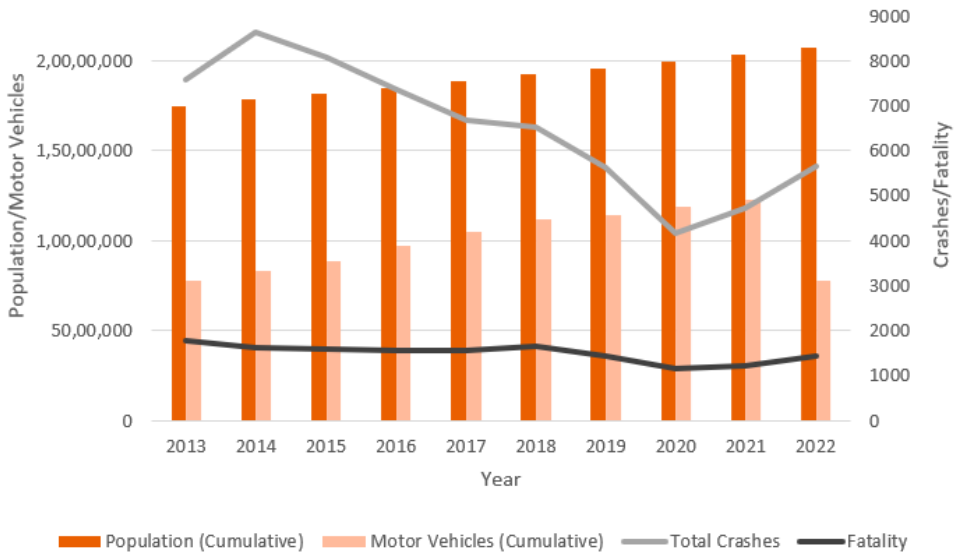
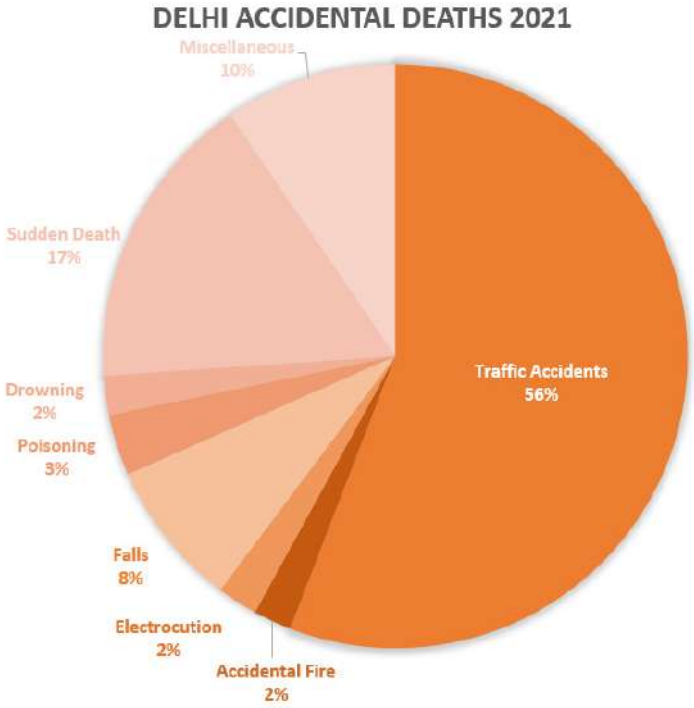


FIGURE 2.3 POPULATION VEHICLES AND ROAD CRASH TREND

CAUSES OF DEATHS IN DELHI

In Delhi, traffic accidents account for a significant portion of accidental deaths, comprising 56% of the total. The prevalence of traffic-related fatalities is alarming compared to other causes of accidental deaths, such as electrocutions, falls, drowning, poisoning, sudden death, miscellaneous incidents, and accidental fire.



Source: NCRB 2021

FIGURE 2.4 DELHI ACCIDENTAL DEATHS, 2021

This data highlights the urgent need to prioritize road safety measures and implement effective strategies to reduce the number of traffic accidents. By addressing factors such as reckless driving, speeding, drunk driving, inadequate infrastructure, and lack of awareness, efforts can be made to mitigate the risks associated with road accidents and minimize the loss of lives.The high percentage of traffic-related fatalities underscores the importance of comprehensive road safety initiatives, including public awareness campaigns, strict enforcement of traffic rules, infrastructure improvement, effective traffic management systems implementation, and promotion of responsible driving behaviours.

2.6 SAFE ROAD INFRASTRUCTURE

Road infrastructure has traditionally focused on motorized transport and economic efficiency at the expense of safety, particularly for pedestrians, cyclists and motorcyclists.

The design of roads can have a considerable impact on their safety. Ideally, roads should be designed keeping in mind the safety of all road users. This would mean making sure that there are adequate facilities for pedestrians, cyclists, and motorcyclists. Measures such as walkable footpaths, cycling lanes, safe crossing points, and other traffic calming measures can be critical to reducing the risk of injury among these road users. (Source: fact sheet WHO: Road traffic injuries June 2022)

It is important to ensure that existing roads, new roads and public transport systems are all built to a high safety standard for all road users. Prioritizing the needs of vulnerable road users and recognizing the importance of the road environment with appropriate modifications can bring a significant reduction in crashes.

Safe road infrastructure is essential to reduce road trauma. Road infrastructure must be planned, designed, built and operated to enable multimodal mobility, including shared/public transport, and walking and cycling. By building bicycle and pedestrian lanes, tunnels and car-free zones, other environmental and engineering solutions, level of pedestrian safety may be increased. Where road users cannot be separated by introducing the above mentioned means, the pedestrian safety should be given priority over vehicular traffic – particularly by reducing speed. However, with the increased presence and tactical deployment of traffic staff, the current traffic management strategies, use of modern technologies like R.L.V.D., O.S.V.D. cameras on strategic locations and other steps taken after in-depth analysis of cases of road crashes have proved to be effective in reducing the number of road crashes, over the years.

03

ROAD CRASH VICTIMS

Towards Zero Traffic Death

No loss of life on road is acceptable

3.1 ROAD CRASH VICTIMS

The number of deaths on the world's roads remain unacceptably high, with 1.35 million people dying yearly. More than half of global road traffic deaths are amongst pedestrians, cyclists, and motorcyclists, who are still too often neglected in road traffic system design. Although pedestrians, cyclists, and motorized two and three-wheelers are more vulnerable due to being less protected than car occupants, the heavy burden of deaths borne by these road users is also a reflection of infrastructure and vehicle design that prioritizes car and other motorized transport.

Pedestrians, cyclists, motorized Two-Wheelers, and riders/passengers of three-wheelers are collectively known as "vulnerable road users" and account for half of all road crash deaths worldwide. More vulnerable road users die in low-income countries than in high-income countries. (WHO: 10 facts on global road safety) Vulnerable road users (VRU) are more at risk because they do not have the protective covering that can minimize the effects of road crashes, as opposed to the surface provided by cars and heavy vehicles. Moreover, VRU are at additional risk when their needs are not considered during land use or road engineering planning. In most countries, roads are planned and built to allow motor vehicles to travel faster. At the same time, insufficient thought is given to the needs of pedestrians and cyclists, forcing them to face an increased risk of death while using roads.

TABLE 3.1 VICTIMS KILLED AND INJURED IN DELHI

Year	Pedestrian		Cyclists		Car Occupants		Scooter/M. Cycle Riders		Bus Passengers		*Slow Moving Vehicles, Pullar and Passengers		Drivers of Animal Driven Vehicle		Other Drivers		Total	
	Kld	Inj	Kld	Inj	Kld	Inj	Kld	Inj	Kld	Inj	Kld	Inj	Kld	Inj	Kld	Inj	Kld	Inj
2018	775	2160	53	155	66	307	570	2542	9	39	17	158	4	26	196	699	1690	6086
2019	678	1887	36	108	39	281	496	2110	5	30	26	151	1	10	182	575	1463	5152
2020	505	1241	48	115	37	184	441	1613	5	18	21	110	2	9	132	372	1196	3662
2021	504	1536	45	123	42	158	472	1868	3	12	18	145	0	7	155	424	1239	4273
2022	629	1777	48	134	39	227	552	2263	3	25	26	200	1	2	163	573	1461	5201

**Hand Cart, Electric rickshaw and Cycle Rickshaw.*

In 2022, 21.93% of the total road accident victims lost their lives, compared to 22.47% in 2021.

The fatality rate amongst all road accident victims has been decreasing steadily for the last few years, except in 2021, and 2022, when the fatality rate had increased.

3.2 VULNERABLE ROAD USERS IN ROAD CRASHES

Pedestrians comprised 43% of the total victims killed, while motorcyclists accounted for 38%. When considering the injured victims, motorcyclists represented 44% of the total, while pedestrians accounted for 34%. These two groups make up 78% of the injured and 81% of the killed victims and are categorized as vulnerable road users.

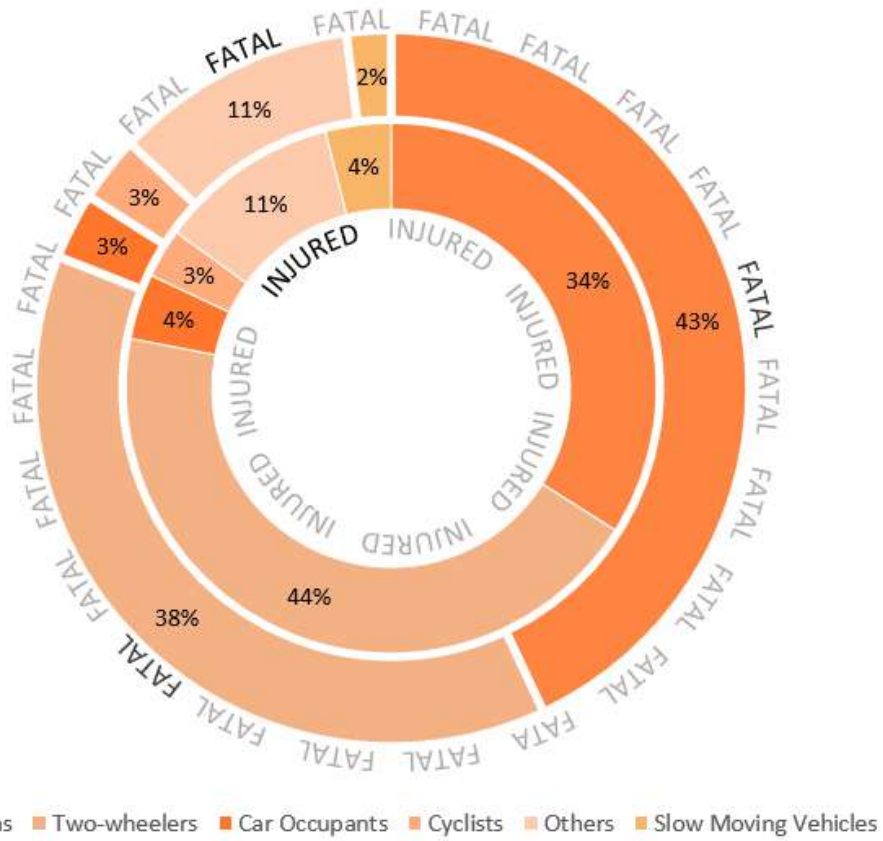


FIGURE 3.1 TYPE OF ROAD USERS KLLED & INJURED IN ROAD CRASHES

PEDESTRIANS:

Pedestrians are the most vulnerable victims in fatal road crashes and continue to suffer the highest in preventable road crashes. In 2022, 629 pedestrians lost their lives, and 1777 were injured, compared to 504 pedestrians who lost their lives and 1536 pedestrians who were injured in 2021. This represents 43.05% of all victims killed in the year 2022 as compared to 40.67% in 2021.

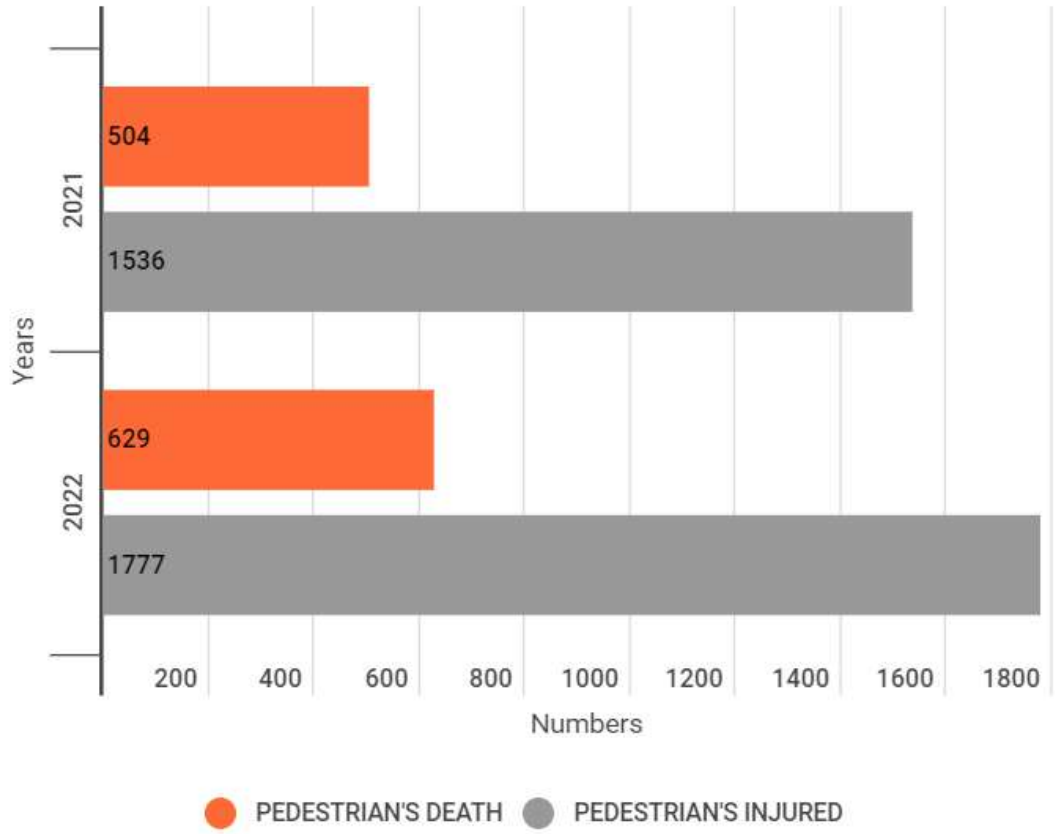


FIGURE 3.2 PEDESTRIANS KILLED AND INJURED IN ROAD CRASHES

The trend in the deaths of pedestrians shows that the share of pedestrian deaths ranges between 40% and 50% of the total victims of fatal accidents.

MOTORCYCLISTS:

After pedestrians, motorcyclists are the next most vulnerable category of victims, accounting for 552 (37.78%) of all fatal road crashes in Delhi and 2263 (43.49%) injured victims in 2022. In 2022, fatal crashes involving two-wheeler riders increased. Two-wheeler riders injured in road crashes rose from 1868 in 2021 to 2263 in 2022.

Crash data suggests that two-wheeler riders were the victims in one of every three deaths or injuries. One crucial fact that can be noted is that the share of two-wheelers as victims (fatalities and injuries) is gradually increasing from 2020.

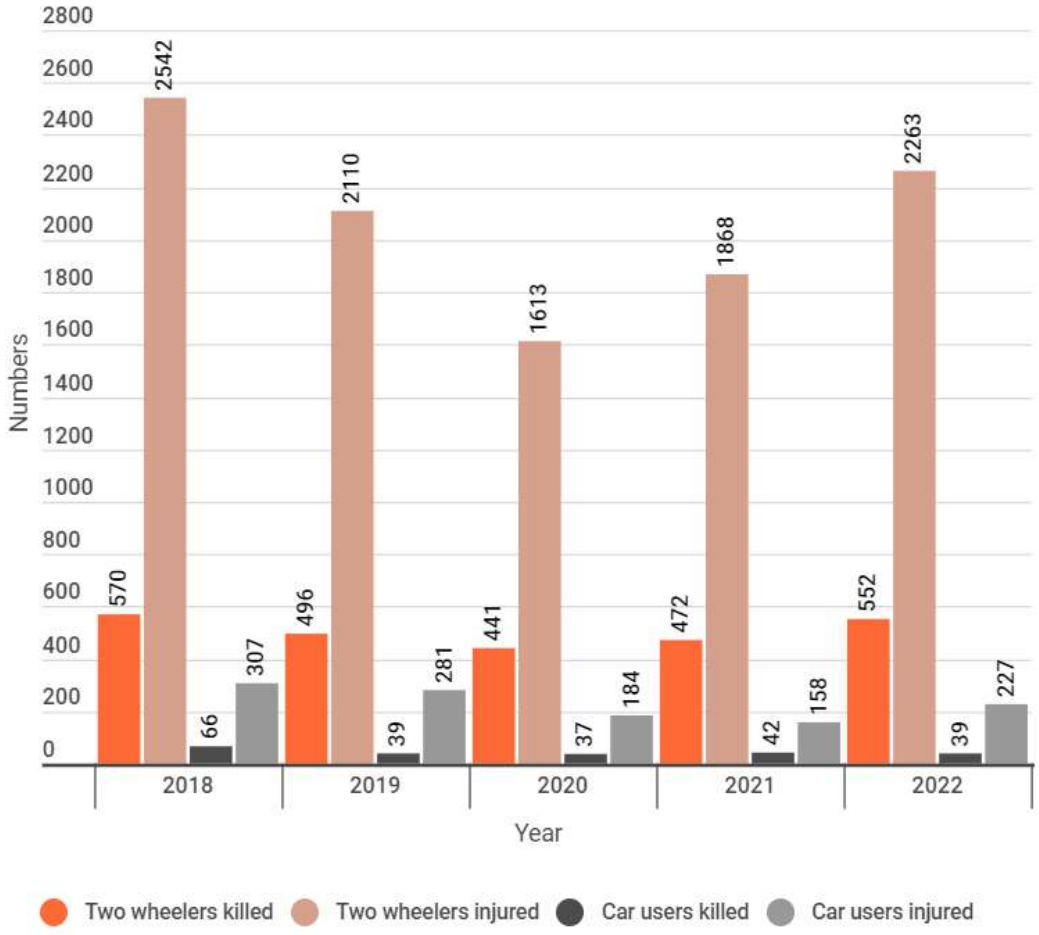


FIGURE 3.3 SHARE OF TWO-WHEELERS AND CAR USERS KILLED AND INJURED IN ROAD CRASHES

Over the years, the share of deaths of car occupants out of total fatalities has remained between 2% and 4%. The percentage of deaths of car occupants decreased from 3.38 % (2021) to 2.66 % (2022). In the case of non-fatal injuries, it has remained between 4 % and 8 % over the years. Whereas, Bus commuters are among the safest road users.

CYCLISTS:

The cyclist's share of road crash victims remained around 2 % to 4 % during the last eight years. The percentage of cyclists injured in road crashes has been reducing gradually over the previous 15 years, from 5.05 % in 2007 to 2.57 % in 2022. The proportion of cyclists killed (3.2% in 2022 against 3.63% in 2021) and injured (2.57% in 2022 against 2.87% in 2021) is less in 2021.

E- RICKSHAWS:

E-rickshaws are popular modes of transportation in the city, especially in densely populated areas and narrow streets. E-rickshaw occupants were victims in 13 fatal crashes and 99 simple crashes in 2022, resulting in the death of 13 persons and 145 injuries.

DEMOGRAPHIC CLASSIFICATION OF ALL VICTIMS:

Demographic classification of road accidents in Delhi is essential to understand the requirements for gender and age-specific road safety decisions and infrastructure. In this report, minors are defined as those below the age of 18 years and adults are those above the age of 18 years.

In all, 1270 male and 114 female adults died, while 4145 male and 647 female adults were injured in road traffic crashes in the year 2022. Of the total minor victims of crashes, 57 boys and 20 girls were killed, whereas 303 boys and 106 girls were injured.
The fatalities and injuries of minor crashes were highest in 2018 and started decreasing until 2021. There has been an increase in the fatalities and injuries of minor victims as compared to previous year where 48 boys and 12 girls were killed whereas 221 boys and 75 girls accounted for injured victims.

So far in last 5 years, 300 minor males are killed and 104 minor females are killed in road crashes, whereas a total 6112 adult males and 533 adult females deaths have been recorded.

TABLE 3.2 AGE AND GENDER OF CRASH VICTIMS

Year	Below 18 Years				Above 18 Years			
	Killed		Injured		Killed		Injured	
	Male	Female	Male	Female	Male	Female	Male	Female
2018	88	29	418	142	1439	134	4862	664
2019	67	22	307	89	1262	112	4200	556
2020	40	21	187	51	1049	86	3060	364
2021	48	12	221	75	1092	87	3536	441
2022	57	20	303	106	1270	114	4145	647

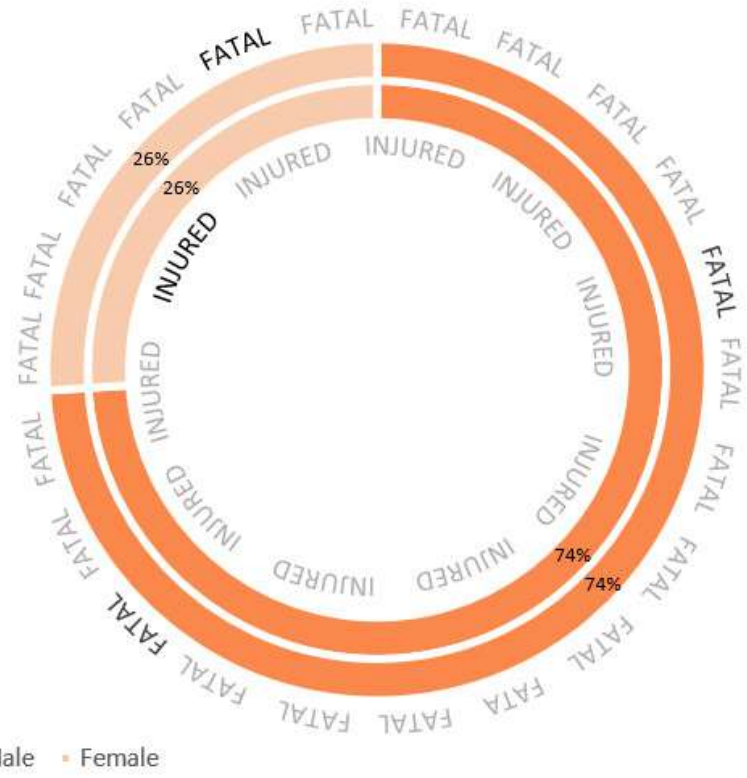


FIGURE 3.4 CRASH DEATHS AND INJURIES BY GENDER BELOW 18 YEARS OLD, 2022

For the year 2022, the number of Males accounted for 74 % of road crash injuries and females for 26 % of injuries below the age of 18. The fatality rate was also found to be similar below the age group of 18 years.

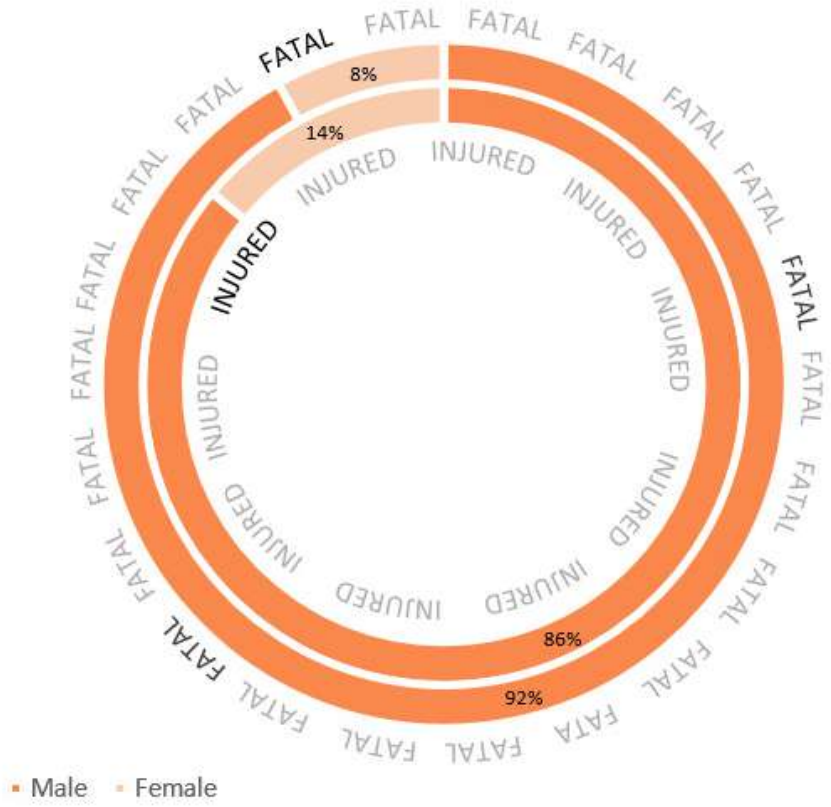


FIGURE 3.5 CRASH DEATHS AND INJURIES BY GENDER ABOVE 18 YEARS OLD, 2022

The above figure shows that males accounted for 92 % of the road crash death victims, whereas 86% of males were involved in road injuries for 2022 for the age group of 18 years and above.

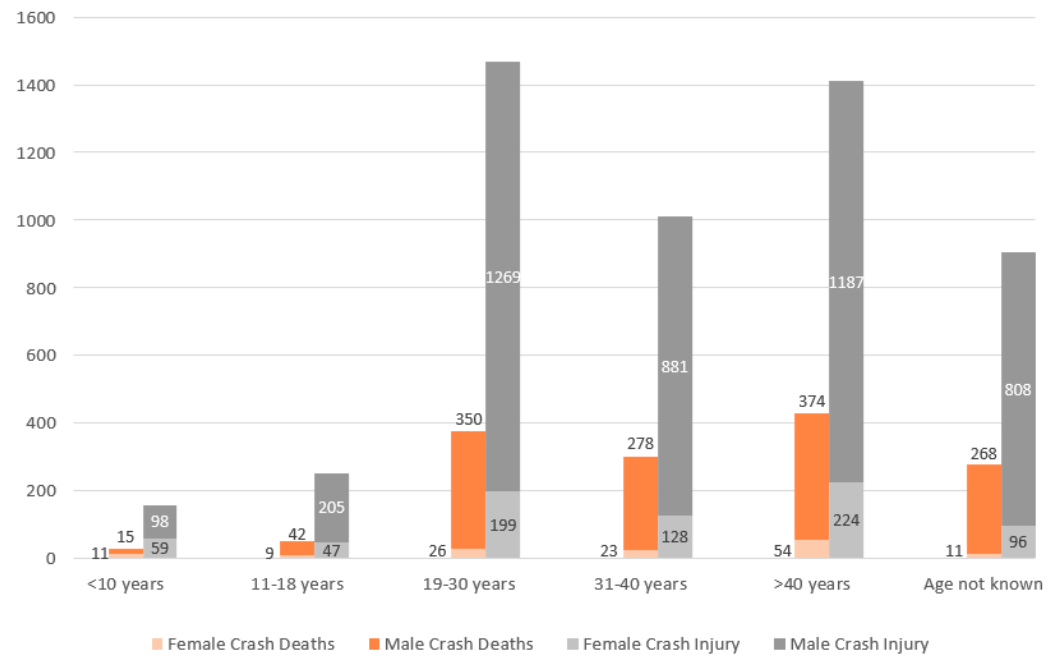


FIGURE 3.6 AGE AND GENDER OF CRASH DEATHS AND INJURIES

The above figure shows that most fatalities occurred among men and women aged 40 years and above. The high number of deaths indicates that older individuals may be more vulnerable to the consequences of road accidents, emphasizing the need for targeted safety measures and awareness campaigns for this age group.

The analysis shows that the age group of 19-30 years had the highest number of male injuries, while female above 40 experienced the highest injuries. These findings suggest that young men and older women are particularly at risk on the roads. The high number of injuries among males aged 19-30 years is particularly concerning, as these injuries can result in long-term disabilities and hinder the overall growth and development of the city. Targeted interventions such as educational campaigns, stricter enforcement of traffic laws, and the provision of safer transportation options could help mitigate the risks this age group faces. Moreover, significant injuries and deaths among males aged 11-18 years are alarming and highlight the pressing issue of children's safety on roads.

3.3 ROAD DESIGN FOR PEDESTRIAN SAFETY

Lack of proper and sufficient number of pedestrian crossings, Foot Over Bridges (FOBs), subways, encroachment, poorly maintained footpaths, disregard for road safety rules, and for other road users' rights by vehicle drivers are some of the key reasons for such road crashes.

The condition of road crossing facilities could be more pedestrian-friendly. Poor placement of FOBs, lack of accessible escalators for disabled people, lack of accessible footpaths for persons with disabilities, dark and dingy subways, insufficient number of FOBs/Subways, and lack of signages lead to unsafe pedestrian crossing.Sidewalks separate pedestrians from motorized vehicles and bicycles. They provide space for different types of pedestrians to walk, move, run, play, meet, and talk. To enhance pedestrian safety, it is essential to incorporate sidewalks into the design of every new roadway, considering both current and potential future demand. (Source: WHO save lives tech. package)

3.4 ROAD DESIGN FOR CYCLISTS SAFETY

Cyclists in Delhi are a vulnerable group of road users, and it is crucial to prioritize their safety. Many cyclists rely on their bicycles for livelihood rather than for recreational purposes. Therefore, it is imperative to focus on improving the infrastructure and conditions for cycling to ensure their well-being.

The first step is to enhance the street infrastructure for cyclists by incorporating dedicated cycle lanes, implementing traffic calming measures, and establishing protected intersections. Creating separate lanes for cyclists will provide them a safe space to ride and minimize potential conflicts with motor vehicles. Additionally, installing bike boxes at strategic locations will offer designated parking spaces for bicycles, further encouraging people to choose cycling as a sustainable mode of transport. Improving communication and visibility is also crucial. Clear and visible signage including bicycle-specific signs, lane markings, and shared lane markings (sharrows), will enhance awareness and understanding between cyclists and motorists, reducing potential conflicts.

By implementing these road design methods and initiatives, we can create a safer and more accommodating environment for cyclists. The safe cycle infrastructure, in turn, will encourage active transportation and help to reduce the risks associated with cycling on roads shared with motor vehicles. It is essential to prioritize the safety and well-being of cyclists, recognizing their contribution as breadwinners and promoting sustainable and inclusive transportation options.

3.5 ROAD SAFETY FOR TWO- WHEELERS

Two-wheeler riders rank as the second-highest group of victims in road crashes after pedestrians. They are particularly vulnerable to severe injuries and fatalities due to environmental exposure and lack of metal protection like cars. Given the significant number of two-wheelers registered in Delhi, ensuring a safe design system becomes crucial for the well-being of these riders.

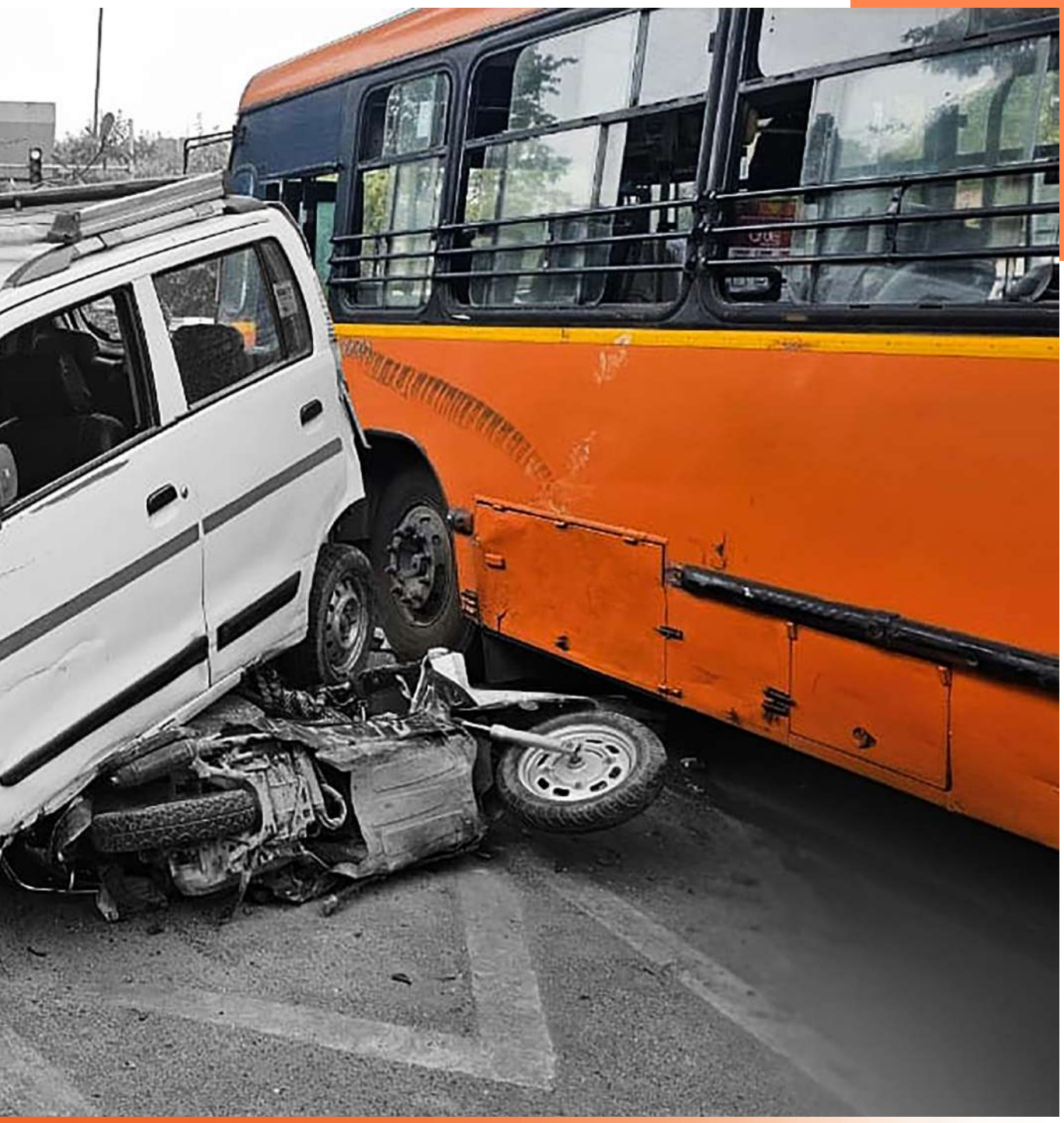
One of the most critical factors influencing the safety of two-wheeler riders is helmet usage, which is mandatory for both riders and pillion rider in Delhi. It is imperative to wear appropriately fitting ISI-certified helmets that securely fasten to provide adequate head protection in the event of an accident.

Adhering to traffic rules is another crucial aspect that two-wheeler riders should focus on. This includes obeying speed limits, stopping at red lights, using indicators for lane changes and turns, and respecting pedestrian crossings. Enhancing visibility is vital in mitigating accidents involving two-wheelers. Using headlights, taillights, and reflectors, particularly during low-light conditions, helps other road users spot the rider and maintain a safe distance.

Furthermore, avoiding distracted riding, such as using mobile phones while riding, is paramount. Maintaining focus, avoiding distractions, and prioritizing road awareness and safety are essential for the well-being of two-wheeler riders. By diligently following these measures, we can actively contribute in reducing accidents and fostering a safer environment for two-wheeler riders in Delhi.

04

ACCUSED VEHICLES



Accidents don't happen

They are caused

Safe vehicles play a critical role in averting crashes and reducing the likelihood of serious injury. Vehicles sold in 80 % of all countries worldwide fail to meet basic safety standards. The safety of vehicles plays a critical role in averting crashes and reducing the likelihood of serious injury in the event of a crash. (WHO: 10 facts on global road safety)

There is a need to apply harmonized legislative standards for vehicle design and technology to ensure a uniform and acceptable level of safety worldwide. Vehicles should be designed to ensure the safety of occupants inside the vehicle and simultaneously road users. Different features can be integrated into vehicle design to improve vehicle safety, to avoid crashes (active safety), and reduce the injury risk for occupants and other road users during a crash (passive safety).

An increase in traffic volume on both major and minor roads and at junctions, increases the exposure of two-wheelers to other vehicles moving at different speeds and, consequently, increases the likelihood of crashes.

The size and speed of impacting vehicles are pertinent determinants of the extent of damage and severity of crashes. With improvements in technology, individual/private vehicles have become safer for passengers.

An increase in average speed is directly related both to the likelihood of a crash occurring and to the severity of the consequences of the crash. Managing speed is another factor which is critical to the effective implementation of the Safe System approach. Appropriate speed management not only directly impacts crash likelihood and severity, but also affects other safety interventions effectiveness. Speed management interventions are possible across various road safety arenas, including road design and engineering.

Over the years, vehicles are improving and being made safer for passengers, with airbags, Anti-lock Braking System (ABS), strong and non-collapsing body, protective internal design and having safe exit in case of mishap.

However, given the fact that Indian roads have a wide range of heterogeneous and mixed variety of road users, there is a need to minimize danger to the pedestrians and other small vehicles including non-motorized vehicles.

4.1 ACCUSED VEHICLES TREND

Vehicle wise crash trend from year 2020 to year 2022 shows an increasing trend in total crashes caused by maximum mode of vehicles except cycle rick-shaws, military vehicles, call centre cabs and gramin sewa vehicles.

TABLE 4.1 PROFILE OF ACCUSED VEHICLES

TYPE OF VEHICLE	FATAL CRASHES			NON- FATAL CRASHES			TOTAL CRASHES		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Ambulance	1	2	1	8	13	9	9	15	10
Call Centre Cab	0	0	0	2	1	1	2	1	1
Cluster Bus	20	29	22	57	69	85	77	98	107
Crane	12	8	6	11	15	25	23	23	31
Cycle Rickshaw	2	0	0	3	4	0	5	4	0
Delivery Van	10	13	14	50	45	68	60	58	82
DTC Bus	19	17	37	54	66	89	73	83	126
E_Rickshaw	1	10	8	37	45	58	38	55	66
Goods Carrier *	104	142	178	145	190	241	249	332	419
Gramin Sewa	3	5	1	17	16	19	20	21	20
Military Veh.	2	0	0	4	0	0	6	0	0
Mini Bus	5	7	7	15	13	24	20	20	31
Other State Bus	2	1	5	4	3	4	6	4	9
Private Bus	13	12	23	34	38	68	47	50	91
Private Car	146	168	196	972	1003	1275	1118	1171	1471
Road Roller	0	0	0	0	1	1	0	1	1
School Bus	0	0	0	0	1	1	0	1	1
Scooter /M. Cycle	126	114	144	425	562	645	551	676	789
Tanker	7	3	3	8	9	8	15	12	11
Taxi	7	8	10	55	51	59	62	59	69
Tempo	56	72	65	156	172	229	212	244	294
Tonga/Rehra	0	0	0	0	1	0	0	1	0
Tractor	19	17	12	11	18	35	30	35	47
TSR	29	23	28	85	143	176	114	166	204
Unknown Vehicle	579	555	668	862	1035	1104	1441	1590	1772

*(*Goods Carrier includes HTV Trucks, Trailers and Containers)*

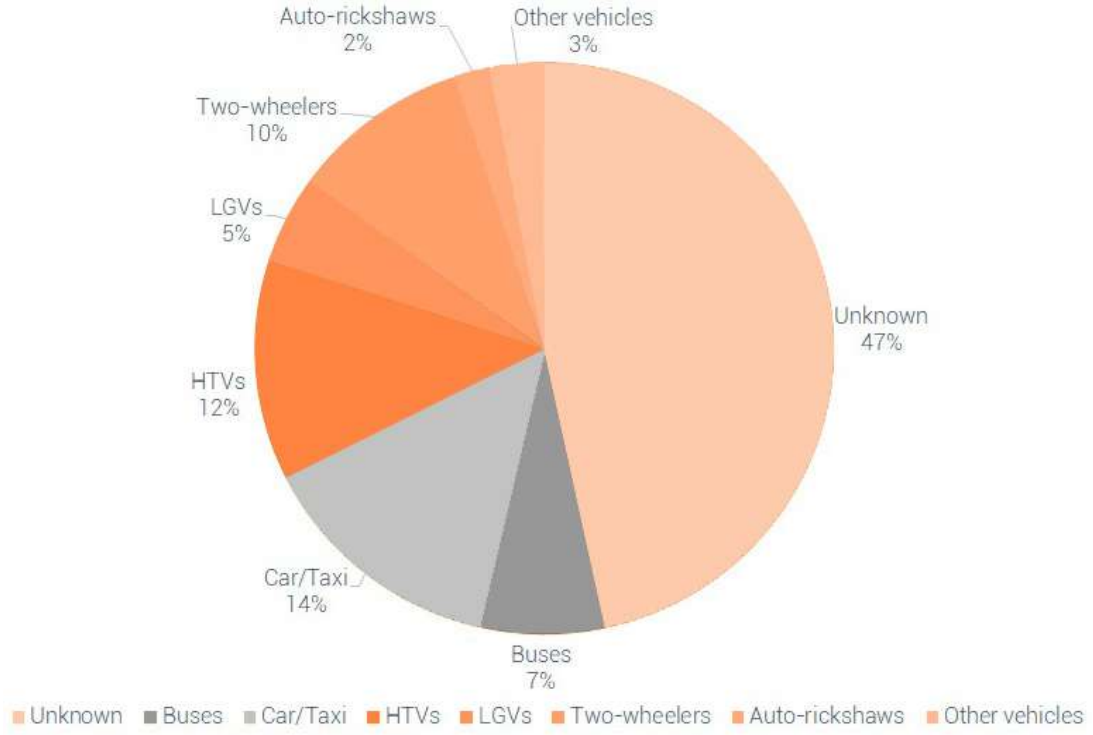


FIGURE 4.1 COMPOSITION OF ACCUSED VEHICLES RESULTING IN FATAL CRASHES

The above figure depicts that in 2022, 47% of vehicles accounting for 668 fatal crashes remain unreported/unknown, cars/taxis caused 206 fatal crashes accounting for 14.42 % of total fatal crashes. HTVs come next with 181 fatal crashes (12.67%) in year 2022 which has increased from 12 % recorded in the year 2021. Two-wheelers caused 10.1 % of total fatal crashes in 2022, while for 2021, it was 9.5 %. Light goods vehicles (LGVs) have been showing an increasing trend in fatal crashes. Fatal crashes by city buses have increased to 7% in 2022 as compared to 5.5% in the previous year.

As compared to 2021, where car/taxis caused 30 % of all simple crashes in non-fatal crashes, in 2022 they caused 31.6 % simple crashes. Two-wheeler riders (scooters/motorcycles) were next, with 15.26 % of simple crashes this year, which is almost the same share in 2021, viz. 15.99 %.

Maximum fatal crashes caused by trucks occurred in Bawana, Badarpur, Nangloi, Samaipur Badli, Vasant Kunj and Timarpur circles.

Maximum fatal crashes caused by buses occurred in Lajpat Nagar, Kotwali, Paharganj, Parliament Street and Samaipur Badli circles.

Maximum fatal crashes caused by cars occurred in Vasant Kunj, Paschim Vihar, Rajouri Garden and Bawana circles.

4.2 VICTIMS AND VICTIM VEHICLES TREND

Victim and victim vehicles trend provides valuable insights into the factors that are the most affected during crashes. The information helps in identifying patterns and trends, such as specific types of vehicles and demographic groups susceptible to road crashes.

VICTIMS IN TOTAL CRASHES:

TABLE 4.2 ACCUSED AND VICTIM VEHICLES (TOTAL CRASHES-2022)

Victims	Accused Vehicles								
	HTVs	LGVs	BUS	Car/ Taxi/ Jeep	TSRs	SC/ MC	Unknown Vehicles	Others	Total
SC/MCs	217	134	130	780	64	183	677	103	2288
Pedestrians	107	86	114	391	75	412	949	100	2234
Car/Taxi/ Jeep	38	23	22	103	7	10	37	6	246
Self	5	7	6	42	38	121	0	18	237
TSRs	16	8	13	87	1	5	40	10	180
Cyclists	15	10	12	50	7	40	26	10	170
Others	25	18	18	31	6	9	22	4	133
Electric Rickshaws	4	8	15	42	3	6	16	5	99
Cycle Rickshaws	3	0	7	14	3	3	5	2	37
Passengers	0	0	28	0	0	0	0	0	28
Total	**430**	**294**	**365**	**1540**	**204**	**789**	**1772**	**258**	**5652**

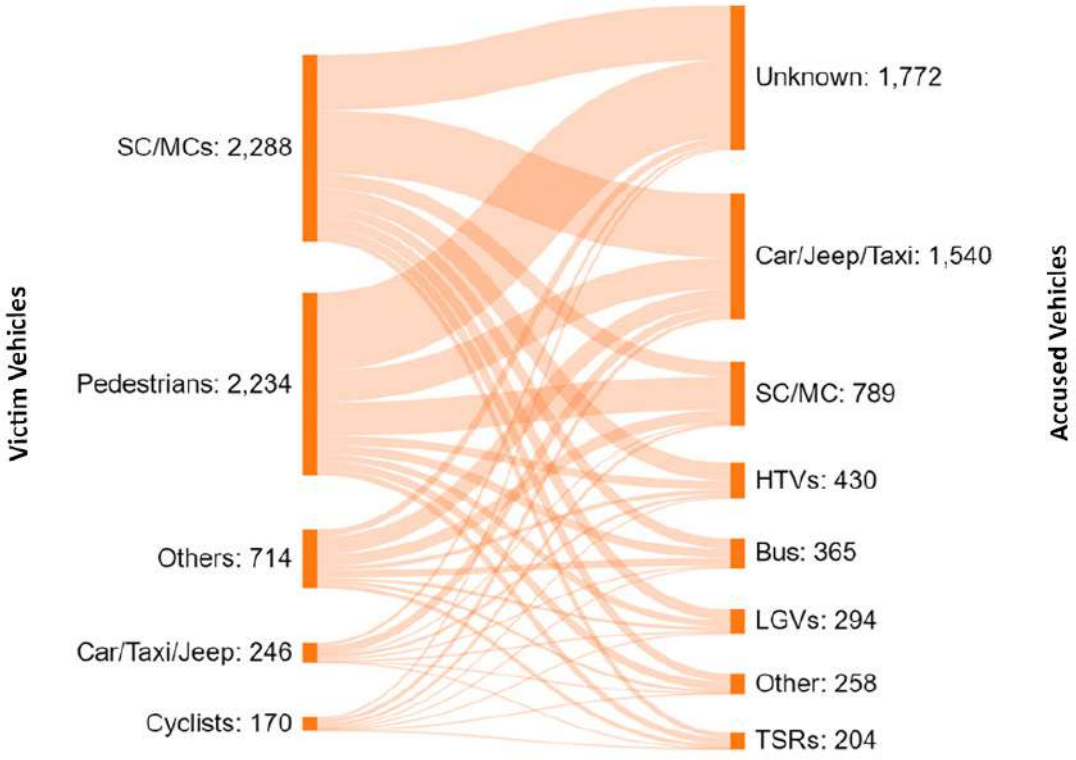


FIGURE 4.2 ACCUSED AND VICTIM VEHICLES (TOTAL CRASHES 2022)

Crashes towards Motorized Two- wheelers are mostly caused by Car/Taxi/ Jeep which are 780 crashes in year 2022 followed by crashes by unknown vehicles which are 677 in number. Out of 2234 total crashes towards pedestrians, Unknown Vehicles account for 949 crashes, 412 crashes are caused by Two- wheelers, 391 are caused by Car/Taxi/Jeep respectively.

VICTIMS IN FATAL CRASHES:

Victims in fatal crashes trend helps in understanding the vulnerable road users and patterns of increasing and decreasing trend in victims in fatal crashes.

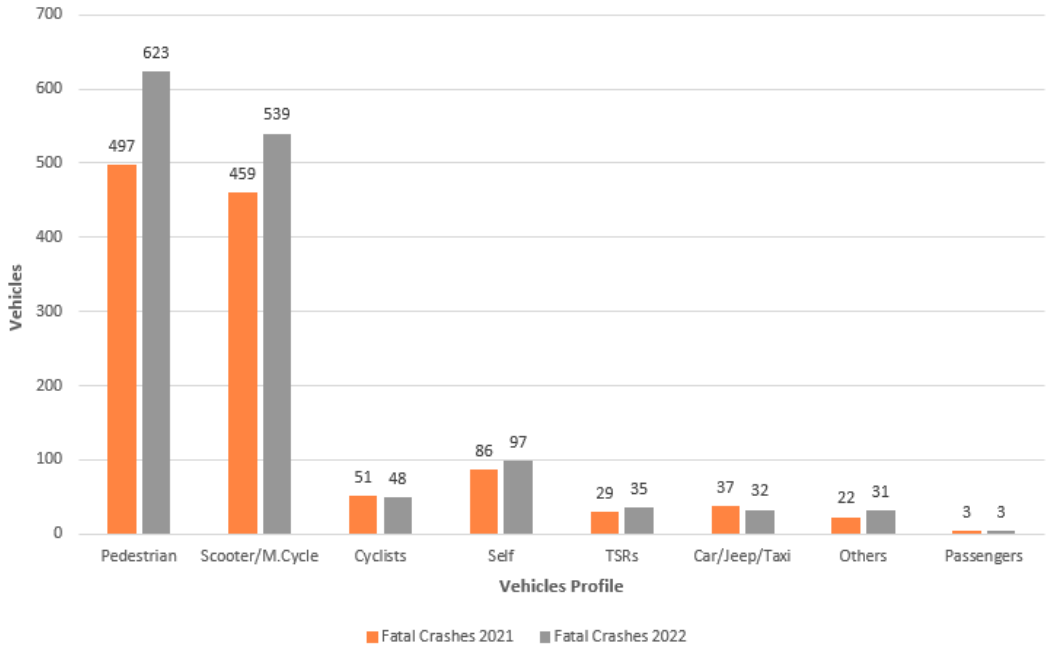


FIGURE 4.3 COMPARISON OF VICTIM VEHICLES IN FATAL CRASHES

The above figure depicts victim vehicles analysis of years 2021 and 2022. It shows an increasing trend in fatal crashes of pedestrians , two-wheelers, self and TSRs. Data also shows a slight decrease in fatal crashes towards cyclists, Car/Taxi in the year 2022 when compared to year 2021. However, the number of cyclists killed has increased from 45 in the year 2021 to 48 in 2022.

It can be inferred from the above figure the need to integrate an efficient and safe pedestrian infrastructure on roads to reduce the number of rising pedestrian victims and other vulnerable road users in fatal road crashes. As 42.4% unknown vehicles account for total crashes towards pedestrians, measures for robust identification of vehicles should be considered.

The rise in fatal crashes towards two wheelers is also concerning and highlights the need to integrate a robust safety mechanism and introducing stringent penalties for traffic violations. According to Global NCAP, future two-wheelers should be equipped with crash-avoidance technologies including anti-lock brakes and autonomous emergency braking systems.

TABLE 4.3 ACCUSED AND VICTIM VEHICLES (FATAL CRASHES-2022)

Victims	Accused vehicles								
	HTVs	LGVs	Bus	Car/Taxi/ Jeep	TSR	SC/MC	Unknown Vehicle	Others	Total
Pedestrian	52	27	30	69	12	54	358	21	623
SC/MCs	98	26	45	83	6	19	250	12	539
Self	1	4	2	16	6	63	0	5	97
Cyclists	10	3	2	10	1	6	15	1	48
TSRs	2	0	5	9	0	0	17	2	35
Car/Taxi/Jeep	7	3	4	5	1	0	12	0	32
Others	11	0	0	8	1	1	9	1	31
Electric Rick-shaws	0	2	1	4	0	1	5	0	13
Cycle Rick-shaws	0	0	2	2	1	0	2	0	7
Passengers	0	0	3	0	0	0	0	0	3
Total	**181**	**65**	**94**	**206**	**28**	**144**	**668**	**42**	**1428**

In 2022, 629 pedestrians died in 623 fatal crashes caused by all types of vehicles as compared to 504 pedestrian deaths in 2021. The pedestrian casualties due to car/jeep/taxis have increased to 69 this year compared to 63 in 2021. Two-wheelers caused 54 pedestrian fatal crashes in 2022 against 34 in 2021. 358 fatal crashes towards pedestrians were caused by unknown vehicles in 2022 against 297 in 2021. Buses were responsible for 30 fatal crashes in 2022 against 20 in 2021. *(Source for data 2021: Delhi Road Crash Report 2021)*

The least number of fatal crashes towards pedestrians has been caused by LGVs (27), other mode of vehicles (21) and TSR (12) respectively.

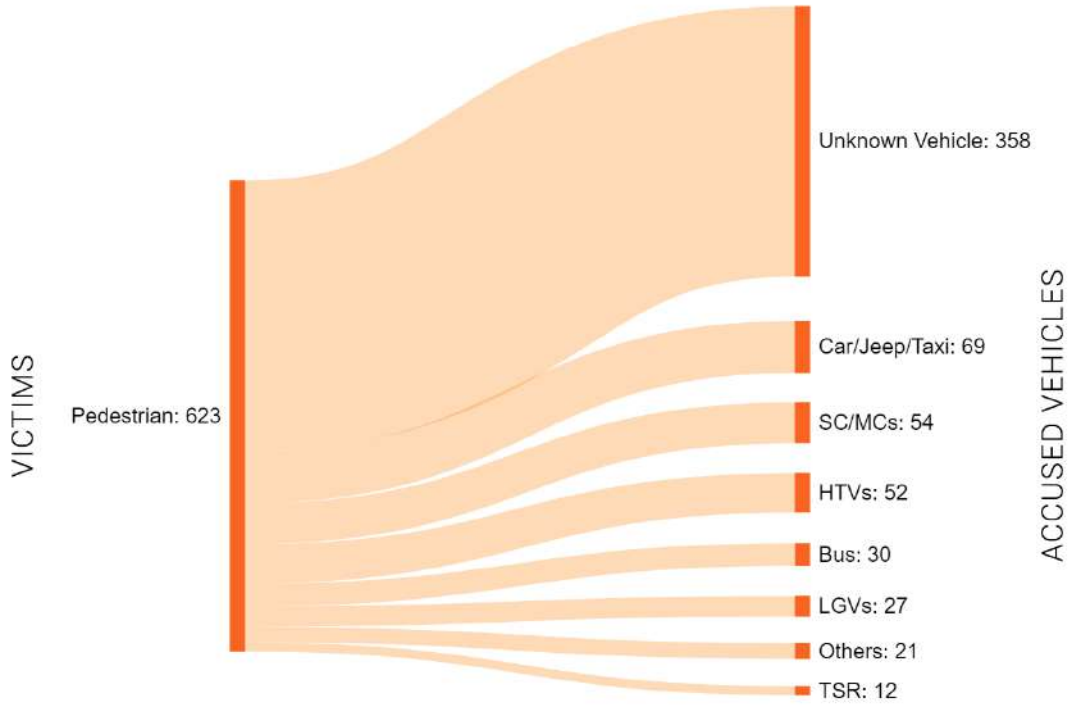


FIGURE 4.4 ACCUSED VEHICLES CAUSING FATAL CRASHES TOWARDS PEDESTRIANS

The above figure depicts the fatal crashes caused towards pedestrians in year 2022. Out of 623 fatal crashes caused towards pedestrians, 358 fatal crashes which accounts for 57.4 % crashes are caused by unidentified vehicles. The fatal crashes by unknown vehicles suggests hit and run cases. Car/Taxi/Jeep accounted for 11 % fatal crashes towards pedestrians emerging as second most accused vehicles. HTVs and Buses account for 8.6 % and 4.8 % fatal crashes towards pedestrians respectively. Increasing fatal crashes towards pedestrians has emerged as one of the major concern in year 2022.

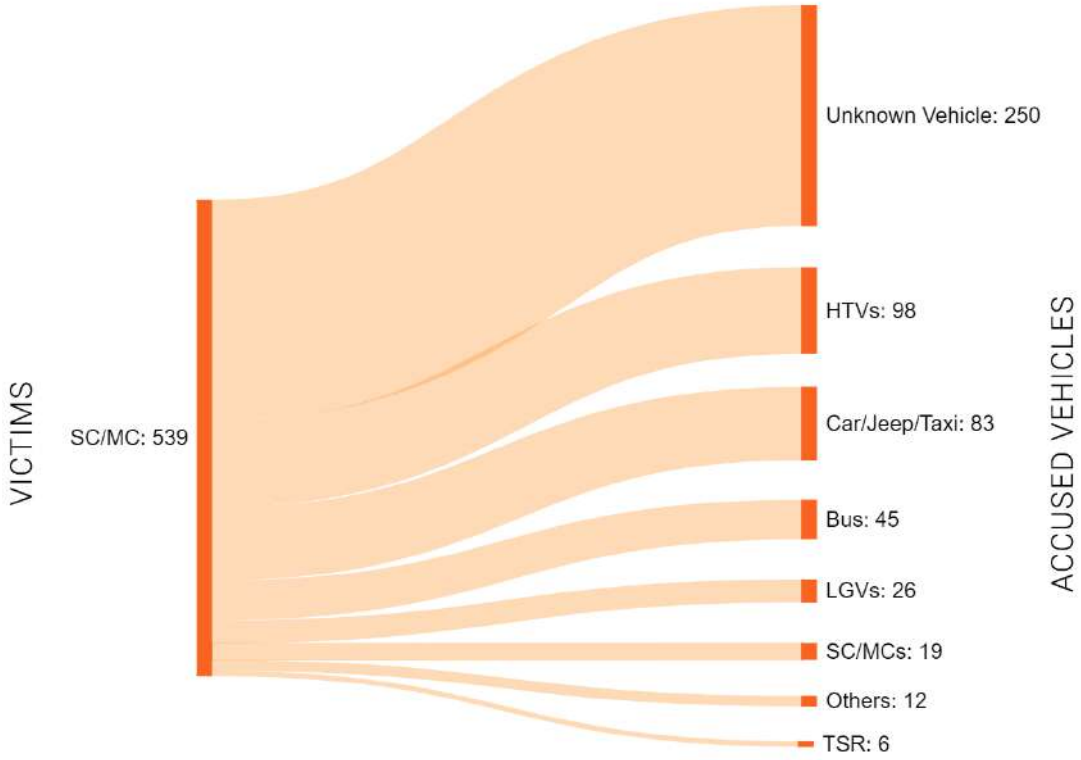


FIGURE 4.5 ACCUSED VEHICLES CAUSING FATAL CRASHES TOWARDS TWO-WHEELERS

Two-wheeler riders have emerged as second most fatal crash-prone victims. The above figure shows 539 fatal crashes of two-wheelers in 2022 as compared to 459 in 2021. These two-wheelers were the worst hit by Heavy Vehicles (HTVs) (98) followed by Car/Jeep/Taxis (83) in 2022. A total of 250 riders have been victims to fatal crashes by unknown vehicles this year, which is higher than 212 recorded in 2021. Fatal crashes by self-hit accounted for 97 crashes in 2022 as against 86 in 2021. Further two-wheeler riders top this category, 63 in 2022 as against 59 in 2021. Cars/jeeps/taxis occupants are the next higher number of victims of fatal crashes due to self-hit. There has been an increase in cyclist related fatal crashes during 2022 (48) over 2021 (45). These crashes have been caused by unknown vehicles followed by Cars/taxis, HTVs and Two-wheelers. *(Source for data 2021: Delhi Road Crash Report 2021)*

4.3 STATE-WISE CLASSIFICATION OF ACCUSED VEHICLES AND VICTIMS

As per the data, vehicles registered in Delhi caused more fatal accidents. (68.03 % of the vehicles with registration details) followed by those registered in Haryana (22.29 %), and in Uttar Pradesh (4.75%). This scenario is similar to that of the year 2021. In case of simple crashes, accused vehicles are not known in 1744 cases against the total 4132 simple crash cases. Out of those cases in which the registration number of offending vehicles is known, Delhi stands at 76.84% (1835 Cases), Haryana at 14.1 %, and Uttar Pradesh at (6.03%). HTVs registered in Haryana were involved in 80 (52.63%) fatal crash cases. The data shows that 65 buses registered in Delhi caused fatal crashes (79.26% of fatal crashes caused by buses and in which registration number of the offending vehicles is available).

TABLE 4.4 CRASHES CAUSED BY STATE-WISE REGISTERED VEHICLES

State	Non-Injury Crashes	Simple Crashes	Fatal Crashes	Total Crashes	Persons Injured	Persons Killed
Assam	0	0	2	2	2	3
Bihar	0	1	0	1	1	0
Chandigarh	0	6	1	7	9	1
Chhattisgarh	0	1	0	1	1	0
Delhi	54	1835	415	2304	2336	430
Gujarat	0	0	3	3	0	3
Haryana	20	337	136	493	471	140
Himachal Pradesh	0	3	5	8	5	5
Jammu and Kashmir	0	2	0	2	3	0
Jharkhand	0	2	0	2	2	0
Madhya Pradesh	0	6	3	9	10	3
Maharashtra	0	8	1	9	10	1
Nagaland	0	4	1	5	6	1
Punjab	0	12	4	16	15	4
Rajasthan	2	18	9	29	30	10
Uttar Pradesh	8	144	29	181	188	31
Uttarakhand	0	7	1	8	8	1
West Bengal	0	2	0	2	2	0
State Unknown	8	1744	818	2570	2102	828
Total	**92**	**4132**	**1428**	**5652**	**5201**	**1461**

Out of 1461 deaths in 2022, 828 deaths were caused by vehicles with state registration not known, 430 deaths were caused by vehicles registered in Delhi, 140 were killed by vehicles belonging to Haryana and 31 deaths were caused by vehicles belonging to Uttar Pradesh. It becomes crucial to integrate technology which helps in improved number plate reading and proper identification of vehicles.

4.4 HIT AND RUN CRASHES

Hit and run fatal crash cases have shown an increasing trend in 2022 as compared to last year 2021 (555 in the year 2021 to 668 in 2022). About 47% of all the fatal crash cases come under the category of hit and run. Similar trend is seen in case of simple crashes i.e., an increase from 1035 in 2021 to 1104 in 2022 (26.1 %). Lack of proper identification of vehicle viz. faulty/smeared number plate is mainly responsible for fleeing offenders. Passers-by witnessing the crash also refrain from reporting the matter to police.Lack of surveillance cameras at the accident spot is another crucial reason.

4.5 STATE- WISE ACCUSED VEHICLES

State-wise accused vehicles analysis provides valuable insights into the responsible states for crashes and fatal crashes towards road users. It can help in implementing strategies towards reducing state- wise accused vehicles number.

From the below table, it can be understood that out of total 5652 crashes in year 2022, 45.47 % of crashes are caused by vehicles belonging to state unknown, followed by 40.76 % of vehicles registered in Delhi, 8.7 % of vehicles belonging to Haryana, 3.2 % belonging to state of Uttar Pradesh and 1.87 % of vehicles belonging to rest of the states in India.

Among the category of total crashes caused by Delhi registered vehicles, maximum crashes were committed by private cars (939 viz. 40.75%),

followed by scooters/ motorcycles (516 viz. 22.39%). In all, 160 'Self-accidents' were caused by Delhi registered vehicles.

TABLE 4.5 STATE-WISE REGISTERED ACCUSED VEHICLES (ALL CRASHES)

State	Accused Vehicles								
	Two-Wheelers	TSRs	Car/ Taxi	Buses	LGVs	HTVs	Unknown Vehicles	Others	Total
Assam	0	0	0	1	0	0	0	1	2
Bihar	0	0	0	1	0	0	0	0	1
Chandigarh	0	0	7	0	0	0	0	0	7
Chhattisgarh	0	0	1	0	0	0	0	0	1
Delhi	516	128	939	265	245	104	1	106	2304
Gujarat	1	0	1	0	0	0	0	1	3
Haryana	27	2	211	23	24	183	0	23	493
Himachal Pradesh	0	0	3	0	0	2	1	2	8
Jammu and Kashmir	0	0	0	0	1	1	0	0	2
Jharkhand	1	0	1	0	0	0	0	0	2
Madhya Pradesh	0	0	3	0	0	5	0	1	9
Maharashtra	1	0	3	0	0	4	0	1	9
Nagaland	0	0	1	0	0	2	0	2	5
Punjab	2	0	4	0	1	8	1	0	16
Rajasthan	3	0	2	2	2	17	0	3	29
Uttar Pradesh	27	6	85	20	3	29	1	10	181
Uttarakhand	0	0	7	0	0	1	0	0	8
West Bengal	0	0	2	0	0	0	0	0	2
State unknown	211	68	270	53	18	74	1768	108	2570
Total	**789**	**204**	**1540**	**365**	**294**	**430**	**1772**	**258**	**5652**

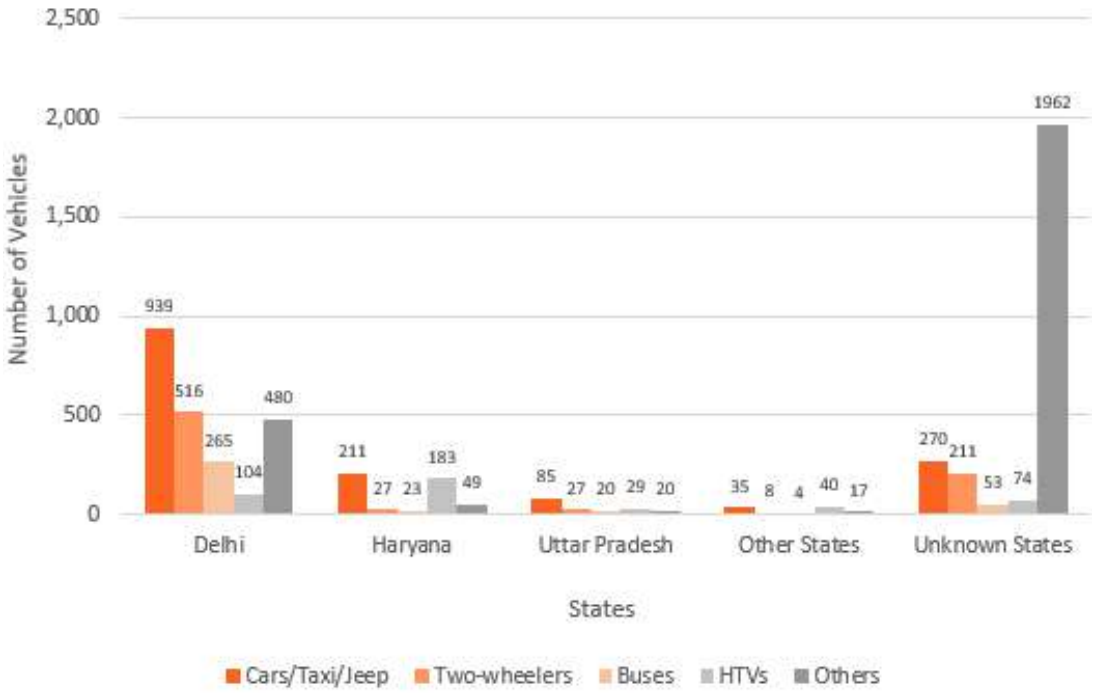


FIGURE 4.6 STATE-WISE REGISTERED ACCUSED VEHICLES (ALL CRASHES)

The above figure depicts that on analyzing state-wise registered accused vehicles, vehicles belonging to states of Haryana, Uttar Pradesh and Delhi, Cars/Taxi/Jeep are responsible for most of the total crashes. In other states HTVs are responsible for crashes. Out of total crashes caused in year 2022, vehicles belonging to Delhi accounts for 40.7%, Haryana accounts for 8.7% and Uttar Pradesh accounts for 3.2% of crashes respectively. Vehicles beloning to unknown states are responsible for 45.4% of total crashes.

Out of 5652 total crashes, 2304 crashes were caused by Vehicles belonging to Delhi which accounts for 40.7% total road crashes. Out of total crashes caused by vehicles belonging to Delhi, 939 Crashes were caused by Car/Taxi/Jeep, 516 crashes were caused by two wheelers, and Buses accounted to 265 crashes whereas HTVs and other vehicles accounted for 104 and 480 crashes respectively.

TABLE 4.6 STATE-WISE REGISTERED ACCUSED VEHICLES (FATAL CRASHES)

State	Accused Vehicles								
	Two-Wheelers	TSRs	Car/ Taxi	Buses	LGVs	HTVs	Unknown Vehicles	Others	TOTAL
Assam	0	0	0	1	0	0	0	1	2
Chandigarh	0	0	1	0	0	0	0	0	1
Delhi	96	13	118	65	57	48	1	17	415
Gujarat	1	0	1	0	0	0	0	1	3
Haryana	6	0	34	10	2	80	0	4	136
Himachal Pradesh	0	0	1	0	0	2	1	1	5
Madhya Pradesh	0	0	1	0	0	2	0	0	3
Maharashtra	0	0	0	0	0	1	0	0	1
Nagaland	0	0	0	0	0	1	0	0	1
Punjab	0	0	1	0	0	3	0	0	4
Rajasthan	1	0	2	0	0	6	0	0	9
Uttar Pradesh	3	0	9	6	1	9	0	1	29
Uttarakhand	0	0	1	0	0	0	0	0	1
State unknown	37	15	37	12	5	29	666	17	818
Total	**144**	**28**	**206**	**94**	**65**	**181**	**668**	**42**	**1428**

From the above table, it can be understood that out of 1428 fatal crashes in year 2022, 57.28% of crashes are caused by vehicles belonging to state unknown, followed by 29% of vehicles registered in Delhi, 9.5% of vehicles belonging to Haryana, 2% belonging to state of Uttar Pradesh and 2.22% of vehicles belonging to rest of the states in India.

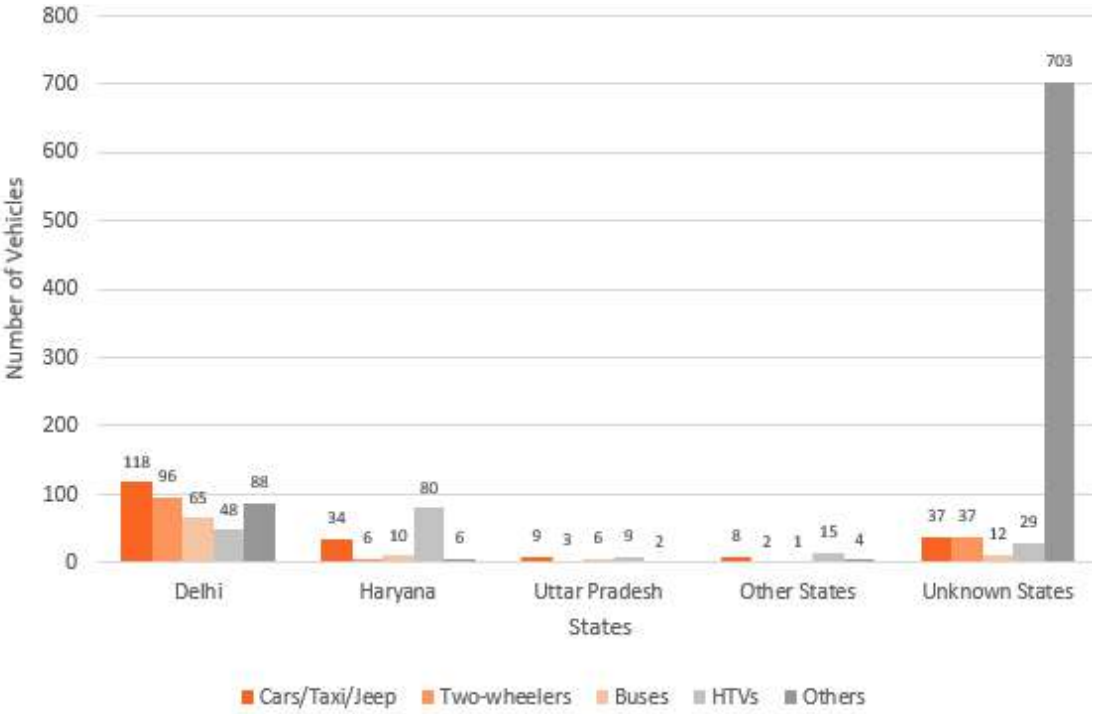


FIGURE 4.7 STATE-WISE REGISTERED ACCUSED VEHICLES (FATAL CRASHES)

The above figure depicts that the accused vehicles belonging to Delhi state, car/taxis were responsible for most of the fatal accidents (118 i.e. 28.43%) followed by two-wheelers (96 i.e. 23.13%) and buses (65 i.e.15.66%).

Out of all accused vehicles belonging to Haryana, it is found that HTVs were responsible for most of the fatal crashes (80 i.e 58.8%) followed by Car/Taxi (34 i.e 25%) and Buses (10 i.e 7.35%).Uttar Pradesh accused vehicles analysis shows that Car/Taxi and HTVs are equally responsible for fatal crashes (9 i.e 31% each) followed by Buses (6 i.e 20.69%).

4.6 STATE VS VICTIMS

State vs victims data helps in understanding the quantum of vulnerable road users. It also helps in studying the correlation between accused vehicles belonging to different states and victims.

TABLE 4.7 STATE-VS-VICTIMS (ALL CRASHES)

STATE	Victims										
	Cyclists	Cycle Rick-shaw	Electric Erick-shaw	Two-Wheel-ers	Pedes-trians	Passen-gers	Self	TSRs	Car/Taxi	Others	Total
Assam	0	0	0	1	0	0	1	0	0	0	2
Bihar	0	0	0	0	0	0	0	0	1	0	1
Chandigarh	0	0	1	2	2	0	1	0	1	0	7
Chhattisgarh	0	0	0	1	0	0	0	0	0	0	1
Delhi	82	23	54	919	775	19	160	86	124	62	2304
Gujarat	0	0	0		2	0	1	0	0	0	3
Haryana	16	3	7	225	133	0	16	20	42	31	493
Himachal Pradesh	0	0	0	5	1	0	0	1	0	1	8
Jammu and Kashmir	0	0	0	1	0	0	0	0	1	0	2
Jharkhand	0	0	0	1	1	0	0	0	0	0	2
Madhya Pradesh	0	0	0	5	1	0	0	1	2	0	9
Maharashtra	0	0	0	7	1	0	0	1	0	0	9
Nagaland	0	0	0	4	0	0	0	0	0	1	5
Punjab	1	0	1	8	5	0	0	0	1	0	16
Rajasthan	0	1	1	9	6	1	1	0	7	3	29
Uttar Pradesh	8	2	3	74	49	1	10	12	16	6	181
Uttarakhand	0	0	0	6	0	0	1	1	0	0	8
West Bengal	0	0	0	1	1	0	0	0	0	0	2
State unknown	63	8	32	1019	1257	7	46	58	51	29	2570
Total	**170**	**37**	**99**	**2288**	**2234**	**28**	**237**	**180**	**246**	**133**	**5652**

The above table depicts that the highest number of victims in total crashes belong to Delhi (2304) followed by Haryana (493) and Uttar Pradesh (181) after victims of state unknown i.e 2507 in number.
Vehicles registered in Delhi and Haryana were involved in the total crashes of about 34.7 % and 5.95 % pedestrians respectively.
40. 1 % and 9.83 % of two-wheelers were victims to vehicles registered in Delhi and Haryana respectively.

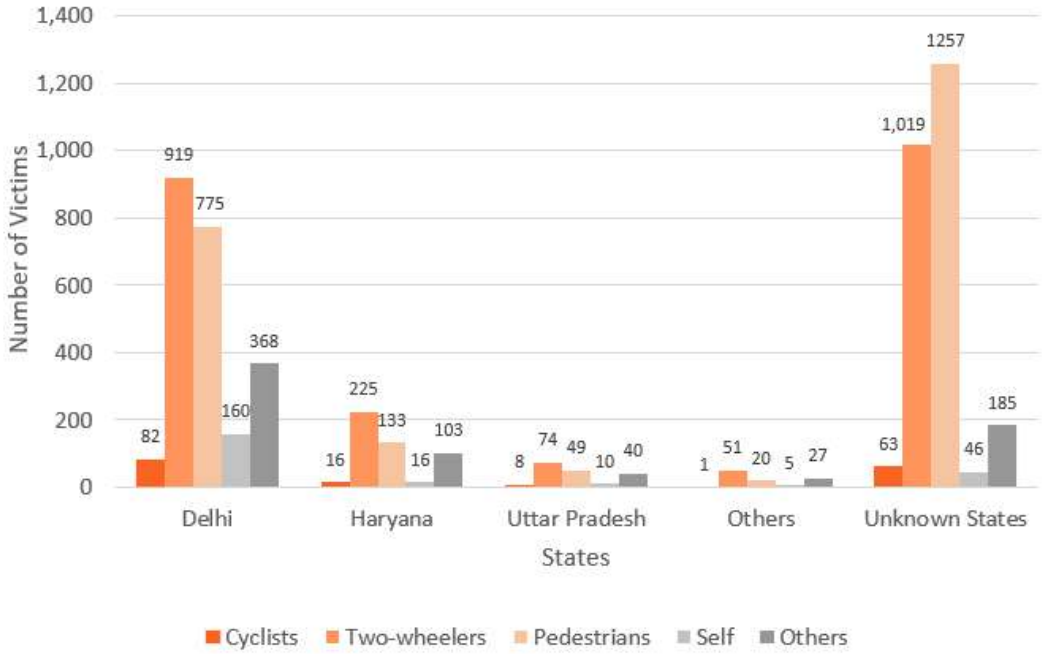


FIGURE 4.8 STATE vs VICTIMS (TOTAL CRASHES)

State vs victims total crashes analysis shows that the state with the highest victim vehicles belong to Delhi which are 2304 in number after State unknown followed by Haryana, Uttar Pradesh.

Out of 2304, crashes caused by vehicles registered in Delhi, 919 victims are two-wheeler riders followed by 775 pedestrian victims, 368 are others.State vs victims trend depicts that two- wheelers have been highly prone to crashes by vehicles belonging to Delhi, Haryana, Uttar Pradesh and other states.

TABLE 4.8 STATE-VS-VICTIMS (FATAL CRASHES)

State	Victims										
	Cyclists	Cycle Rick-shaws	Electric Rick-shaws	Two-Wheelers	Pedestri-ans	Passen-gers	Self	TSRs	Car/ Taxi	Others	Total
Assam	0	0	0	1	0	0	1	0	0	0	2
Chandigarh	0	0	0	0	0	0	1	0	0	0	1
Delhi	17	3	6	141	148	1	70	11	9	9	415
Gujarat	0	0	0	0	2	0	1	0	0	0	3
Haryana	8	1	2	60	39	0	6	4	6	10	136
Himachal Pradesh	0	0	0	3	1	0	0	1	0	0	5
Madhya Pradesh	0	0	0	3	0	0	0	0	0	0	3
Maharashtra	0	0	0	1	0	0	0	0	0	0	1
Nagaland	0	0	0	1	0	0	0	0	0	0	1
Punjab	1	0	0	1	2	0	0	0	0	0	4
Rajasthan	0	0	0	3	1	0	0	0	4	1	9
Uttar Pradesh	1	0	0	12	12	0	2	1	0	1	29
Uttarakhand	0	0	0	1	0	0	0	0	0	0	1
State Unknown	21	3	5	312	418	2	16	18	13	10	818
Total	**48**	**7**	**13**	**539**	**623**	**3**	**97**	**35**	**32**	**31**	**1428**

The above table depicts that the highest number of victims in fatal crashes belong to Delhi (415) followed by Haryana (136) and Uttar Pradesh (29) after victims of state unknown i.e 818 in number. Vehicles registered in Delhi and Haryana were involved in the fatal crashes of about 23.75 % and 6.26 % pedestrians respectively.

57.9 % two-wheeler riders were victims of fatal crashes by vehicles whose registration state could not be traced; 26.15 % and 11.13 % of fatal crashes were caused by the vehicles registered in Delhi and in Haryana respectively.Similar trends as described above were observed in case of total accidents caused in Delhi by vehicles registered in different states.

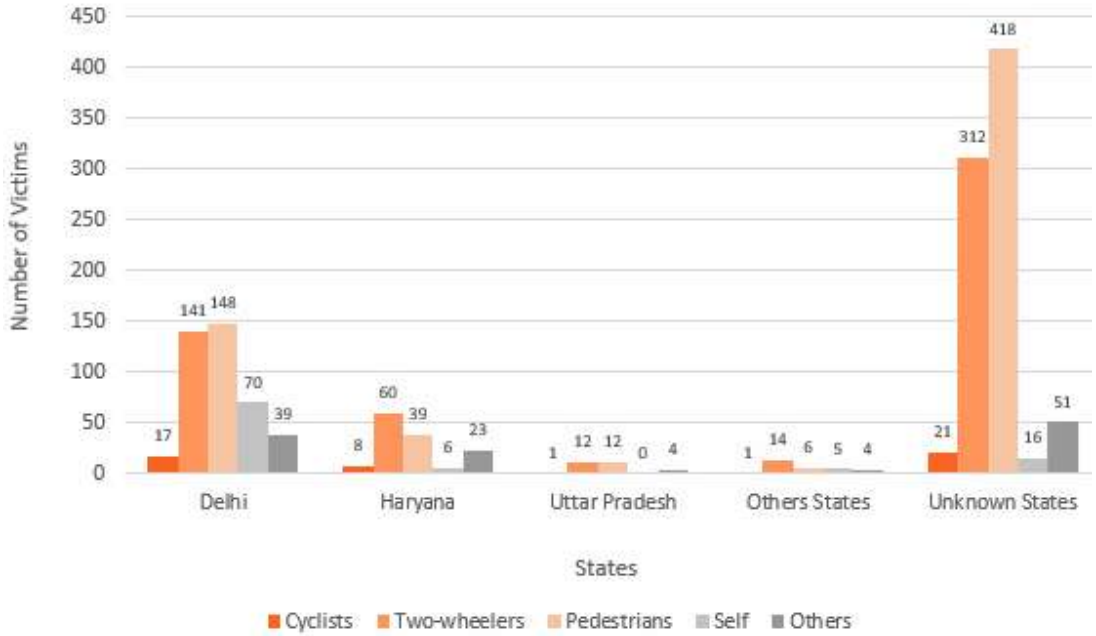


FIGURE 4.9 STATE vs VICTIMS (FATAL CRASHES)

Most victims of the crashes caused by the vehicles registered in Delhi were pedestrians (148 i.e., 35.7%) followed by scooter/motor cyclists (141 i.e., 33.9%). Vehicles registered in Delhi were involved in 70 self-hit fatal crashes.In case of crashes by vehicles registered in Haryana, 60 i.e 44.1 % victims of fatal crashes were two-wheeler riders and 39 i.e 28.7 % were pedestrians.The % share of Two-wheeler victims is more than the % share of pedestrian victims, in case of accidents by vehicles registered in Haryana state when compared to Delhi and Uttar Pradesh. Vehicles with registration state not-known caused 418 fatal crashes towards pedestrians, which accounted for 67.09 % of all pedestrians killed in the year 2022.

05

TEMPORAL CRASH DATA

A comparative analysis of the temporal trends of different kinds of crashes, day wise, month wise and hour wise makes many important /significant revelations. Temporal trends of crashes helps in understanding the underlying issues in terms of road safety measures and road infrastructure on different days and throughout the year.

5.1 CRASHES BY DAYS OF THE WEEK

By analyzing the crash data by days of the week in the below table, it was found that total and fatal crashes in 2022 have increased in comparison to 2021. A significant increase in crashes on each day is seen in the year 2022 when compared to the year 2021.

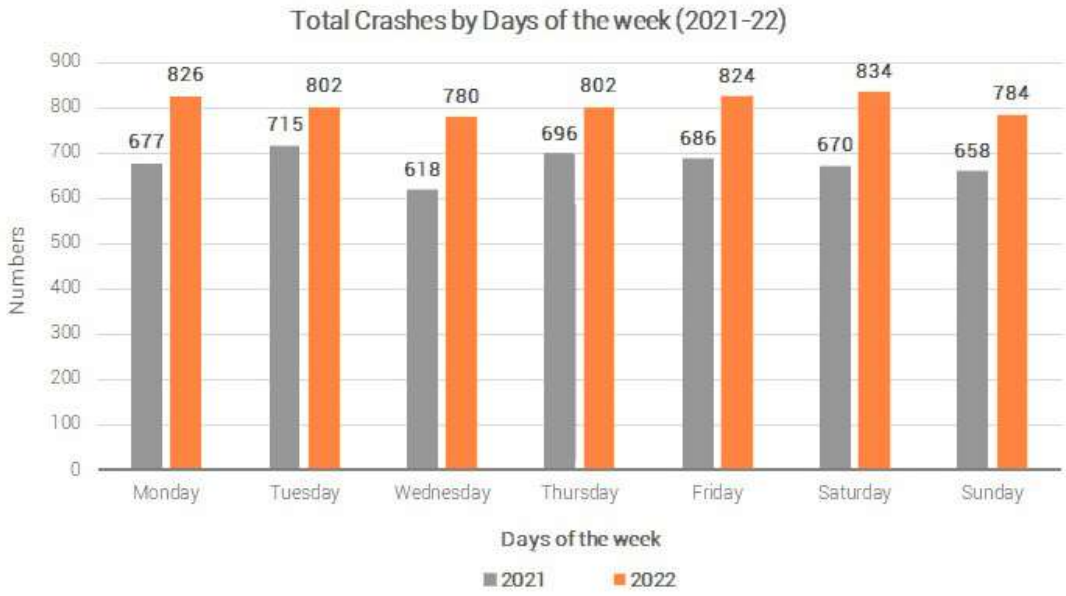


FIGURE 5.1 COMPARISON OF TOTAL CRASHES BY DAYS OF THE WEEK

From the above figure, it can be understood that the number of total crashes has been the highest on Saturday followed by Monday and Friday in the year 2022. Wednesday has witnessed the lowest crashes in the year 2021 as well as year 2022.

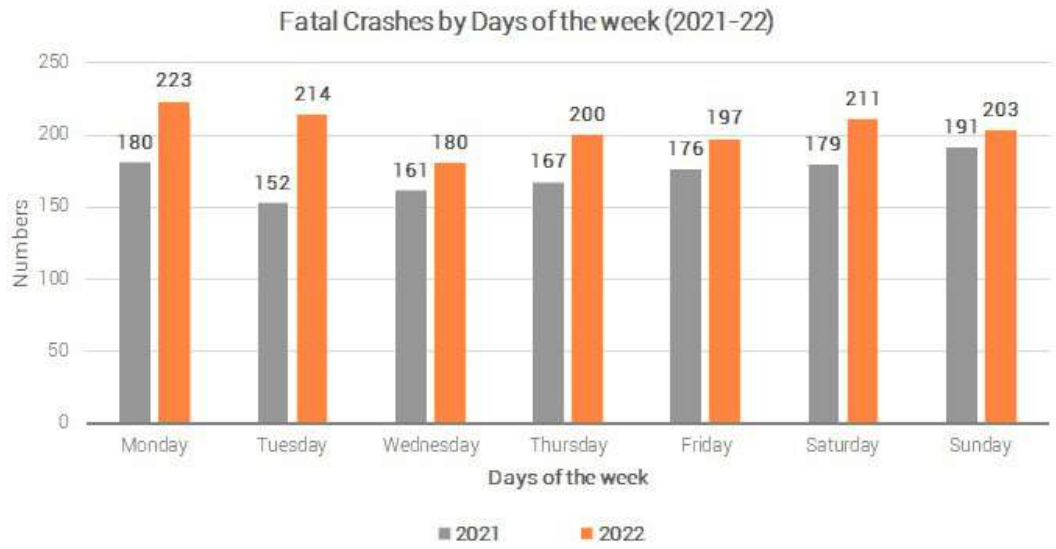


FIGURE 5.2 COMPARISON OF FATAL CRASHES BY DAYS OF THE WEEK

Fatal crashes trend on different days of the week, highlights a significant increase in fatal crashes on Tuesday followed by Monday in 2022, when compared to fatal crashes in 2021. In 2022, Monday (223) accounted for the highest number of fatal crashes followed by Tuesday (214) and Saturday (211). Wednesday witnessed the lowest fatal crashes in the year 2022. Tuesday had the lowest number of fatal crashes in the year 2021.

TABLE 5.1 CRASHES BY DAYS OF THE WEEK

Type of Crash	Mon		Tue		Wed		Thu		Fri		Sat		Sun		Total	
	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022	2021	2022
Fatal	180	223	152	214	161	180	167	200	176	197	179	211	191	203	1206	1428
Non Fatal	497	603	563	588	457	600	529	602	510	627	491	623	467	581	3514	4224
Total	677	826	715	802	618	780	696	802	686	824	670	834	658	784	4720	5652

5.2 CRASHES BY MONTH

In 2022, Month- wise crashes data represents an increase in crashes each month except the month of September when compared to 2021. December, October and April has recorded higher number of total crashes in 2022. April and May have witnessed the highest percentage increase of total crashes in 2022 compared to 2021.

TABLE 5.2 CRASHES BY MONTH

Month	Fatal		Injury		Non-Injury		Total	
	2021	2022	2021	2022	2021	2022	2021	2022
January	114	113	271	301	3	10	388	424
February	88	111	278	309	3	10	369	430
March	122	130	357	314	3	7	482	451
April	78	118	217	388	2	12	297	518
May	69	114	163	355	3	5	235	474
June	97	127	251	322	3	9	351	458
July	101	128	277	349	2	8	380	485
August	118	130	304	327	3	7	425	464
September	108	93	316	326	2	3	426	422
October	106	133	320	377	3	10	429	520
November	109	117	337	348	3	7	449	472
December	96	114	389	416	4	4	489	534
Total	**1206**	**1428**	**3480**	**4132**	**34**	**92**	**4720**	**5652**

The above table depicts month-wise fatal, injury and non- injury crashes for the years 2021 and 2022. There has been an increase in injury

except month of march. The total crashes shows an increasing trend in all the months in the year 2022 when compared to 2021 except the month of September.

FIGURE 5.3 COMPARISON OF FATAL CRASHES BY MONTH (2021-22)

In 2022, maximum fatal crashes occurred in the months of October (133), August (130) and March (130) whereas a lesser number of fatal crashes occurred in September (93), February (111) and December (114). There has been a decrease in fatal crashes in the month of September from 108 fatal crashes in 2021 to 93 fatal crashes in 2022.

5.3 CRASHES BY TIME OF OCCURRENCE

Temporal trend analysis of crashes at day and night and hour-wise helped in understanding the peak crash duration and the vulnerable road victims at different time intervals. It provides valuable insights into the timing and distribution of road crashes throughout the day and night. Road crashes analysis at time of occurrence provides a deeper understanding of the factors contributing to road crashes and helps in developing effective strategies for prevention and mitigation of road crashes.

TABLE 5.3 CRASHES BY DAY AND NIGHT

Month	Fatal		Injury		Non-Injury		Total	
	Day	Night	Day	Night	Day	Night	Day	Night
2018	743	914	2823	1960	35	40	3601	2914
2019	656	777	2474	1651	23	29	3153	2457
2020	551	612	1851	1146	8	10	2410	1768
2021	561	645	2098	1382	14	20	2673	2047
2022	622	806	2472	1660	41	51	3135	2517

The above table shows a decreasing trend in fatal crashes during day and night from year 2018 to 2020 and increasing trend from year 2020 onwards. Similar trends can be seen in injury, non-injury and total crashes from 2018 to 2022.

Crash classifications in the below figure according to day and night shows that in 2022, 806 fatal crashes occurred during the night time whereas 622 occurred during the day time. In 2021, there were 561 fatal crashes during the day time and 645 during the night time.

Fatal crashes in day time were uniformly higher than those in night time in all the years from 2018 to 2022. This shows that during the day, due to higher traffic volume on roads speeding does not happen . Hence the number of crashes resulting in fatalities are lesser. At night, due to lesser vehicle volume, vehicles tend to overspeed leading to more fatal crashes. More fatal crashes at night also suggests lack of sufficient lighting and visible policing on the roads. In case of simple crashes, the day time crash figures are higher than the night time.

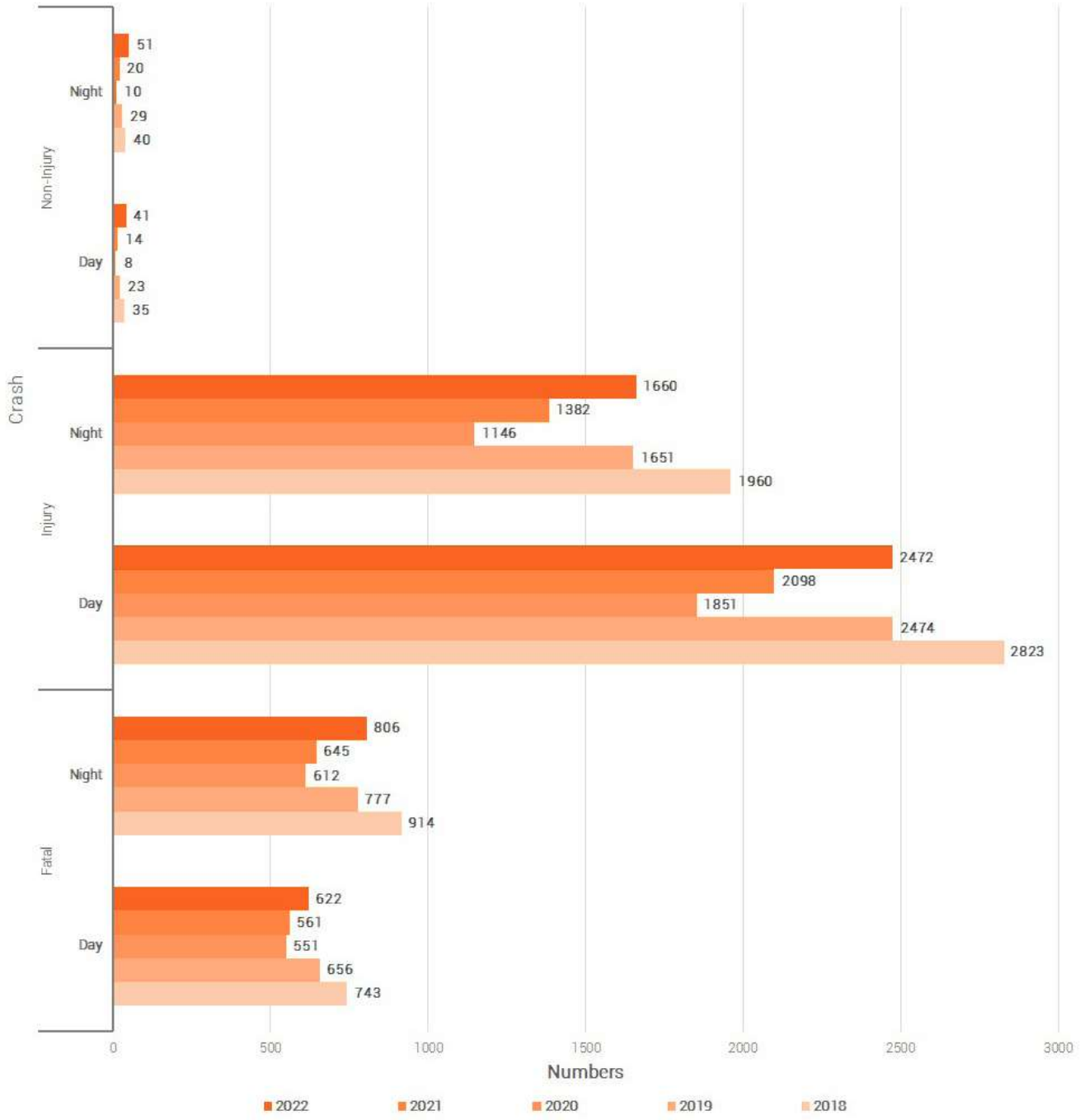


FIGURE 5.4 CRASHES BY DAY AND NIGHT

CRASHES BY HOUR

Crashes by hour analysis helps in identifying high- risk periods, provide insights into driver behavior and patterns, and crashes prevention by identifying time-based vulnerable road users.

Time-wise analysis in the below table has revealed that fatal crashes increased gradually from 1900 hrs (64) onwards to peak by 0000 hrs (113) and started declining afterwards. The highest number of fatal crashes occurred between 2300 hours to 0000 hours.

This time period also overlaps with the evening peak hours of traffic. This increases the heterogeneity of vehicles on the road. There is a sudden surge in different vehicle categories on the roads as entry ristrictions are removed for medium and heavy goods vehicles creating the conditions for collisions, knock downs, etc. Poor road lighting on various roads and streets also contribute to making them unsafe and prone to more crashes.

Thereafter, fatal crashes decreased gradually from 0200 hours to 0400 hrs (42). The trend continued to remain low till 1800 hrs with 39 fatal crashes from 1700-1800 hrs. From 1000 hrs to 1800 hrs, it remained low with some variations and again started rising after 1800 hrs. The same trend persisted in the year 2021 with marginal variations.

Owing to reduction in the movement of pedestrians, slow-moving vehicles, non-commercial traffic and commercial traffic, the number of crashes after 0100 hrs also decreases.

TABLE 5.4 CRASHES CLASSIFIED ACCORDING TO THE TIME OF OCCURRENCES

Time	Simple Crashes			Fatal Crashes		
	2020	2021	2022	2020	2021	2022
0000-0100	122	132	167	89	78	95
0100-0200	82	100	129	53	54	82
0200-0300	42	62	99	38	30	59
0300-0400	39	61	70	20	33	42
0400-0500	34	45	79	32	30	58
0500-0600	66	84	95	30	40	55
0600-0700	72	101	135	45	43	48
0700-0800	87	116	145	39	41	45
0800-0900	115	140	149	42	45	49
0900-1000	132	139	213	36	30	37
1000-1100	163	171	177	33	47	39
1100-1200	125	164	149	38	33	44
1200-1300	114	134	188	43	39	38
1300-1400	124	132	201	29	30	49
1400-1500	111	150	189	41	38	52
1500-1600	136	139	177	41	40	50
1600-1700	134	159	176	48	40	47
1700-1800	169	152	201	36	32	39
1800-1900	186	190	209	38	44	48
1900-2000	166	197	219	51	64	64
2000-2100	184	245	265	75	79	66
2100-2200	252	256	286	79	77	97
2200-2300	207	248	276	96	96	112
2300-2400	153	197	230	91	123	113
Total	**3015**	**3514**	**4224**	**1163**	**1206**	**1428**

5.4 TIMEWISE FATAL CRASHES ACCUSED VEHICLES

Timewise fatal crashes accused vehicles provides valuable insights in identifying the mode of vehicle causing fatal crashes at different time intervals. This analysis helps in taking effective strategies to prevent fatal crashes and reduce the number of vulnerable road users (Table 5.5). In the year 2022, in 668 (46.77 %) cases of fatal crashes, registration number of accused vehicles were unknown (hit and run cases), as against 555 (46.01 %) in 2021. The crashes by 'unknown vehicles' have been recorded at all hours, though the number is higher during the time period between 2100 to 0200 hrs. The high rate of hit and run crashes indicates non-reporting of accused vehicles, need for better enforcement, adequate police visibility and the apathy of general public/eye witnesses to report the crashes.

HTVs committed fatal accidents are at almost all hours. However, the number of crashes were highest between 2300 and 0300 hrs. Cars were involved in fatal accidents at all hours of the day and higher during the night time. Maximum accidents by cars were caused during 2100- 0300 hrs.

TABLE 5.5 TIME-WISE ACCUSED VEHICLES (FATAL CRASHES)

Time	Accused Vehicle								
	Buses	TSRs	Two Wheelers	Car/ Taxi	LGVs	HTVs	Unknown Vehicle	Others	TOTAL
0000-0100	1	2	10	7	2	10	62	1	95
0100-0200	1	0	3	16	5	10	46	1	82
0200-0300	2	0	7	12	1	14	21	2	59
0300-0400	2	1	4	6	3	5	21	0	42
0400-0500	0	1	3	8	2	11	33	0	58
0500-0600	3	1	2	4	2	7	36	0	55
0600-0700	1	0	4	6	1	9	26	1	48
0700-0800	5	2	4	6	2	9	16	1	45

0800-0900	6	1	3	9	1	10	15	4	49
0900-1000	7	0	4	3	1	8	12	2	37
1000-1100	3	1	4	4	4	4	15	4	39
1100-1200	3	1	1	13	4	9	12	1	44
1200-1300	1	1	7	8	0	7	11	3	38
1300-1400	5	4	4	4	5	3	20	4	49
1400-1500	7	0	6	10	4	6	17	2	52
1500-1600	7	0	3	5	3	9	21	2	50
1600-1700	4	3	4	11	5	6	11	3	47
1700-1800	1	1	6	7	1	4	19	0	39
1800-1900	3	2	2	9	2	3	24	3	48
1900-2000	6	1	7	5	0	7	36	2	64
2000-2100	6	0	12	8	3	0	36	1	66
2100-2200	3	3	17	16	6	9	40	3	97
2200-2300	11	2	18	14	4	5	57	1	112
2300-2400	6	1	9	15	4	16	61	1	113
Total	**94**	**28**	**144**	**206**	**65**	**181**	**668**	**42**	**1428**

5.5 TIMEWISE FATAL CRASHES VICTIMS

Timewise fatal crashes victims provide valuable insights into the classification of vulnerable road users at different time intervals.

Analysis of time vis-a-vis victims of fatal crashes in the below table indicates that pedestrians were the major victims of fatal crashes from 1900 – 0200 hrs.

Time between 2100-0200 hrs is the most vulnerable for occurrence of crashes involving motorized two-wheelers. Most single vehicle crashes occurred during 2200-0100 hrs. Cyclists accounted as the most vulnerable users of roads between 0700- 0800 and 2000-2100 hrs

TABLE 5.6 TIME-WISE VICTIM (FATAL CRASHES)

Time	Victims										
	Cyclists	Cycle Rick-shaws	Electric Rickshaws	Two Wheelers	Pedestrians	Passengers	Self	TSRs	Car/ Taxi	Other	Total
0000-0100	0	0	0	37	35	0	10	6	2	5	95
0100-0200	2	0	0	36	30	0	7	1	3	3	82
0200-0300	0	1	0	29	17	0	7	2	2	1	59
0300-0400	0	0	0	8	20	0	5	1	4	4	42
0400-0500	1	1	0	25	19	0	5	3	3	1	58
0500-0600	3	0	2	19	21	0	2	2	4	2	55
0600-0700	2	0	1	14	26	0	1	1	1	2	48
0700-0800	5	0	0	14	20	1	2	1	1	1	45
0800-0900	3	1	3	11	25	0	2	0	2	2	49
0900-1000	3	0	2	10	18	0	1	3	0	0	37
1000-1100	2	0	0	17	18	0	1	1	0	0	39
1100-1200	0	0	0	20	20	0	1	1	1	1	44
1200-1300	1	0	0	12	20	0	4	0	0	1	38
1300-1400	0	1	1	23	21	0	1	0	1	1	49
1400-1500	0	0	0	23	24	0	3	1	1	0	52
1500-1600	1	0	0	22	22	1	1	2	0	1	50
1600-1700	4	1	1	17	18	0	4	1	0	1	47
1700-1800	2	0	1	14	19	0	3	0	0	0	39
1800-1900	2	0	0	16	26	0	2	0	1	1	48
1900-2000	3	1	1	19	34	0	3	3	0	0	64
2000-2100	5	1	0	18	35	0	6	1	0	0	66

2100-2200	6	0	0	38	45	0	4	2	0	2	97
2200-2300	2	0	0	51	42	1	14	1	0	1	112
2300-2400	1	0	1	46	48	0	8	2	6	1	113
Total	**48**	**7**	**13**	**539**	**623**	**3**	**97**	**35**	**32**	**31**	**1428**

5.6 ROAD SAFETY MEASURES AT NIGHT

A few road safety measures can be considered while driving at night to decrease the number of crashes and fatalities at night.

Driver's Fitness
First and foremost crucial aspect is the driver's fitness and vision at night. The vision distance at night reduces as compared to day. Hence regular checkups are recommended to prevent the condition of night blindness. Avoiding driving after drinking can also bring down the crashes significantly.

Vehicles Roadworthiness
A well-maintained vehicle will allow for safer driving at night and reduce the risks for vehicle occupants and road users. Use of reflectors on cycle and other vehicles specially during breakdown. Use of reflective jackets by clyclist can help in preventing night time accidents.

Public Education and Training
Another element that crosses all Working Groups and is essential for the success of any road safety programme is public education.

Good Road Infrastructure
Proper lighting on all roads, cctv cameras, activated edges, more checkpoints at night, more police presence/visibility at night can help in reducing the road crashes at night.

06

DISTRIBUTION OF CRASHES BY LOCATION

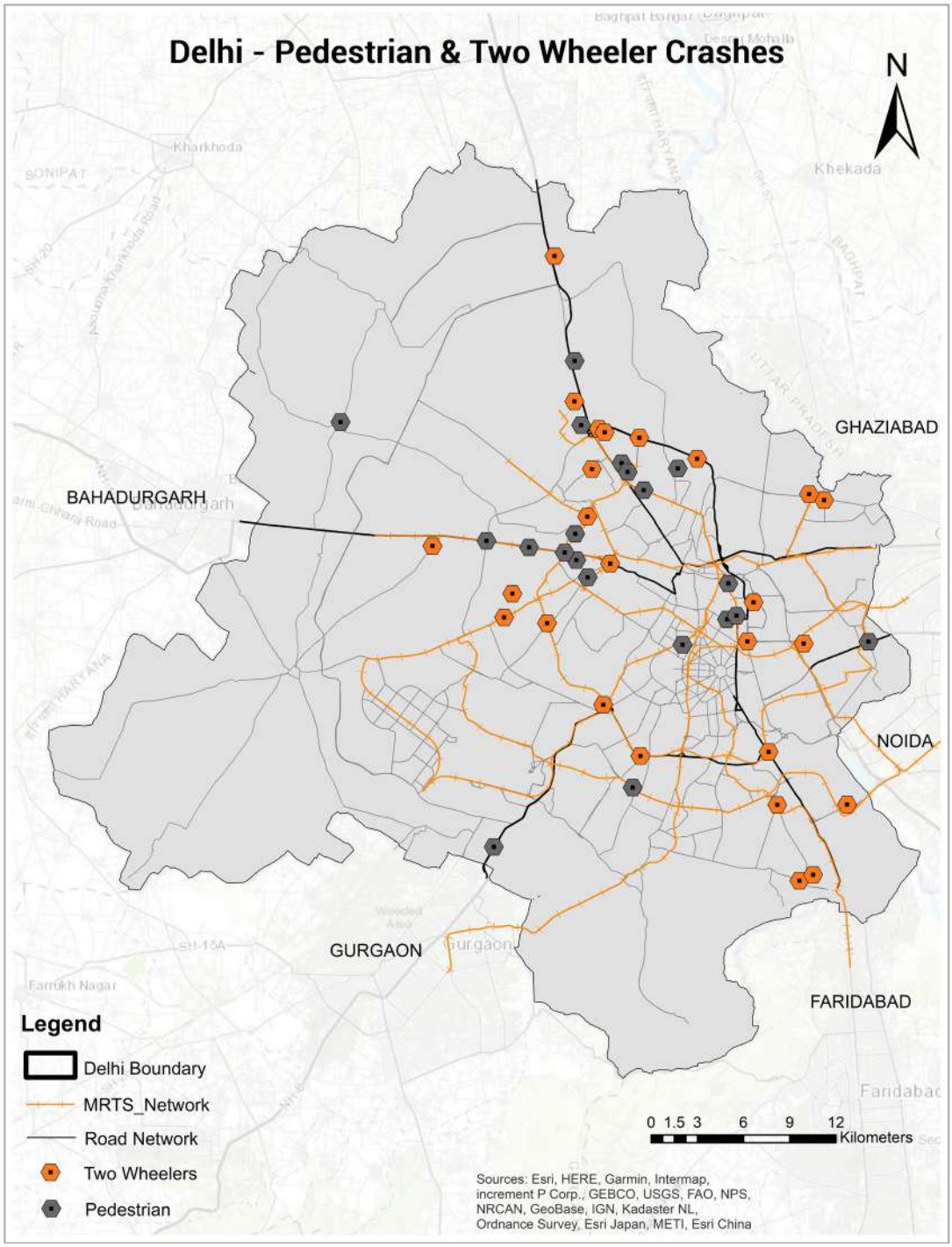
Understanding the spatial trend of accidents is crucial for effective road safety measures. By analyzing the distribution of accidents, high-risk areas can be identified, allowing for allocating necessary resources to prevent further crashes. Additionally, this information aids in designing and planning intersections and roads with proper engineering standards, promoting safer transportation infrastructure.

In the case of Delhi, the spatial trends of crashes exhibit an uneven pattern. Areas with a combination of vulnerable road users and heavy/high-speed vehicles are more prone to fatal crashes. Therefore, it is essential to focus on these high-risk zones and raise awareness among the communities residing in those areas. Integrating engineering measures such as segregation of fast and slow moving traffic, speed calming measures and stricter enforcement during night-time and off-peak hours can be implemented.

LOCATION OF VULNERABLE ROAD USERS

The map below outlines areas in Delhi with a higher likelihood of accidents involving vulnerable road users, primarily pedestrians, and two-wheelers.
Particularly, two-wheeler riders face increased vulnerability in proximity to identified blackspots and along the outer ring road and ring road of Delhi. These locations include Mukarba Chowk, Gandhi Vihar Bus Stand, Bhalaswa Chowk, and Dhaula Kuan Chowk.
Conversely, pedestrians are most exposed to risks at points such as Britania Chowk, the vicinity of GB Pant Hospital, Peeragarhi, and Madipur metro stations. The map clearly represents the elevated risk pedestrians face along Rohtak Road, GT Karnal Road, and specific areas within the central district.

To enhance road safety, addressing the spatial trends of accidents is crucial, prioritizing resource allocation in high-risk areas and ensuring the equitable distribution of police stations across the district. This comprehensive approach will contribute to a safer road environment and reduce the occurrence of crashes.



MAP 6.1 PEDESTRIAN & TWO WHEELER CRASHES

6.1 CRASH DATA AS PER TRAFFIC RANGES

The provided map illustrates the crash record in Delhi, categorized into 6 Traffic Ranges. In 2022, the Northern Range witnessed the highest fatal crashes, totaling 340 incidents. Following closely, the Western Range recorded 338 fatal crashes, while the Eastern Range reported 213 fatal crashes.When considering the total number of crashes, the Western range took the lead with 1310 incidents in 2022. The Northern Range followed closely with 1195 crashes.

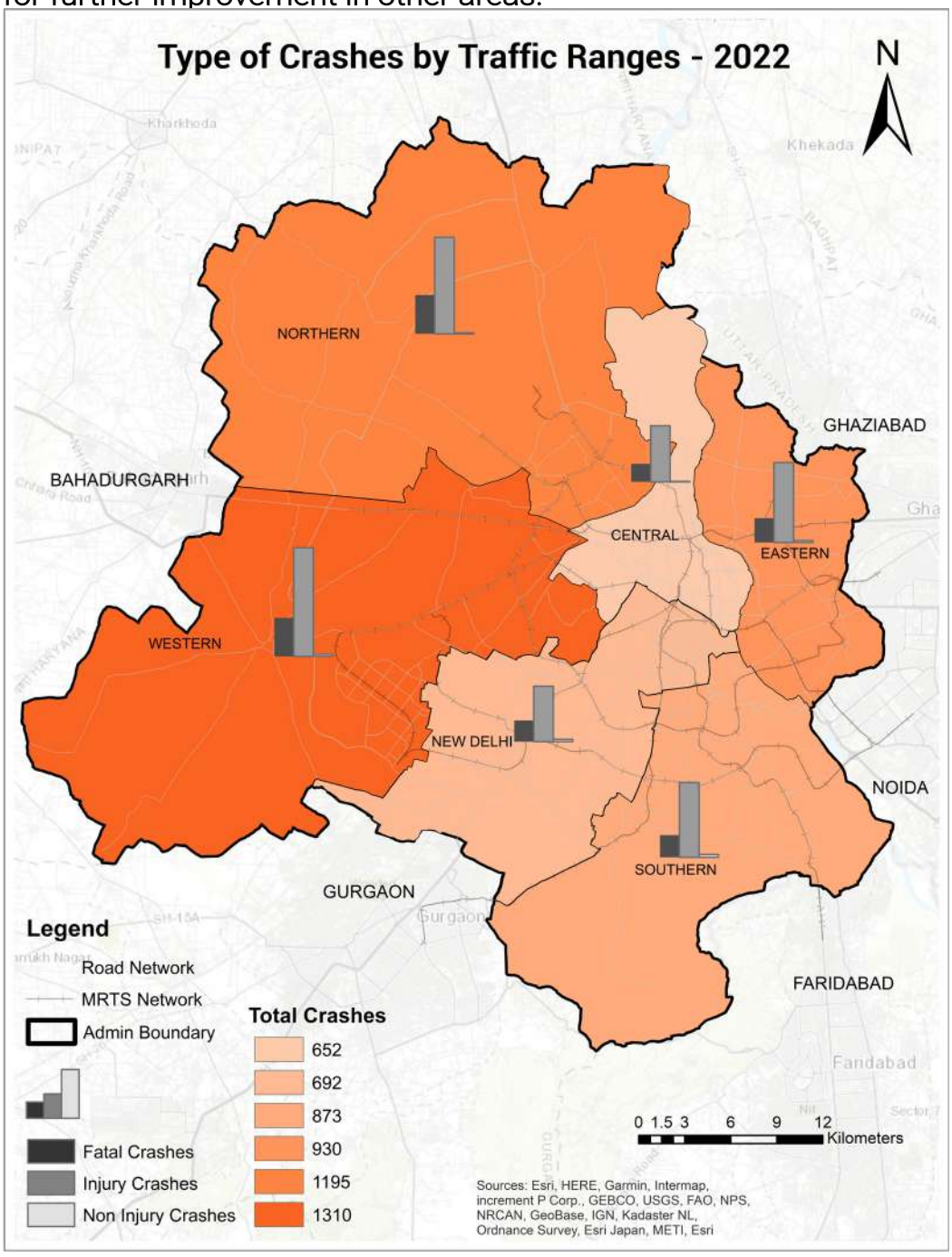
The data analysis reveals that the Western Range in Delhi has the highest number of overall crashes and injurious crashes, suggesting that individuals in this range are at a greater risk of sustaining injuries or experiencing physical deformities due to accidents. Following the Western Range, the Northern and Eastern Ranges also have significant injurious crashes, indicating a higher vulnerability for residents in these areas.

TABLE 6.1 TYPE OF CRASHES BY TRAFFIC RANGES - 2022

Traffic Ranges	Fatal Crashes	Injury Crashes	Non-Injury Crashes	Total Crashes
Central Range	157	491	4	652
Eastern Range	213	701	16	930
New Delhi Range	186	486	20	692
Northern Range	340	846	9	1195
Southern Range	194	655	24	873
Western Range	338	953	19	1310
Total	1428	4132	92	5652

On the other hand, the Central Range of Delhi recorded the lowest number of crashes, with 157 fatal crashes and 491 injury crashes. Overall, these statistics shed light on the distribution of crashes in different areas of Delhi. The higher incidence of injurious crashes in the Western, Northern, and Eastern Ranges emphasizes the need for targeted initiatives to enhance road safety and reduce the risk of disabilities or physical deformities resulting from accidents. Meanwhile the lower number of crashes in the Central and New Delhi Ranges

highlights the effectiveness of existing measures and provides insights for further improvement in other areas.



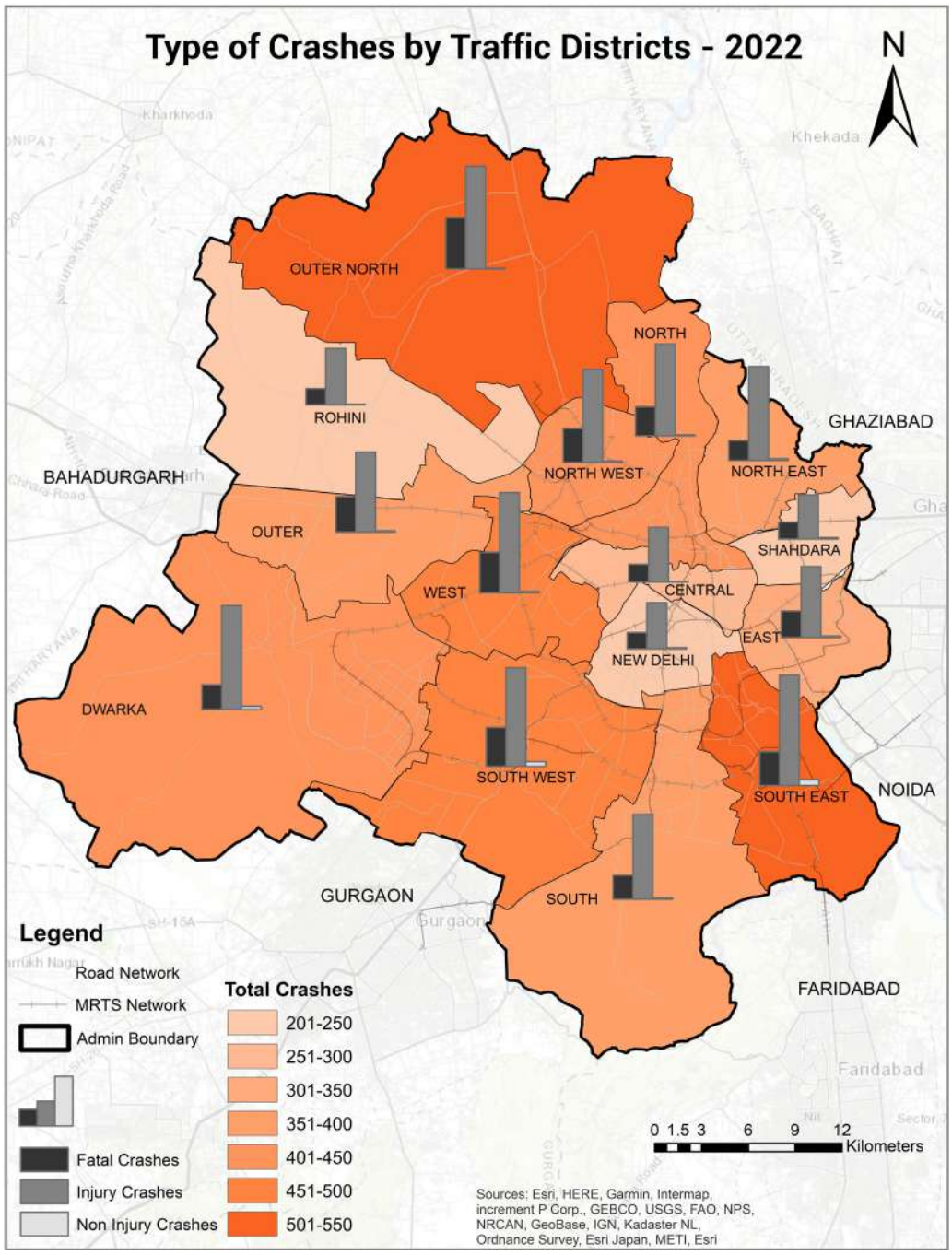
MAP 6.2 TYPE OF CRASHES BY TRAFFIC RANGES

6.2 CRASH DATA AS PER TRAFFIC DISTRICT

In 2022, among the 15 traffic districts in Delhi, certain districts stood out with higher rates of fatal crashes. Outer North district recorded the most fatal crashes with 172 incidents, followed by West district with 136, South West district with 131, Outer district with 119, South East district with 114, and North-West district with 114.Comparing these numbers to the previous year, 2021, the districts with the higher rates of fatal crashes were West (187), North West (180), Outer (143), and South-West (119) districts. The shift in rankings and the variations in the numbers between the two years is worth noting.

TABLE 6.2 TYPE OF CRASHES BY TRAFFIC DISTRICTS – 2022

Traffic Districts	Fatal Crashes	Injury Crashes	Non-Injury Crashes	Total Crashes
Central	59	183	1	243
Dwarka	83	349	11	443
East	89	238	5	332
New Delhi	55	155	4	214
North	98	308	3	409
North East	67	315	6	388
North West	114	312	4	430
Outer	119	268	4	391
Outer North	172	345	3	520
Rohini	54	189	2	245
Shahdara	57	148	5	210
South	80	284	4	368
South East	114	371	20	505
South West	131	331	16	478
West	136	336	4	476
Total	**1428**	**4132**	**92**	**5652**



MAP 6.3 TYPE OF CRASHES BY TRAFFIC DISTRICTS

When considering the total number of road crashes in 2022, the Outer North district had the highest incidence with 520 crashes, followed by the South East district with 505, the South West District with 478, and the West District with 476. These districts consistently showed a higher occurrence of crashes throughout the year.

Regarding the most injurious crashes, the South East district recorded the highest number with 371 incidents, followed by the Dwarka district with 349 and the Outer North district with 345. These districts pose a higher risk of disabilities and injuries resulting from crashes.Lastly, Delhi's Outer North, West, and Outer regions reported the maximum number of pedestrian fatalities, indicating the need for targeted measures to enhance pedestrian safety.

6.3 CRASH DATA AS PER TRAFFIC CIRCLES

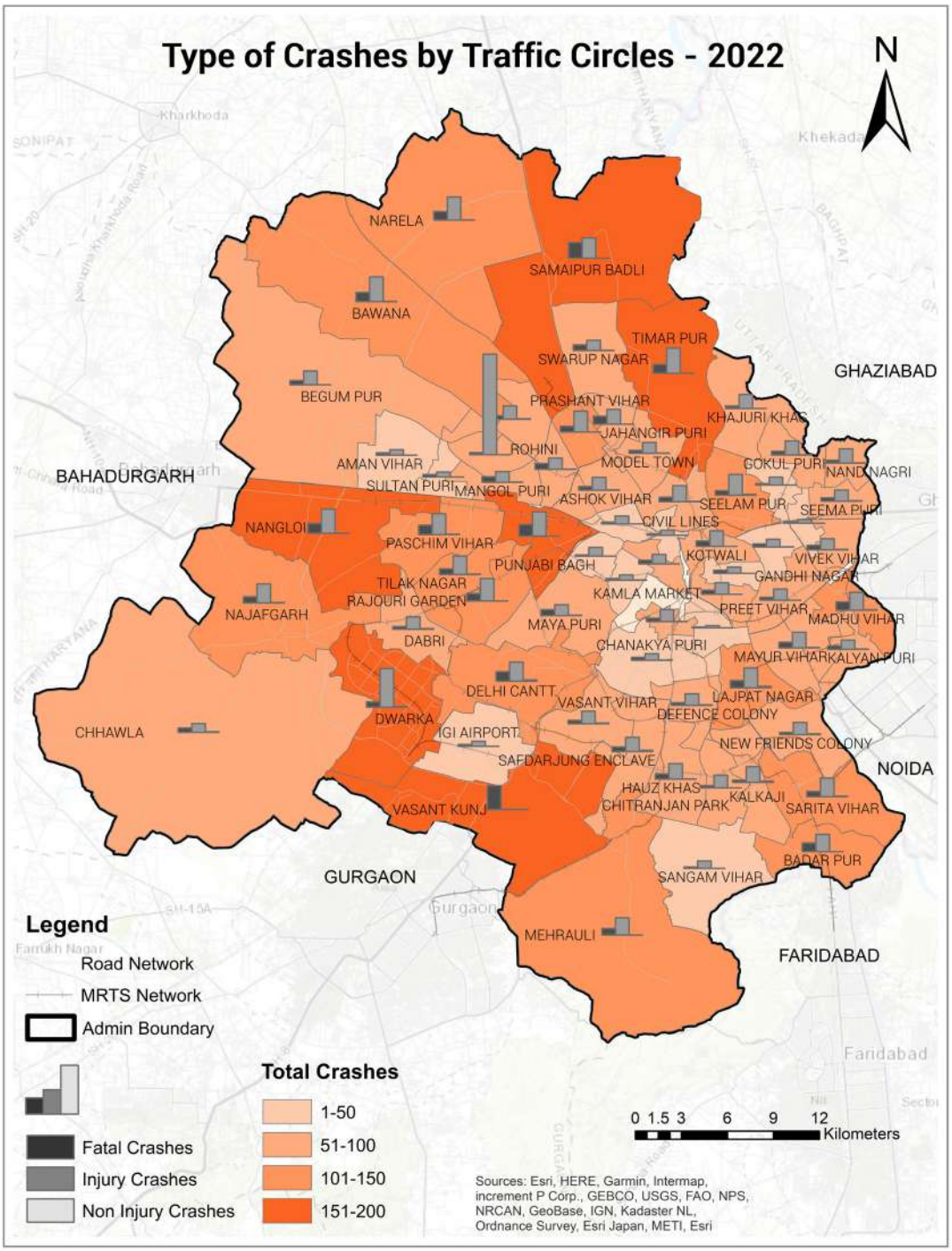
Delhi has 69 traffic circles. In 2022, Samaipur Badli Circle recorded the highest number of fatal crashes with 69 incidents, followed by Punjabi Bagh with 51, Vasant Kunj with 45, Nangloi with 43, and Delhi Cantt with 42. These circles stood out as areas with a higher risk of fatal accidents. When considering the total number of crashes in Delhi during the same year, Dwarka circle had the highest incidence with 198 crashes, followed by Samaipur Badli and Punjabi Bagh circles with 158 each, Vasant Kunj with 152, Nangloi with 151, Timarpur with 151, and Bawana with 150. These circles experienced a higher overall number of crashes throughout the year.Notably, most of these traffic circles are in the outer peripheral areas of Delhi, where the incidence of crashes is exceptionally high. Therefore, developing and implementing strategies specifically targeted at reducing accidents in these peripheral areas is crucial.

The vulnerability of two-wheeler victims was higher in Samaipur Badli, Delhi Cantt, Badarpur, and Vasant Kunj circles. On the other hand, the total number of crashes involving two-wheelers was higher in Dwarka, Timarpur, Bawana, Vasant Kunj, and Nangloi circles. Additionally, Bawana, Vasant Kunj, Badarpur, and Sarita Vihar circles were more vulnerable for cyclists.

TABLE 6.3 TYPE OF CRASHES BY TRAFFIC CIRCLES – 2022

Traffic Circles	Fatal Crashes	Injury Crashes	Non-Injury Crashes	Total Crashes
Aman Vihar	10	24	0	34
Ashok Vihar	16	57	2	75
Badarpur	38	76	0	114
Bara Khamba Road	4	10	0	14
Bawana	40	109	1	150
Begum Pur	19	61	0	80
Bhajan Pura	7	35	0	42
Chanakya Puri	13	29	1	43
Chhawla	20	39	3	62
Chitranjan Park	10	56	0	66
Civil Lines	20	71	2	93
Dabri	12	55	3	70
Darya Ganj	13	27	0	40
Defence Colony	12	51	3	66
Delhi Cantt	42	84	5	131
Dwarka	24	171	3	198
Gandhi Nagar	14	34	1	49
Gokul Puri	16	62	1	79
Hauz Khas	23	68	1	92
IGI Airport	8	22	0	30
Jahangir Puri	35	65	0	100
Kalkaji	10	70	6	86
Kalyan Puri	15	41	1	57
Kamla Market	18	51	0	69
Karol Bagh	7	24	1	32
Khajuri Khas	11	62	0	73
Kotwali	24	69	0	93
Lajpat Nagar	32	88	7	127
Madhu Vihar	37	79	2	118
Mangol Puri	24	47	1	72

Maya Puri	27	48	2	77
Mayur Vihar	25	69	2	96
Mehrauli	29	76	0	105
Model Town	13	48	1	62
Najafgarh	27	84	2	113
Nand Nagri	13	64	1	78
Nangloi	43	107	1	151
Narela	38	102	1	141
New Friends Colony	10	54	4	68
Pahar Ganj	16	42	0	58
Parliament House	5	14	0	19
Parliament Street	15	54	1	70
Prashant Vihar	16	59	2	77
Paschim Vihar	41	92	2	135
Patel Nagar	5	39	0	44
Preet Vihar	12	49	0	61
Punjabi Bagh	51	107	0	158
Rajouri Garden	33	99	0	132
Rohini	9	45	0	54
Sadar Bazar	7	22	0	29
Safdarjung Enclave	21	63	6	90
Samaipur Badli	69	89	0	158
Sangam Vihar	6	33	0	39
Sarai Rohilla	8	35	0	43
Sarita Vihar	24	83	3	110
Seelampur	20	92	4	116
Seemapuri	15	49	2	66
Shahdara	8	16	0	24
Shalimar Bagh	25	92	0	117
Subhash Place	25	50	1	76
Sultan Puri	11	22	0	33
Swaroop Nagar	25	45	1	71
Tilak Marg	11	23	0	34
Tilak Nagar	25	82	2	109
Timarpur	39	111	1	151
Tughlak Road	7	25	2	34
Vasant Kunj	45	106	1	152
Vasant Vihar	15	56	4	75
Vivek Vihar	20	49	2	71
Total	**1428**	**4132**	**92**	**5652**



MAP 6.4 TYPE OF CRASHES BY TRAFFIC CIRCLES

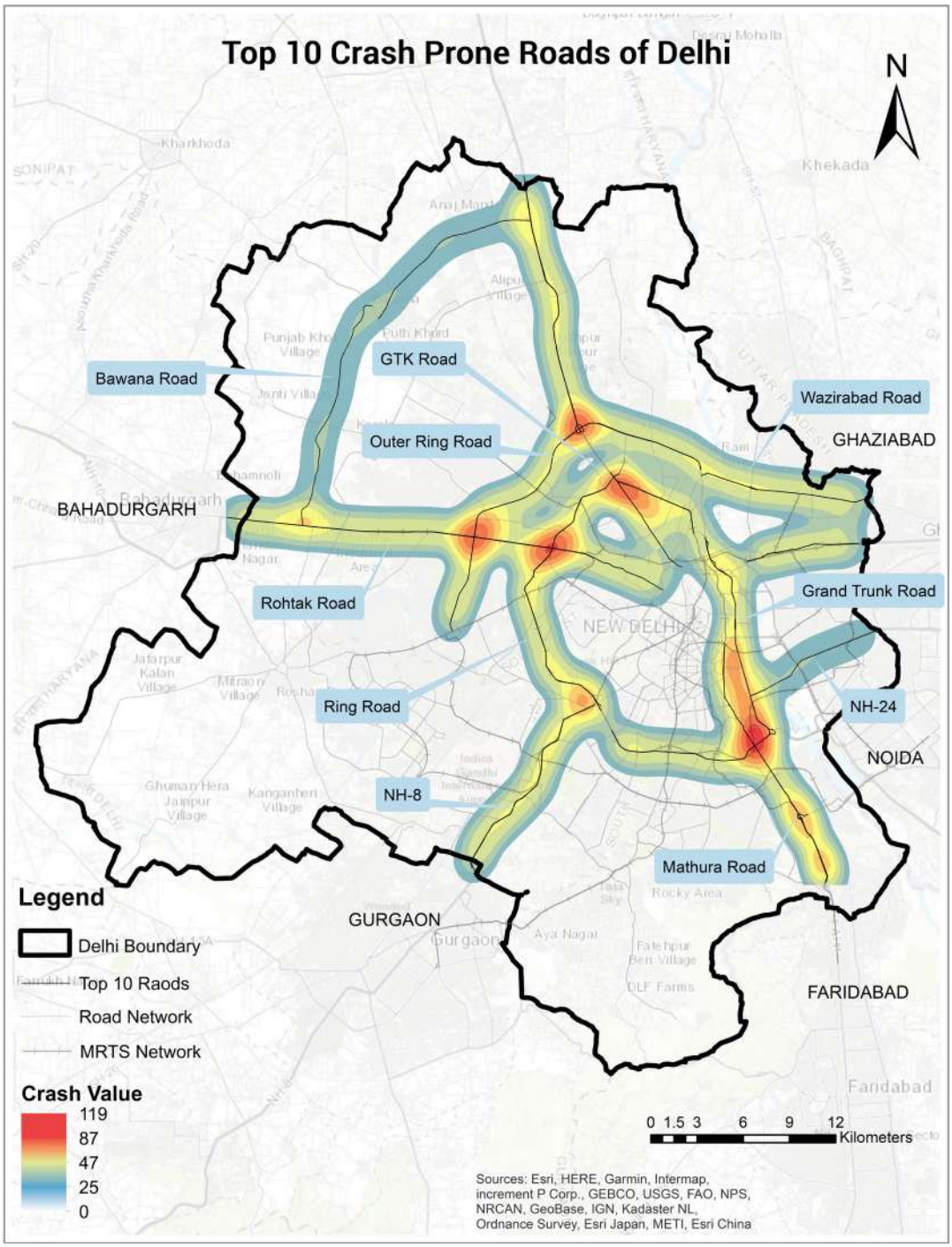
6.4 TOP 10 CRASH PRONE ROADS

Among the roads in Delhi, the top 10 fatal crash-prone roads in 2022 are Ring Road with 119 fatal crashes, Outer Ring Road with 102, GTK Road with 65, Rohtak Road with 63, NH-8 with 29, Bawana Road with 28, Mathura Road with 27, Grand Trunk Road with 25, Wazirabad Road with 25, and NH-24 with 25.

In terms of total crashes, the top 10 crash-prone roads are as follows: Ring Road and Outer Ring Road, both with 349 crashes, Rohtak Road with 191, GTK Road with 183, Najafgarh Road with 120, Mathura Road with 117, Wazirabad Road with 105, Grand Trunk Road with 98, NH-24 with 93, and NH-8 with 84. It is worth noting that the Northern Stretch of the Outer Ring Road had the highest number of crashes. The stretch of Ring Road between Azadpur to Dhaula Kuan and Dhaula Kuan to IP Depot is the most crash-prone section.

TABLE 6.4 TOP 10 FATAL CRASH PRONE ROADS

S. No.	Fatal Crash Prone Roads	Fatal Crashes	Deaths	Total crashes
1	Ring Road	119	122	349
2	Outer Ring Road	102	104	349
3	GTK Road	65	70	183
4	Rohtak Road	63	64	191
5	NH-8	29	30	84
6	Bawana Road	28	28	79
7	Mathura Road	27	27	117
8	Grand Trunk Road	25	27	98
9	Wazirabad Road	25	26	105
10	NH-24	25	26	93



MAP 6.5 HEAT MAP OF TOP 10 CRASH PRONE ROADS OF DELHI

6.5 CRASHES CLASSIFIED ACCORDING TO PLACE OF OCCURENCE

The table below shows the details of fatal, injury, and non-injury crashes on 103 significant roads in Delhi from 2020 to 2022.

The data highlights various inferences on the crash data from 2020 to 2022. Major roads such as the outer ring road, ring road, GTK Road, Rohtak Road, Najafgarh Road, Wazirabad Road, Grand trunk road, NH-24, NH-8, Bawana Road, and Pusta Road have consistently shown a higher number of crashes throughout 2022.

Additionally, specific roads have witnessed a notable increase in the number of accidents. For example, Alipur Road recorded 2 crashes in 2021, which increased to 11 in 2022. Similarly, Chattarpur Road had one crash in 2021, but the number rose to 6 crashes in 2022. DSIDC Narela Road saw an increase from 1 crash in 2021 to 8 crashes in 2022. Jharoda Road saw a rise from 8 crashes in 2021 to 20 crashes in 2022. Palam Dabri Road had one crash in 2021, but the number escalated to 16 in 2022. Other roads like Ravi Das Marg, Road Number 40, Bawana Auchandi Road, and Pusta Road also experienced an increase in the number of crashes. It is crucial to promptly address the safety concerns on these roads to prevent them from becoming fatal crash hotspots.

On the positive side, some stretches of roads have shown a reduction in the number of crashes. For instance, Ambedkar Road had four crashes in 2021, which decreased to 0 in 2022. Similarly, Mehrauli Badarpur road had 72 crashes in 2021, which decreased to 45 in 2022. Rani Jhansi road also showed improvement, with the number of crashes decreasing from 13 in 2021 to 5 in 2022. Lessons learned from these roads can be applied to other crash-prone roads in Delhi to reduce the number of crashes effectively.

By studying the patterns and implementing appropriate measures, the aim is to enhance road safety and mitigate the risks associated with these specific roads in Delhi.

TABLE 6.5 TYPE OF CRASHES ON ROADS – 2022

Sl. No	Road Name	Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
		2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
1	Africa Avenue	0	0	0	3	5	7	0	0	0	3	5	7
2	Alipur Road	0	0	1	2	2	10	0	0	0	2	2	11
3	Anand Mai Marg	8	5	8	12	15	32	0	2	2	20	22	40
4	Aruna Asaf Ali Marg	1	1	0	3	7	6	0	0	0	4	8	6
5	Asaf Ali Road	1	1	1	1	3	1	0	0	0	2	4	2
6	August Kranti Marg	0	0	0	1	4	2	0	0	0	1	4	2
7	Aurobindo Marg	6	3	6	19	15	17	0	0	1	25	18	24
8	Bahadur Shah Zr Marg	2	1	1	2	7	6	0	0	0	4	8	7
9	Bawana Road	14	19	28	17	28	50	0	0	1	31	47	79
10	Bhati Mine Marg	0	0	0	7	1	0	0	0	0	7	1	0
11	Boulevard Road	2	2	1	7	14	8	0	0	0	9	16	9
12	Captain Gaur Marg	1	1	1	1	3	3	0	0	0	2	4	4
13	Chhatarpur Road	0	1	0	3	0	6	0	0	0	3	1	6
14	Dhansa Road	5	8	8	3	8	7	0	0	2	8	16	17
15	Desh Bandu Gupta Road	2	3	10	12	11	16	0	1	0	14	15	26
16	Dr. Ambedkar Road	0	2	0	2	2	0	0	0	0	2	4	0
17	DSIDC Narela Road	2	0	1	0	1	7	0	0	0	2	1	8
18	Dwarka Road	0			0			0			0		
19	Faiz Road	2	0	1	1	1	1	0	0	0	3	1	2
20	Ghuman Hera Marg	0	2	1	1	2	0	0	0	0	1	4	1
21	Grand Trunk Road	14	21	25	40	57	71	0	0	2	54	78	98
22	GTK Road	46	44	65	72	90	117	1	0	1	119	134	183
23	Gurgaon Road	0	0	0	0	1	0	0	0	0	0	1	0
24	ISBT Road	0		0	0		1	0		0	0		1
25	Jawahar Lal Nehru Road	4	1	6	1	14	11	0	0	0	5	15	17
26	Jharoda Road	5	7	7	5	1	13	0	0	0	10	8	20
27	Kanjhawala Road	10	6	10	23	25	20	0	0	0	33	31	30
28	Lala Lajpat Rai Path	5	2	5	15	24	21	0	0	1	20	26	27
29	Loni Road	4	2	3	3	11	14	0	0	1	7	13	18
30	Mahipal Pur Road	8	3	3	14	11	15	0	0	1	22	14	19
31	Mandoli Road	1	0	1	1	5	5	0	0	0	2	5	6

32	Mayapuri Marg	2	4	6	1	4	11	0	1	0	3	9	17
33	Mehrauli Badarpur Road	18	18	20	38	54	24	1	0	1	57	72	45
34	Mehrauli Gurgaon Road	2	11	9	10	12	24	0	0	0	12	23	33
35	Najafgarh Road	20	28	24	84	78	94	0	1	2	104	107	120
36	Najafgarh Nangloi Road	7	10	4	21	28	25	0	0	0	28	38	29
37	Nangloi Sultanpuri Road	0	0	0	0	0	0	0	0	0	0	0	0
38	Naraina Road	1	0	1	3	3	3	0	0	0	4	3	4
39	Narela Road	6	9	9	8	12	20	0	0	0	14	21	29
40	Nelson Mandela Marg	2	0	2	5	6	2	0	0	0	7	6	4
41	New Rohtak Road	7	11	5	17	12	20	0	0	0	24	23	25
42	NH-24	17	15	25	26	32	68	0	0	0	43	47	93
43	NH-8	27	26	29	61	56	55	0	3	0	88	85	84
44	Noida DND Road	3	4	2	6	6	8	0	0	0	9	10	10
45	Old Gurgaon Road	1	2	4	2	3	5	0	0	0	3	5	9
46	Old Rohtak Road	1	2	4	7	6	3	0	0	0	8	8	7
47	Olof Palme Marg	0	0	0	0	0	0	0	0	1	0	0	1
48	Outer Circle C. Place	0	0	4	3	0	4	1	0	0	4	0	8
49	Outer Ring Road	97	95	102	158	182	239	1	3	8	256	280	349
50	Palam Dabri Road	0	0	2	1	1	14	0	0	0	1	1	16
51	Palla Road	1	0	5	0	3	8	0	0	0	1	0	13
52	Panchkuian Road	1	3	2	9	10	2	0	0	1	10	13	5
53	Pankha Road	7	9	9	9	15	19	0	0	0	16	24	28
54	Patel Road	7	4	7	23	23	23	0	0	0	30	27	30
55	Patpar Ganj Road	2	1	3	6	8	6	0	0	1	8	9	10
56	Press Enclave Marg	0	2	4	4	6	5	0	0	0	4	8	9
57	Prithvi Raj Road	0	1	1	0	4	9	0	0	0	0	5	10
58	Qutab Road	0	2	1	0	1	2	0	0	0	0	3	3
59	Raja Ram Marg	3	2	4	3	7	5	0	1	0	6	10	9
60	Rama Road	1	1	3	7	3	7	0	0	0	8	4	10
61	Rani Jhansi Road	0	1	0	16	12	5	0	0	0	16	13	5
62	Rao Tula Ram Marg	1	2	3	10	6	10	0	1	2	11	9	15

63	Ravi Das Marg	3	1	1	3	7	18	0	0	0	6	8	19
64	Ring Road	85	85	119	200	192	223	2	3	7	287	280	349
65	Rithala Road	3	0	0	4	1	2	0	0	0	7	1	2
66	Road No 13	0	0	0	0	2	0	0	0	0	0	2	0
67	Road No 37	1	2	1	1	1	3	0	0	0	2	3	4
68	Road No 40	2	1	2	7	4	14	0	0	0	9	5	16
69	Road No 41	5	6	2	11	10	5	0	0	0	16	16	7
70	Road No 56	7	9	15	23	14	23	0	0	0	30	23	38
71	Road No 57	2	4	6	12	11	20	0	1	1	14	16	27
72	Road No 66	0	5	0	3	9	11	0	0	0	3	14	11
73	Rohtak Road	38	46	63	100	89	126	1	1	2	139	136	191
74	Roshanara Road	2	0	3	2	10	9	0	0	0	4	10	12
75	Shanti Path	0	0	0	2	0	0	0	0	0	2	0	2
76	Station Road	3	3	1	14	6	7	0	1	1	17	10	9
77	Todapur Road (Dps Marg)	5	8	4	6	8	14	0	0	0	11	16	18
78	Vikas Marg	7	5	9	20	30	33	0	1	0	27	36	42
79	Viveka Nand Marg	0	0	0	3	1	2	0	0	0	3	1	2
80	Wazirabad Road	23	21	25	41	80	78	0	0	2	64	101	105
81	Yamuna Pushta Road	8	8	12	16	15	18	0	0	0	24	23	30
82	Road No 13A	3	6	6	9	17	12	0	0	0	12	23	18
83	Baba Kharak Singh Marg	2	6	3	3	6	10	0	0	0	5	12	13
84	Bawana Auchandi Road	1	0	5	4	2	2	0	0	0	5	2	7
85	Bijwasan Road	9	9	7	10	12	13	9	0	0	19	21	20
86	Burari Road	5	5	6	20	17	9	1	0	1	26	22	16
87	Chhawla Road	2	0	1	3	3	3	0	0	0	5	3	4
88	DDU Marg	0	1	1	1	2	5	0	0	0	1	3	6
89	Jai Singh Road	0	0	0	0	1	0	0	0	0	0	1	0
90	Jail Road	1	3	1	4	7	7	0	0	0	5	10	8
91	Jaitpur Road	1	2	4	3	9	0	0	0	0	4	11	4
92	Janpath	1	2	2	2	4	5	0	0	0	3	6	7
93	Kotla Road	2	3	4	1	9	4	0	0	0	3	12	8
94	Lodi Road	2	0	0	13	6	2	0	0	1	15	6	3
95	Maharaja Surajmal Road	1	0	0	0	1	3	0	0	0	1	1	3
96	Pusa Road	2	1	2	4	12	6	0	0	0	6	13	8
97	Pusta Road	10	7	10	26	29	53	0	0	1	36	36	65
98	Qutab Garh Road	4	0	2	4	4	2	0	0	0	8	4	4
99	Ramdev Marg	0	1	0	2	0	2	0	0	0	2	1	2
100	Ridge Road	2	3	2	2	3	2	0	0	1	4	6	5
101	Sardar Patel Marg	3	3	5	3	4	5	0	0	0	6	7	10
102	S P M Marg	3	4	4	0	0	1	0	0	0	6	0	5

The 19 Major crash prone roads of Delhi are responsible for 2105 crashes (approx. 40% crashes) in 2022. These roads are divided into four categories of roads that is National Highways Outer Ring Road, Ring Road, and others. The National highway which comprises of roads such as Rohtak Road (NH-10), Mathura Road (NH-2), NH 8, NH 24, GT Karnal Road (NH-1), and GT Road (NH-58) has recorded 758 crashes in the year 2022, accounting for 11% of crashes on all major roads. The ring road and outer ring collectively witnessed 13% of the total crashes while the remaining 11 roads encountered 12% of the accidents on major roads. The most critical road is NH-10 (Rohtak Road) having 191 crashes in 2022 and 136 crashes in 2021. (Table 6.9)

TABLE 6.6 TYPE OF CRASHES ON NATIONAL HIGHWAYS

Road	National Highways											
	Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
Rohtak Road (NH-10)	38	46	63	100	89	126	1	1	2	139	136	191
Mathura Road NH-2	15	14	27	60	66	86	0	0	4	75	80	109
NH-8	27	26	29	61	56	55	0	3	0	88	85	84
NH- 24	17	15	25	26	32	68	0	0	0	43	47	93
G.T. Karnal Road NH-1	46	44	65	72	90	117	1	0	1	119	134	183
G.T. Road NH-58	14	21	25	40	57	71	0	0	2	54	78	98

In 2022, the ring road and outer ring road in Delhi witnessed 349 accidents each. Among these, the specific stretch of the ring road that passes through Azadpur, Dhaula Kuan, IP Depot, IP College, and back to Azadpur is particularly noteworthy. This particular stretch is considered one of the most critical sections in Delhi in terms of road safety.

In 2021 the ring road recorded 280 crashes, which rose to 349 crashes in 2022. Notably, the Azadpur to Dhaula Kuan stretch specifically saw an increase of 34 crashes compared to the previous year.

These statistics highlight the importance of addressing safety concerns and implementing measures to mitigate the risks associated with this critical stretch of the ring road in Delhi. By focusing on this specific area and implementing targeted interventions, it is possible to enhance road safety and reduce the occurrence of accidents in the mentioned stretch.

TABLE 6.7 TYPE OF CRASHES ON RING ROAD

Road	Ring Road											
	Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
Azad Pur To Dhaula Kuan	41	38	59	69	62	72	0	0	3	110	100	134
Dhaula Kuan To I. P. Depot	23	21	29	58	68	76	2	3	3	83	92	108
I.P. Depot To I. P. College	10	18	18	37	41	50	0	0	0	47	59	68
I. P. College To Azad Pur	11	8	13	36	21	25	0	0	1	47	29	39

In 2022, the outer ring road in Delhi witnessed 349 crashes, reflecting an increase compared to the 280 crashes recorded in 2021. The outer ring road spans Delhi's northern, western, and southern regions, serving as a significant arterial route.Among the different sections of the Outer Ring Road, the northern part experienced the highest number of crashes in 2022, with 192 incidents. This particular road segment carries a greater risk in terms of road safety.

TABLE 6.8 TYPE OF CRASHES ON OUTER RING ROAD

Road	Outer Ring Road											
	Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
Outer Ring Road (West)	7	12	23	23	14	49	0	0	1	30	26	73
Outer Ring Road (North)	72	70	63	105	126	128	1	1	1	178	197	192
Outer Ring Road (South)	18	13	16	30	42	62	0	2	6	48	57	84

6.6 CRASH PRONE ROADS WITH MORE THAN 10 DEATHS

Apart from the previously mentioned roads, nine other roads in Delhi recorded ten or more deaths in 2022. These roads include Najafgarh Road, Mehrauli Badarpur Road, Road No 201, Road No 56, Yamuna Pusta Road, Pusta Road, Kanjhawala Road, Deshbandu Road, and Vikas Marg. These roads accounted for 127 fatalities and 465 crashes in a year.

TABLE 6.9 CRASH PRONE ROADS WITH MORE THAN 10 DEATHS

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Ring Road	119	349	122
2	Outer Ring Road	102	349	104
3	GTK Road	65	183	70
4	Rohtak Road	63	191	64
5	NH-8	29	84	30
6	Bawana Road	28	79	28
7	Mathura Road	27	117	27
8	Wazirabad Road	25	105	26
9	Grand Trunk Road	25	98	27
10	NH-24	25	93	26
11	Najafgarh Road	24	120	25
12	Mehrauli Badarpur Road	20	45	20
13	201 No. Road	15	70	15
14	Road No 56	15	38	15
15	Yamuna Pusta Road	12	30	12
16	Pusta Road	10	64	10
17	Kanjhawala Road	10	30	10
18	Desh Bandu Gupta Road	10	26	10
19	Vikas Marg	9	42	10

6.7 CRASH PRONE ROADS BY VICTIMS AND TIME

Among the road network in Delhi, pedestrians are the most vulnerable road users. The table below shows 25 roads with the highest number of pedestrian crashes. Notably, the critical roads include the Outer Ring Road, Ring Road, Rohtak Road, and GTK Road, collectively contributing to 194 crashes during the daytime and 189 crashes during the night-time.

Specifically, the Ring Road accounts for 62 pedestrian crashes, of which 29 are fatal at night. Following closely, the Outer Ring Road recorded 25 fatal crashes and 61 crashes involving pedestrians.

TABLE 6.10 CRASH PRONE ROADS FOR PEDESTRIANS BY TIME

S. No.	Road Name	Simple Crashes		Fatal Crashes		Total Crashes	
		Day	Night	Day	Night	Day	Night
1	Outer Ring Road	31	36	15	25	46	61
2	Ring Road	41	33	10	29	51	62
3	Rohtak Road	33	20	21	14	54	34
4	GTK Road	29	13	14	19	43	32
5	Bawana Road	9	4	4	8	13	12
6	Road No 56	7	2	7	5	14	7
7	Mathura Road	17	10	5	6	22	16
8	NH-8	3	2	5	6	8	8
9	Najafgarh Road	20	13	3	7	23	20
10	Grand Trunk Road	17	6	4	5	21	11
11	Wazirabad Road	28	11	2	5	30	16
12	Desh Bandu Gupta Road	5	5	5	2	10	7
13	Pusta Road	16	11	2	4	18	15
14	201 No. Road	10	8	5	1	15	9
15	Mehrauli Badarpur Road	4	3	3	3	7	6
16	Jawar Lal Nehru Road	4	0	4	2	8	2
17	Patel Road	2	4	2	3	4	7

18	NH-24	13	10	3	1	16	11
19	Pankha Road	8	2	0	4	8	6
20	Road No 57	7	1	3	1	10	2
21	Narela Road	4	3	1	3	5	6
22	Yamuna Pusta Road	3	3	0	4	3	7
23	Lala Lajpat Rai Path	6	0	2	2	8	2
24	Mehrauli Gurgaon Road	7	2	1	2	8	4
25	Baba Kharak Singh Marg	4	4	2	1	6	5

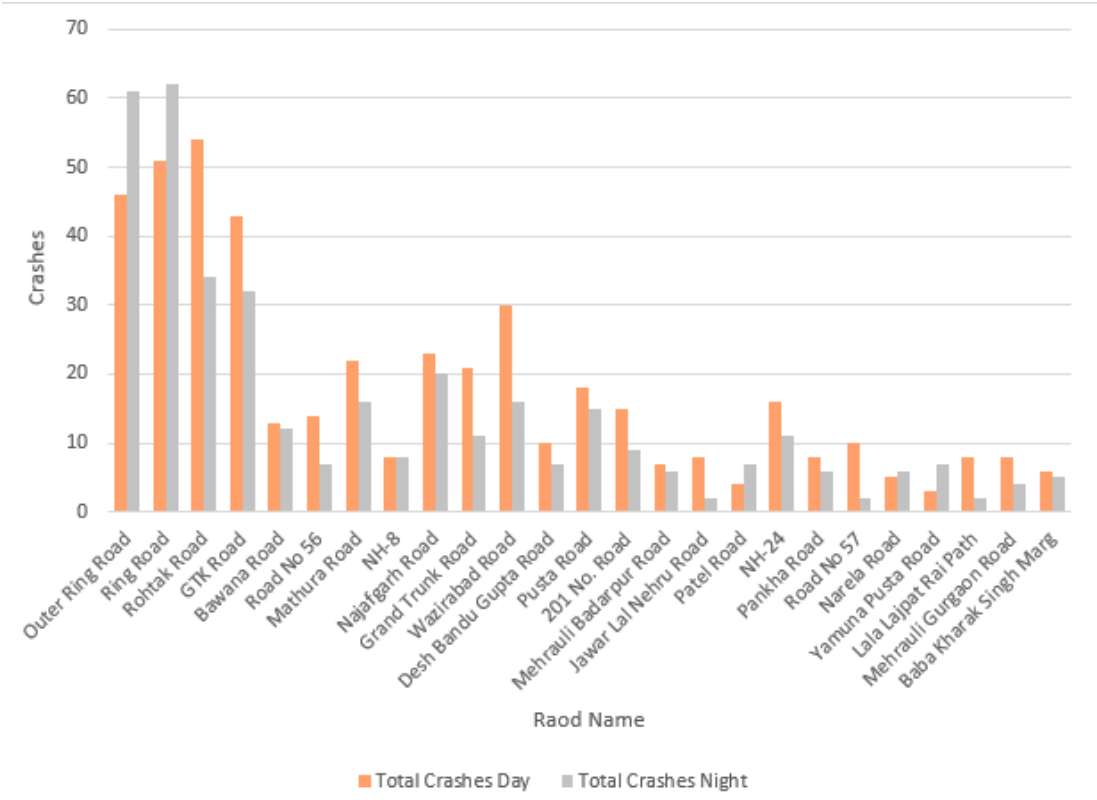


FIGURE 6.1 TOTAL PEDESTRIANS CRASHES BY DAY AND NIGHT

Following pedestrians, two-wheelers are the second most vulnerable road users. The following table highlights the top 25 road stretches critical for two-wheeler riders.

TABLE 6.11 CRASH PRONE ROADS FOR TWO-WHEELERS BY TIME

S. NO.	Road Name	Simple Crashes		Fatal Crashes		Total Crashes	
		Day	Night	Day	Night	Day	Night
1	Ring Road	50	46	24	27	74	74
2	Outer Ring Road	65	49	17	29	82	78
3	GTK Road	31	14	9	14	40	28
4	Rohtak Road	26	28	7	12	33	40
5	Wazirabad Road	18	11	9	7	27	18
6	NH-24	16	12	4	10	20	22
7	Bawana Road	22	7	6	7	28	14
8	NH-8	18	18	4	8	22	26
9	Najafgarh Road	20	21	7	4	27	26
10	Grand Trunk Road	20	11	3	7	23	18
11	Mehrauli Badarpur Road	6	5	4	6	10	11
12	Mathura Road	16	20	2	6	18	26
13	Kanjhawala Road	3	5	3	4	6	9
14	201 No. Road	10	13	2	4	12	17
15	Anand Mai Marg	13	5	3	3	16	8
16	Vikas Marg	10	7	2	3	12	10
17	Mehrauli Gurgaon Road	6	7	0	5	6	12
18	Bijwasan Road	5	1	3	2	8	3
19	Narela Road	6	4	0	4	6	8
20	Agra Canal Road	6	4	2	2	8	6
21	Yamuna Pusta Road	6	3	2	2	8	5
22	Pankha Road	1	6	0	4	1	10
23	13A No Road	5	0	2	2	7	2
24	Jharoda Road	3	1	3	1	6	2
25	Dansha Road	2	0	2	2	4	2

The Outer Ring Road experiences the highest number of two-wheeler crashes during daytime (82) and night time (78), with 29 fatal crashes occurring specifically during night time. The Ring Road follows closely-

with 74 crashes in both daytime and night time, 24 and 27 fatal crashes occured during day and night time respectively.

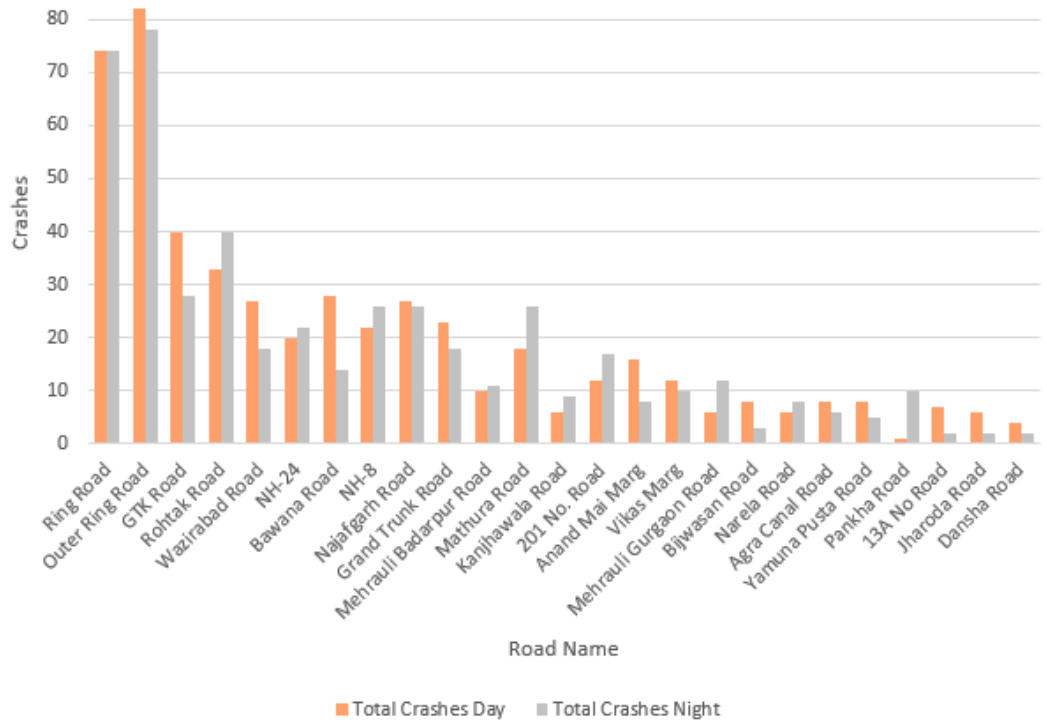


FIGURE 6.2 TOTAL CRASHES OF TWO WHEELERS BY DAY AND NIGHT

Cyclists in Delhi are another vulnerable road users and the table below highlights the day time and night time crashes involving cyclists. Mathura road witnessed most of the crashes with 6 in day time and 2 in night time, followed by Rothak road witnessing 3 crashes in daytime and 3 in night time.

TABLE 6.12 CRASH PRONE ROADS FOR CYCLISTS BY TIME

S. No.	Road Name	Simple Crashes		Fatal Crashes		Total Crashes	
		Day	Night	Day	Night	Day	Night
1	Rohtak Road	2	1	1	2	3	3
2	Mathura Road	5	1	1	1	6	2
3	Mehrauli Badarpur Road	1	2	1	1	2	3

4	Bawana Road	1	1	1	1	2	2
5	Outer Ring Road	2	3	1	0	3	3
6	GTK Road	2	1	1	0	3	1
7	Grand Trunk Road	3	0	0	1	3	1
8	Rajpur Road	0	1	1	0	1	1
9	NH-24	0	1	1	0	1	1
10	Anand Mai Marg	2	1	0	0	2	1

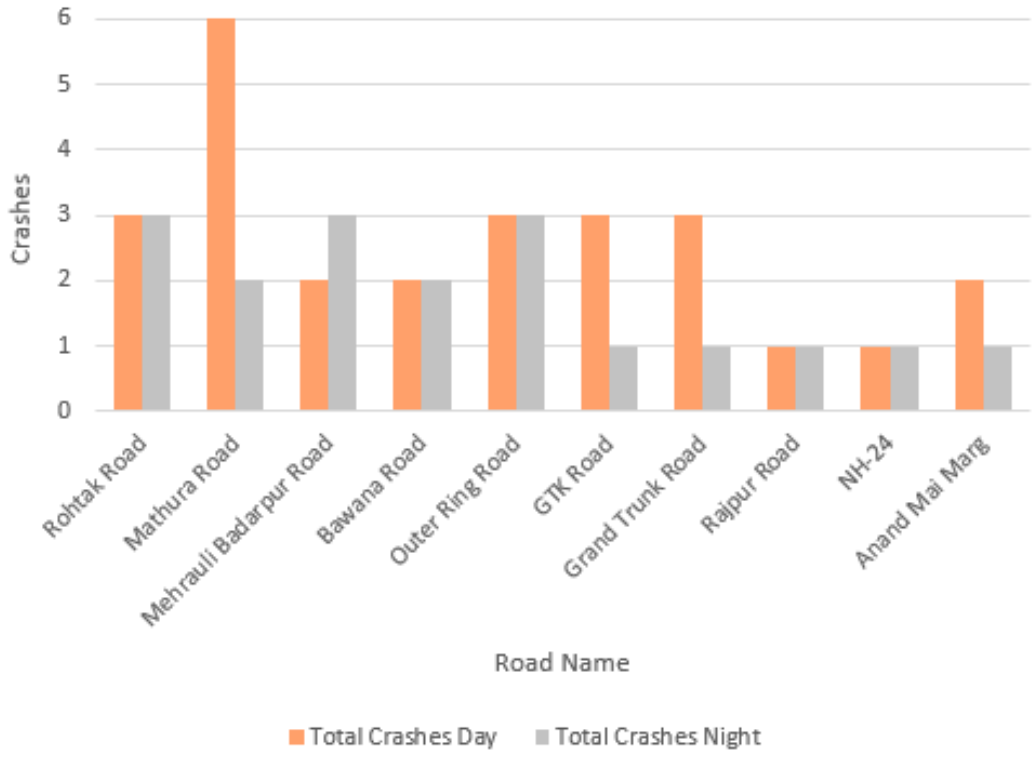
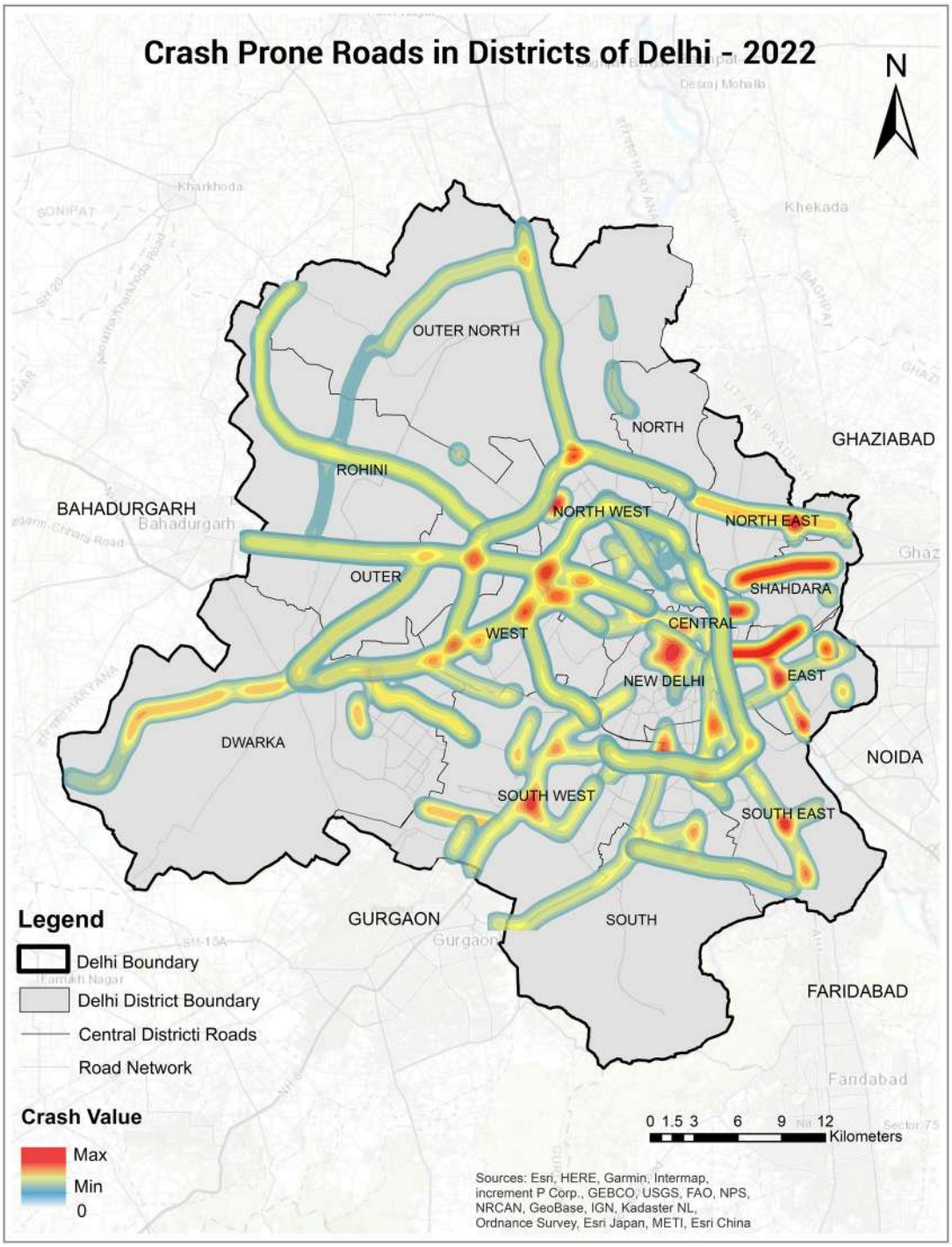


FIGURE 6.3 CRASHES OF CYCLISTS BY DAY AND NIGHT

6.8 DISTRICT WISE CRASH PRONE ROADS

Delhi consists of 15 traffic districts, and the following data highlights the critical road stretches in each district:



MAP 6.6 CRASH PRONE ROADS IN DISTRICTS OF DELHI

CENTRAL DISTRICT :

In the central district, Ring Road witnessed the highest number of crashes, with 32 incidents, resulting in 9 fatalities in 2022. Following closely, Desh Bandhu Gupta Road recorded 26 crashes, resulting in 10 fatalities during the same period.

TABLE 6.13 CRASH PRONE ROADS IN CENTRAL DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Desh Bandu Gupta Rd	10	26	10
2	Ring Road	9	32	9
3	Jawar Lal Nehru Rd	6	17	6
4	New Rohtak Road	4	19	4
5	Vikas Marg	4	13	4
6	Patel Road	2	14	2
7	Pusa Road	2	8	2
8	Minto Road	2	2	2
9	Indra Prastha Marg	2	2	2
10	Bahadur Shah Zr Marg	1	7	1

DWARKA DISTRICT:

In the Dwarka district of Delhi, Najafgarh Road has recorded the highest number of crashes, totaling 57 incidents in 2022. Unfortunately, these crashes have resulted in 12 fatalities. Following closely is Road No. 201, which has experienced 51 crashes and ten fatalities. Additionally, Jharoda Road has experienced 20 crashes, resulting in 9 fatalities.

TABLE 6.14 CRASH PRONE ROADS IN DWARKA DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Najafgarh Road	11	57	12
2	201 No. Road	10	51	10

3	Dansha Road	8	17	9
4	Jharoda Road	7	20	7
5	Palam Dabri Road	1	15	1
6	Najafgarh Nangloi Road	1	7	1
7	Chhawla Road	1	4	1
8	Dabri-Nasirpur Road	1	3	1
9	Ghuman Hera Marg	1	1	1
10	Bharthal Marg	1	1	1

EAST DISTRICT:

NH 24 has recorded many crashes in the East district of Delhi, with 88 incidents occurring in 2022. Tragically, these crashes have resulted in 24 fatalities. Road No. 56 follows with 30 crashes and 13 fatalities during the same period.

TABLE 6.15 CRASH PRONE ROADS IN EAST DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	NH-24	23	88	24
2	Road No 56	13	30	13
3	Yamuna Pusta Road	6	14	6
4	Kotla Road	4	8	4
5	Vikas Marg	3	24	4
6	Road No 57	3	13	3
7	Noida Road	2	13	2
8	Patpar Ganj Road	2	8	2
9	Narwana Road	1	5	1
10	Khichari Pur Road	1	3	1

NEW DELHI DISTRICT :

Baba Kharak Singh Marg stands out as a critical road stretch within the New Delhi district, with 13 crashes recorded in 2022. Unfortunately, these crashes have resulted in 3 fatalities. Asoka Road and Sardar Patel Marg closely follow, with 3 and 5 fatalities, respectively.

TABLE 6.16 CRASH PRONE ROADS IN NEW DELHI DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Sardar Patel Marg	5	10	5
2	Outer Circle CP	4	8	4
3	Baba Kharak Singh Marg	3	13	3
4	Ashoka Road	3	10	3
5	Ring Road	3	4	3
6	Janpath	2	7	2
7	Vinay Marg	2	6	2
8	Barakhamba Road	2	5	2
9	Panchkuian Road	2	5	2
10	Tilak Marg	2	4	2

NORTH DISTRICT:

The North District in Delhi is one of the most critical areas in terms of road safety. Within this district, the Outer Ring Road has experienced the highest number of crashes, with 97 incidents recorded in 2022. Tragically, these crashes have resulted in 27 fatalities. Following is the Ring Road, which has witnessed 44 crashes and nine fatalities during the same period.

TABLE 6.17 CRASH PRONE ROADS IN NORTH DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Outer Ring Road	27	97	27
2	Ring Road	9	44	9
3	Burari Road	4	10	4

4	Wazirabad Road	4	9	4
5	Raja Ram Marg	4	9	4
6	Old Rohtak Road	4	7	4
7	SPM Marg	4	5	4
8	Roshanara Road	3	12	3
9	Road No 40	2	16	2
10	Rajpur Road	2	12	2

NORTH EAST DISTRICT:

In the North Eastern District of Delhi, Wazirabad Road is a significant road stretch with 96 recorded crashes in 2022. Tragically, these crashes have resulted in 22 fatalities. Following closely are Grand Trunk Road and Pusta Road, which have witnessed 61 and 64 crashes, respectively.

TABLE 6.18 CRASH PRONE ROADS IN NORTH EAST DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Wazirabad Road	21	96	22
2	Grand Trunk Road	13	61	15
3	Pusta Road	10	64	10
4	Loni Road	3	15	3
5	100 Foota Road	2	3	2
6	Karawal Nagar Road	1	11	1
7	Tahirpur Road	1	2	1
8	Mandoli Road	1	2	2
9	Road No 66	0	11	0
10	Braham Puri Road	0	4	0

SHAHDARA DISTRICT:

Within the Shahdara district of Delhi, Grand Trunk Road has experienced 37 crashes in 2022. Tragically, these crashes have resulted in 12 fatalities. Following closely is Yamuna Pusta Road, which has witnessed 16 crashes and 6 fatalities during the same period.

TABLE 6.19 CRASH PRONE ROADS IN SHAHDARA DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Grand Trunk Road	12	37	12
2	Yamuna Pusta Road	6	16	6
3	Road No 57	3	14	3
4	Road No 56	2	8	2
5	71 No Road	2	6	2
6	Vikas Marg	2	5	2
7	Road No 58	2	4	2
8	Master Somanath Marg	2	2	2
9	GTB Hospital Road	1	4	1
10	Raja Ram Kohli Marg	1	3	1

NORTH WEST DISTRICT:

The North Western District is the second most critical district in Delhi, following the Northern District. Within this district, several major roads are particularly prone to accidents, including the Ring Road, Outer Ring Road, GTK Road, and Road No. 51.Among these roads, the Ring Road and Outer Ring Road stand out with 82 and 80 recorded crashes, respectively, in 2022. Unfortunately, both roads have also witnessed a significant number of fatalities, with 33 deaths reported on each road during the same period.

TABLE 6.20 CRASH PRONE ROADS IN NORTH WEST DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Ring Road	33	82	33
2	Outer Ring Road	32	80	33
3	GTK Road	14	67	14
4	51 No Road	4	14	4
5	Lawrance Road	2	10	2
6	Swami Narain Marg	1	10	1
7	Road No 37	1	4	1
8	Road No 43	1	2	1
9	Road No 41	1	1	1
10	Satyawati Road	1	1	1

OUTER DISTRICT:

In the Outer District of Delhi, Rohtak Road stands out as a critical road stretch, accounting for 149 recorded crashes in 2022. Tragically, these crashes have resulted in 45 fatalities. Following is the Outer Ring Road, with 60 crashes, and Najafgarh Road, with 22 crashes during the same period

TABLE 6.21 CRASH PRONE ROADS IN OUTER DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crash-es	Persons Killed
1	Rohtak Road	44	149	45
2	Outer Ring Road	21	60	21
3	Najafgarh Nangloi Road	3	22	3
4	Kanjhawala Road	1	6	1
5	Road No 43	1	3	1
6	Road No 30	1	2	1
7	Parwana Road	1	2	1
8	Kirari Road	0	1	0
9	Balbir Singh Marg	0	1	0

OUTER NORTH DISTRICT:

GTK Road has been identified as a critical road stretch in the Outer North district of Delhi, witnessing 114 recorded crashes in 2022. Tragically, these crashes have resulted in 56 fatalities. Following closely is Bawana Road, which has seen 79 crashes and 28 fatalities during the same period.

TABLE 6.22 CRASH PRONE ROADS IN OUTER NORTH DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	GTK Road	51	114	56
2	Bawana Road	28	79	28
3	Narela Road	9	29	9
4	Palla Road	5	13	5
5	Bawana Auchandi Road	5	7	5
6	Burari Road	2	5	2
7	Outer Ring Road	2	3	2
8	Alipur Road	1	11	1
9	DSIDC Narela Road	1	8	1
10	Kanjhawala Road	1	3	1

ROHINI DISTRICT:

Within the Rohini district of Delhi, Kanjhawala Road has been identified as a critical road stretch, recording 21 crashes in 2022. Tragically, these crashes have resulted in 8 fatalities. Following is Bhagwan Mahavir Marg, which has also witnessed 21 crashes, resulting in 4 fatalities during the same period.

TABLE 6.23 CRASH PRONE ROADS IN ROHINI DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Kanjhawala Road	8	21	8
2	Bhagwan Mahavir Marg	4	21	4
3	Qutab Garh Road	2	4	2

4	Road No 41	1	5	1
5	Dinbandhu Chhote Ram Marg	1	2	1
6	Rithala Road	0	2	0
7	Parwana Road	0	1	0
8	Maharaja Agarsen Road	0	1	0
9	Begumpur Road	0	1	0
10	Awantika Road	0	1	0

SOUTH DISTRICT:

Mehrauli Badarpur Road has been identified as a critical stretch, recording 34 crashes and resulting in 10 fatalities. Following is Mehrauli Gurgaon Road, with 33 crashes and nine fatalities. Additionally, Aurobindo Marg has witnessed 24 crashes, resulting in 6 fatalities.

TABLE 6.24 CRASH PRONE ROADS IN SOUTH DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Mehrauli Badarpur Road	10	34	10
2	Mehrauli Gurgaon Road	9	33	9
3	Aurobindo Marg	6	24	6
4	Ring Road	4	20	6
5	Press Enclave Marg	4	9	4
6	Outer Ring Road	3	30	3
7	Lala Lajpat Rai Path	3	8	3
8	Anuvrat Road	2	5	2
9	100 Foota Chhattar Pur Road	2	3	2
10	Lal Bhadur Shastri Marg	1	17	1

SOUTH EAST DISTRICT:

Mathura Road has been identified as a critical crash-prone road in the South East District of Delhi, witnessing 110 recorded crashes in a year. Tragically, these crashes have resulted in 26 fatalities. Following closely is Ring Road, which has seen 55 crashes and 17 fatalities during the same period.

TABLE 6.25 : CRASH PRONE ROADS IN SOUTH EAST DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Mathura Road	26	110	26
2	Ring Road	16	55	17
3	Mehrauli Badarpur Road	10	11	10
4	Anand Mai Marg	8	42	8
5	Agra Canal Road	6	21	6
6	13A No Road	6	18	6
7	Jaitpur Road	4	4	4
8	Outer Ring Road	3	21	3
9	Okhla Road	3	6	3
10	Lala Lajpat Rai Path	2	19	3

SOUTH WEST DISTRICT:

Within the South West district of Delhi, NH-8 is a critical road with 84 recorded crashes in a year. Tragically, these crashes have resulted in 30 fatalities. Following is Ring Road, which has witnessed 47 crashes and 15 fatalities during the same period.

TABLE 6.26 CRASH PRONE ROADS IN SOUTH WEST DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	NH-8	29	84	30
2	Ring Road	15	47	15
3	Outer Ring Road	10	33	11

4	Bijwasan Road	7	16	7
5	201 No. Road	5	19	5
6	Old Gurgaon Road	4	9	4
7	Mahipal Pur Road	3	19	3
8	Rao Tula Ram Marg	3	15	3
9	Thimayya Marg	3	7	3
10	Nelson Mandela Marg	2	4	2

WEST DISTRICT:

In the West District of Delhi, Ring Road emerges as a critical stretch yet again, witnessing 65 recorded crashes. Tragically, these crashes have resulted in 30 fatalities. Following closely is Rohtak Road, which has seen 42 crashes and 19 fatalities during the same period.

TABLE 6.27 CRASH PRONE ROADS IN WEST DISTRICT

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1	Ring Road	30	65	30
2	Rohtak Road	19	42	19
3	Najafgarh Road	13	63	13
4	Pankha Road	8	27	8
5	Mayapuri Marg	6	17	6
6	Patel Road	5	16	5
7	Outer Ring Road	4	25	4
8	Dev Prakash Shastri Road	4	18	5
9	Rama Road	3	10	3
10	Jail Road	1	8	1

The Ring Road and Outer Ring Road in Delhi are among the city's most critical and crash-prone roads. The district-wise data on crash-prone roads emphasizes the importance of identifying these critical stretches within each district, as they contribute to the area's vulnerability. By recognizing and acknowledging these specific road segments, each district can prioritize the implementation of targeted safety measures to ensure the well-being and safety of the citizens of Delhi. The data serves as a valuable resource to guide district-level efforts in addressing road safety concerns and working towards reducing the number of accidents in these vulnerable zones.

6.9 CRASH PRONE ZONES AND BLACK SPOTS

All accident spots are geo-tagged and marked on GIS Map. This helps in advanced analysis including spatial and cluster-based analysis of Crash-Prone Zones (APZ).

The Criteria adopted to define such Crash-Prone Zones are:
Three or more fatal accidents within the diameter of 500 meters or ten or more total accidents in the same region.
Crashes on all the major and minor roads joining the intersection having direct influence of traffic movement are considered to identify crash-prone zones:

A. All major road corridors of Delhi.
B. Top roads having maximum fatal crashes during the year 2022.

117 cluster points were identified as Crash-Prone Zones in 2022, as per the above mentioned criteria. Around 29.90% of total fatal crashes (427 out of 1428) occurred in the road-stretch at crash prone zones which is about 60 km. in length.
Top 10 such crash prone zones having maximum number of fatal crashes are termed as crash "Blackspots". (Time period taken is the calendar year i.e. 1st January to 31st December).

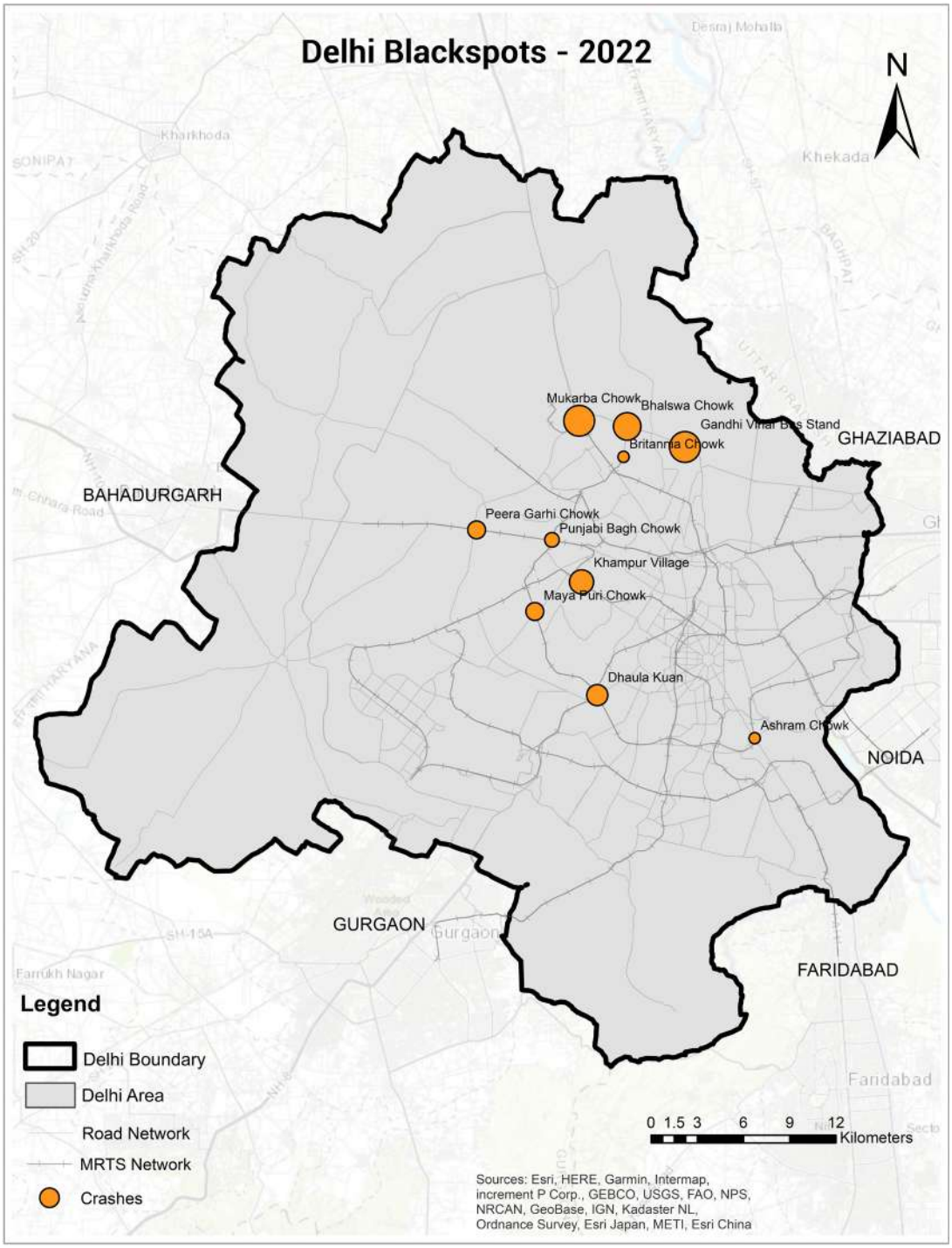
TABLE 6.28 BLACK SPOTS OF THE YEAR 2022

S. No.	Black Spot	Non-Injury Crashes	Simple Crashes	Fatal Crashes	Total Crashes	Persons Killed	Persons Injured
1	Mukarba Chowk	1	10	12	23	12	14
2	Khampur Village	1	8	10	19	10	12
3	Dhaula Kuan	1	8	8	17	8	13
4	Maya Puri Chowk	0	8	8	16	8	14
5	Gandhi Vihar Bus Stand	0	18	7	25	7	23
6	Bhalswa Chowk	0	14	7	21	7	17
7	Peera Garhi Chowk	0	9	7	16	7	14
8	Punjabi Bagh Chowk	0	8	7	15	7	11
9	Britannia Chowk	0	7	7	14	7	9
10	Ashram Chowk	0	7	7	14	7	9

**In 2021; Mukarba Chowk, Bhalswa Chowk, Punjabi Bagh Chowk were at Serial No. 3, 1 and 2 respectively.*

The table above presents the ten most critical blackspots in Delhi. Among them, Gandhi Vihar Bus Stand has recorded 25 crashes, followed by Mukarba Chowk with 23 crashes, Bhalaswa Chowk with 21 crashes, Khampur Village with 19 crashes, Dhaula Kuan with 17 crashes, Peera Garhi and Mayapuri with 16 crashes each, Punjabi Bagh with 15 crashes, and both Britani Chowk and Ashram Chowk with 14 crashes each.When considering fatal crashes specifically, Mukarba Chowk emerges as the most critical blackspot with 12 fatal crashes, followed by Khampur Village with ten fatal crashes in 2022.

These ten blackspots have resulted in 136 injuries and 80 deaths. The cumulative number of crashes reported on these blackspots is 180. Comparing the data from the previous year, it is evident that particular blackspots have experienced notable changes in their status. Bhalswa Chowk, for instance, has witnessed a significant increase in crashes, rising from 11 crashes in 2021 to 21 crashes in 2022. Similarly, Azadpur Chowk has emerged as a critical intersection, with crashes increasing from 6 in 2021 to 12 in 2022. Mukarba Chowk has also seen a rise in total crashes, increasing from 18 in 2021 to 23 in 2022. Additionally, Mukundpur Chowk reported 21 crashes in 2022, compared to just 13 in 2021.



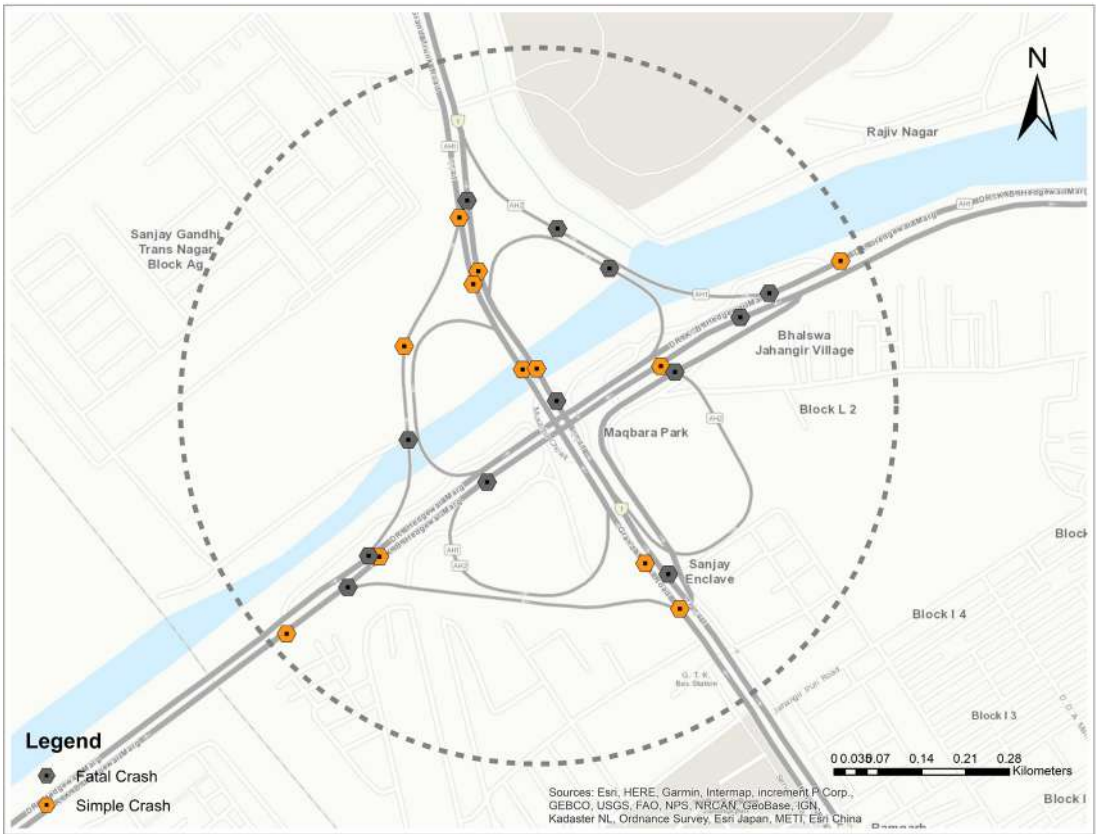
MAP 6.7 DELHI BLACKSPOTS

TABLE 6.29 COMPARATIVE STATUS OF BLACK SPOTS – 2021 & 2022

S. No	Black Spot	Simple Crashes		Fatal Crashes		Total Crashes		Persons Injured		Persons Killed	
		2021	2022	2021	2022	2021	2022	2021	2022	2021	2022
1	Azadpur Chowk	4	9	2	3	6	12	4	11	2	3
2	Bhalswa Chowk	3	14	8	7	11	21	3	17	8	7
3	Mukarba Chowk	11	11	7	12	18	23	15	14	7	12
4	Burari Chowk	4	9	4	2	8	11	6	16	5	2
5	Majnu Ka Tila	10	6	4	2	14	8	15	7	4	2
6	Punjabi Bagh Chowk	11	8	7	7	18	15	16	11	7	7
7	Ghazipur Flyover Murga Mandi	8	8	2	5	10	13	9	10	2	5
8	Mukundpur Chowk	7	16	6	5	13	21	12	29	6	5
9	Rajoukari Fly-over	6	6	2	5	8	11	8	7	2	5
10	Madhuban Chowk	4	2	1	4	5	6	6	3	1	4

MUKARBA CHOWK:

Mukarba Chowk is around the junction point of Outer Ring Road and GT Karnal Road. Outer Ring Road and GT Karnal Road witness movement of high speed as well as heavy vehicles including HTVs etc. Most of the fatal crashes were hit and run cases. HTVs and Cars were the main offending vehicles. Two-wheeler riders were victims in nine fatal crashes and pedestrians were victims in three fatal crashes. More fatal crashes occurred during the night.



MAP 6.8 MUKARBA CHOWK

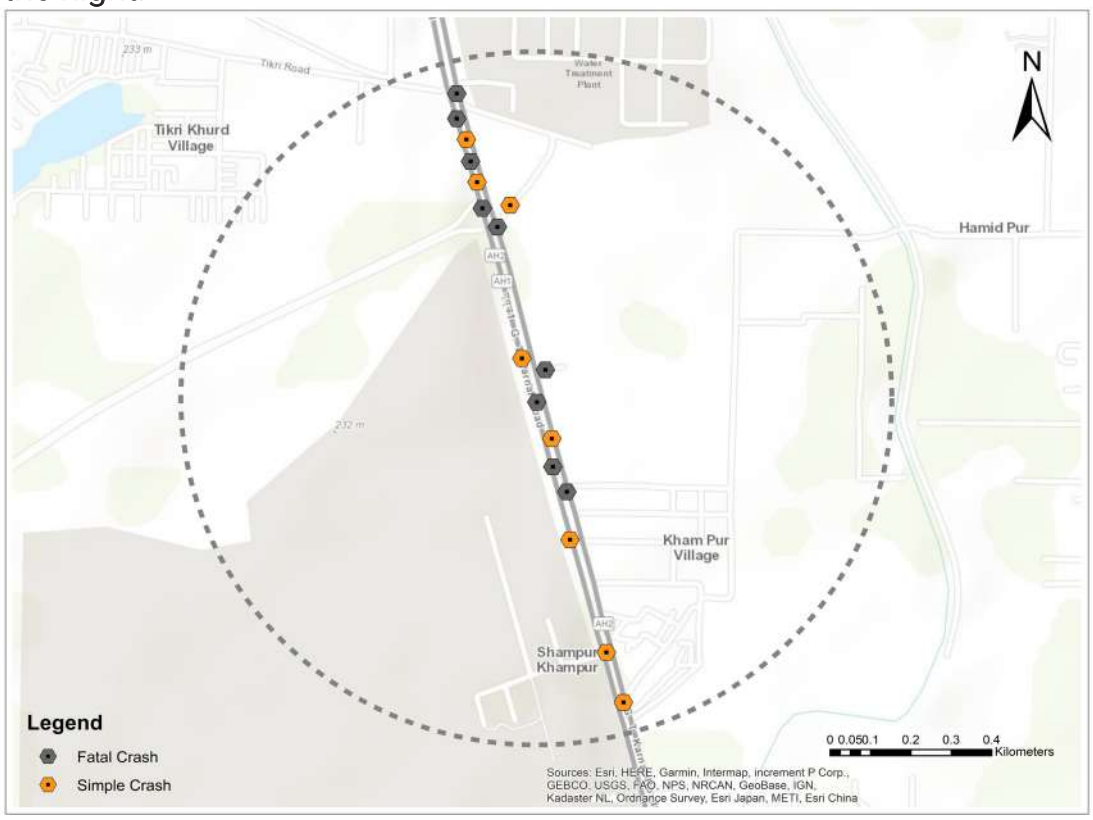
TABLE 6.30 COMPARISON OF ROAD ACCIDENTS AT MUKARBA CHOWK

Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	11	7	18	15	7
2022	11	12	23	14	12
Day Night-Wise Accidents			**Most Vulnerable Period**		
	Fatal	Total		Fatal	Total
Night	7	12	1100-1700	4	4
Day	5	11	2100-2400	4	6

Top Offending Vehicles			Top Victims		
	Fatal	Total		Fatal	Total
Un-Known Vehicle	6	8	Scooter/M.Cycle	9	11
HTV/Goods	2	6	Pedestrians	3	6
Car Pvt	2	4			

KHAMPUR VILLAGE:

Khampur village is situated on both sides of GT Karnal Road. There is high speed vehicular movement on the GT Karnal Road, including HTVs and other heavy motor vehicles. Out of ten fatal crashes six fatal crashes were hit and run cases. HTVs are the main offending vehicles. Two-wheeler riders were victims in four fatal crashes and Pedestrians were victims in three fatal crashes. More fatal crashes occurred during the night.



MAP 6.9 KHAMPUR VILLAGE

TABLE 6.31 COMPARISON OF ROAD ACCIDENTS AT KHAMPUR

Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	3	3	6	3	3
2022	9	10	19	12	10
Day Night-Wise Accidents			**Most Vulnerable Period**		
	Fatal	Total		Fatal	Total
Night	6	9	0000-0400	3	5
Day	4	10	2100-2400	3	4
Top Offending Vehicles			**Top Victims**		
	Fatal	Total		Fatal	Total
Un-Known Vehicle	6	11	Scooter/M. Cycle	4	6
HTV/Goods	2	3	Pedestrian	3	8

DHAULA KUAN:

Dhaula Kuan is the region around the junction point of NH-8 and Ring Road. NH-8 and Ring Road witness movement of high speed as well as heavy vehicles including HTVs, etc. There is a junction of interstate bus halting points. Most of the fatal crashes were hit and run cases. HTVs are the main offending vehicles. Two-wheeler riders were victims in four fatal crashes and pedestrians were victims in three fatal crashes. More fatal crashes occurred during day time.

TABLE 6.32 COMPARISON OF ROAD ACCIDENTS AT DHAULA KUAN

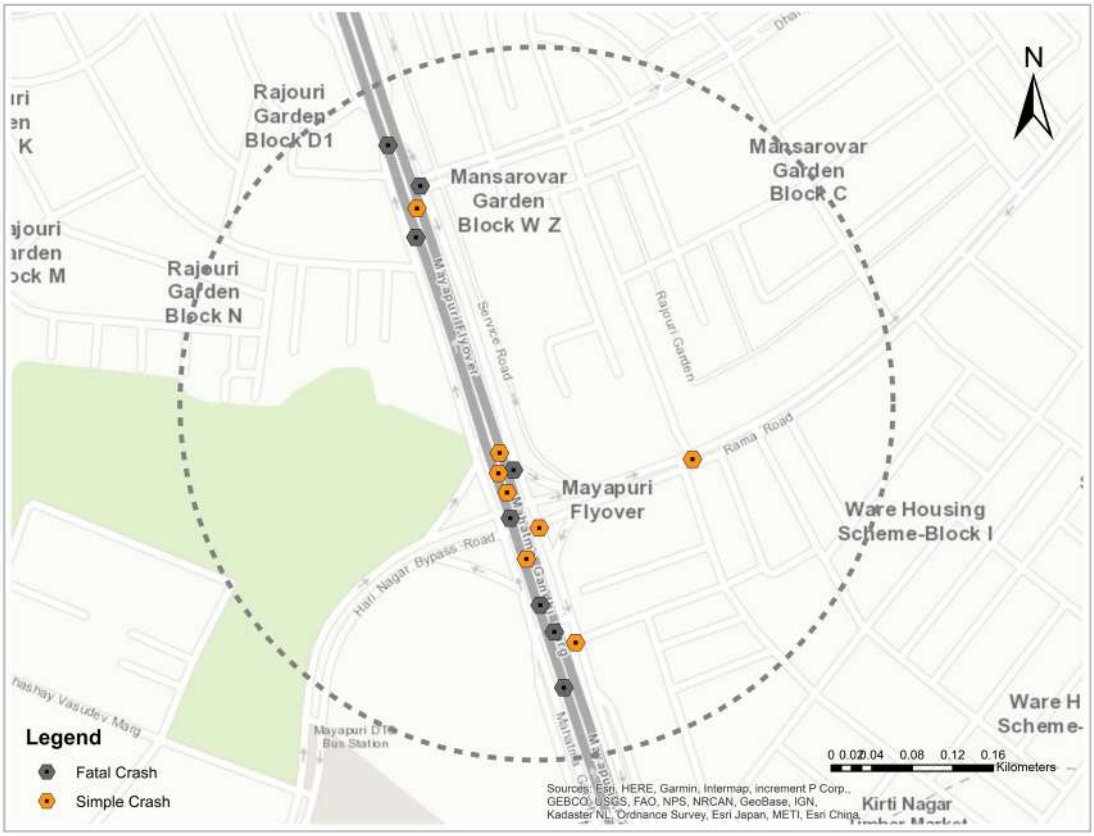
Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	8	3	11	7	3

2022	9	8	17	13	8
Day Night-Wise Accidents			**Most Vulnerable Period**		
	Fatal	Total		Fatal	Total
Night	3	9	1700-2100	4	5
Day	5	8	0400-0800	1	4
Top Offending Vehicles			**Top Victims**		
	Fatal	Total		FATAL	TOTAL
Un-Known Vehicle	5	7	Scooter/M.Cycle	4	7
HTV/Goods	1	3	Pedestrian	3	5

MAP 6.10 DHAULA KUAN

MAYAPURI CHOWK:

Mayapuri Chowk is the region around the junction point of Ring Road and Mayapuri Road. Ring Road witnesses movement of high speed as well as heavy vehicles including HTVs, etc. Out of eight fatal crashes four were hit and run cases. HTVs are the main offending vehicles. Two-wheeler riders were victims in five fatal crashes and pedestrians were victims in two fatal crashes. Fatal crashes were maximum during night.



MAP 6.11 MAYAPURI CHOWK

TABLE 6.33 COMPARISON OF ROAD ACCIDENTS AT MAYAPURI CHOWK

Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	5	4	9	6	4

2022	8	8	16	14	8
Day Night-Wise Accidents			**Most Vulnerable Period**		
	Fatal	Total		Fatal	Total
Night	6	`11	0400-0800	3	4
Day	2	5	1100-1700	2	4
Top Offending Vehicles			**Top Victims**		
	Fatal	Total		Fatal	Total
Un-Known Vehicle	4	6	Scooter/M. Cycle	5	9
HTV/Goods`	2	5	Pedestrian	2	5
Car Pvt	1	2			

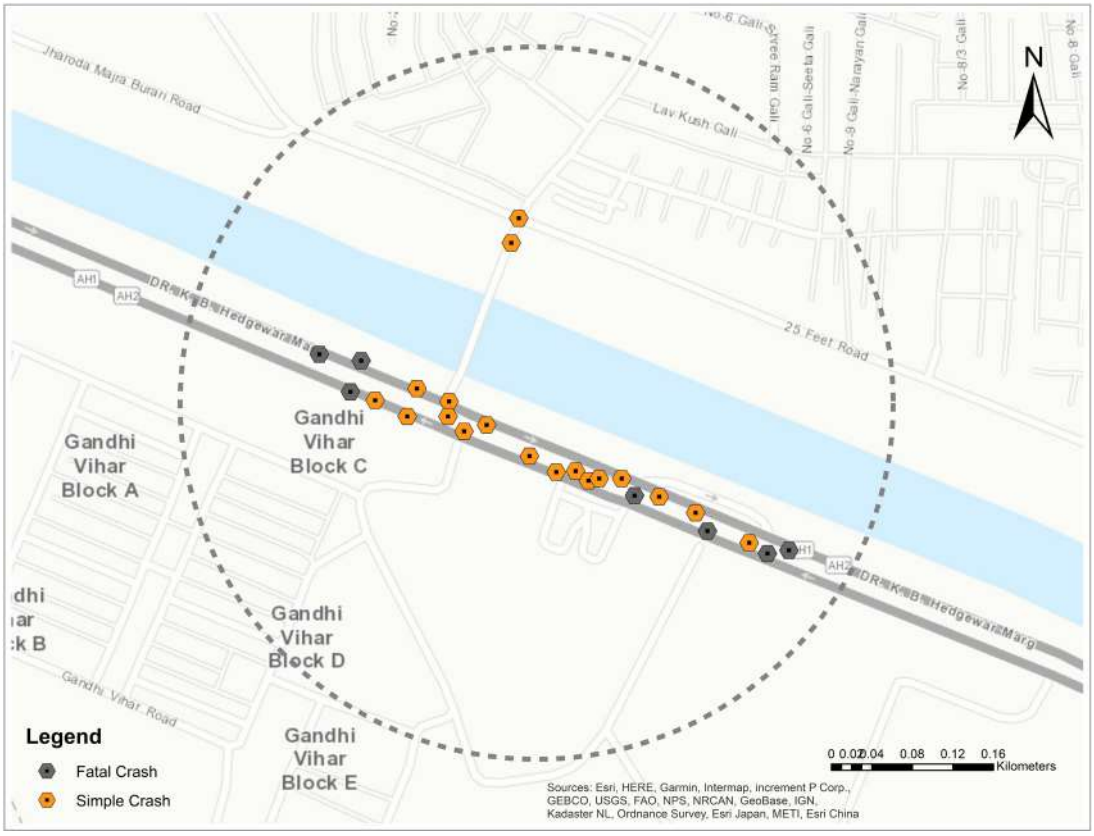
GANDHI VIHAR BUS STAND:

Gandhi Vihar Bus stand is situated on Outer Ring Road. There is heavy movement of pedestrians. Outer Ring Road witnesses movement of high speed as well as heavy vehicles including HTVs, etc. Out of seven fatal crashes four were hit and run cases. HTVs are the main offending vehicles. Two-wheeler riders were victims in five fatal crashes and pedestrians were victims in one fatal crash. More fatal crashes occurred during the night.

TABLE 6.34 COMPARISON OF ROAD ACCIDENTS AT GANDHI VIHAR BUS STAND

Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	23	3	26	37	3
2022	18	7	25	23	7

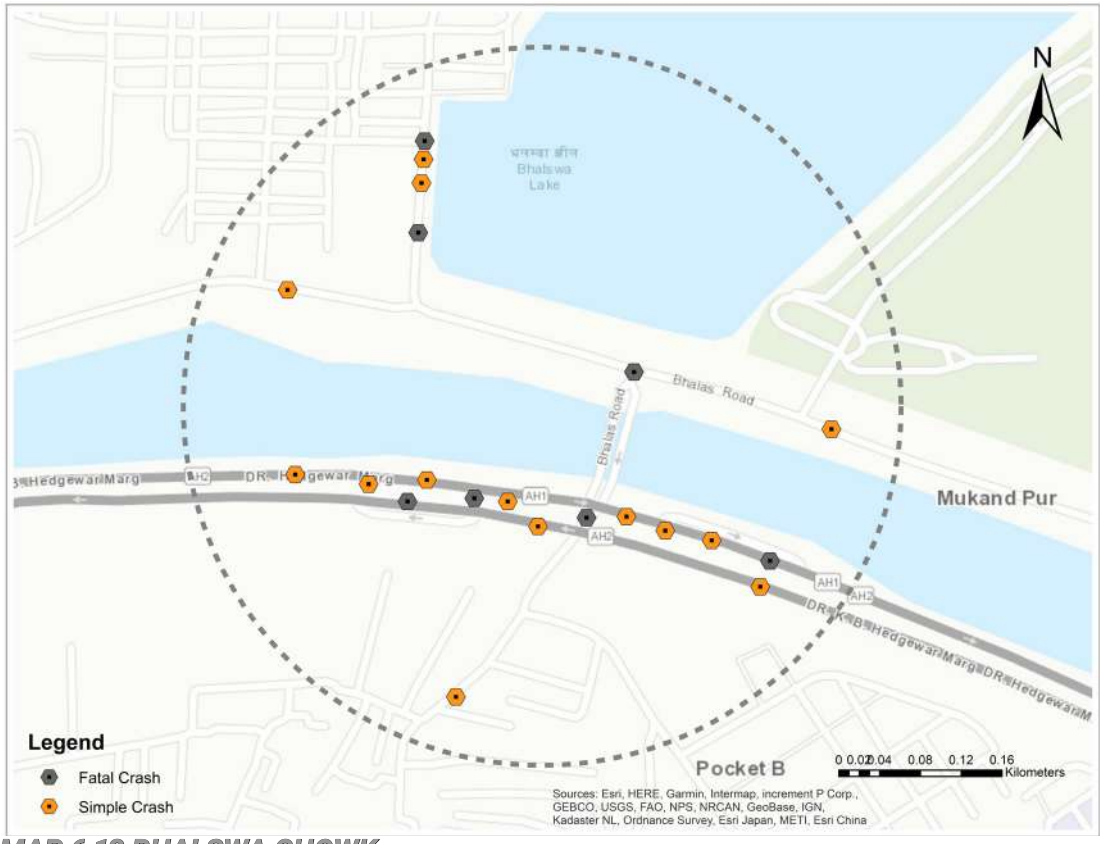
Day Night Wise Accidents			Most Vulnerable Period		
	Fatal	Total		Fatal	Total
Night	5	12	2100-2400	2	8
Day	2	13	1100-1700	2	7
Top Offending Vehicles			**Top Victims**		
	Fatal	Total		Fatal	Total
Un-Known Vehicle	4	12	Scooter/M.Cycle	5	17
HTV/Goods	1	1	Pedestrian	1	4
Delivery Van	1	1	TSR	1	2



MAP 6.12 GANDHI VIHAR BUS STAND

BHALSWA CHOWK:

Bhalswa Chowk is situated on the Outer Ring Road near Bhalswa Village. There is a heavy movement of pedestrians, two wheelers and other vehicles. The volume of traffic is heavy on the Outer Ring Road. Out of seven fatal crashes, three were hit and run cases. Cars and two wheelers were the main offending vehicles. Two-wheeler riders were victims in four fatal crashes and pedestrians were victims in two fatal crashes. Most of the fatal crashes occurred during day time.



MAP 6.13 BHALSWA CHOWK

TABLE 6.35 COMPARISON OF ROAD ACCIDENTS AT BHALSWA CHOWK

Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	3	8	11	3	8

2022	14	7	21	17	7
Day Night Wise Accidents			**Most Vulnerable Period**		
	Fatal	Total		Fatal	Total
Night	1	5	1100-1700	4	9
Day	6	16	1700-2100	2	4
Top Offending Vehicles			**Top Victims**		
	Fatal	Total		Fatal	Total
Un Known Vehicle	3	11	Scooter/M.Cycle	4	10
Car Pvt	1	2	Pedestrian	2	8
Scooter/M.Cycle	1	2			

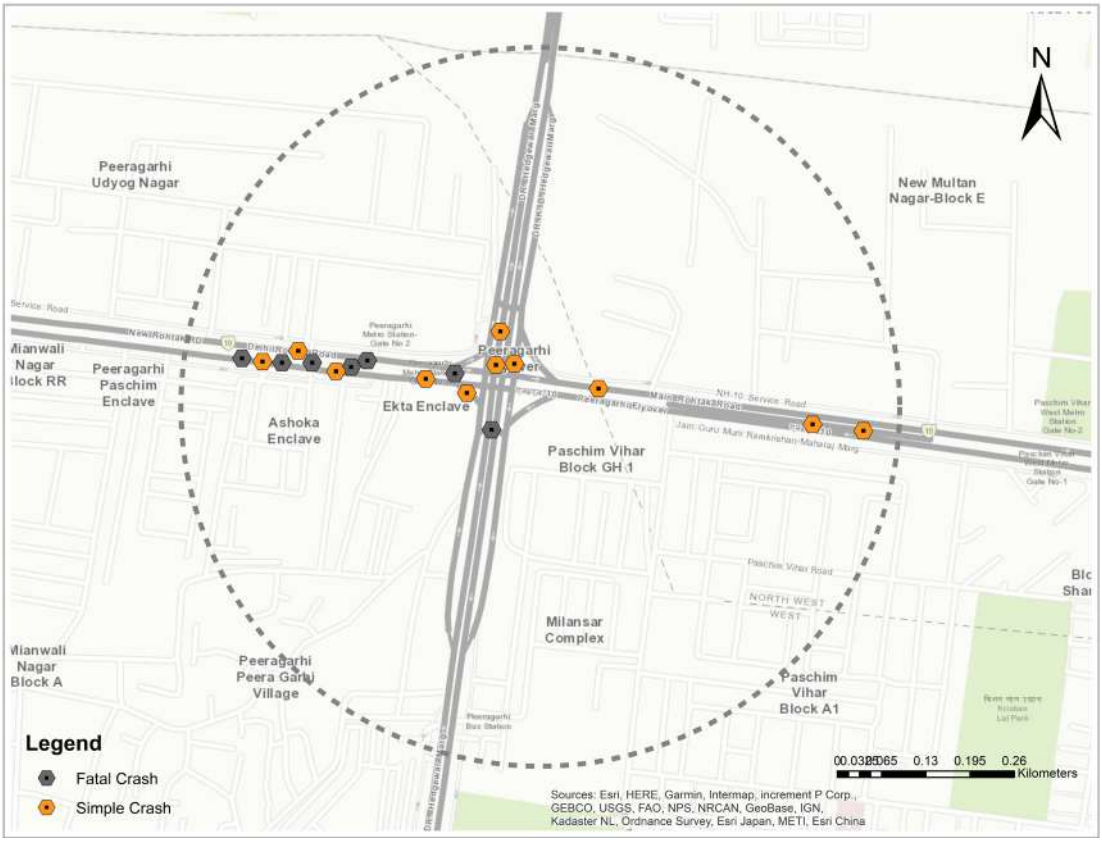
PEERA GARHI CHOWK:

Peera Garhi Chowk is the region around the junction point of Outer Ring Road and Rohtak Road. Rohtak Road and Outer Ring Road witness movement of high speed as well as heavy vehicles including HTVs, etc. HTVs are the main offending vehicles. Pedestrians were victims in four fatal crashes and Two-wheeler riders were victims in two fatal crashes. More fatal crashes occurred during day time.

TABLE 6.36 COMPARISON OF ROAD ACCIDENTS AT PEERA GARHI CHOWK

Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	10	3	13	12	3
2022	9	7	16	14	7
Day Night Wise Accidents			**Most Vulnerable Period**		
	Fatal	Total		Fatal	Total
Night	3	5	0800-1100	2	3

Day	4	11	1700-2100	2	3
Top Offending Vehicles			**Top Victims**		
	Fatal	Total		Fatal	Total
Un Known Vehicle	2	8	Pedestrian	4	8
HTV/Goods	3	3	Scooter/M.Cycle	2	5
			Self	1	1



MAP 6.14 PEER GARHI CHOWK

PUNJABI BAGH CHOWK:

Punjabi Bagh Chowk is the region around the junction point of Ring Road and Rohtak Road. The chowk has three levels, a flyover on Ring Road, an underpass on Rohtak Road and a signal controlled roundabout at-

ground level. There is high speed vehicular movement on Ring Road and Rohtak Road, including HTVs and other heavy motor vehicles. Out of seven fatal crashes three were hit and run cases. HTVs are the main offending vehicles. Pedestrians were victims in three fatal crashes and Two-wheeler riders were victims in two fatal crashes. Most fatal crashes occurred during the night.

MAP 6.15 PUNJABI BAGH CHOWK

TABLE 6.37 COMPARISON OF ROAD ACCIDENTS AT PUNJABI BAGH CHOWK

Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	11	7	18	16	7
2022	8	7	15	11	7

Day Night Wise Accidents			Most Vulnerable Period		
	FATAL	TOTAL		Fatal	Total
NIGHT	6	13	2100-2400	2	8
DAY	1	2	0000-0400	2	3
Top Offending Vehicles			**Top Victims**		
	Fatal	Total		Fatal	Total
Un Known Vehicle	3	7	Pedestrian	3	4
TSR	1	1	Scooter/M.Cycle	2	8
HTV/Goods	1	3	Self	1	1

BRITANNIA CHOWK:

Britannia Chowk is the region around the junction point of Ring Road and Lawrence Road. There is high speed vehicular movement on Ring Road, including HTVs and other heavy motor vehicles. Out of seven fatal crashes five were hit and run cases. HTVs and cars were the main offending vehicles. Pedestrians were victims in five fatal crashes and Two-wheeler riders were victims in two fatal crashes. More fatal crashes occurred during the night.

TABLE 6.38 COMPARISON OF ROAD ACCIDENTS AT BRITANNIA CHOWK

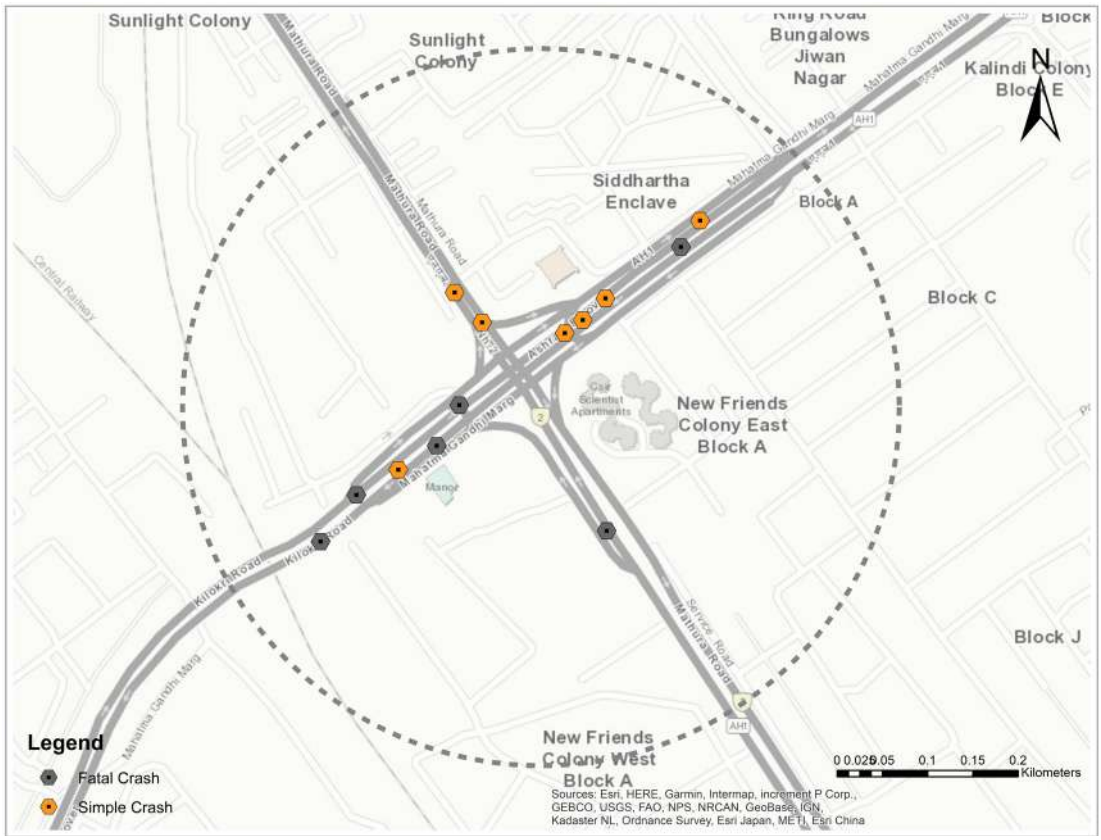
Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	5	2	7	5	2
2022	7	7	14	9	7
Day Night Wise Accidents			**Most Vulnerable Period**		
	Fatal	Total		Fatal	Total
Night	4	7	1700-2100	2	5
Day	3	7	2100-2400	3	5

Top Offending Vehicles			Top Victims		
	Fatal	Total		Fatal	Total
Unknown Vehicle	5	7	Pedestrian	5	9
Car/Pvt	1	3	Scooter/M.Cycle	2	2
HTV/Goods	1	2			

MAP 6.16 BRITANNIA CHOWK

ASHRAM CHOWK:

Ashram Chowk is the region around the junction point of Ring Road and Mathura Road. There is high speed vehicular movement on Ring Road and Mathura Road. Out of seven fatal crashes two were hit and run cases. HTVs were the main offending vehicles. Two-wheeler riders were victims in four fatal crashes and Pedestrians were victims in two fatal crashes. Most fatal crashes occurred during the night.



MAP 6.17 ASHRAM CHOWK

TABLE 6.39 COMPARISON OF ROAD ACCIDENTS AT ASHRAM CHOWK

Comparative Road Accidents					
Year	Simple Accidents	Fatal Accidents	Total Accidents	Persons Injured	Persons Killed
2021	5	2	7	5	2
2022	7	7	14	9	7
Day Night Wise Accidents			**Most Vulnerable Period**		
	Fatal	Total		Fatal	Total
Night	6	10	0000-0400	3	7
Day	1	4	2100-2400	3	3

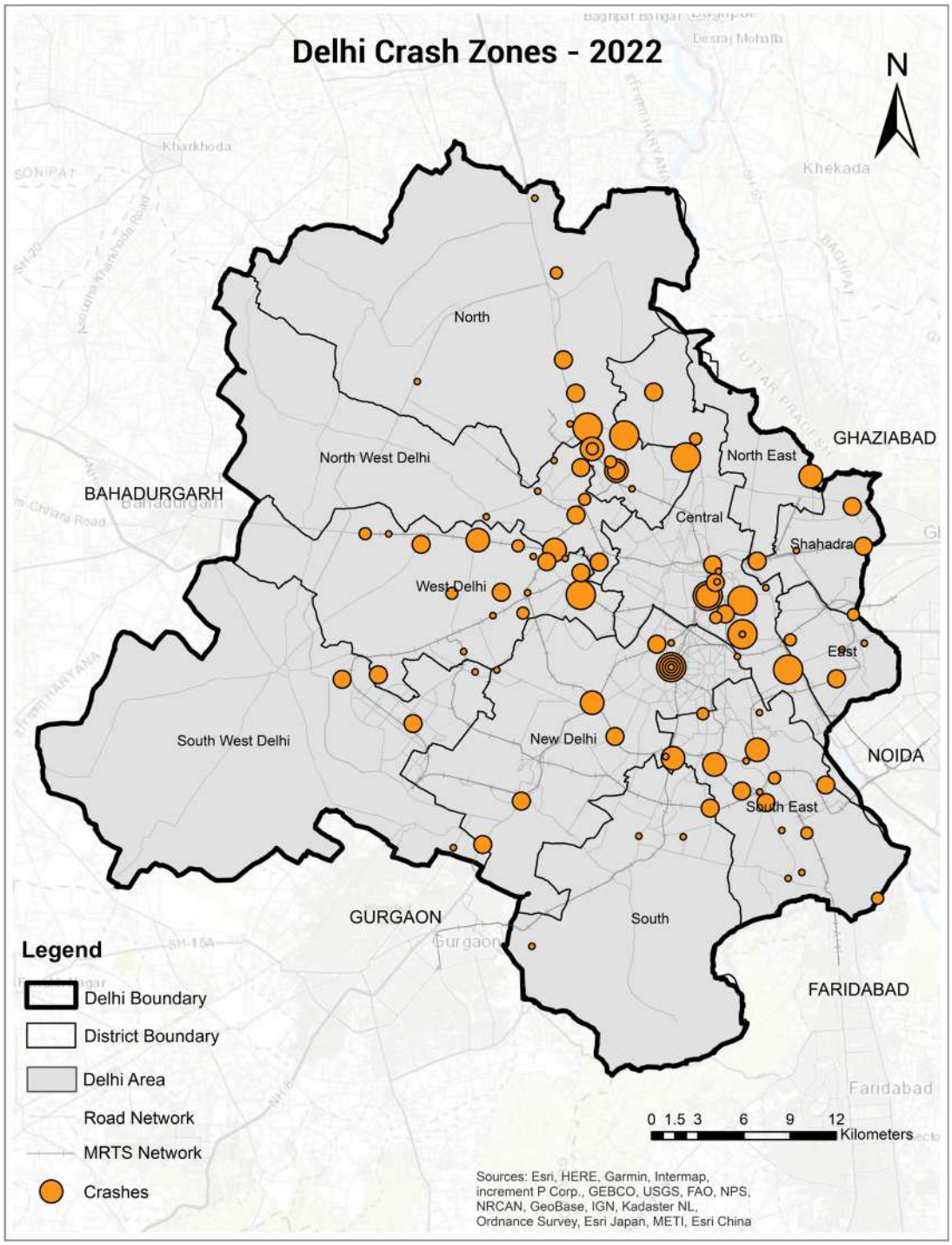
Top Offending Vehicles			Top Victims		
	Fatal	Total		Fatal	Total
Un Known Vehicle	2	7	Scooter/M.Cycle	4	7
HTV/Goods	3	3	Pedestrian	2	5
			Self	1	1

6.10 CRASH PRONE ZONES 2022

Delhi has a total of 117 crash-prone zones, which have collectively witnessed 1,209 crashes. Out of these, 782 crashes were classified as simple crashes, while 427 crashes were identified as fatal crashes.

TABLE 6.40: CRASH PRONE ZONES

Categories of Crashes		Simple Crashes	Fatal Crashes	Total Crashes
Crashes in 2022		4224	1428	5652
Crashes at Crash prone zones	Number	782	427	1209
	%age	18.51%	29.90%	21.39%



MAP 6.18 DELHI CRASH ZONES 2022

TABLE 6.41 CRASH PRONE ZONES – 2022

S. No.	Accident Prone Zones	Simple Crashes	FatalCrashes	Total Accidents
1	Mukarba Chowk	11	12	23
2	Khampur Village	9	10	19
3	Dhaula Kuan	9	8	17
4	Maya Puri Chowk	8	8	16
5	Gandhi Vihar Bus Stand	18	7	25
6	Bhalswa Chowk	14	7	21
7	Peeragarhi Chowk	9	7	16
8	Punjabi Bagh Chowk	8	7	15
9	Britannia Chowk	7	7	14
10	Ashram Chowk	7	7	14
11	Akshardham Mandir	17	6	23
12	Adarsh Nagar	4	6	10
13	Mukundpur Chowk	16	5	21
14	Nirankari Colony	11	5	16
15	Loni Road Crossing	11	5	16
16	Murga Mandi Flyover	8	5	13
17	Shalimar Bagh	8	5	13
18	Rama Road Crossing	7	5	12
19	Kalindi Kunj	7	5	12
20	Monestry Ring Road	6	5	11
21	Nangli Poona	6	5	11
22	Rajoukari Flyover	6	5	11
23	Metro Station Dilshad Garden	6	5	11
24	Wazir Pur Depot	6	5	11
25	Metro Station Madipur	5	5	10
26	Gb Pant Hospital	4	5	9
27	Under Pass Gajipur	3	5	8
28	SGT Nagar	2	5	7
29	Okhla More	2	5	7
30	Shanti Van	16	4	20
31	ITO/I P Flyover	15	4	19
32	AIIMS	13	4	17
33	Zakhira Flyover	9	4	13
34	Azadpur Bus Terminal	8	4	12
35	Mahipalpur Flyover	7	4	11
36	Toll Plaza Badarpur	6	4	10
37	Prem Bari Pull	5	4	9
38	Libaspur Bus Stand	5	4	9
39	Telco Gajipur	4	4	8
40	Jahangir Puri Bus Stand Outer Ring Road	4	4	8
41	CNG Pump/Jain Mandir Nh-1	3	4	7

42	C-1 Janakpuri	3	4	7
43	Gurudwara Raja Garden	3	4	7
44	DC Office	3	4	7
45	Shamshan Ghat Punjabi Bagh	2	4	6
46	Madhuban Chowk	2	4	6
47	Shani Mandir Nh-1	2	4	6
48	Red Light Rajiv Gandhi Hospital	2	4	6
49	Lajwanti Chowk	1	4	5
50	Singhu Border	1	4	5
51	ICD Tuglakabad	0	4	4
52	Shastri Park/IT Park	22	3	25
53	Azadpur Sabzi Mandi	11	3	14
54	Govindpuri Metro Station	10	3	13
55	RML Hospital	10	3	13
56	Kakrola Dwarka More	9	3	12
57	Azad Pur Chowk	9	3	12
58	Delhi Gate	8	3	11
59	Pani Ki Tanki Nangloi	8	3	11
60	Shakarpur Chungi	7	3	10
61	Wazirabad	6	3	9
62	Gokalpuri	6	3	9
63	Dharampura Red Light Seelampur	6	3	9
64	Shiv Murti Nh-8	5	3	8
65	Sanjay T-Point	5	3	8
66	Hyaat Hotel	5	3	8
67	Bakoli Bus Stand	5	3	8
68	IP DTC Depot	4	3	7
69	Kalkaji Mandir	4	3	7
70	Delhi Public Lib/Sriniwas Puri/Gupta Market	4	3	7
71	Shyam Lal College	4	3	7
72	Hanuman Mandir Yamuna Bazar	4	3	7
73	Bhajanpura Chowk	4	3	7
74	Rajdhani Park	4	3	7
75	Gazipur Village Near Petrol Pump	4	3	7
76	Barwala Village Bawana Road	3	3	6
77	Metro Station East Punjabi Bagh	3	3	6
78	Round About Okhla Estate	3	3	6
79	East Vinod Nagar/Mv Ii Red Light	3	3	6
80	Sarai Kale Khan	3	3	6
81	Janak Cinema	3	3	6
82	IG Indoor Stadium	3	3	6
83	VIP College Pitampura	3	3	6
84	West Enclave Red Light	3	3	6
85	Gurudwara Bangla Sahib	2	3	5

86	Sai Baba Mandir Nh-1	2	3	5
87	Lajpat Rai Market (Lal Qila)	2	3	5
88	Model Town IIIrd	2	3	5
89	Subhash Nagar Metro Station	2	3	5
90	Lado Sarai Crossing	2	3	5
91	Shamshan Ghat Geeta Colony	2	3	5
92	Budhpur Ganda Nala/Hanuman Mandir	1	3	4
93	Near Maurya Sheraton Hotel	1	3	4
94	Safdarjung Hospital	1	3	4
95	Mool Chand	12	2	14
96	Swaroop Nagar	11	2	13
97	Khajoori Chowk	10	2	12
98	Gagan Cinema	10	2	12
99	Kings Way Camp Chowk	9	2	11
100	Shyamgiri Mandir Shastri Park	9	2	11
101	Burari Chowk	9	2	11
102	NSIT Dwarka	9	2	11
103	Mundka Metro Station	8	2	10
104	Rajouri Garden	8	2	10
105	Rajapuri Red Light	8	2	10
106	Jahangir Puri Metro Station GTK Road	14	1	15
107	Moti Bagh Flyover	10	1	11
108	Moti Nagar Flyover	10	1	11
109	Nehru Palace	10	1	11
110	Chirag Delhi Flyover	10	1	11
111	Khichadi Pur	10	1	11
112	Kashmiri Gate Chowk Boulevard Road	10	1	11
113	Durgapuri Chowk	9	1	10
114	Sarita Vihar Metro Station	9	1	10
115	Keshopur T Point	9	1	10
116	Modi Mill Flyover	9	1	10
117	Sec 10 Red Light Dwarka	12	0	12

In addition to the top ten blackspots, Akshardham Chowk in Delhi has experienced the highest number of crashes in 2022, with 17 simple and six fatal crashes, making a total of 23 crashes. Following is Shastri Park with 25 crashes and Mukundpur Chowk with 21 crashes, resulting in 5 fatalities.

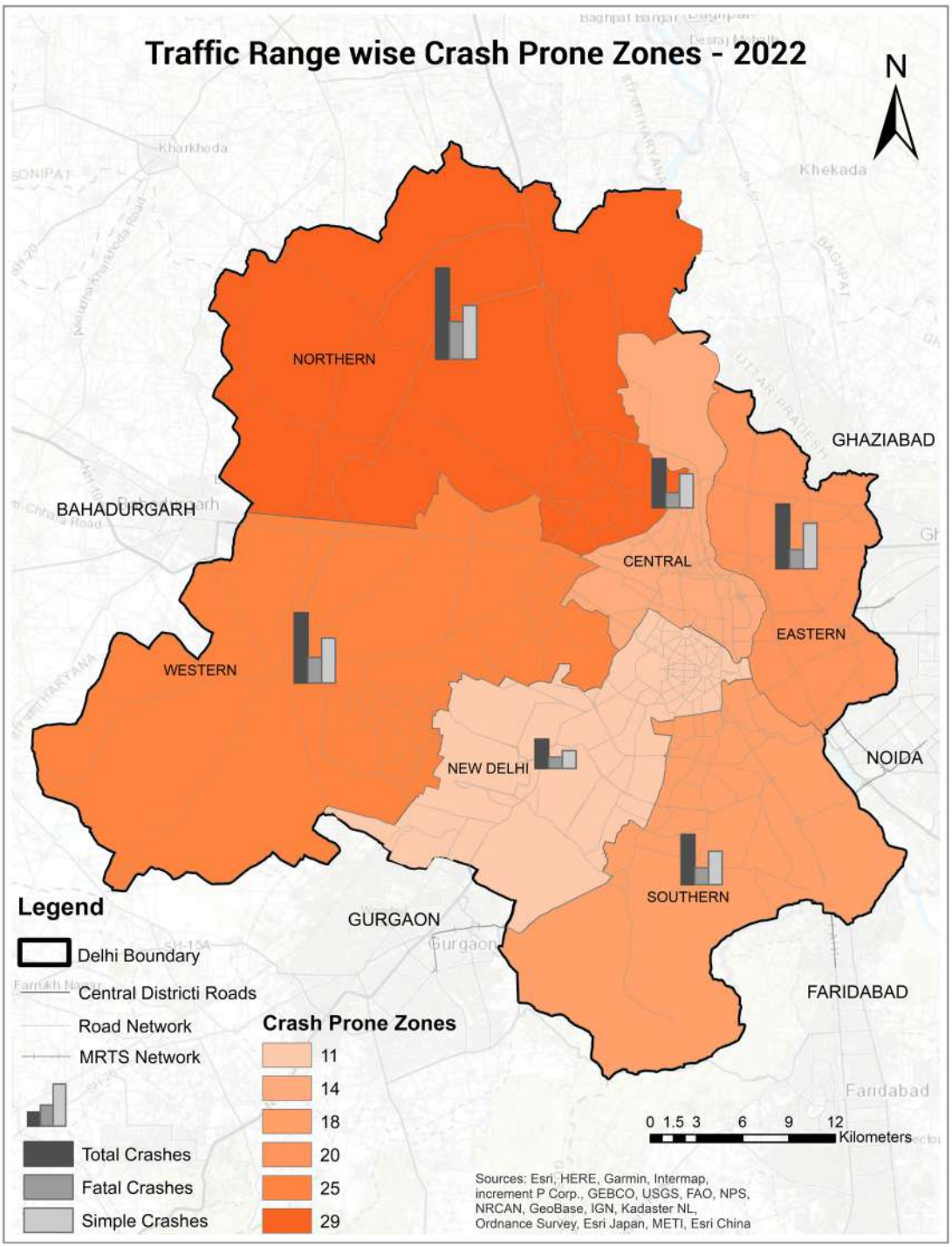
The crash-prone areas in Delhi are primarily concentrated in the Northern, Western, and South Eastern parts of the city along the Ring Road and national highways.

6.11 CRASH DATA ANALYSIS- TRAFFIC RANGE WISE

TABLE 6.42 TRAFFIC RANGE WISE CRASH PRONE ZONES – 2022

S. No.	Traffic Range	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1	Central Range	14	116	51	167
2	Eastern Range	20	155	65	220
3	New Delhi Range	11	61	39	100
4	Northern Range	29	183	128	311
5	Southern Range	18	114	57	171
6	Western Range	25	153	87	240
7	Total	117	782	427	1209

The map below presents the data on crash-prone zones across different traffic ranges, with the Northern traffic range having the highest number of recorded crash-prone zones.Among the traffic ranges, Northern Range (29), Western Range (25), Eastern Range (20), and Southern Range (18), have the highest concentration of crash prone zones. On the other hand, the New Delhi traffic range has reported the lowest number of crash-prone zones, totaling 11 in the year 2022.

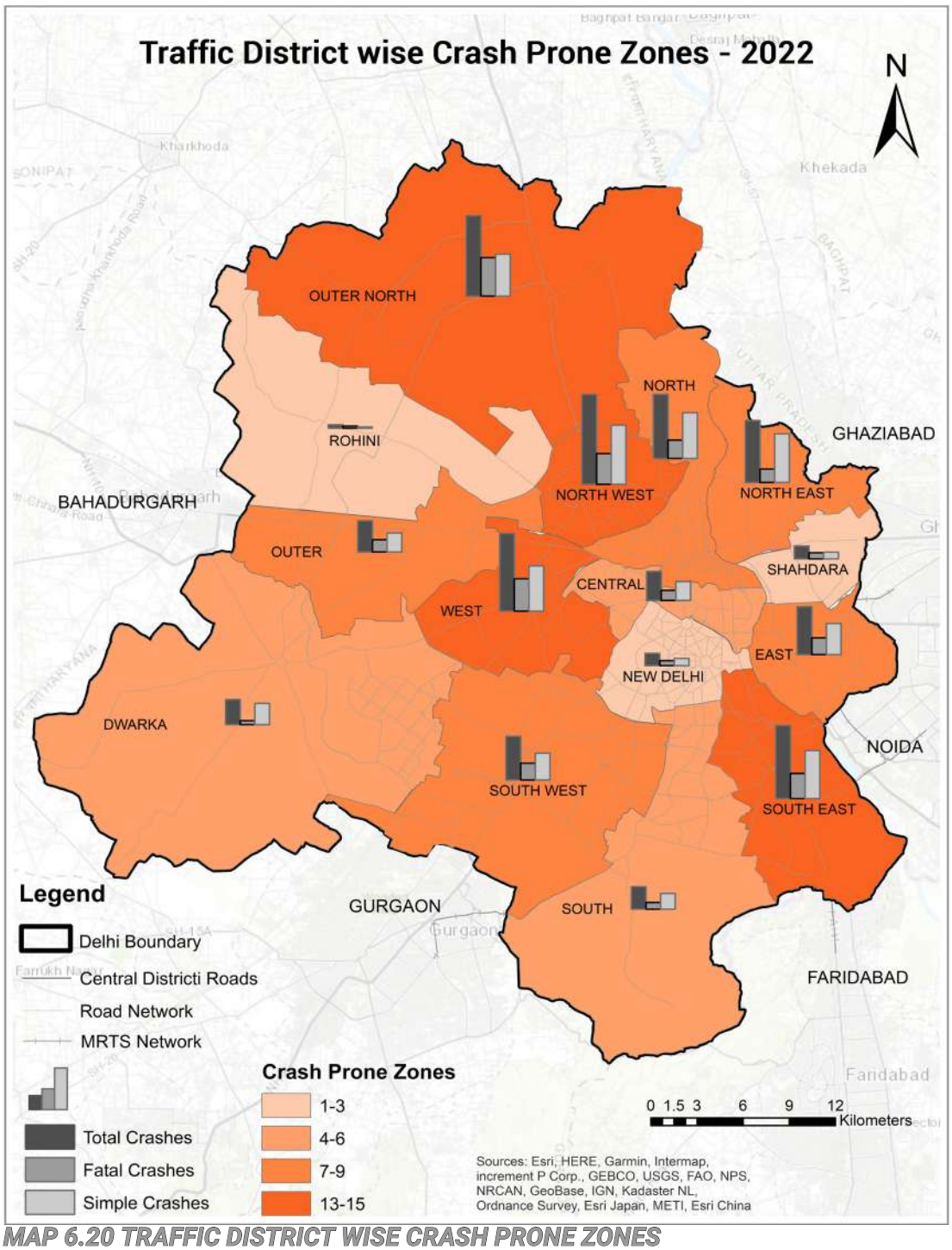


MAP 6.19 TRAFFIC RANGE WISE CRASH PRONE AREAS

TABLE 6.43 TRAFFIC DISTRICTS WISE CRASH PRONE ZONES – 2022

S. No.	Traffic Districts	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1	Central	5	34	18	52
2	Dwarka	4	38	7	45
3	East	8	56	30	86
4	New Delhi	3	13	9	22
5	North	9	82	33	115
6	North East	9	87	24	111
7	North West	14	106	55	161
8	Outer	6	34	22	56
9	Outer North	14	75	69	144
10	Rohini	1	2	4	6
11	Shahdara	3	12	11	23
12	South	4	28	12	40
13	South East	14	86	45	131
14	South West	8	48	30	78
15	West	15	81	58	139
16	**Total**	**117**	**782**	**427**	**1209**

Among the Traffic Districts, West (15), North-West (14), Outer North (14), and South-East (14) have maximum crash prone zones. Rohini, New Delhi and Shahdara recorded the lowest crash prone zones.



MAP 6.20 TRAFFIC DISTRICT WISE CRASH PRONE ZONES

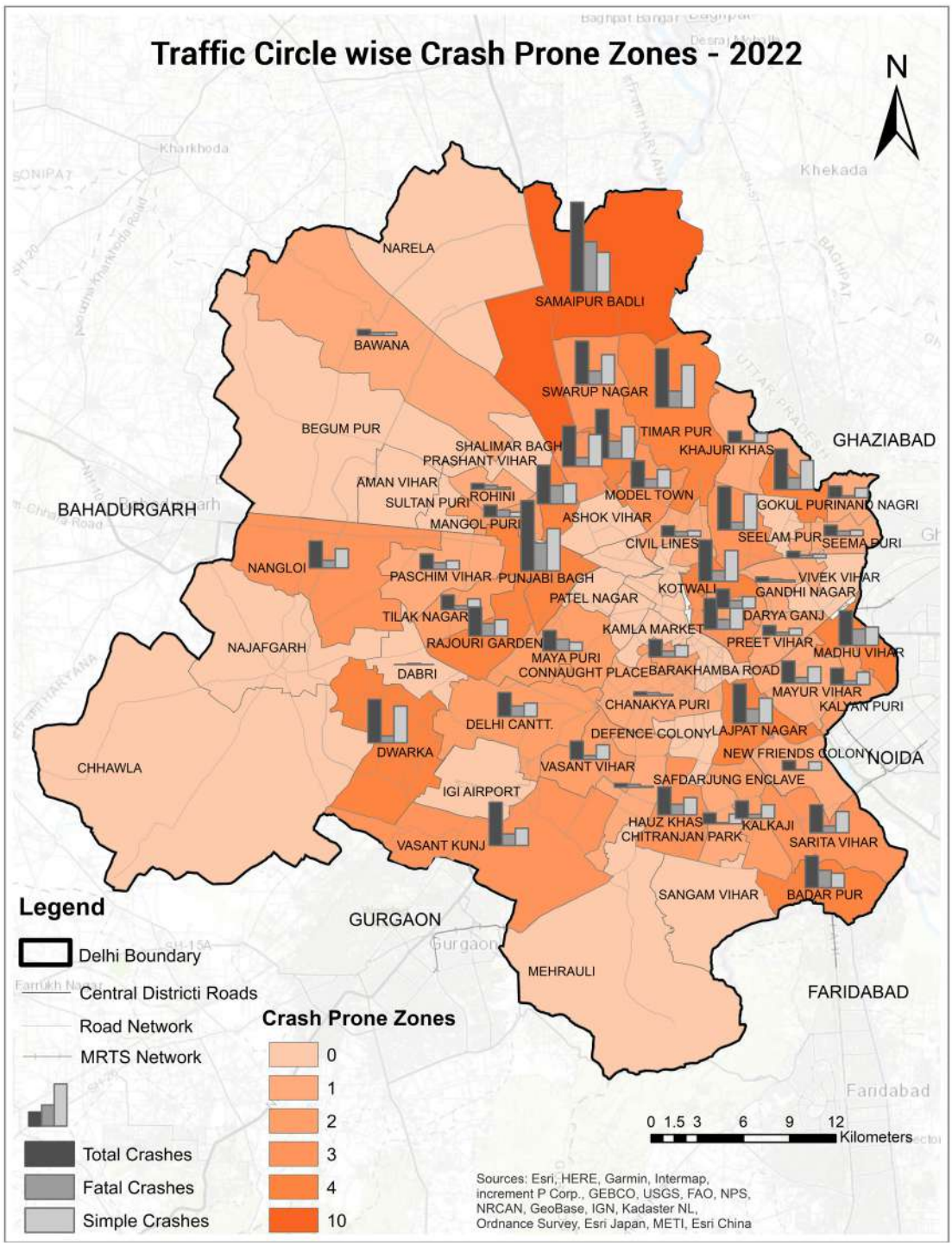
6.12 CRASH DATA ANALYSIS- TRAFFIC CIRCLE WISE

TABLE 6.44 TRAFFIC CIRCLES WISE CRASH PRONE ZONES – 2022

S.No.	Circle Name	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1	Samay Pur Badli Circle	10	41	52	93
2	Punjabi Bagh Circle	7	44	29	73
3	Badarpur Circle	4	15	18	33
4	Madhu Vihar Circle	4	19	17	36
5	Lajpat Nagar Circle	4	26	15	41
6	Dwarka Circle	4	38	7	45
7	Kotwali Circle	4	32	11	43
8	Rajouri Garden Circle	4	17	13	30
9	Gokul Puri Circle	4	30	12	42
10	Subhash Place Circle	4	21	19	40
11	Timarpur Circle	4	44	17	61
12	Jahangir Puri Circle	4	33	18	51
13	Vasant Kunj Circle	3	18	12	30
14	Nangloi Circle	3	20	8	28
15	Swaroop Nagar Circle	3	31	14	45
16	Kamla Market Circle	3	22	10	32
17	Model Town Circle	3	19	9	28
18	Seelampur Circle	3	37	8	45
19	Shalimar Bagh Circle	3	33	9	42
20	Sarita Vihar Circle	3	22	7	29
21	Hauz Khas Circle	3	18	11	29
22	Kalkaji Circle	2	14	4	18
23	Mangol Puri Circle	2	5	7	12
24	Kalyan Puri Circle	2	13	4	17

25	Darya Ganj Circle	2	12	8	20
26	Maya Puri Circle	2	9	12	21
27	Vasant Vihar Circle	2	15	4	19
28	Delhi Cantt Circle	2	14	11	25
29	Tilak Nagar Circle	2	11	4	15
30	Parliament Street Circle	2	12	6	18
31	Gandhi Nagar Circle	1	2	3	5
32	Civil lines Circle	1	6	5	11
33	Chitranjan Park Circle	1	10	1	11
34	Chanakya Puri Circle	1	1	3	4
35	Bawana Circle	1	3	3	6
36	Khajuri Khas Circle	1	10	2	12
37	Nand Nagri Circle	1	10	2	12
38	New Friends Colony Circle	1	9	1	10
39	Paschim Vihar Circle	1	9	7	16
40	Preet Vihar Circle	1	7	3	10
41	Rohini Circle	1	2	4	6
42	Safdarjung Enclave Circle	1	1	3	4
43	Seemapuri Circle	1	6	5	11
44	Shahdara Circle	1	4	3	7
45	Mayur Vihar Circle	1	17	6	23
	Total	**117**	**782**	**427**	**1209**

The roads of Samaipur Badli (10) and Punjabi Bagh (7) circles have maximum crash prone zones.The 57 crash prone zones falling under 12 different circles accounted for 228 fatal accidents in the year 2022.

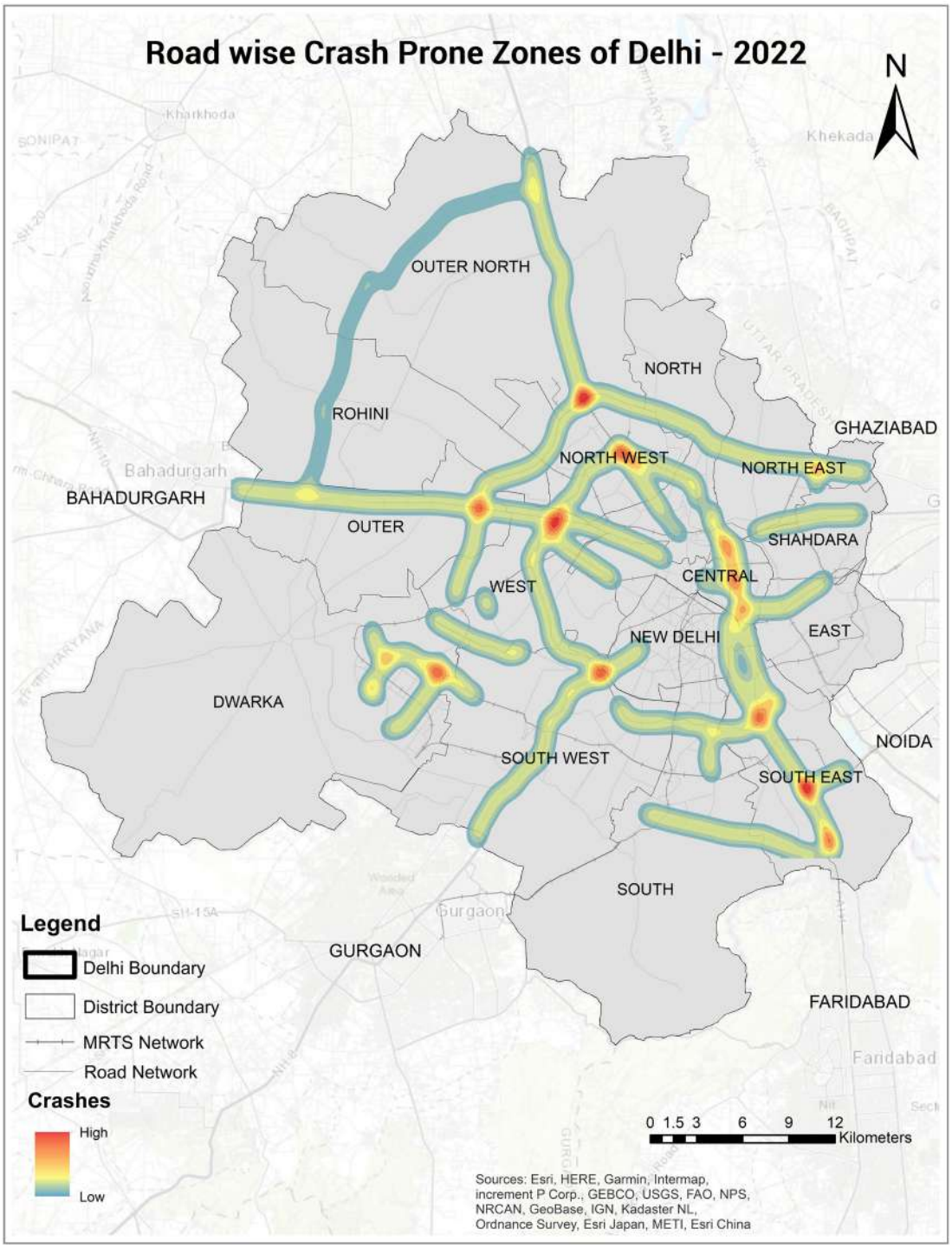


MAP 6.21 TRAFFIC CIRCLE WISE CRASH PRONE ZONES

TABLE 6.45 ROAD WISE CRASH PRONE ZONES – 2022

S. No.	Road Name	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1	Ring Road	25	174	104	278
2	GTK Road	17	104	76	180
3	Outer Ring Road	15	127	56	183
4	NH-24	5	41	20	61
5	Rohtak Road	5	29	17	46
6	G.T. Road	5	47	16	63
7	Wazirabad Road	5	41	15	56
8	Mehrauli Badarpur Road	4	7	16	23
9	NH-8	4	23	15	38
10	Mathura Road	3	19	8	27
11	Pankha Road	2	6	7	13
12	Road No.56	2	8	7	15
13	Najafgarh Road	2	11	6	17
14	Anand Mai Marg	2	13	6	19
15	BKS Marg	2	12	6	18
16	N. Subhash Marg	2	10	6	16
17	Patel Road	2	17	6	23
18	Jawahar Lal Nehru Marg	1	4	5	9
19	Road No 13a	1	7	5	12
20	Jail Road	1	1	4	5
21	Road No. 41	1	2	4	6
22	Yamuna Pusta Road	1	2	3	5
23	Nangloi Najafgarh Rd	1	8	3	11
24	Sardar Patel Marg	1	1	3	4
25	Vikas Marg	1	7	3	10
26	Bawana Road	1	3	3	6
27	Azad Hind Fauj Marg	1	9	2	11
28	Road No.201	1	8	2	10
29	Loni Road	1	9	1	10
30	Josef Brij Tito Marg	1	10	1	11
31	Boulevard Road	1	10	1	11
32	Road No 224	1	12	0	12
	Total	**117**	**782**	**427**	**1209**

Top ten roads have 88 crash prone zones and 343 fatal crashes occurred at these crash prone zones in 2022. The Ring Road (25), GT Karnal Road (17) and Outer Ring Road (15) have the maximum number of dangerous stretches.



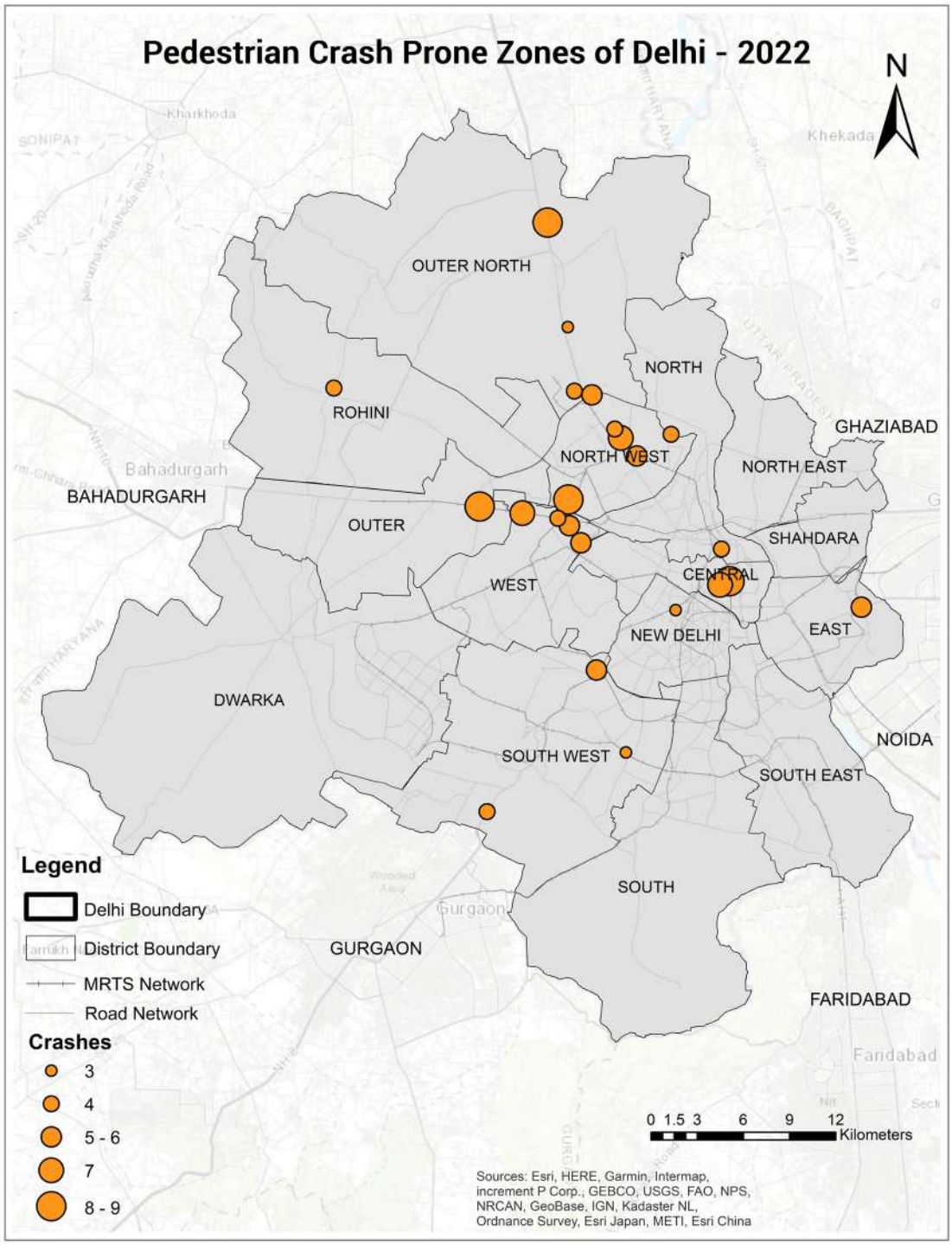
MAP 6.22 ROAD WISE CRASH ZONES OF DELHI

6.13 PEDESTRIAN CRASH PRONE ZONES

Out of the 117 crash prone zones, 24 are identified as pedestrian crash prone zones based on the criteria of three or more fatal or ten or more total pedestrian crashes within the range of 500-meter diameter.

TABLE 6.46 PEDESTRIAN CRASH PRONE ZONES – 2022

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1	Britannia Chowk	4	5	9
2	GB Pant Hospital	2	5	7
3	Peera Garhi Chowk	4	4	8
4	Metro Station Madipur	3	4	7
5	Rama Road Crossing	2	4	6
6	Rajoukari Flyover	0	4	4
7	Adarsh Nagar	0	4	4
8	Delhi Gate	5	3	8
9	Khampur Village	5	3	8
10	Azadpur Bus Terminal	4	3	7
11	Mukarba Chowk	3	3	6
12	Monestry Ring Road	3	3	6
13	Dhaula Kuan	2	3	5
14	Metro Station East Punjabi Bagh	2	3	5
15	Under Pass Gajipur	2	3	5
16	Nirankari Colony	1	3	4
17	Punjabi Bagh Chowk	1	3	4
18	DC Office	1	3	4
19	SGT Nagar	1	3	4
20	Telco Ghazipur	1	3	4
21	Lajpat Rai Market (Lal Qila)	1	3	4
22	Gurudwara Bangla Sahib	0	3	3
23	Nangli Poona	0	3	3
24	CNG Pump/Jain Mandir	0	3	3



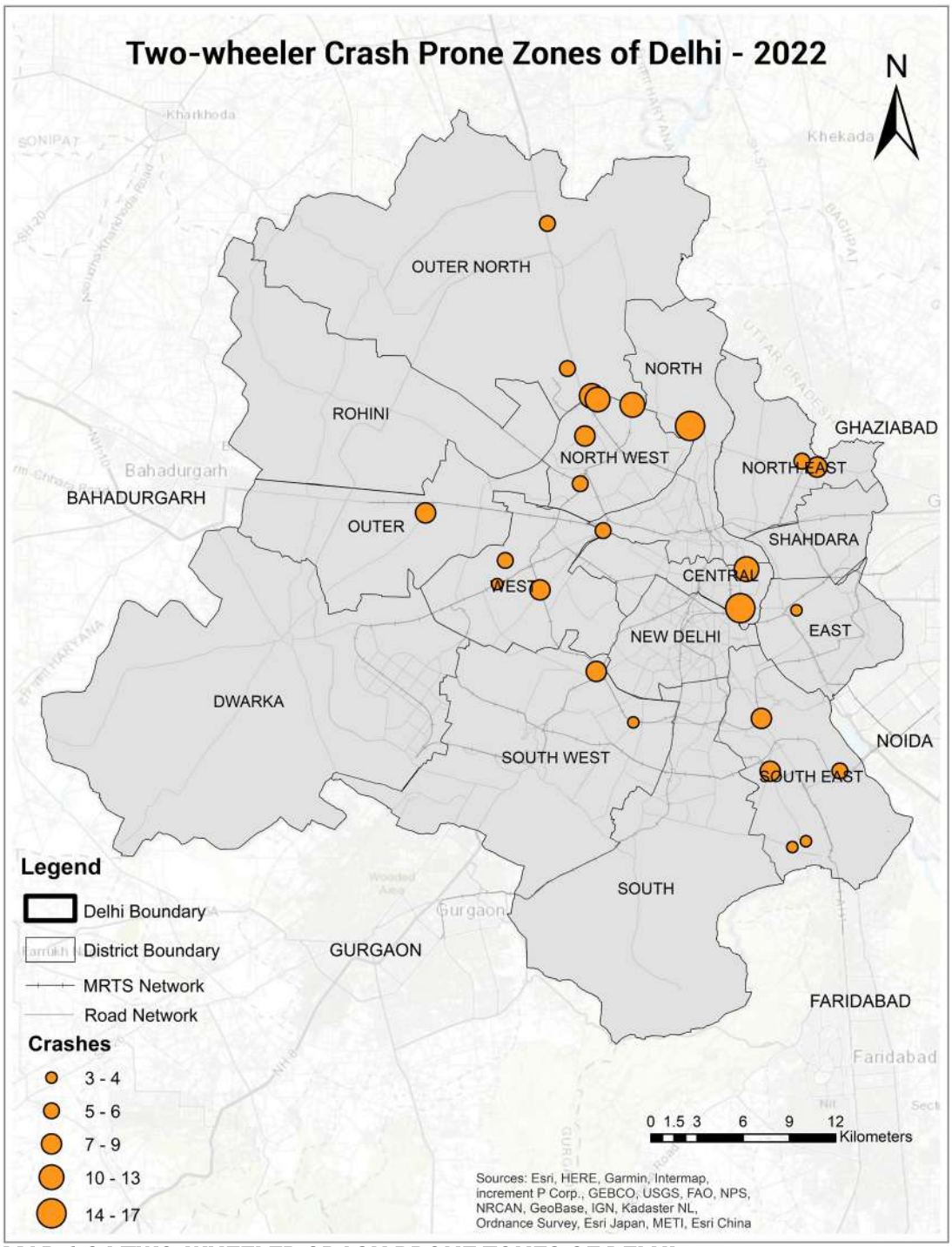
MAP 6.23 PEDESTRIAN CRASH PRONE ZONES OF DELHI

6.14 TWO-WHEELER CRASH PRONE ZONES

Out of the 117 crash prone zones, 25 are identified as Two-wheeler crash prone zones based on the criteria of three or more fatal or ten or more total two wheeler crashes within the range of 500 meter diameter.

TABLE 6.47 TWO-WHEELER CRASH PRONE ZONES – 2022

S. No.	Accident Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1	Mukarba Chowk	2	9	11
2	Gandhi Vihar Bus Stand	12	5	17
3	Maya Puri Chowk	4	5	9
4	Bhalswa Chowk	6	4	10
5	Dhaula Kuan	3	4	7
6	Ashram Chowk	3	4	7
7	Murga Mandi Flyover	2	4	6
8	Kalindi Kunj	2	4	6
9	Khampur Village	2	4	6
10	Wazir Pur Depot	1	4	5
11	ITO/I P Flyover	13	3	16
12	Shalimar Bagh	5	3	8
13	Pani Ki Tanki	5	3	8
14	Govindpuri Metro Station	4	3	7
15	Loni Road Crossing	4	3	7
16	Zakhira Flyover	3	3	6
17	Gokalpuri	2	3	5
18	Libas Pur Bus Stand	2	3	5
19	Hyaat Hotel	1	3	4
20	Okhla More	1	3	4
21	Shakar Pur Chungi	1	3	4
22	Subhash Nagar Metro Station	1	3	4
23	ICD Tuglakabad	0	3	3
24	Mukund Pur Chowk	11	2	13
25	Shanti Van	8	2	10



MAP 6.24 TWO-WHEELER CRASH PRONE ZONES OF DELHI

Mukarba chowk (11), Gandhi Vihar Bus Stand (17), Mayapuri chowk (9) and Bhalswa chowk (10) recorded the highest two wheeler crashes at these crash prone zones.

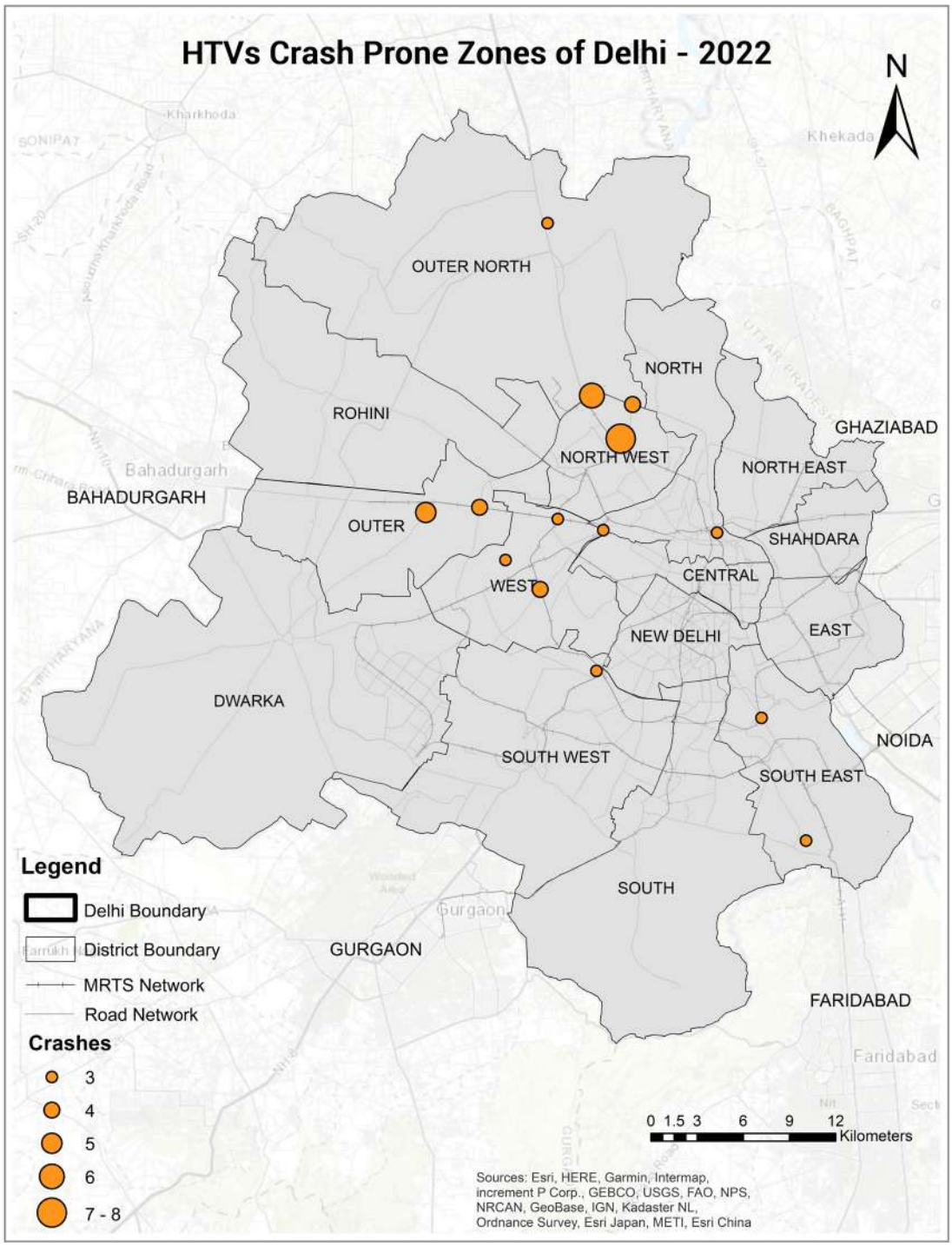
6.15 HTVS CRASH PRONE ZONES

14 crash prone zones are identified as HTVs crash prone zones identified by the criteria of three or more total accidents by HTVs within the range of 500-meter diameter.

TABLE 6.48 HTVs CRASH PRONE ZONES – 2022

S. No.	Crash Prone Zone	Simple Crashes	Fatal Crashes	Total Crashes
1	Peera Garhi Chowk	1	3	4
2	ICD Tuglakabad	0	3	3
3	Ashram Chowk	0	3	3
4	Azadpur Sabzi Mandi	6	2	8
5	Mukarba Chowk	4	2	6
6	Maya Puri Chowk	2	2	4
7	Murga Mandi Flyover	1	2	3
8	Khampur Village	1	2	3
9	Pani Ki Tanki	4	1	5
10	Mukund Pur Chowk	3	1	4
11	Zakhira Flyover	2	1	3
12	Punjabi Bagh Chowk	2	1	3
13	Dhaula Kuan	2	1	3
14	Kashmiri Gate Chowk	3	0	3

Primarily heavy vehicles move on these stretches (NHs and Ring Road/ Outer Ring Road).



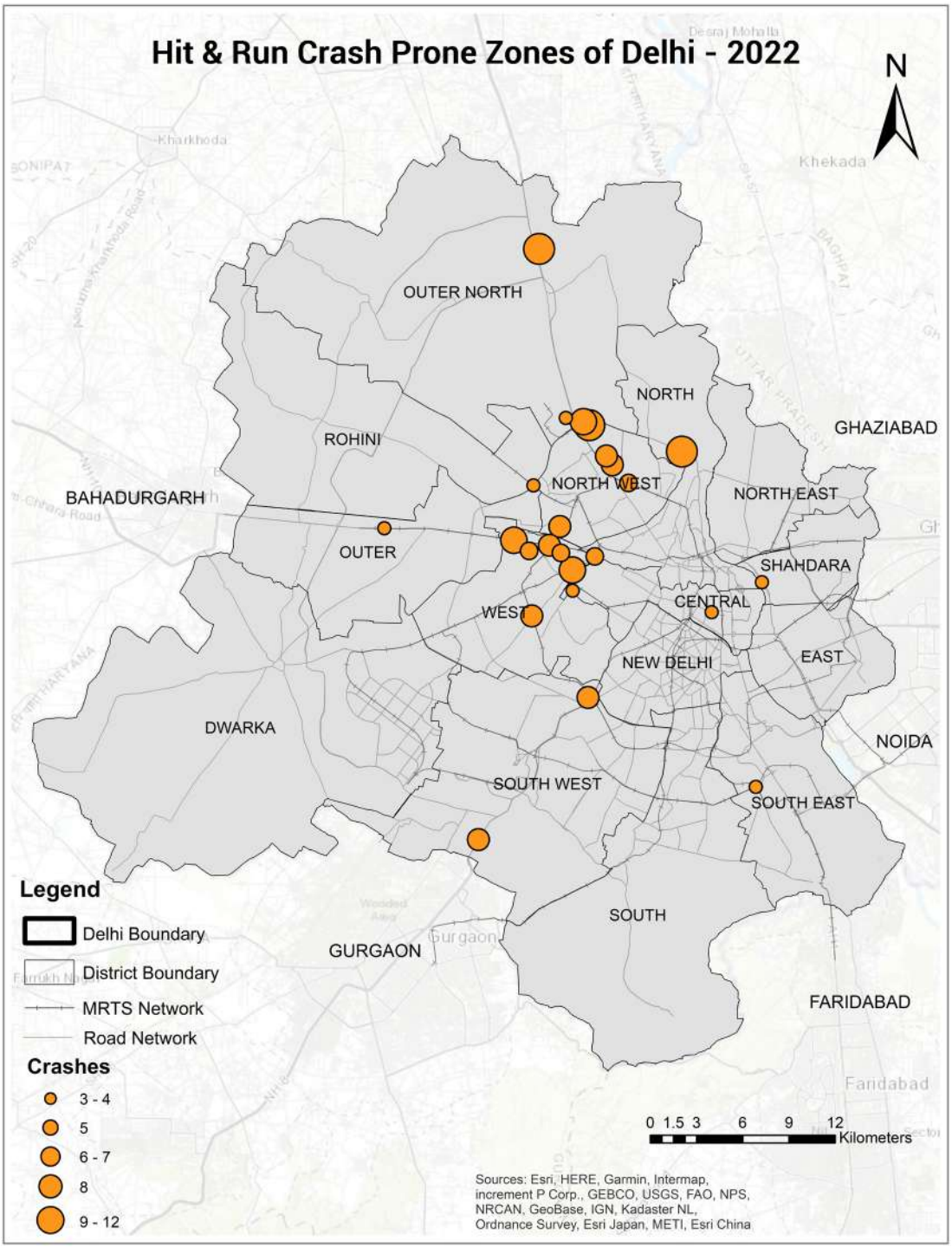
MAP 6.25 HTVs CRASH PRONE ZONES OF DELHI

6.16 HIT AND RUN CRASH PRONE ZONES

26 crash prone zones are identified as hit and run crash prone zones based on the criteria of three or more fatal crashes (hit and run cases) within the range of 500-meter diameter. Installation of CCTV cameras and stationing of CATs ambulances at these places can be effective in preventing fatalities. These are the places with high speed corridors and the places where there is heavy vehicle movement during the night.

TABLE 6.49 HIT AND RUN CRASH PRONE ZONES – 2022

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1	Khampur Village	5	6	11
2	Mukarba Chowk	2	6	8
3	Britannia Chowk	2	5	7
4	Dhaula Kuan	2	5	7
5	Gandhi Vihar Bus Stand	8	4	12
6	Metro Station Madipur	4	4	8
7	Rama Road Crossing	4	4	8
8	Maya Puri Chowk	2	4	6
9	Adarsh Nagar	2	4	6
10	Rajoukari Flyover	2	4	6
11	Monestry Ring Road	1	4	5
12	Shamshan Ghat Punjabi Bagh	1	4	5
13	GB Pant Hospital	0	4	4
14	Shani Mandir	0	4	4
15	Bhalswa Chowk	8	3	11
16	Shalimar Bagh	5	3	8
17	Punjabi Bagh Chowk	4	3	7
18	Azad Pur Chowk	4	3	7
19	Zakhira Flyover	2	3	5
20	Metro Station East Punjabi Bagh	2	3	5
21	Rajdhani Park	1	3	4
22	SGT Nagar	1	3	4
23	Madhuban Chowk	1	3	4
24	Shamshan Ghat Geeta Colony	1	3	4
25	Sai Baba Mandir	0	3	3
26	Kalkaji Mandir	0	3	3



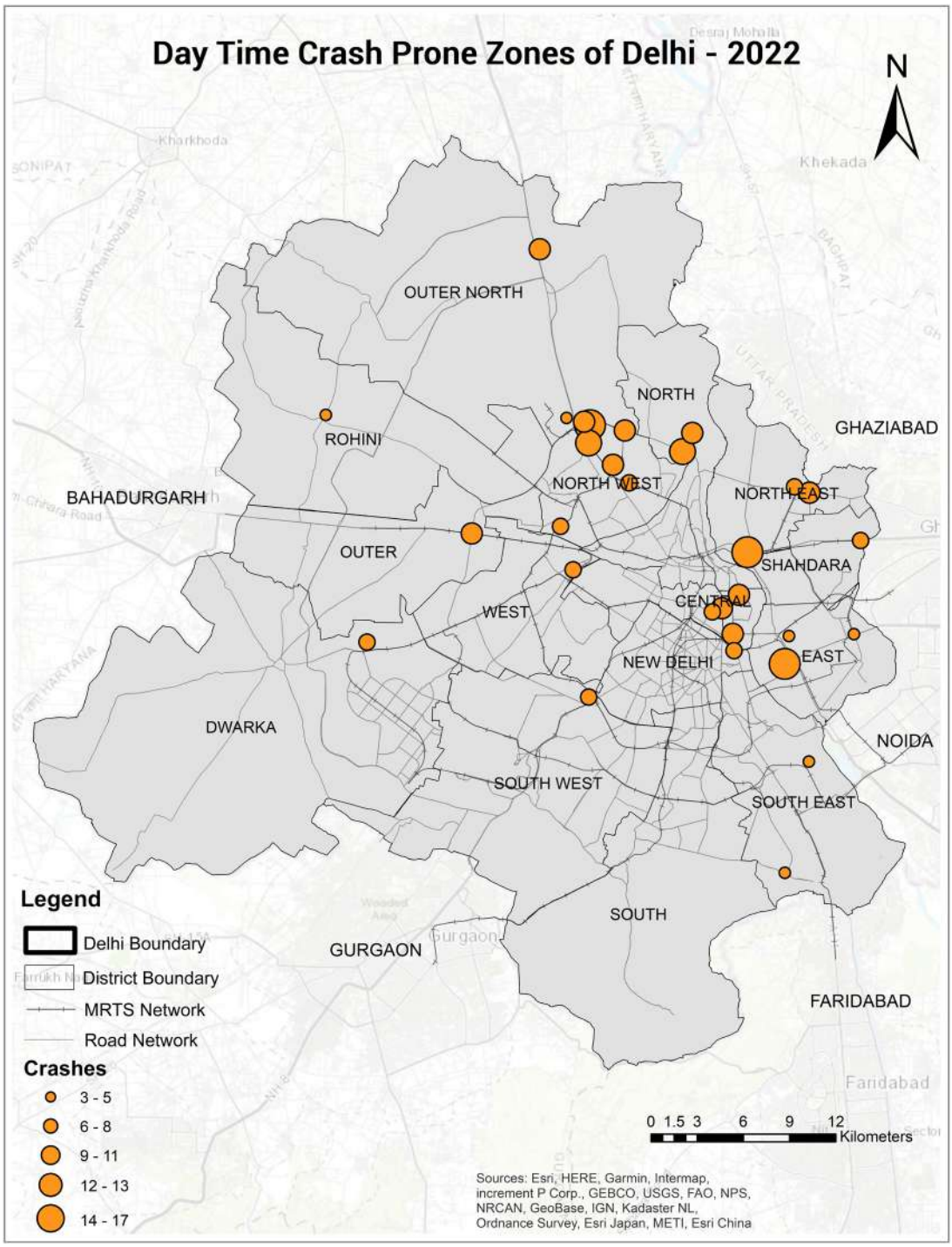
MAP 6.26 HIT & RUN CRASH PRONE ZONES OF DELHI

The major roads affected by these incidents are NH-10 and GTK Road. Notably, Khampur Village, Gandhi Vihar Bus Stand, and Mukarba Chowk are identified as critical crash-prone zones for hit-and-run cases, with 11, 12, and 8 incidents, respectively. Enhancing enforcement measures and implementing stricter monitoring systems is crucial to deter and control hit-and-run cases in these areas.

6.17 DAY-TIME CRASH PRONE ZONES

TABLE 6.50 DAY-TIME CRASH PRONE ZONES – 2022

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1	Bhalswa Chowk	10	6	16
2	Mukarba Chowk	6	5	11
3	Dhaula Kuan	3	5	8
4	Okhla More	0	5	5
5	Akshardham Mandir	11	4	15
6	Peera Garhi Chowk	7	4	11
7	Loni Road Crossing	6	4	10
8	Khampur Village	6	4	10
9	GB Pant Hospital	3	4	7
10	Mukund Pur Chowk	8	3	11
11	ITO/I P Flyover	7	3	10
12	Wazirabad	6	3	9
13	Britannia Chowk	4	3	7
14	Kakrola Dwarka More	4	3	7
15	Rama Road Crossing	4	3	7
16	IP DTC Depot	3	3	6
17	Metro Station Dilshad Garden	3	3	6
18	Monestry Ring Road	3	3	6
19	Gokalpuri	3	3	6
20	Shakar Pur Chungi	2	3	5
21	SGT Nagar	2	3	5
22	DC Office	2	3	5
23	Round About Okhla Estate	1	3	4
24	Under Pass Gajipur	0	3	3
25	Shastri Park/IT Park	15	2	17
26	Gandhi Vihar Bus Stand	11	2	13
27	Delhi Gate	8	2	10
28	Azadpur Bus Terminal	8	2	10
29	Jahangir Puri Metro Station	12	1	13
30	Shanti Van	9	1	10



MAP 6.27 DAY TIME CRASH PRONE ZONES OF DELHI

Day-Time crashes are mostly recorded in the North Western and Central district of Delhi. Few crashes are observed in the North Eastern district of Delhi.

6.18 NIGHT-TIME CRASH PRONE ZONES

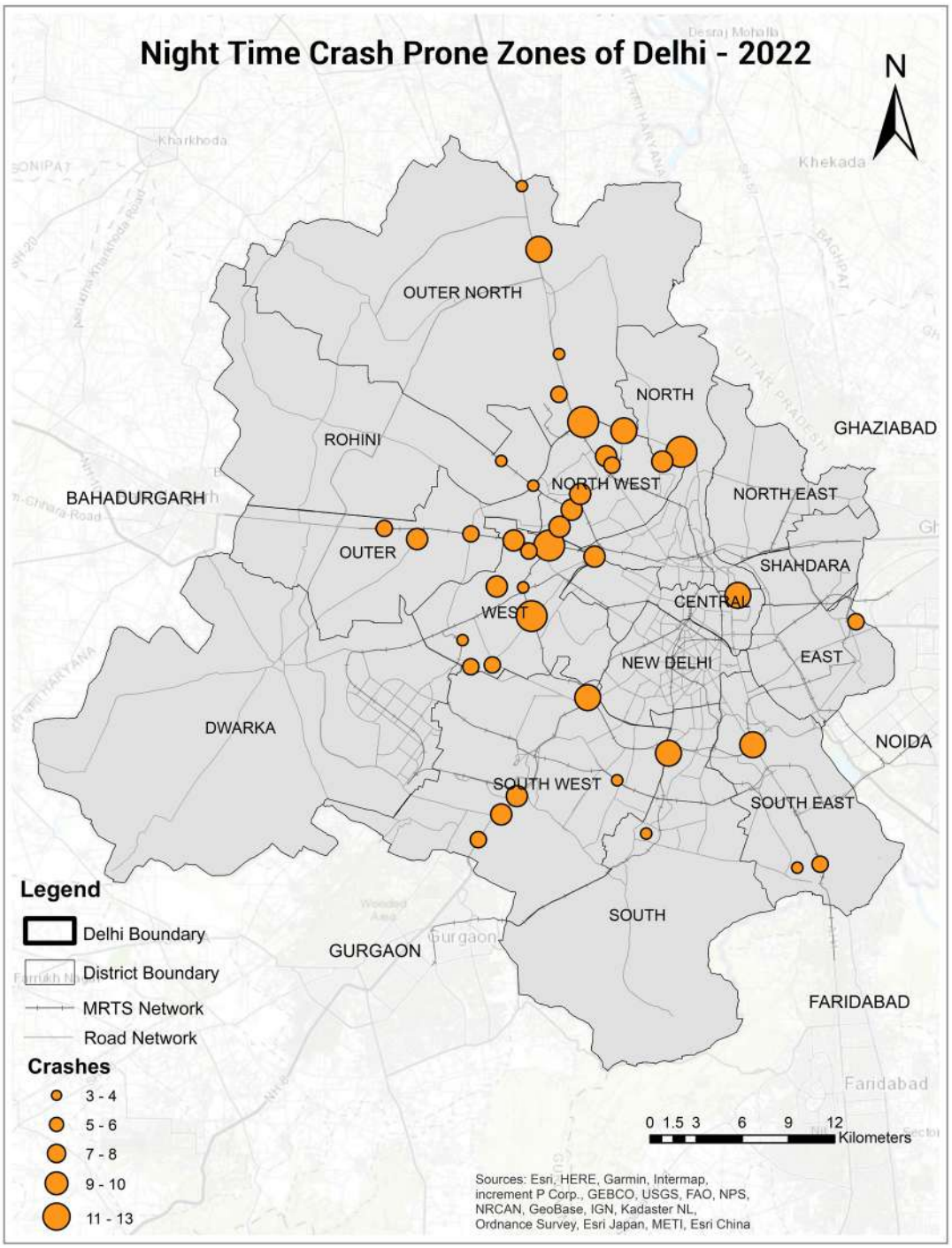
43 crash prone zones were vulnerable zones during the night time. Proper illumination and reflective markings and signages can reduce crashes at these places.

TABLE 6.51 NIGHT-TIME CRASH PRONE ZONES – 2022

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1	Mukarba Chowk	5	7	12
2	Punjabi Bagh Chowk	7	6	13
3	Maya Puri Chowk	5	6	11
4	Ashram Chowk	4	6	10
5	Khampur Village	3	6	9
6	Gandhi Vihar Bus Stand	7	5	12
7	Adarsh Nagar	2	5	7
8	Wazir Pur Depot	4	4	8
9	Zakhira Flyover	4	4	8
10	Britannia Chowk	3	4	7
11	Mahipalpur Flyover	3	4	7
12	Prem Bari Pull	3	4	7
13	Shamshan Ghat Punjabi Bagh	2	4	6
14	Shani Mandir	1	4	5
15	Lajwanti Chowk	1	4	5
16	Madhuban Chowk	0	4	4
17	AIIMS	7	3	10
18	Shanti Van	7	3	10
19	Dhaula Kuan	6	3	9
20	Nirankari Colony	5	3	8
21	Murga Mandi Flyover	5	3	8
22	Shalimar Bagh	5	3	8

23	Metro Station Madipur	5	3	8
24	Pani Ki Tanki	5	3	8
25	Shiv Murti	4	3	7
26	Rajdhani Park	3	3	6
27	Azad Pur Chowk	2	3	5
28	Ghazipur Village Near Petrol Pump	2	3	5
29	Kalindi Kunj	2	3	5
30	Peera Garhi Chowk	2	3	5
31	Toll Plaza Badarpur	2	3	5
32	Libas Pur Bus Stand	2	3	5
33	Rajoukari Flyover	2	3	5
34	Janak Cinema	2	3	5
35	Gurudwara Raja Garden	1	3	4
36	Singhu Border	1	3	4
37	CNG Pump/Jain Mandir	1	3	4
38	Red Light Rajiv Gandhi Hospital	1	3	4
39	Nangli Poona	1	3	4
40	Lado Sarai Crossing	0	3	3
41	ICD Tuglakabad	0	3	3
42	C-1 Janakpuri	0	3	3
43	Mukund Pur Chowk	8	2	10

The highest number of night time crashes in Delhi is observed on the Ring Road, particularly in the North Western, Western, and Outer North districts. These specific locations should be prioritized for implementing night safety measures to address the challenges associated with night time driving. By focusing on improving visibility, enhancing lighting infrastructure, and implementing effective traffic management strategies, authorities can work towards ensuring safer conditions for road users during night time.



MAP 6.28 NIGHT TIME CRASH PRONE ZONES OF DELHI

6.19 CRASH PRONE ZONES TYPES

There are 12 crash prone zone types based on different geometric conditions of roads. The multi level intersections experienced 28 crash prone zones, at-grade intersections experienced 20, road stretches faced 15 crash prone zones. The least number of crash prone zones are recorded on Flyover, and roundabouts.

TABLE 6.52 ZONE TYPES CRASH PRONE ZONES – 2022

S. No.	Zone Types	Number Of Crash Prone Zones
1	Multi-Level Intersection	28
2	Intersection	20
3	Road Stretch	15
4	T-Intersection	13
5	Metro Station	10
6	Multi-Intersection	9
7	Highway Village	7
8	Bus-Stand	6
9	Hospital	4
10	Exchange Hub	3
11	Round About	1
12	Flyover	1
	Total	117

Note: Multilevel intersections are the intersections which are modified by making flyovers, underpasses, flyover loops at normal intersections e.g. Punjabi Bagh Chowk, Dhaula Kuan, Mukarba Chowk, etc.
Multi intersections are the junction points of more than two roads or a stretch of single major road having more than two minor roads joining within a 500-meter stretch. Exchange hubs are the places where there is a facility of changing of different modes of transport like, city buses, TSRs, Gramin sewa, RTVs, interstate buses, E-Rickshaw at the same place eg. ISBT, Peera Garhi Chowk, Mukarba Chowk, etc.

1. The above classification does not completely segregate one category from the other, as there may be some overlapping among various categories for example, some metro stations are also exchange hubs (Peera Garhi Chowk) and some Exchange hubs are also multilevel intersections e.g. Mukarba Chowk.
2. The classification clearly shows that intersections of different types are more prone to accidents. Multilevel intersections are the most dangerous.
3. Other crash prone places are places of high foot fall e.g. bus stands, metro stations exchange hubs, etc. This indicates the lack of proper systematic and planned last mile connectivity of public transport system at these spots:

- These points lack a safe, systematic transport exchange facility (metro buses, buses, TSR, E-rickshaw, etc.) for passengers.
- These points do not have safe boarding facilities for passengers to board buses/RTVs etc. (People stand, wait and board from the road).
- There is also lack of proper and enough information or guidelines about the facilities available for change of vehicles like TSR, E-rickshaw and feeder buses, etc. which causes random movement of people, depending on their visible senses.

6.20 CORRECTING CRASH PRONE ZONES

Field officers study and analyze these spots for the causative factors of crashes like:

- Slopes
- Embankments
- Road curvatures
- Road surface
- Line of sight visibility
- Angle of intersections
- Cuts in central verges

- Need for FOBs/Subways

The preventive measures are required to be taken up by civic agencies. The field officers send proposals through the Traffic Engineering Cell for improvement in road structure and road design. The proposals can be short-term having immediate effects like:

- Speed calming measures
- Making fresh road markings
- Fixing cautionary and informative boards
- Proper illumination at the spot and fixing of reflective gadgets (CAT eyes, road blinkers, thermoplastic road markings, reflective bollards, etc.)
- Nose protection
- Modification or change of traffic movement
- Fixing of railing on road side or on divider
- The long-term measures for the mitigation of traffic related problems, by way of traffic regulation and accidents reduction at crash spot have also identified, which are as follows:
- Suggesting Underpass/FOB
- Developing footpath for pedestrians
- Proper waiting/ boarding place/ platform for pedestrians
- Developing service lanes
- Change in route of buses or other transport vehicles
- Displacing bus stands
- Closure of cuts on roads
- Making oval round-about, etc.
- Back to Back 'U' turns

Accordingly, corrective measures listed above are suggested to the concerned authorities. Along with the above, enforcement action and road safety activities are also undertaken.

07

ROAD CRASH CAUSES

Unravelling Road Crashes

Understanding Causes, Ensuring Safety.

7.1 ROAD CRASHES CAUSES

Road crashes result from a multitude of factors, ranging from engineering deficiencies to a lack of awareness among citizens. All stakeholders, including road-owning agencies, engineering authorities (responsible for infrastructure and vehicles), emergency healthcare systems, traffic police, and the citizens themselves, bear the responsibility for road safety. Even a single stakeholder's failure or mistake can lead to the loss of lives of road users.

The root causes of road crashes begin with the planning phase, extending through the design process, and continue with educating users about road usage. High-speed corridors often traverse densely populated areas, posing a threat to the lives of nearby residents. The widening of roads can inadvertently encourage higher car usage and facilitate over-speeding of vehicles. Unfortunately, there has been a greater emphasis on promoting fast mobility rather than prioritising better accessibility and last-mile connectivity. The increasing number of motor vehicle registrations, especially two-wheelers, has been a concerning trend in India. This surge in vehicles on the roads contributes to a rise in accidents. Interestingly, previous chapters have highlighted that people travelling in buses and using public transportation are less affected by road crashes compared to other road users. Addressing these issues requires a collective effort from all stakeholders, with a focus on enhancing road safety measures, improving infrastructure planning and design, promoting responsible driving behaviour, and raising awareness among citizens about safe road practices.

Road traffic crashes are primarily influenced by these main factors:

Planning and Engineering Issue: Planning errors can result in various issues concerning road safety like improper management of traffic flow, including poorly timed traffic signals, the absence of roundabouts, inappropriate lane markings, or poorly designed highways neglecting the adjoining land use characteristics. Another planning concern arises when urban development overly prioritises accommodating motor

vehicles at the cost of neglecting public transportation and alternative modes of transport. This imbalance can cause increased traffic, worsened congestion, and ultimately lead to higher rates of accidents on the roads. Proper urban planning that addresses these issues is essential to create safer and more efficient transportation systems for all road users.

Faulty Road Design: 'Faulty Road Condition / Design', refers to factors or conditions which are either part of layout or design or defects in the construction of roads. These conditions may arise before or after construction of the road which are not congenial to smooth and safe road traffic and may, therefore, lead to crashes. This can further be broken down into: -

- No central verge, etc.
- Hole or pit on road
- Faulty road design
- Narrow road
- Sharp curve

To reduce the road crashes, it becomes utmost important to analyse the root causes of a road crash, identify the factors contributing towards the occurrence and take preventative and mitigating measures for the reduction of these road crashes.

Poor Road Condition: Poor road condition refers to ad-hoc or temporary factors/conditions that existed on roads which are not congenial to smooth and safe road traffic and that may lead to crash. This factor can further be broken down into:

- Poor Light Condition: Implies lack of artificial illumination or sub-standard lighting on roads, making driver's and road users potential to see road hazards, road signs, other road occupants difficult
- Weather condition: It refers to the adverse weather conditions such as high winds, extreme temperatures, precipitation affecting driver's capabilities, hampering vehicle performance leading to the occurrence of a road crash.
- Unguarded civil work, etc.: Civil work often involves the use of barricades, cones and temporary barriers which obstruct driver's visibili-

ty leading to road fatalities.

- Slippery road: Slippery roads reduce the traction between road surface and vehicle's tyres increasing the risk of road crashes.
- Light reflection from front: Glare and light reflection from the front causes discomfort to the driver and results in reduced visibility contributing to the occurrence of road crashes.
- Encroachment on road: Encroachments on roads in the form of temporary construction, hawkers/Vendors result in reduced road space, lane obstruction, impaired visibility and often forces pedestrians to walk on the road. All these factors lead to the occurrence of road crashes.

Due to poor road conditions, two cases were reported. One such crash occurred due to poor light conditions and one due to unguarded civil works.

Vehicle's Fault: Road crashes can be attributed to various factors related to vehicles, encompassing their design, condition, and operation. Mechanical failures, defective parts, inadequate design, and poor maintenance are just a few examples of how vehicles can contribute to accidents. Overloaded vehicles also pose a risk on the road, as they can compromise safe driving measures. Ensuring proper vehicle maintenance and adherence to safety regulations are vital in mitigating the potential hazards which the vehicles may pose on the road.

Road environment fault: This refers to the circumstances or conditions of the roads which contributed to the occurrence of a crash like poorly designed roads and intersections, inadequate signage, and confusing traffic patterns. Additionally, faults in the road design, or failure to maintain roads properly can lead to potholes, uneven surfaces, and road hazards.

Driver's fault: Human errors on the roads can stem from various factors, including distracted driving, driving under the influence of alcohol and drugs, failure to obey traffic rules, and driving while fatigued. Moreover, lack of awareness among individuals about traffic signs, regulations, and the seriousness of road crashes can also contribute to human errors and pose a significant threat on the roads.

Enforcement Issue: The lack of strict enforcement of traffic laws allows individuals to commit more violations, such as breaking laws and disregarding traffic rules. Therefore, discouraging responsible driving behaviour poses greater risks to people's lives. To address these concerns, stringent laws should be in place to deter overspeeding, overloading, unlicensed or underage driving, and non-compliance with traffic regulations. Strict enforcement measures will improve traffic management and fewer road crashes. Prioritising responsible and law-abiding driving practices can significantly enhance road safety and safeguard the well-being of all road users.

Other reasons

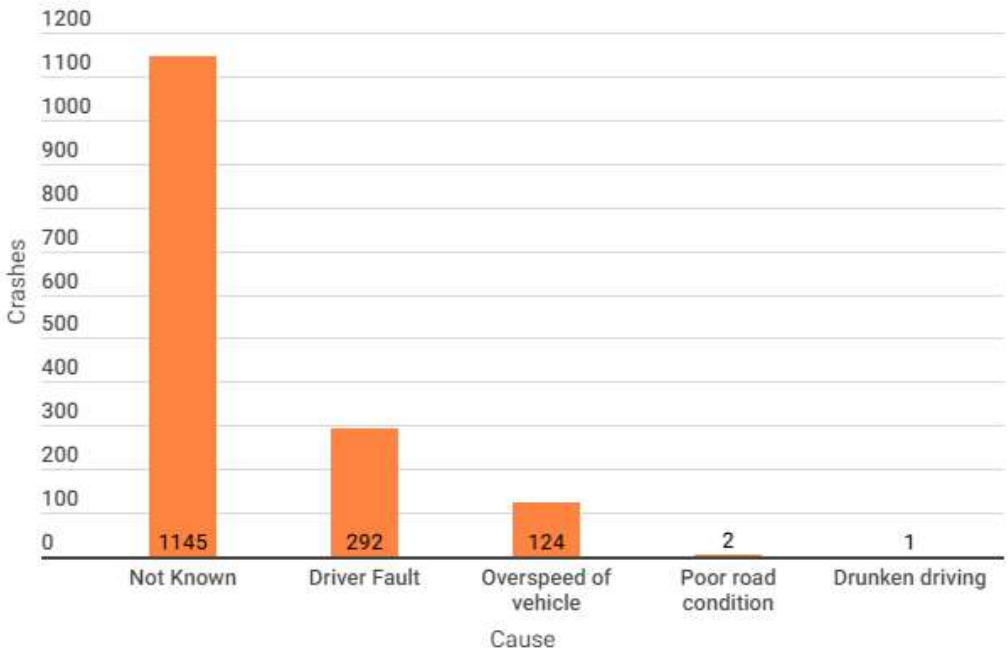


FIGURE 7.1 REPORTED ROAD CRASH CAUSES

After analysing the causes of fatal road crashes that occurred in 2022, it was discovered that approximately 73% of the actual reasons behind these accidents remained unidentified. Out of 283 fatal crashes, causes were reported for some, but in many cases, no causes were mentioned

for the remaining 1145 fatal crashes. To effectively implement strategies aimed at reducing fatal crashes, understanding the causes behind them becomes critical. The high percentage of unknown causes suggests the need for better integration of technology that can assist in assessing the reasons for crashes, enabling the implementation of effective measures to prevent them.

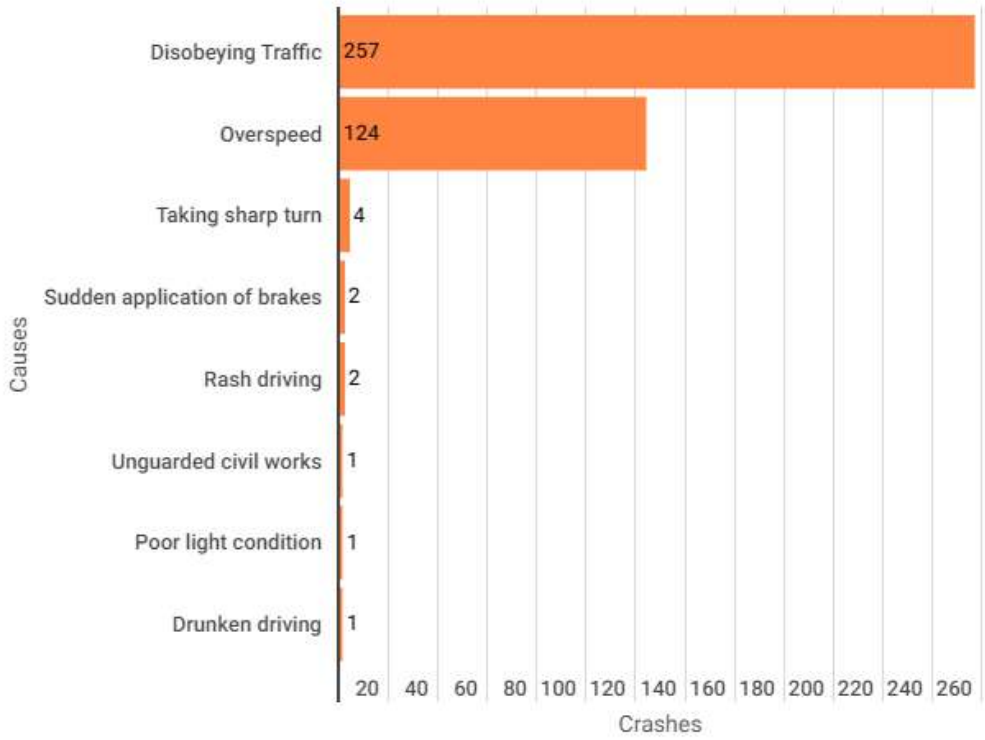


FIGURE 7.2 DETAILS OF REPORTED ROAD CRASH CAUSES

From the above figure, it can be inferred that not obeying traffic rules have been the cause for the maximum number of road crashes. It also suggests the need for stronger enforcement of traffic rules and efficient road traffic management to reduce the number of road crashes. Over-speeding emerges as the second cause of road crashes. The data implies that adequate road safety measures in terms of design and technology need to be integrated to ensure reduction in fatal crashes due to over-speeding.

08

ENFORCEMENT AND PROSECUTION DATA

Enacting and enforcing legislation on key risk factors are critical components of an integrated strategy to prevent road crashes and injuries. A number of countries have achieved sustained reduction in traffic-related injuries and fatalities through effective road safety programmes and legislative changes. The most positive changes in road users' behaviour happen when road safety legislation is supported by strong and sustained enforcement, and where the public is made aware of the reasons behind the law and consequences of non-compliance.

If traffic laws on drunk-driving, seat-belt wearing, speed limits, helmets, and child restraints are not enforced, they cannot bring about the expected reduction in road traffic fatalities and injuries related to specific behaviours. Behavioural patterns of road users/motorists have a direct relation with the occurrence of a crash. Road safety laws improve road users' behaviour which is a critical factor in road safety, to reduce road traffic crashes and injuries.

8.1 USE OF HELMETS WHILE DRIVING TWO-WHEELERS

As per section 129 of the Motor Vehicles Act 1988, every Two-wheeler rider including pillion rider is mandatory to wear a good quality BIS approved helmet in a proper manner while riding a two-wheeler. As per section 194D of the MV Act, riders violating the provision of wearing helmets would be subjected to a fine of maximum Rs 1000 or disqualified for holding a licence for a period of three months. Strict enforcement is being done by traffic police besides creating awareness by its road safety education cell. Yet, a lot of people wear helmets only due to fear of prosecution and not for their safety. The tendency of people not to wear helmets or wear substandard helmets puts the rider at the risk.

In the year 2022, a total of 2,12,440 riders and 44,475 pillion riders were prosecuted by Delhi Traffic Police for not using helmets. There has been more than 100% growth in riders and pillion riders prosecuted for not using helmets when compared to 91,036 riders and 16,724 pillion riders in 2021.

Head injuries are the leading cause of death and major trauma for two-wheeler users. The use of helmets is one of the important means of preventing road traffic deaths. Good helmet design and correct use of standard helmets when riding a two-wheeler is very important. Helmets save life effectively only when they are of worn properly.

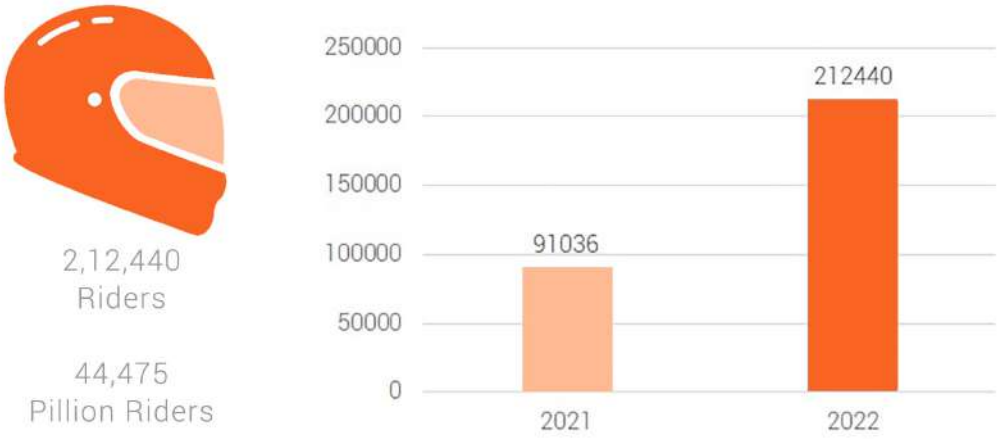


FIGURE 8.1 RIDERS AND PILLION RIDERS PROSECUTED FOR NOT USING HELMETS

8.2 SEATBELT USE

Seat-belts have been made a compulsory fitment in four-wheeled vehicles for drivers and co-passengers. Both are required to wear seat-belts, when the vehicle is in motion.

Driving without fastening seat-belt is a punishable offence under section 138(3) Central Motor Vehicle Rules 1989. According to CMVR, mandatory wearing of rear seatbelts was notified in 2004 and came into force in 2005. As per sub-section 1 of Section 194 of Motor Vehicle Act, 1988, a fine of Rs 1000 is imposed on drivers driving without wearing a seat belt or carrying passengers not wearing a safety belt. But still, many car users and HTV, LGV and bus drivers tend to violate this law. Occupants sitting at rear seats are seldomly seem to be wearing rear seat-belts. Traffic Police has been prosecuting these violators extensively. Road

Safety Awareness campaigns are launched from time to time and wide media publicity is given to make people aware of the use of seat-belts as a safety precaution.

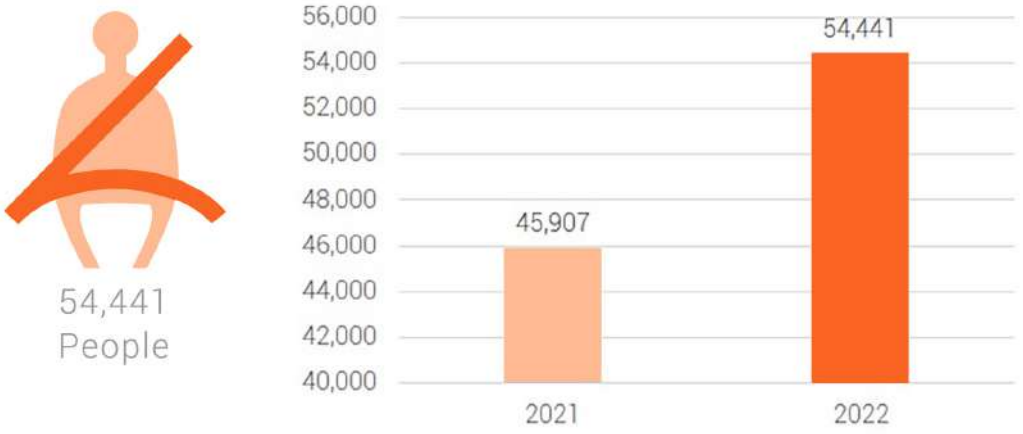


FIGURE 8.2 PEOPLE PROSECUTED FOR NOT WEARING A SEATBELT

In the year 2022, 54,441 people were prosecuted by Delhi Traffic Police for driving without seat-belt, as against 45,907 in 2021. The increase in offenders not wearing seat-belts poses a threat on lives of drivers and fellow occupants. Hence a stronger enforcement mechanism and awareness campaigns are required to reduce the number of prosecutors for not wearing seat-belts. Need for awareness regarding rear seat-belts' significance is also felt.

8.3 DRINKING AND DRIVING

Driving under the influence of liquor/drugs is a punishable offence under section 185 Motor Vehicle Act 1988. Drunken driving has proved to be one of the major causes of traffic accidents. According to the law, the punishment for a drinking and driving is liable upto an imprisonment for six months and a fine of Rs 2000 or both. Moreover, 668 out of 1428 fatal crashes which is around 47% of fatal crash cases are 'hit and run' cases, in which the causes of accident could not be ascertained. However, inference may be made that the motorist might have been under -

the influence of alcohol. Efforts were made to reduce the number of crashes caused due to drunk driving by increasing the prosecution of drivers driving under the influence of alcohol.

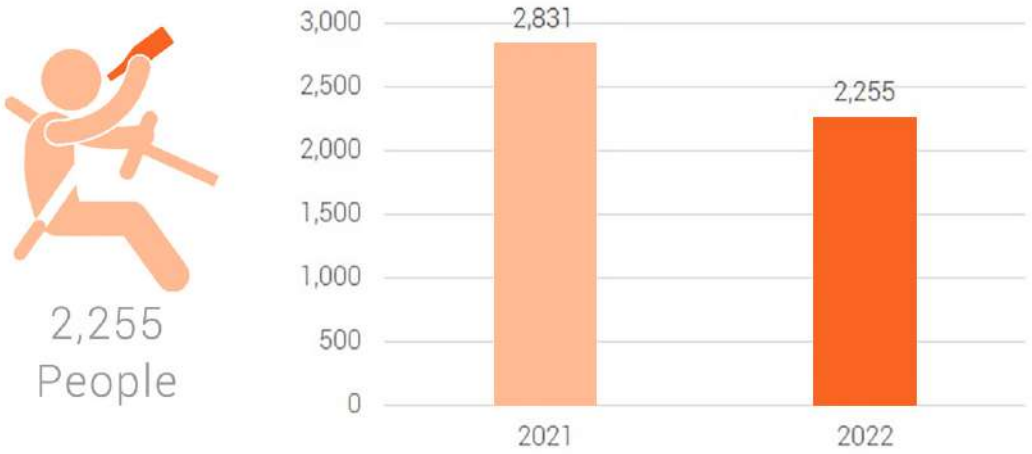


FIGURE 8.3 PEOPLE PROSECUTED FOR DRINKING AND DRIVING

In 2022, 2,255 persons were prosecuted on this account which is less than 2831 persons prosecuted in 2021.

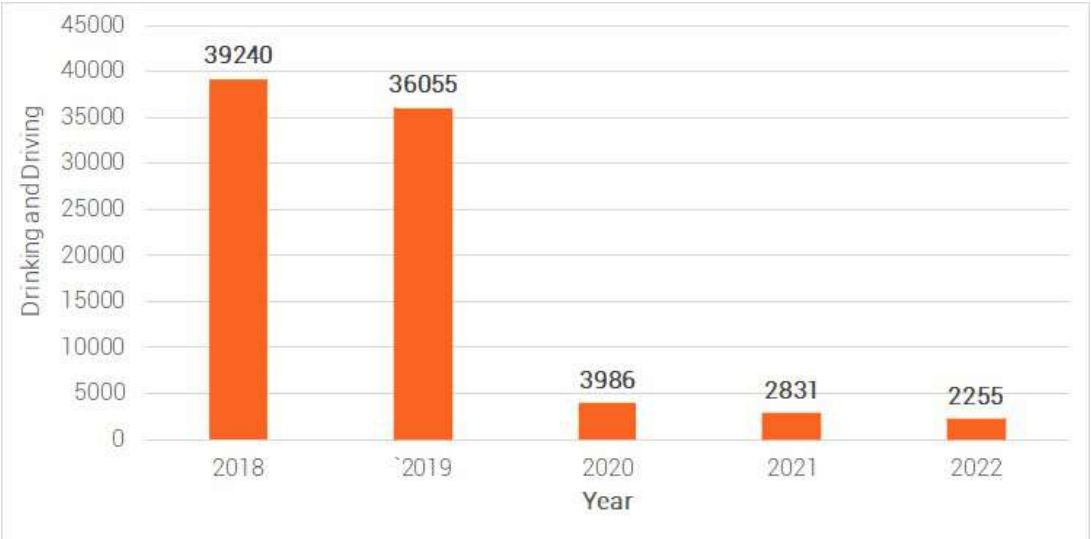


FIGURE 8.4 DRINKING AND DRIVING PROSECUTORS 2018-2022

As can be depicted in the above figure, there has been a decreasing trend in drinking and driving violators from 2018 onwards.

With continuous pressure and strategic prosecution by launching special drives by Traffic Police till late night, there has been a positive impact in the reduction of road accidents due to drunk driving.

8.4 DISTRACTED DRIVING

The use of mobile phones while driving falls under distracted driving and hence is a punishable offence under section 184 Motor Vehicle Act 1988. A fine of Rs 5,000 and disqualification of license for 3 months is imposed for using mobile while driving. The growing trend of using mobile phones while driving has now become a virtual menace for safe driving on Delhi roads.

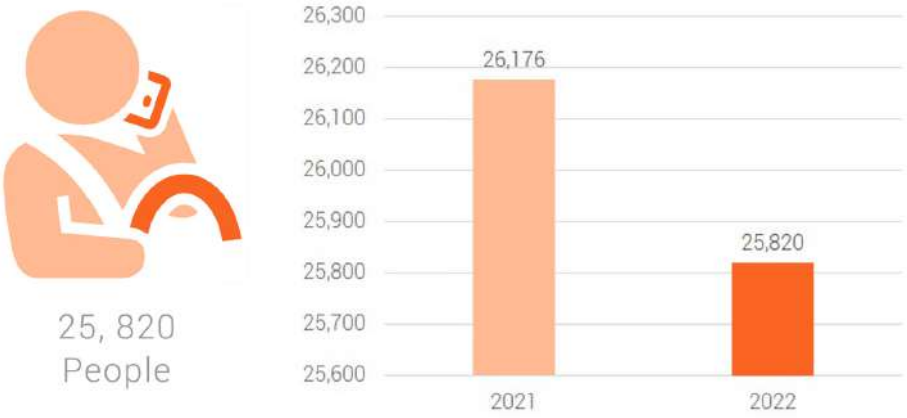


FIGURE 8.5 PEOPLE PROSECUTED FOR DISTRACTED DRIVING

In the year 2022, 25,820 people were prosecuted on the spot by Delhi Traffic Police for distracted driving as against 26,176 in 2021. There are many types of distractions that can lead to impaired driving. The distraction caused by mobile phones is a growing concern for road safety.

8.5 SPEED:

Under Section 112 of the Motor Vehicles Act 1988, motorists should follow the speed limit as notified for the road. Minimum penalties as per 183 of MV Act is Rs 2,000 for LMV and Rs 4,000 for Medium passenger vehicles are imposed under MV Act 1988 for over speeding.

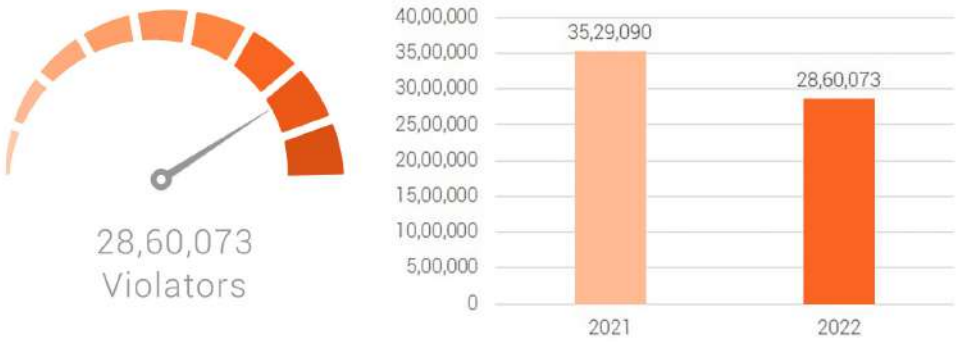


FIGURE 8.6 NOTICES SENT TO PEOPLE FOR OVER-SPEEDING

Notices on the basis of violations recorded by OSVD cameras and Tripod mounted cameras were issued to 28,60,073 vehicles for over speeding in the year 2022, as against 35,29,090 in the year 2021.

8.6 LANE DRIVING

The Hon'ble Supreme Court of India has ordered for commercial vehicles to move in the extreme left lane (Bus lane) and disallowed other private vehicles in this lane. The heavy traffic volume on all roads require huge deployment to enforce this rule by Traffic Police.

Commercial vehicles are impounded under the 'Violation of Hon'ble Supreme Court's Directions' and their permits are suspended for mandated periods to deter them from repeating the violation. Road Safety Education is imparted to a cross section of the society along with media campaigns, social media and FM radio broadcast.

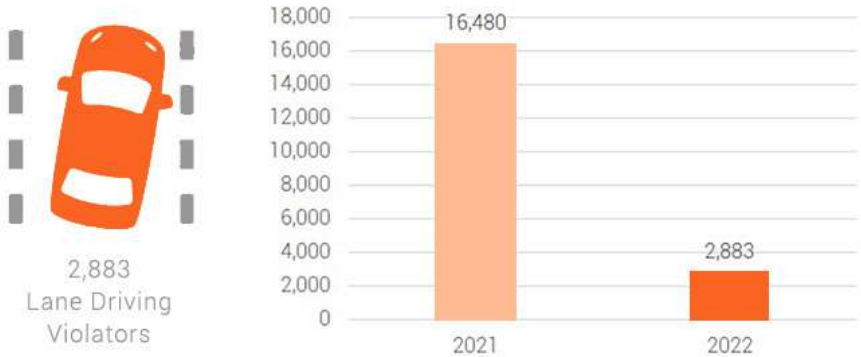


FIGURE 8.7 LANE VIOLATION THROUGH VIOLATION ON CAMERA APP

In 2022, 2298 vehicles were prosecuted for the 'Violation of the Hon'ble Supreme Court's Guidelines' as against 2594 in 2021. In the year 2022, 2,883 vehicles were prosecuted for lane violation through violation on camera app (VOCA). There has been a significant reduction in prosecutors for lane violation from 16480 violators in the year 2021.

TABLE 8.1 PROSECUTION AGAINST VIOLATION OF RULES - 2022

S. No	Vehicles	Not Using Seat Belt	Rider W/O Helmet	Pillion Rider W/O Helmet	Drunken Driving	Dangerous Driving
1	HTV	867	0	0	11	2174
2	LGV / MMV	7950	0	0	95	19288
3	D. Van	205	0	0	23	1393
4	School Cab	14	0	0	0	12
5	Chartpvt	412	0	0	2	769
6	DTC	29	0	0	1	606
7	Trailor	3	0	0	0	16
8	School Bus	52	0	0	0	141
9	Roadways	19	0	0	0	483
10	RTV	109	0	0	1	162
11	Callcentre	46	0	0	4	15
12	Taxi	2025	0	0	68	2172
13	Carjeep	42422	0	0	634	12801
14	Tractor	0	0	0	1	32
15	TSR	0	0	0	67	1777
16	Sc/Mcycle	0	212440	44475	1306	21567
17	G. Sewa	53	0	0	9	165
18	Cluster Bus	99	0	0	0	1104

19.	Interstate Bus	53	0	0	4	294
20.	E Rickshaw	0	0	0	28	1251
21.	Others	83	0	0	1	37
Total Challan		**54441**	**212440**	**44475**	**2255**	**66259**
Compound Challan		**2700**	**1508**	**145**	**0**	**5**
Court Challan		**51741**	**210932**	**44330**	**2255**	**66254**

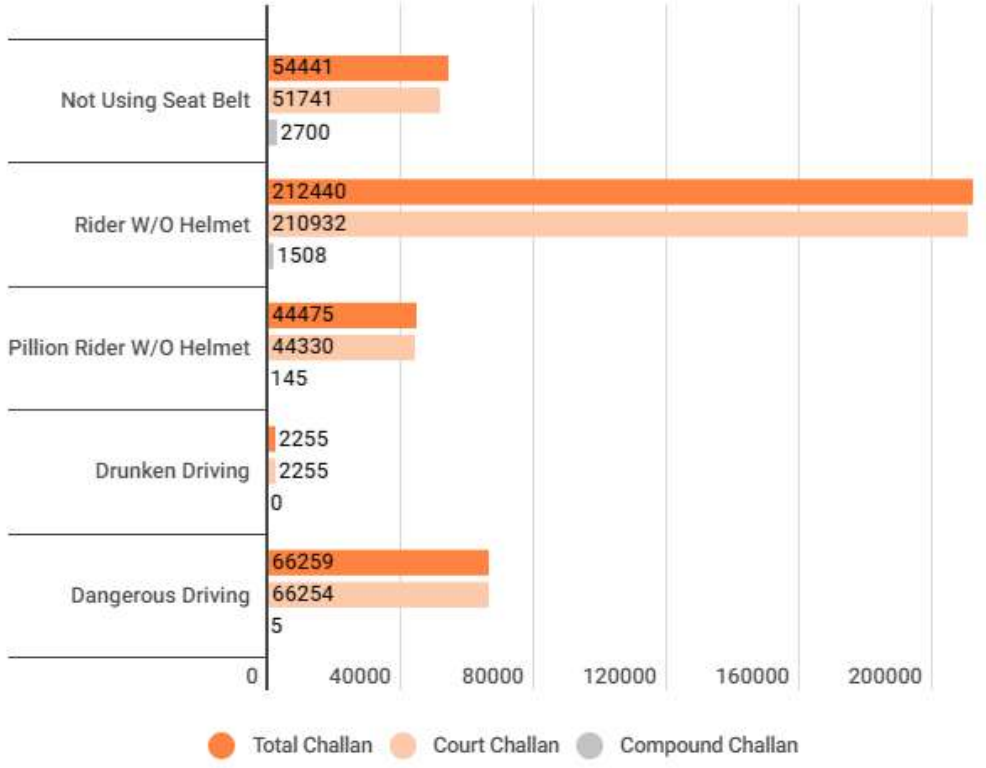


FIGURE 8.8 PROSECUTION AGAINST VIOLATION OF RULES -2022

From the above figure, it can be inferred that prosecutors not using helmets have been the highest defaulter followed by people responsible for dangerous driving and not using seat belts respectively.

8.7 ENVIRONMENTAL CHALLENGES FOR PROSECUTION

The factors that are contributing to Delhi's declining air quality index include the sharp rise in vehicles on the road brought on by a greater reliance on personal vehicles in the absence of adequate, comfortable, and effective public transportation services, as well as the lack of facilities for walking and cycling.

Delhi has lost the air quality gains achieved earlier through actions like large scale conversion of public transport buses and three wheelers to natural gas, relocation of polluting industries, and improvement in emission standards for vehicles among others.

Both particulate levels (PM 10 and PM 2.5) as well as Nitrogen Oxides are increasing steadily. During winter, PM 2.5 levels are normally 3 to 4 times higher than the standard and when smog engulfs the city, it can go as high as 7 to 8 times than the standard. This has serious public health consequences.

At present the number of vehicles registered in Delhi is over 77.39 lakhs, which is distributed over a human population of approximately 207.2 lakhs, indicating a high number of vehicles per lakh human population when compared with other developed cities.

Inferior and adulterated fuel quality, poor motor vehicle maintenance, inadequate traffic and transportation planning are some of the major contributors in increasing vehicular pollution.

Regular measurement of air pollutants and monitoring of air quality, establishment of realistic air quality standards, source inventories, understanding on seasonal variations of air pollutants in the atmosphere are some of the important factors of any pollution management scheme.
To mitigate vehicular pollution, the following environmental challenges are being faced by Delhi Traffic Police for which necessary prosecution action and regulation measures are taken by Delhi Traffic Police.

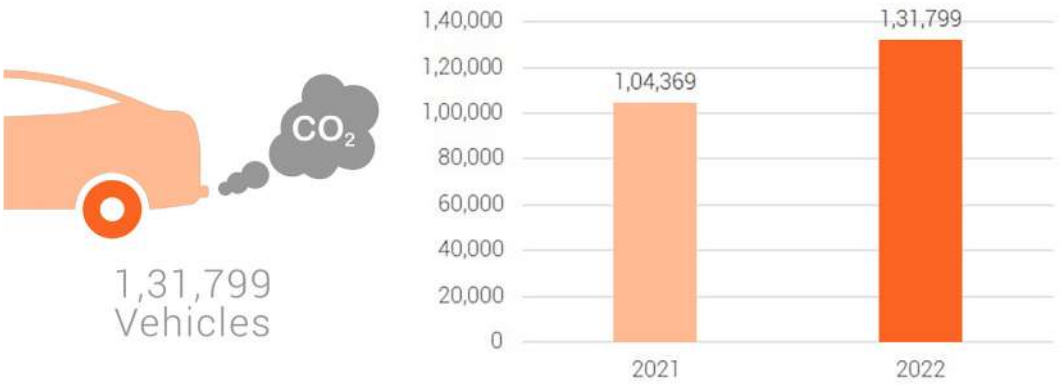


FIGURE 8.9 VEHICLES PROSECUTED FOR PLYING WITHOUT PUCC

1,31,799 vehicles were prosecuted for plying without PUCC in 2022. From the below table, it can be observed, 405 vehicles were prosecuted for carrying construction and allied material without proper covers in goods vehicles in 2022. 1147 diesel/ petrol driven vehicles which were 10/15 years old were impounded in 2022. 362844 vehicles were prosecuted for parking of motor vehicles on metal roads in 2022. 12,268 vehicles were checked at Delhi borders and 3,274 vehicles were returned for being non-destined goods vehicles in 2022. 14159 vehicles were prosecuted for using pressure horns installed and modified silencers in motor vehicles in 2022.

TABLE 8.2 PROSECUTION ACTION TO REDUCE POLLUTION

Years	Without PUCC Vehicle	Building Material	10 Yrs And 15 Yrs Old Vehicle	Parking on Metalled Roads	Border Checked/ Non-Destined Vehicle		Pressure Horn and Modified Silencer
	Challan	Challan	Impounded	Challan	Checked	Re-turned	Challan
2022	**131799**	**405**	**1147**	**362844**	**12268**	**3274**	**14159**

8.8 ENFORCEMENT OF TRAFFIC LAWS

If traffic laws are not enforced or are perceived as not being enforced, it is likely that they will not be complied with, and therefore, will have very little chance of bringing about road safety behavior.

Effective enforcement is the key deterrent factor in ensuring road discipline and also increasing public awareness.

Emphasis was given on selective quality prosecution to maximize the positive impact of enforcement on road discipline. The prosecution includes spot challans by traffic circles' staff, notices issued on the complaints received on social media or through traffic helpline, Traffic Sentinel App and violations captured on, RLVD's, OSVD's and interceptors (Figure 8.10). The amount mentioned in the figure excludes the amount collected through fines imposed by the courts for all court challans.

A vehicle violating traffic rule may not be intercepted at the spot, in some instances. These violations are photographed/ video graphed through the automated device RLVD/OSVD and by the police staff as well as the general public and later they are sent to the centralized Notice Branch of Traffic Police. These violations are scanned, processed and uploaded in the centralized computer.

Notice under section 133 M.V. Act are generated and issued to the violators /owners of these vehicles. The violators may compound the challan amount before the Traffic Police, or before the court.

The total on the spot challan trend as depicted in the below figure, shows an increasing trend from 2016 to 2018. The challan was reduced in the year 2019 due to COVID restrictions when compared to the previous year 2018. There is an increasing trend in total challan from the year 2020 which is concerning as it shows an increase in violation of road safety and traffic rules after relaxation of lockdown.

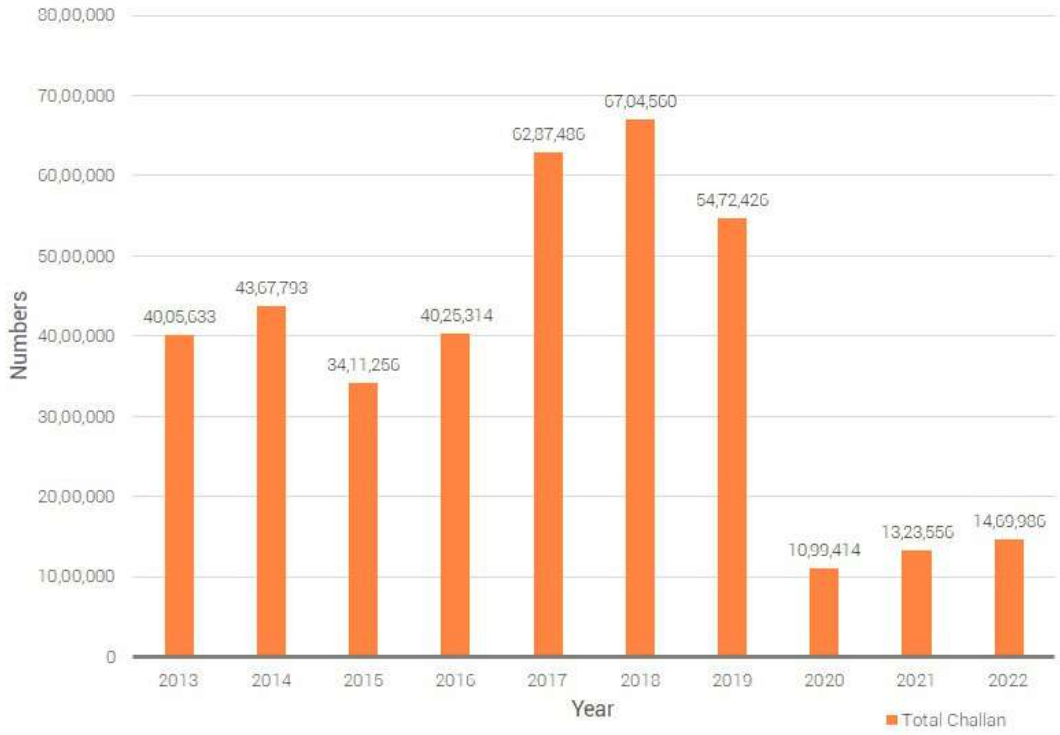


FIGURE 8.10 ON THE SPOT CHALLAN TREND FROM 2013-2022

TABLE 8.3 CHANGE IN PATTERN OF CHALLAN

Year	Total Challan	Court Challan	Compounding Challan	Compounding Amount (In Rs.)
On The Spot Challan				
2021	13,23,556	11,44,922 (86%)	1,78,634 (14%)	9,79,80,500
2022	14,69,986	14,23,390 (97%)	46,596 (3%)	2,67,92,500
Notices Issued U/S 133 M.V. Act 1988				
2021	65,69,985	41,71,650	8,02,552	71,82,19,300
2022	57,20,705	35,75,531	10,68,362	1,27,36,84,200

The above table depicts that in 2022 a total of 14,69,986 on the spot challans (46,596 compounded and 14,23,390 to court) and 57,20,705 notices (10,68,362 compounded and 35,75,531 to court) were issued. The number of the spot challans increased from 13,23,556 to 14,69,986 in 2022, the number of notices decreased from 65,69,985 to 57,20,705 in 2022. After 2019, this primarily happened due to installation of the RLVD cameras system at 37 prominent junctions and the OSVD camera system at 100 locations. This electronic enforcement is a milestone in the field of contactless prosecution.

TABLE 8.4 TOTAL CHALLANS AND COMPOUNDING AMOUNT BY TRAFFIC CIRCLE

Year	Total Challan	Total Compounding Amount
2013	40,05,633	Rs. 60,15,10,000/-
2014	43,67,793	Rs 71,04,97,500/-
2015	34,11,256	Rs 64,53,20,400/-
2016	40,25,314	Rs. 66,89,28,000/
2017	62,87,486	Rs. 98,56,71,300/-
2018	67,04,560	Rs. 1,09,82,07,500/-
2019	54,72,426	Rs. 78,20,32,400/-
2020	10,99,414	Rs. 15,87,94,400/-
2021	13,23,556	Rs. 9,79,80,500/-
2022	14,69,986	Rs. 2,67,92,500/-

The above table depicts that the total compounding amount from on the spot challan has been the lowest in year 2022 when compared with years from 2013 till year 2021.As most of the challans were sent to court.

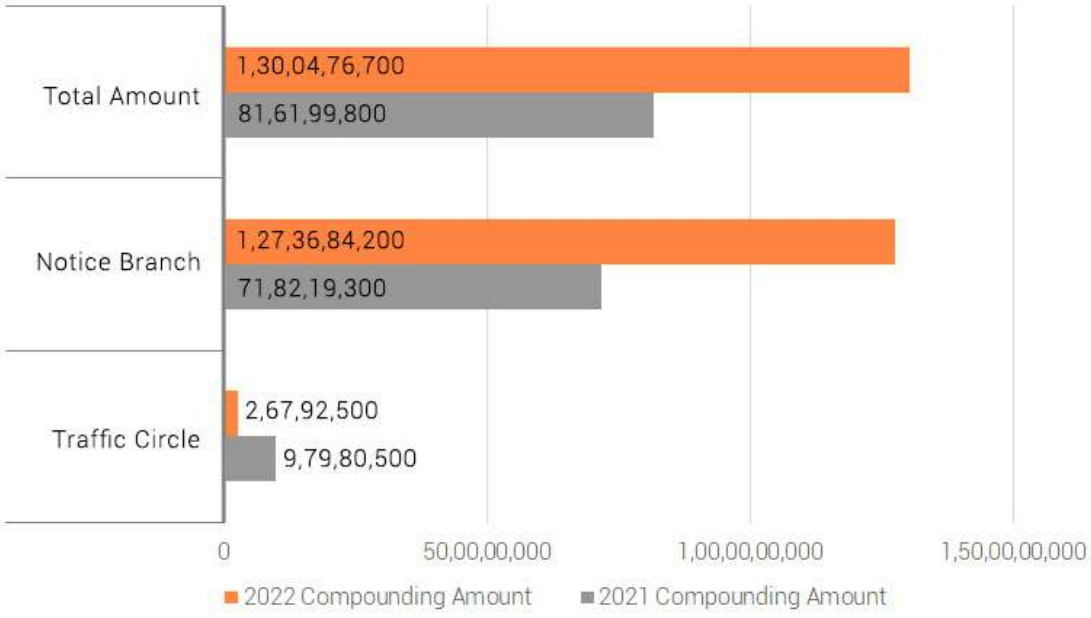


FIGURE 8.11 TOTAL COMPOUNDING AMOUNT (2021-2022)

From the above figure it can be known that Compounding amounts of Rs. 2,67,92,500/- and Rs. 1,27,36,84,200/- respectively, were realised for traffic circle and notice branch respectively for the year 2022. There has been a significant increase in compounding amount realised by the notice branch in 2022 when compared to 2021.

TABLE 8.5 OFFENCE-WISE PROSECUTION (ON THE SPOT CHALLAN)

S. No.	Offences	2018	2019	2020	2021	2022
1	Traffic Signal	216916	230502	48639	40208	55936
2	W/O Driving License	61981	76845	25167	28992	60453
3	Minor Driving	1228	1038	77	32	110
4	Over Speed	141052	104450	8043	18	0
5	Violation of Restrictions	69622	71752	26401	54608	83120
6	Tripple Riding	198903	162182	8128	7572	19029
7	W/O Helmet	1237745	1036151	94555	91036	212440
8	W/O Helmet Pillion Rider	581811	454912	22329	16724	44475
9	Improper Parking	1208608	934699	279830	463732	362844
10	Dangerous Driving	243735	225553	52072	48759	66259
11	Permit Violation	56973	65018	20407	23584	25557
12	Drunken Driving	39240	36055	3986	2831	2255

13	Playing Music	1631	2665	1142	389	132
14	Pressure Horn	7584	24760	8367	4051	9220
15	Tinted Glass	65896	48070	5536	5926	7602
16	High/Long Load	128127	14968	2896	1877	1496
17	Footboard Travel	322	175	2	3	4
18	Stop Line Crossing	401243	338031	87779	24352	26038
19	W/O Pollution Certi.	46439	81246	69199	104369	131799
20	W/O Registration	30681	53489	25637	21367	22086
21	Defective Number Plate	94764	74580	6979	18412	12052
22	Allowing U/A to Drive	31392	40810	16263	18497	34966
23	Using Veh Unsafe Condn.	347	332	126	154	183
24	Using Top Light	20	34	37	9	2
25	Yellow Line Violation	86992	52776	836	6005	6426
26	W/O Light/Head/Ind./Tail	277610	231067	22812	15989	9322
27	Not Driving in Proper Lane	6034	4431	465	1937	1829
28	W/O Speed Governer	442	776	15	25	2
29	Stop Without Bus Stop	762	952	89	221	146
30	Park/Wait in Bus Lane	89508	56422	2620	8888	2756
31	Wrong Overtaking	6587	6347	662	411	321
32	W/O Uniform Dvr/Condtr	28762	15333	614	83	112
33	Over Charge/Misbehave	1510	847	37	19	20
34	Over Crowd In Pass Veh	19713	16100	4982	6979	7648
35	Refusal By Taxi/TSR	2605	1377	36	15	6
36	W/O Fare Chart/Def.Mtr	24	34	0	0	18
37	One Way Violation	377158	293698	112170	123796	91196
38	Carry Goods in Pass Veh	4031	3464	1734	1899	924
39	Carry Pass in Goods Veh	3792	3687	1100	1527	827
40	Carry Anml in Goods Veh	404	282	8	22	10
41	Honking Horn	24393	23522	1235	380	249
42	Unauthorized CNG/LPG	435	576	295	603	256
43	Not Using Seat Belt	650536	508707	45907	62190	54441
44	Use M.Phone While Drive	16154	18451	10915	26176	25820
45	Using Pvt.Veh as Taxi	14161	22379	11811	12605	9940
46	Smoking While Driving	3822	1540	1653	2759	1674
47	Others	202611	102776	57388	62753	59004
48	W/O Insurance	13624	25438	8241	10563	18888
49	W/O PSV Badge	4132	1884	45	12	18
50	Rupd/Lupd(124 CMVR)	2486	1191	129	150	72
51	Using U/A Color Light	14	52	20	47	3
52	**On The Spot Challan**	**6704560**	**5472426**	**1099414**	**1323556**	**1469986**
53	**Driver Arrest**	**6731**	**7180**	**1030**	**141**	**0**
54	**Vehicle Impounded**	**53428**	**51570**	**9506**	**10667**	**8142**

From the above table, it can be concluded that the maximum challans i.e 3,62,844 has been issued for 'Improper Parking' in year 2022 followed by riders without helmets i.e 2,12,440 and driving without pollution certificate which has been 1,31,799 respectively.

TABLE 8.6 VEHICLE-WISE PROSECUTION – 2022

Vehicles	2018	2019	2020	2021	2022
HTV	418733	271459	33523	37436	23357
LGV / MMV	1081822	673390	93257	105318	105735
Bus	78914	58559	9199	11491	15265
Cluster Bus	7398	4815	1744	3016	1960
D.T.C.	5652	4318	897	1995	1142
Taxi/Call Centre	333276	264070	56067	59680	43751
T.S.R.	307706	288292	84733	103177	76815
Scooter/ M/Cycle	2848956	2565231	502796	516018	746628
Car / Jeep	1231757	1025191	268735	396028	329453
E-Rickshaw	165952	160564	24645	61712	97777
D-Van	144159	104660	15494	17298	15736
G-Sewa	40134	28808	4312	4827	5063
RTV	15635	8008	1397	1919	1497
Other	24466	15061	2615	3641	5807

In 2022, maximum challans viz. 7,46,628 were issued against two wheelers followed by Cars (3,29,453), LGVs/MMVs (1,05,735) and E rickshaw (97,777). The vehicle-wise prosecution trend from 2020-2022 shows an increasing trend towards challans issued against two wheelers. Challans against cars have reduced slightly from 3,96,028 in the year 2021.

TABLE 8.7(A) OFFENCE- WISE VEHICLE – 2022

Offence	HTV	LGV	Delivery Van	Sch Cab	Ch. Bus	DTC	Trailor	School Bus	Road-ways	RTV	Call Centre
Traffic Signal	100	1419	329	3	88	31	1	20	1	18	149
W/O Driving License	168	1375	367	4	28	2	0	7	1	7	2
Violation Of Restrictions	9365	28043	2831	41	138		349	1	21		
Improper Parking	4351	21143	5653	79	1639	101	38	78	113	407	442
Dangerous Driving	2174	19288	1393	12	769	606	16	141	483	162	15
Permit Violation	1129	1602	33	66	6696	92	6	115	105	521	37
Drunken Driving	11	95	23	0	2	1	0	0	0	1	4
Playing Music	13	29	3	0	2	0	0	0	0	4	0
Pressure Horn	176	168	11	0	54	1	0	0	22	44	2
Tinted Glass	18	111	5	0	14	0	0	0	0	4	1
High/Long Load	296	1095	101	0	0	0	0	0	0	0	0
Footboard Travel	0	0	0	0	3	0	0	0	0	0	0
Stop Line Crossing	132	1031	250	3	49	37	1	4	6	15	76
W/O Pullution Certi.	292	1977	390	4	57	0	2	5	5	7	11
W/O Registration	237	1114	145	85	120	2	0	4	2	25	3
Defective Number Plate	256	751	72	1	34	2	2	1	0	6	0
Owner Allowing U/A Major Person to Drive	135	1191	183	6	28	6	0	5	4	7	8
Using Veh Unsafe Condn.	8	27	6	0	1	0	0	0	0	0	0
Yellow Line Violation	3	121	55		13	3	0	3	0	1	0
W/O Light/Head/Ind./Tail	1892	5184	767	1	228	2	2	11	0	27	1
Not Driving Proper Lane	132	588	15		137	86	3	20	86	22	2
W/O Speed Governer	0	1	0	0	0	1	0	0	0	0	0
Stop Without Bus Stop	0	0	0	0	94	2	0	8	2	4	0
Park/Wait In Bus Lane	7	178	12	0	1	2	0	0	0	0	12
Wrong Overtaking	48	95	4	0	53	29	0	3	14	4	0
W/O Uniform Dvr/Condtr	0	0	0	0	23	2	0	0	2	5	0
Over Charge/Misbehave	0	0	0	0	2	0	0	0			0
Over Crowd in Pass Veh	0	0	0	44	179	50	0	1	1	12	0
One Way Violation	405	3735	992	6	140	25	0	9	20	44	23
Carry Goods in Pass Veh	0	0	0	0	1	0	0	0	0	0	0
Carry Pass in Goods Veh	45	587	118	0	0	0	0	0	0	0	0
Carry Anml in Goods Veh	0	8	0	0	0	0	0	0	0	0	0

Carry Anml in Goods Veh	0	8	0	0	0	0	0	0	0	0	0
Honking Horn	13	27	0	0	0	0	0	0	0	1	0
Unauthorized CNG/LPG	0	6	0	0	0	0	0	0	0	0	0
Not Using Seat Belt	867	7950	205	14	412	29	3	52	19	109	46
Use M.Phone While Drive	47	1174	224	2	18	11	0	1	1	4	16
Using Pvt.Veh as Taxi	0	13	1	120	0	0	0	0	0	0	0
Smoking While driving	17	63	6	0	4	0	0	0	0	0	4
Others	897	4690	1389	12	158	19	3	11	7	31	17
W/O Insurance	66	844	153	2	15	0	0	2	3	5	5
W/O PSV Badge	0	1	0	0	0	0	0	2	0	0	0
RUPD/LUPD (124 Cmvr)	57	11	0	0	0	0	0	0	0	0	0
Total	**23357**	**105743**	**15736**	**505**	**11200**	**1142**	**426**	**504**	**918**	**1497**	**876**

TABLE 8.7(B) OFFENCE-WISE VEHICLE – 2022

Offence	Taxi	Car/ jeep	Tractor	TSR	SC/MC	Other	G. Sewa	Clus-ter	Pvt. Int. Bus	E Rick-shaw
Traffic Signal	1387	32768	14	830	18152	15	55	112	11	433
W/O Driving Licence	227	6597	23	1476	43491	42	136	5	56	6439
Owner Allowing Minor To Driving		7		3	85					15
Violation Of Restric-tions	13	2264	390	5	4950	165			2	34542
Triple Riding					19029					
W/O Helmet					212440					
W/O Helmet Pillion Rid-er					44475					
Improper Parking	15822	89534	554	43367	134581	194	2546	181	426	41595
Dangerous Driving	2172	12801	32	1777	21567	37	165	1104	294	1251
Permit Violation	5690	0	1	6806		30	1034	99	1465	30
Drunken Driving	68	634	1	67	1306	1	9		4	28
Playing Music	9	53		11	7					1
Pressure Horn	64	1420	6	9	7206	4	4		21	8
Tinted Glass	90	7343	0		0	15			1	
High/Long Load						4				
Footboard Travel						1				

Stop Line Crossing	1843	11901	6	1053	9254	8	37	44	9	279
W/O Pullution Certi.	498	32535	17	1375	94360	123	121	2	18	
W/O Registration	190	5767	229	953	11335	1053	109		10	703
Defective Number Plate	60	3523	6	165	6919	12	38		3	201
Owner Allowing U/A Major Person to Drive	107	2956	15	920	24559	48	92	11	44	4641
Using Veh Unsafe Condn.	5	6		1	31		1			97
Using Top Light		2								
Yellow Line Violation	903	4507	11	583	212	1		3	1	6
W/O Light/Head/Ind./Tail	914	86		59	27		4	1	2	114
Not Driving Proper Lane	69	526		5	4	3		106	23	2
Stop Without Bus Stop						2	1	6	27	
Park/Wait In Bus Lane	100	232		1563	184	1	19	5		440
Wrong Overtaking	1	2				10		51	3	4
W/O Uniform Dvr/Condtr	31			40		1	6		2	
Over Charge/Misbehave				4		2				12
Over Crowd in Pass Veh	60			3793		713	181	5	1	2608
Refusal By Taxi/Tsr				5						1
W/O Fare Chart/Def.Mtr	2			8			6			2
One Way Violation	5609	26906	158	4858	46848	35	163	67	28	1125
Carry Goods in Pass Veh	64			177		562	92			28
Carry Pass in Goods Veh						77				
Carry Anml in Goods Veh						2				
Honking Horn	3	118		2	85					
Unauthorized Cng/Lpg	4	226		11	1	8				
Not Using Seat Belt	2025	42422				83	53	99	53	
Use M.Phone While Drive	334	16380	7	150	7269	8	9	30	17	118
Using Pvt.Veh as Taxi	8	9783	0			14				1
Smoking While driving	41	1406	1	12	108	2	1	1		8
Others	4143	13212	26	6151	25611	67	149	28	109	2274
W/O Insurance	317	3532	12	573	12532	13	30		13	771
W/O Psv Badge	2	1		3		7	2			
Rupd/Lupd (124 Cmvr)						4				
Using U/A Coloured Light		3								
Total	**42875**	**329453**	**1509**	**76815**	**746628**	**3367**	**5063**	**1960**	**2643**	**97777**

The above tables depicts that out of 7,46,628 challans issued against two wheelers, 2,12,440 challans were for riding without helmets, 1,34,581 challans issued were for improper parking and 94360 challans issued were for riding without pollution certificate.Out of 3,29,453 challans issued against cars, 89,534 were issued for improper parking, 42,422 were for not using seat belts during driving and 32,768 challans were issued for not obeying traffic signals.

Total challans issued against LGVs were 1,05,743, out of which maximum challans i.e 28043 were for violation of restrictions followed by 21143 challans for improper parking and 19288 challans were issued for dangerous driving.

E-rickshaws accounted for 97,777 challan out of which 41595 challans were for improper parking followed by 34542 challans for violation of restrictions.

TABLE 8.8: CIRCLE-WISE PROSECUTION – 2022

Circle	Compound	Court	Total Challan	Amount
AMV	0	2272	2272	0
AVC	1343	18678	20021	766000
BDP	131	12749	12880	83500
BGP	1	1977	1978	1000
BKR	828	12119	12947	449000
BNA	887	24608	25495	474500
BRD	459	10218	10677	251000
CHP	520	9253	9773	283500
CLC	1116	22310	23426	593000
CPC	189	2128	2317	99500
CRP	284	16725	17009	201500
CWL	12	8767	8779	6000
DBC	443	25852	26295	228500
DCC	449	9676	10125	243000
DFC	913	25543	26456	533000
DGC	1437	26241	27678	771000
DWC	885	40717	41602	476500
GKC	204	7982	8186	163500

GNC	784	17469	18253	427000
HKC	1077	36373	37450	606000
IGI	890	18296	19186	589000
JPC	310	19210	19520	172000
JRP	635	6048	6683	328000
KBC	1897	25649	27546	1012500
KJC	486	41008	41494	275500
KKC	1238	31943	33181	797500
KMC	482	19811	20293	264500
KOT	1401	45930	47331	737000
KPA	259	10384	10643	143000
KPC	2337	35565	37902	1254500
LNC	541	32171	32712	385500
MGP	746	51238	51984	433000
MPC	1339	46684	48023	718500
MRC	563	25828	26391	332500
MTC	1436	13784	15220	754500
MWC	569	8197	8766	334000
NFC	253	16602	16855	151000
NJC	1005	55259	56264	600500
NLC	1770	45718	47488	1152000
NRL	552	10757	11309	310000
PAP	111	1151	1262	60000
PBC	608	39230	39838	343500
PGC	1360	15213	16573	855000
PNC	431	18690	19121	241500
PRV	94	4242	4336	53000
PSV	42	8727	8769	27000
PTC	1130	20025	21155	607500
PTH	124	2379	2503	77500
PVC	673	12174	12847	385500
RGC	1111	54807	55918	658500
RHN	490	17527	18017	271000
RKP	598	9655	10253	352000
SBC	454	25126	25580	261500
SBP	47	1929	1976	31000
SDE	795	11867	12662	568500
SDV	190	5694	5884	101000
SGV	253	12460	12713	194500
SHD	795	41555	42350	467500
SKT	245	4531	4776	137000

SLC	10	335	345	6500
SLP	1	4704	4705	500
SMB	416	3648	4064	212000
SMC	233	7263	7496	132500
SNC	301	2620	2921	158500
SPB	477	5935	6412	272500
SPC	936	19486	20422	539500
SRC	188	13575	13763	118500
SVR	527	31027	31554	318000
TMC	495	9153	9648	281000
TMP	50	7061	7111	27500
TNC	695	56729	57424	454000
TRC	379	8043	8422	212500
VKC	445	19608	20053	253500
VKJ	319	13043	13362	190500
VVC	902	22439	23341	520000
TOTAL	**46596**	**1423390**	**1469986**	**26792500**

The above table depicts that the highest challan of 57424 has been issued at TNC Circle, followed by 56264 challans at NJC circle and 55918 challans at RGC Circle. SLC Circle has issued the lowest number of challan i.e 345 followed by 1262 challans by PAP and 1976 challans by SBP Circle.

8.9 VEHICLES IMPOUNDED

From the below table it can be observed that in the year 2022, a total of 8,142 vehicles were impounded. Prime offenders were drivers of cars, scooters and motorcycles. Primarily 2532 scooters/motorcycles, 1815 Electric Rickshaws, 868 TSRs and 576 Cars were impounded. School cabs, School Buses and Call centre cabs were among the lowest vehicle category to be impounded.

TABLE 8.9: VEHICLE IMPOUNDED – 2022

S. No.	Vehicle	Vehicles Impounded
1	HTV	150
2	LGV / MMV	175
3	Delivery Van	44
4	School Cab	2
5	Private Charter Bus	181
6	DTC	5
7	Trailor	4
8	School Bus	1
9	Roadways	4
10	RTV	12
11	Call Centre	1
12	Taxi	72
13	Car/Jeep	576
14	Tractor	223
15	TSR	868
16	SC/MC	2532
17	Others	973
18	Gramin Sewa	120
19	Cluster Bus	7
20	Inter State Bus	377
21	Electric Rickshaw	1815
	TOTAL	**8142**

While Two-wheeler riders accounted for 10% of fatal crashes in 2022, they ranked second on the list of road crash victims, comprising 38% of all the incidents, following pedestrians who accounted for 43% of the total cases. This indicates the importance of implementing measures to enhance the safety of both pedestrians and Two-wheeler riders, addressing the unique challenges faced by each group to effectively reduce road accidents and fatalities.

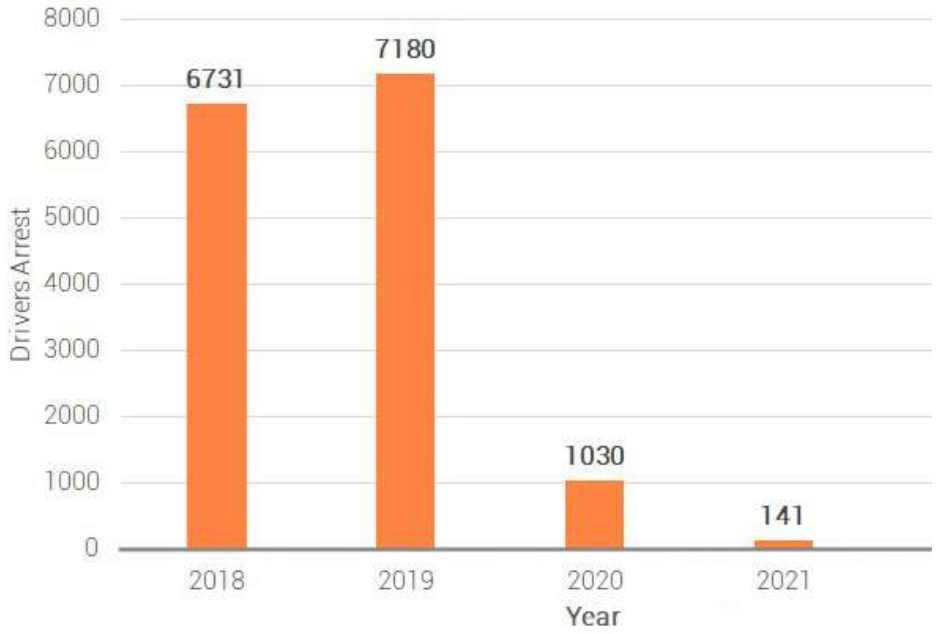


FIGURE 8.12 DRIVER'S ARREST TREND 2018-2022

8.10 CHASE AND CHALLAN' BY TRAFFIC POLICE MOTOR-CYCLE RIDERS

Traffic motorcycles are designed and detailed for chase and challan wherein the traffic police staff chases and prosecutes the violating vehicles after intercepting them. The basic aim of this scheme is to bring about road discipline thereby reducing number of crashes.

As can be depicted in the below table, In 2022, a total of 2,43,403 chase and challans were issued. Under this category, scooter/motorcycle riders topped the list of those prosecuted (24.2%) followed by car/jeep drivers (23.8%). These two categories together make 48% of total prosecution by Traffic Police motorcycles. Month of September witnessed the highest number of chase and challan prosecutions followed by months of July and June respectively. Month of January witnessed the lowest number of chase and challan prosecutions.

TABLE 8.10: MONTH-WISE TOTAL MOTORCYCLE PROSECUTION – 2022 (CHASE AND C

Month	HTV	LGV / MMV	Delivery Van	School-cab	Chart pvt	DTC	Trailor	School Bus	Road-ways
JAN	5	486	265	0	0	0	0	0	7
FEB	7	840	450	2	1	0	0	0	18
MAR	12	1822	403	2	0	0	0	0	32
APR	13	1475	580	0	0	0	0	0	8
MAY	9	1260	462	0	0	0	0	0	2
JUN	12	1252	490	1	0	0	0	0	3
JUL	22	2540	846	3	2	0	0	0	45
AUG	16	1725	485	5	2	0	0	1	34
SEP	16	3215	412	7	4	0	0	1	32
OCT	12	1423	250	4	2	0	0	1	22
NOV	15	1632	222	2	6	0	0	0	1
DEC	12	2332	195	1	2	0	0	0	4
TOTAL	151	20002	5060	27	19	0	0	3	208

CHALLAN)

	RTV	Call Centre	Taxi	Car/jeep	Tractor	TSR	SC/MC	Gramin Sewa	Cluster Bus	E-Rick-shaw	Other	Total
	12	18	240	2430	2	1480	2201	230	12	1609	33	**9030**
	25	30	931	4260	1	3506	1105	160	9	1722	39	**13106**
	27	18	920	4004	1	4046	5052	252	95	5260	90	**22036**
	25	44	860	5685	2	5801	5865	321	4	3215	45	**23943**
	18	35	629	4035	0	4602	4812	275	2	650	26	**16817**
	22	41	890	5968	1	5901	6029	350	6	3974	35	**24975**
	46	52	795	6520	2	5952	7595	465	44	5856	92	**30877**
	25	12	523	3815	3	3215	4695	280	22	3347	120	**18325**
	22	180	860	8462	4	3962	8345	462	92	5426	135	**31637**
	20	12	360	3125	2	2465	3815	222	26	2852	58	**14671**
	72	112	325	4302	4	1280	4460	290	25	3265	89	**16102**
	16	160	462	5526	2	3612	4960	625	12	3912	51	**21884**
	330	714	7795	58132	24	45822	58934	3932	349	41088	813	**243403**

8.11 TRAFFIC SENTINEL SCHEME

Delhi Police launched the Traffic Sentinel Scheme in 2015 for the general public. Aim of this scheme was to improve public participation in reporting certain specified violations to traffic police. This scheme empowers citizens by providing an easy to use platform to report certain specified offences to Traffic Police.

11 types of traffic violations are reported through the "Traffic Sentinel" Scheme. Sentinels earn credit points for each violation reported. Driving against the flow of Traffic, Yellow Line Violation, Parking on Footpath, Triple Riding, Defective Number Plate, Without Seat Belt, Without Helmet Rider/Pillion Rider, Stop Line Violation, Red Light Jumping, Dangerous/Zig Zag Driving and Using Mobile Phone while Driving constitute such violations.

The Traffic Sentinel Scheme is accessible through the existing "Delhi Police-Tatpar" App. The scheme was revamped and re-launched with new features and capabilities in 2017. 7414 notices were issued by the Traffic Sentinel App in 2022.

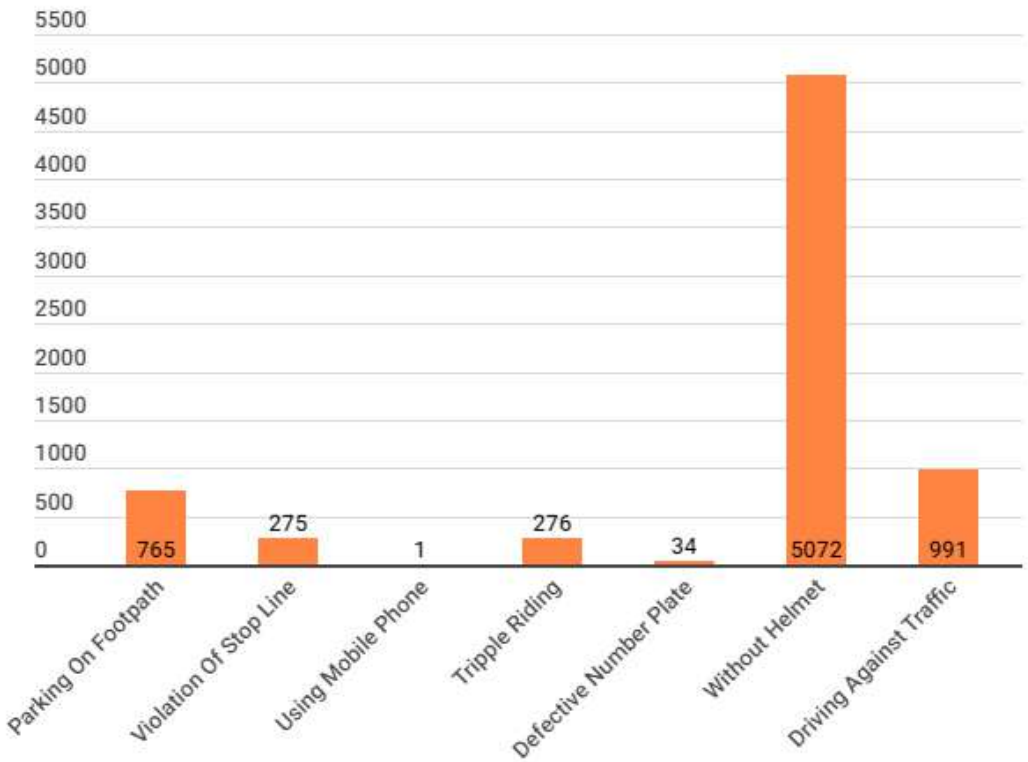


FIGURE 8.13 TRAFFIC SENTINEL NOTICES- 2022

As depicted in above figure a total of 7414 traffic sentinel notices statements were issued in 2022. Out of which 5072 notices were for driving without a helmet followed by 991 notices for driving against traffic and 765 issues against parking on footpaths.

09

ROAD SAFETY INITIATIVES

Raising Awareness, Saving lives

Road Safety Starts with You.

9.1 ROAD SAFETY CELL

Delhi Traffic Police had long ago realised the significance of educating road users about traffic rules as well as imbibing and inculcating them better road sense so as to diminish the chances of traffic congestion and road fatalities. Hence, Road Safety Cell, the educational wing was formed in the year 1972 with a view to organize educational and awareness campaigns to sensitise different categories of road users about various aspects of road safety.

OBJECTIVE :

Road Safety Cell after its inception has worked tirelessly towards increasing the awareness among road users to survive or cope with various problems related to road and transportation. Road safety cell has outlined many objectives to achieve its goal.

1. Sensitise different categories of road users about proper use of road and transportation
2. Make every road user, from a common pedestrian to a vehicle driver, aware of basic tenets of road safety and traffic rules
3. Forewarn people about accident prone zones
4. Bring about behavioral and attitudinal change in the mindset of road users to:-
    - Ensure better sense and orderliness on the road.
    - Imbibe care, concern and mutual respect towards fellow road users.
    - Inculcate respect for others' Right of Way.
    - Create empathy towards road accident victims.
    - Popularize the concept of Good Samaritan.

TARGET GROUPS :

Several vulnerable road users were identified and divided into target groups to impart road safety education to them and achieve effective and result-oriented outcomes. Various modes of education and outreach programmes keeping in view the target groups were conducted.

1. School/college students
2. Commercial Vehicle/Truck Drivers
3. DTC/Cluster bus drivers
4. Armed Forces' staff & Drivers
5. Staff & drivers of Govt./Pvt. organisations
6. TSR /Taxi/Cab Drivers
7. E-Rickshaw drivers
8. Slum Dwellers
9. Cyclists
10. Factory workers
11. NCC volunteers
12. Traffic marshals
13. Delivery boys engaged by e-commerce Cos. and
14. Food delivery boys

METHODOLOGY :

An effective methodology was adopted by the Road Safety Cell to create awareness surrounding road safety and traffic rules. The tailor made efforts for different target groups were established to achieve desirable outcomes.

1. Classroom mode of teaching & Interactive lectures.
2. Road safety awareness sessions on virtual platforms.
3. Film shows and PPTs on road safety.
4. Display of mobile exhibition vans.
5. Competitions based on road safety.
6. Practical education at 4 Traffic Training Parks.
7. Designing/distribution of Road Safety Literatures.
8. Display of posters, banners, boards with road safety messages.
9. On-road campaigns.
10. Road Safety Awareness Summer/winter camps for school/college students.
11. Road Safety Workshop for commercial vehicle drivers.
12. Road Safety march/rallies.
13. Safe two-wheeler rally.
14. Affixing of reflective tapes on cycles.

9.2 INFRASTRUCTURE

FOUR TRAFFIC TRAINING PARKS:

The purpose of traffic training parks is to provide practical instruction to all types of road users, including school children. To educate youngsters about numerous traffic safety rules and regulations, these parks imitate real-world road conditions and contain miniature road signs and automobiles.These traffic training parks are established at Bal Bhawan, Baba Kharak Singh Marg, Punabi Bagh and Roshanara Bagh.

Two Road Safety Mobile Display Vans:

Other than Traffic Training Parks, two road safety mobile display vans are also utilised for the purpose of education. These vans are displayed at prominent locations to spread awareness about the importance of road safety rules and to sensitise motorists as well as the general public about road safety measures through audio-visual means. These vans are equipped with the latest audio-visual gadgets and aim at attracting maximum audience.

9.3 ROAD SAFETY ACTIVITIES

Road safety activities play a crucial role in educating the public, promoting responsible behaviour on roads causing reducing road accidents and road fatalities. These activities help in building a culture of road safety and fostering an environment safer for all road users.

ROAD SAFETY AWARENESS FOR SCHOOL STUDENTS ONLINE/ OFFLINE:

Series of online lectures, powerpoint presentations, and short movies were showcased in sessions to impart knowledge of road safety and best practices to school students and teachers.

TABLE 9.1 SCHOOL STUDENTS TRAINING PROGRAMMES

Mode	Topics covered
• Lecture • Powerpoint presentation • Short Movies • Oath taking • Display of Mobile Exhibition van	• Importance of obeying traffic rules • Advantages of Tatpar app. • Women safety Awareness about good touch and bad touch • Women helpline numbers • Awareness on pandemic Covid-19 Pandemic

A total of 603 sessions were conducted which were participated by 1,74,364 students and 6028 teachers/parents.
Note: Online sessions were conducted till March 2022.

FIGURE 9.1 SCHOOL STUDENTS TRAINING PROGRAMMES

SUMMER CAMP FOR COLLEGE STUDENTS

The objective of organising summer camps was to ensure that students make the most of their vacations by engaging in meaningful activities. These camps were designed not only to instill good road safety values and behaviours in the students but also to equip them with essential life skills that would prove beneficial in handling real-life challenges and situations. By combining road safety education with life skill development, these summer camps aimed to produce responsible and capable individuals who not only understood the importance of safe road practices but are also equipped with valuable skills to navigate various situations confidently.

- Traffic management & road safety
- Safe two-wheeler riding training
- Self-Defence training
- Fire safety
- Disaster management
- First aid and CPR administration

A total of 108 sessions were conducted in which 6626 students and 297 teachers participated.

FIGURE 9.2 SUMMER CAMPS FOR COLLEGE STUDENTS

CYCLE CONSPICUITY CAMPAIGN

There is a substantial correlation between bicycle-vehicle accidents and poor sensory conspicuity and poor bicycle visibility. Cycle conspicuity campaign was conducted by Delhi traffic police to increase safety of cyclists on roads and reduce crashes caused towards cyclists.

OBJECTIVE

- To affix reflective tapes on cycles in areas with high density of cyclists, so as to ensure their visibility to vehicle drivers at night so that they are safe while on roads.
- They were also imparted tips about safe cycling habits that they should follow to ensure their safety on roads.

In a total of 428 sessions conducted, reflective tapes were affixed on 45430 cycles/E-rickshaw at various places .

FIGURE 9.3 AFFIXING OF REFLECTIVE TAPES ON CYCLES/E-RICKSHAW

SAFE RIDER TRAINING PROGRAMME FOR DELIVERY BOYS

Since India is one of the fastest growing economies, it has been the emerging hub for many multinational delivery companies. Delivery boys have emerged as significant road users in the last decade. As per the vision and directions of worthy CP Delhi to sensitise delivery boys about traffic rules for their own safety, Delhi Traffic Police in association with Yulu, Zomato, Swiggy, Dominos and other organisations, arranged a safe rider training programme for delivery boys. Programmes were organized at Traffic Training Park Roshanara Bagh, Punjabi Bagh and Baba Kharak Singh Park.



FIGURE 9.4 TRAINING PROGRAMMES FOR DELIVERY BOYS

9.4 COMMUNITY ENGAGEMENT

RAAHGIRI DAY

Raahgiri Day is India's first sustained open street program that advocates for safe, accessible, and inclusive streets. By closing off a street to all motorised vehicles, Raahgiri Day provides people the opportunity to

experientially rethink and reimagine their streets without any cars, congestion, or danger. The street becomes a place where the local community can come together to reclaim the street, using it as a space for sports, activities, art, performance, and civic engagement. These events promote the safety of pedestrians and cyclists, healthy living, and fostering unity and connection within local communities. Community engagement initiatives such as Raahgiri Day have been encouraged and supported by the Delhi Traffic Police in partnership with Raahgiri Foundation and Nagarro in the inner circle of Connaught Place every Sunday of the month as well as in other locations around Delhi. These events also give the Delhi Traffic Police an opportunity to connect with its citizens and create awareness among them regarding road safety and traffic discipline. By using engaging activities like quizzes and competitions, information about traffic signals and road use practices are diffused to the community in an accessible way. These initiatives also strengthen citizens' trust in traffic police and imbibe in them good road behaviour.

With over 100,000 people in attendance in total, Raahgiri Days have been an invaluable opportunity for the Traffic Police to reach and connect with the community, especially the youth population. The events are also organised in partnership with NGOs and citizen interest groups, providing a close partnership and understanding between them and the Traffic Police to best serve and protect Delhi's citizens. These groups represent the concerns of women, children, the elderly, people with disabilities, and many more. Events this year took place in Kamla Nagar, GK-2, twice in Chandni Chowk, and three times in Connaught Place so far.

Raahgiri Day was organised on the 18th of June at Chandni Chowk in partnership with international organisations FIA Foundation and PMNCH as part of the 1.8 Billion Young People for Change global campaign. India has the largest youth population in the world and the campaign offered a platform to raise their voices and concerns. By engaging with this group, the Traffic Police heard the concerns of the youth while also helping shape safer road users. The event also helped bring the DTP to the international stage due to the global reach of the campaign.

FIGURE 9.5 RAAHGIRI DAYS AT CP

9.5 CAPACITY BUILDING

Training Branch Traffic from time to time organizes different courses for the Delhi Traffic Police Personnel as well as the correctional Training or Counselling session for the Traffic Violators. Training programmes are conducted in the course of Induction course for the fresh arrivals consisting of training of traffic drill and salute, refresher course teaching the handling of different traffic equipment and soft skill course which focuses on Communication and Motivational Skill, Stress Management and time Management.

9.6 WORKSHOP ON REMEDIAL MEASURES FOR BLACK SPOT

In the year 2022, the Delhi Traffic Police's Accident Research Cell of the Traffic Unit conducted an analysis of road crashes, identifying areas with a high frequency of accidents and designating them as crash-prone zones and Black spots.

Subsequently, a 3 day workshop focusing on the ten most critical road Accident Black Spots in Delhi was arranged, with the active participation of all relevant stakeholders, NGOs and retired police officers committed to enhancing road safety in the city. The workshop brought together experts from various organisations and retired Delhi Police officers who shared their valuable insights and recommendations aimed at mitigating road accidents at these specific locations on Delhi's roads. The participants were grouped into teams of four, each tasked with finding solutions for their assigned Blackspots.

On the initial day, a visit to these blackspots allowed the participants to closely observe and document the underlying problems, which varied from geometrical inaccuracies, insufficient road and absence or discontinuity of pedestrian infrastructure to existing mobility challenges.

FIGURE 9.6 SPOT VISIT BY EXPERTS ON DAY 1 OF REMEDIAL MEASURES WORKSHOP

On the second day, there was a table-top exercise where road safety experts shared their observations concerning the issues at each blackspot and discussed potential remedial measures.

The team of experts compiled a comprehensive study report on these black spots and submitted it to the Delhi Traffic Police. The report, which experts from various stakeholders organisations prepared has been shared with field officers of the Delhi Traffic Police and local police districts to facilitate the necessary action. Additionally, it has also been forwarded to the Public Works Department of the Government of the GNCT of Delhi to initiate essential measures for enhancing road infrastructure and design. These actions are expected to significantly contribute to reducing road traffic accidents across the roads of the GNCT of Delhi.

NOTE: Findings from the workshop is attached with this report in Annexure A

FIGURE 9.7 PLANT DISTRIBUTION TO PARTICIPANTS ON DAY 3 OF REMEDIAL MEASURES WORKSHOP

10

CONCLUSION & WAY FORWARD

Every Life Counts

Strive for Zero Deaths and Injuries on Delhi's Roads

OVERVIEW

On average, every single day, 15 road crashes and four deaths occur in Delhi. The toll of road crashes cannot be overstated. Streets are central to any city's functioning and existence. The safety of everyone who uses the streets of Delhi must be our foremost priority.
This report has used extensive empirical data to show the existing trend of road crashes. Road traffic crashes are predictable and, therefore, preventable. Close coordination and collaboration using a holistic and integrated approach across multiple sectors and disciplines. — made faster and more efficient by political will and commitment — can save numerous precious lives.The path to zero road deaths is sustainable mobility. There must be a renewed focus on making cities walkable, cyclable, and easily navigable by public transport. By making these mobility options accessible, immediately the probability of road crashes occurring reduces. While there is a pressing need to lessen the possibility (and manage the toll) of collisions on roads involving motor vehicles, we will get more mileage out of exploring and expanding other mobility options. Designing and implementing cycling, walking, and public transport infrastructure makes streets accessible, resilient, affordable, and safe for all.

10.1 G20 THEME: PROMOTING SUSTAINABLE DEVELOPMENT AND INCLUSIVE GROWTH

The G20, a platform for international economic cooperation, recognises the significance of road safety and aims to promote policies and practices that reduce road traffic accidents and fatalities. As the host country for the G20 summit, India has a unique opportunity to highlight the importance of road safety and sustainable mobility nationally and internationally. In line with the G20 theme of sustainable development, inclusivity, and global cooperation, road safety in Delhi is a prime concern that can be addressed with several key strategies.

The Importance of Road Safety for Sustainable Development:
Safe and efficient transportation systems are crucial for sustainable urban development. Road safety initiatives contribute to various sustainable development goals, including reducing injuries and deaths, promoting health and well-being, ensuring inclusive access to transportation, and fostering environmental sustainability.

Road Safety Challenges in Delhi:

Delhi, the capital city of India, is one of the world's most populous and traffic-congested cities. The rapid urbanization and increasing number of vehicles on its roads have led to several road safety challenges, including:

a. High Accident Rate: Delhi witnesses many road accidents yearly, resulting in fatalities and injuries to pedestrians, cyclists, and motorists.

b. Lack of Road Infrastructure: Insufficient and poorly maintained road infrastructure contributes to accidents and traffic congestion.

c. Non-Compliance with Traffic Rules: Violations of traffic rules, and reckless driving, add to the road safety problem.

Addressing Road Safety in Delhi - Key Strategies:

FIGURE 10.1 KEY STRATEGIES

1. Infrastructure Development:

- Identifying accident-prone areas and upgrading road infrastructure to enhance safety.
- Constructing pedestrian-friendly crossings, sidewalks, and dedicated cycling lanes.
- Implementing traffic calming measures to reduce vehicle speed in residential and high-risk areas.

2. Road Safety Education and Awareness:

- Organizing public awareness campaigns like Raahgiri Day to educate citizens about safe road practices and the importance of following traffic rules.
- Integrating road safety education into the school curriculum to instill safe road habits from an early age.

3. Strengthening Law Enforcement:

- Increasing the presence of traffic police officers at critical intersections and crash-prone areas.
- Utilizing technology, such as surveillance cameras and traffic violation monitoring systems, enhances enforcement and deterring violations.

4. Promoting Sustainable Transportation:

- Encouraging the use of public transportation, walking, and cycling through incentives and improved facilities.
- Supporting the adoption of electric vehicles to reduce pollution and dependence on fossil fuels.

5. Collaboration and Partnerships:

- Forging partnerships between the Delhi Police, government agencies, NGOs, and private stakeholders to coordinate efforts and share resources.
- Collaborating with international organisations and G20 member countries to exchange best practices and resources in road safety management.

Road safety is a shared responsibility that requires collective action from governments, law enforcement, communities, and individuals. The G20 theme of promoting sustainable development and inclusive growth aligns perfectly with addressing road safety issues in Delhi. By adopting a comprehensive approach that integrates infrastructure development, education, law enforcement, sustainable transportation, and with collaboration, the Delhi Police can make significant strides toward creating safer roads, safer vehicles, safer driver and contributing to the global effort to improve road safety.

Through proactive measures and continuous evaluation, Delhi can serve as a model city for road safety initiatives, inspiring positive change across the G20 member countries and beyond.

10.2 STRENGTHENING ROAD SAFETY: A COLLABORATIVE INITIATIVE BY DELHI TRAFFIC POLICE & RAAHGIRI FOUNDATION

This proposes a partnership between the Delhi Traffic Police and the Raahgiri Foundation to address road safety issues, and fostering awareness through Raahgiri Day campaign. Raahgiri Day, a vibrant community initiative, encourages people to reclaim streets for non-motorized activities and promote sustainable transportation. By joining forces, the organisations aim to enhance road safety, build capacities among stakeholders, and improve infrastructure to safeguard vulnerable road users.

Objectives

- Raahgiri Day Campaign: The proposed collaboration between the Delhi Traffic Police and the Raahgiri Foundation will focus on arranging frequent Raahgiri events, advocating for non-motorized transportation, and conducting interactive activities to raise awareness about road safety.

- Capacity Building: Training workshops will be conducted for traffic police officers, volunteers, and community members to enhance their understanding of road safety practices, traffic management, and effective ways to protect vulnerable road users.

- Infrastructure Improvement: Identifying high-risk locations, the partnership will work on improving the blackspots, road infrastructure with a focus on pedestrian crossings, dedicated cycling lanes, and accessible pathways for differently-abled individuals.

- Road Safety Advocacy: Joint awareness campaigns will be conducted to educate the public on safe road behaviours, traffic rules, and the importance of respecting the rights of all road users.

Implementation

- Collaborative Planning: Both organisations will jointly plan and strategize the initiatives, leveraging each other›s expertise and resources.

- Stakeholder Engagement: Local communities, schools, NGOs, and government bodies will be involved to ensure inclusive and sustained participation.

- Monitoring and Evaluation: Regular assessments will gauge the impact of interventions, allowing for course correction and continuous improvement.

Expected Outcomes

- Reduced Road Accidents: By improving infrastructure and awareness, the partnership aims to decrease the number of road accidents involving vulnerable road users.

- Enhanced Road Safety Culture: The Raahgiri Day campaign will foster a culture of responsible road use, leading to greater respect and empathy among road users.

- Sustainable Transport Uptake: Encouraging non-motorized transportation will contribute to reduced traffic congestion and lower carbon emissions.

The proposed collaboration between Delhi Traffic Police and Raahgiri Foundation holds great promise for addressing road safety issues during the Raahgiri Day campaign. By synergizing their efforts, the partnership seeks to create safer roads, build a stronger safety-conscious community, and promote sustainable and inclusive transportation choices for all.

10.3 PARADIGM SHIFT (MOBILITY TO ACCESSIBILITY)

An urgent paradigm shift is required if we are to transform our cities and streets into places that are safe, accessible, and sustainable. This shift goes far beyond just changing physical infrastructure; it's a fundamental change in mindset and in priorities. When we prioritise cars in our cities, we create streets that are unsafe and prone to road crashes. By placing a greater emphasis on the needs of pedestrians and cyclists, we make our streets safer for everyone, the air quality better, and our cities greener and more vibrant. We create denser cities at the scale of humans rather than sprawling cities that require individual use cars to move around. This paradigm shift comes from protecting the most vulnerable road users (pedestrians and two-wheelers) who face the brunt of the consequences of road crashes, integrating cutting-edge technology in innovative and effective ways, and building the capacity of decision-makers and enforcement agencies.

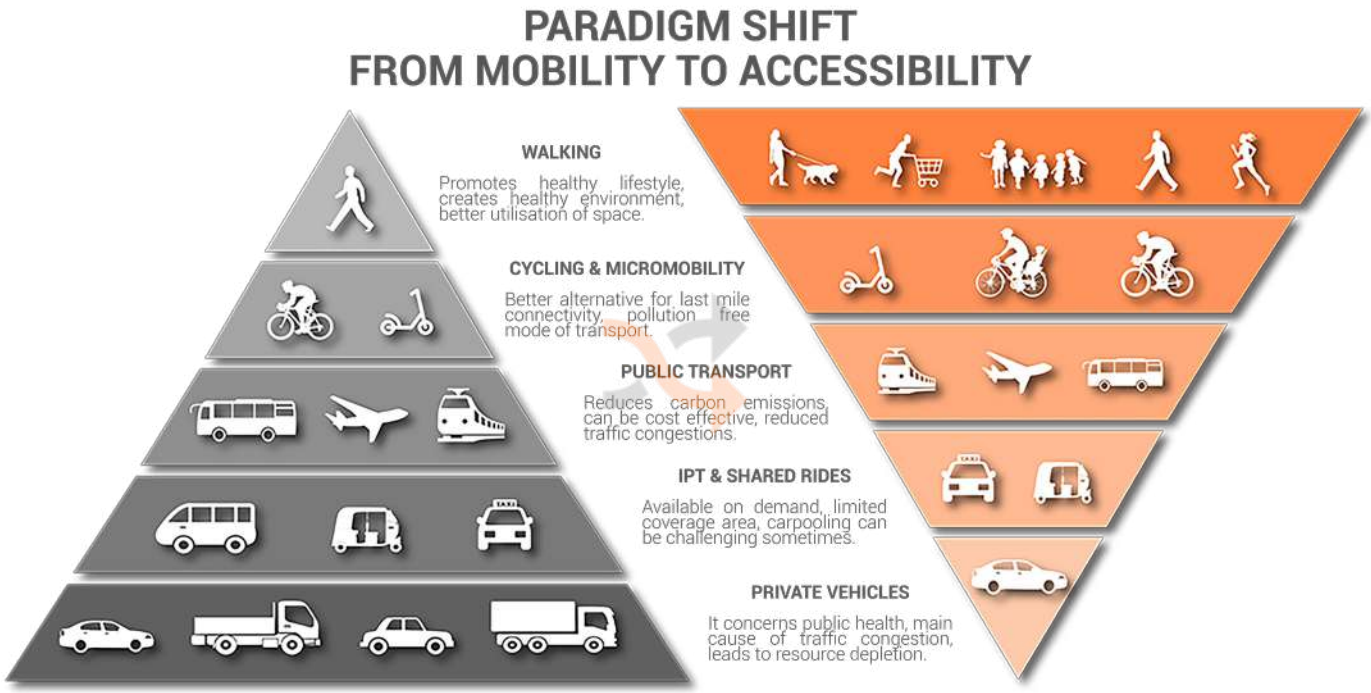


FIGURE 10.2 Paradigm Shift: From Mobility to Accessibility

10.3.1 Working for the safety of most vulnerable road users

The most vulnerable road users are the people who have the least protection in the event of a crash and tend to suffer the most injuries or deaths. The two main groups of vulnerable road users in Delhi are pedestrians and two-wheelers.

Pedestrian Safety

Improving walkability in Delhi requires a comprehensive action plan that addresses various aspects of urban planning, infrastructure, and public awareness. Here's a step-by-step action plan:

- **Pedestrian Infrastructure Assessment:** Conducting a detailed assessment of existing pedestrian infrastructure in Delhi. Identifying areas with high pedestrian traffic, and analyze footpath conditions, crossings, and accessibility for people with disabilities. Pinpoint areas where improvements are most needed.
- **Urban Planning and Zoning:** Incorporating walkability considerations into urban planning and zoning regulations. Encourage mixed-use developments with a focus on creating pedestrian-friendly neighborhoods. Implement policies that prioritise pedestrian friendly roads and optimise pedestrian spaces over vehicular traffic
- **Pedestrian-Only Zones:** Designating certain areas as pedestrian-only zones to create safe and attractive spaces for walking. These zones can be around famous landmarks, markets, and commercial areas.
- **Enhanced Footpaths:** Improving existing footpaths and creating new ones where necessary. Ensuring they are comprehensive, well-maintained, and accessible to all pedestrians. Removing obstacles such as encroachments, utility poles, and illegal parking.
- **Safe Crossings:** Installing pedestrian crossings regularly, especially near schools, markets, and public transportation stops. Implement ing pedestrian-friendly signal timings at traffic lights to allow enough time for people to cross safely.
- **Traffic Calming Measures:** Introducing traffic calming measures such as speed humps, raised pedestrian crossings, and chicanes to reduce vehicle speeds in residential areas and near schools.

- **Public Transportation Integration:** Enhancing integration between public transportation (buses and metro) and pedestrian networks. Ensure that walking paths lead to transit stations and terminals, encouraging people to use public transport for longer journeys.
- **Street Lighting:** Ensuring proper street lighting along walking routes to enhance safety during evenings and nights.
- **Green Spaces and Urban Parks:** Developing and maintaining green spaces and urban parks that are easily accessible on foot. These areas can serve as recreational spots and rest areas for pedestrians.
- **Cycling Infrastructure:** Developing cycling lanes and paths in conjunction with pedestrian pathways to promote active modes of transportation and reduce vehicular congestion.
- **Public Awareness Campaigns:** Launching public awareness campaigns to educate citizens about the benefits of walking and the importance of pedestrian safety. Encourage walking as a healthy and sustainable mode of transport.
- **Enforcement and Fines:** Strengthening enforcement of traffic rules related to pedestrian safety. Introduce fines for violations that endanger pedestrians, such as illegal parking on footpaths.
- **Community Engagement:** Involving the local community, resident associations, and NGOs in the planning and decision-making. Get feedback from citizens to understand their needs and concerns.
- **Monitoring and Evaluation:** Regularly monitoring the progress of the effectiveness of the action plan and crucial for making data driven feedbacks and implementing necessary adjustments.
- **Green Mobility:** By focusing on green mobility, can lead to reduction of carbon footprints, improved air quality and creation of a more sustainable and usable environment for residents.
- **Government Support:** Garnering political and financial support from the Government to ensure the successful implementation of the action plan. If necessary, seek partnerships with private organisations and international agencies to secure funding and expertise.

By implementing this action plan, Delhi can take significant steps towards becoming more walkable and pedestrian-friendly, promoting a healthier, greener, and more vibrant urban environment.

Two Wheeler Safety

The safety of two-wheeler riders has consistently been a significant concern due to the lack of dedicated segregation for them on the roads. No specific lanes are allocated exclusively for two-wheelers, leading to potential dangers. On the left lane, they face vulnerability to heavy commercial vehicles, while on the right, they contend with high-speed traffic. Additionally, riding in the middle lane exposes them to the risks of vehicles changing lanes.

To ensure the safety of two-wheeler riders, it is essential to implement segregated pseudo-two-wheeler tracks. These tracks can be created using 2-meter-wide thermoplastic strips described in the following design proposal.

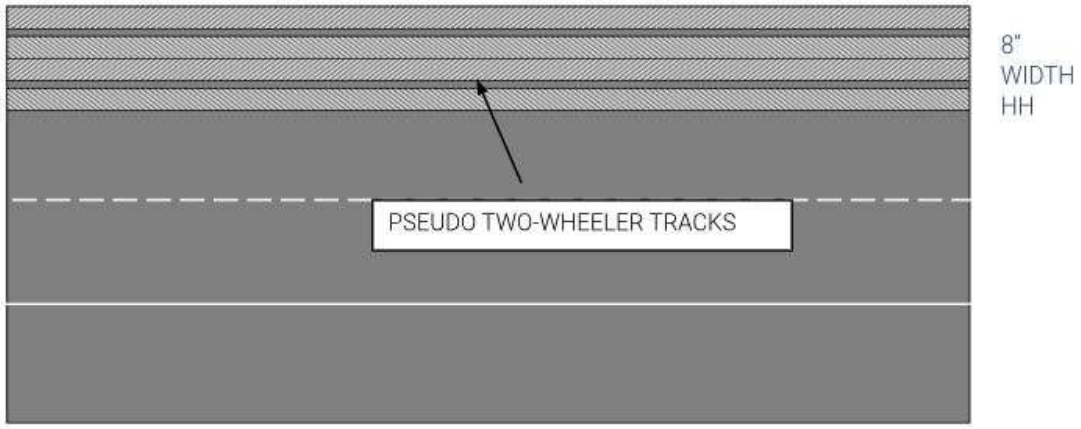


FIGURE 10.3 PSEUDO-TWO-WHEELER TRACKS MADE OF THERMOPLASTIC STRIPS

**The dedicated two-wheeler track should have a width sufficient to ensure the safe passage of two motorcycles or scooters at once without any risk of collision. However, the path should be narrow enough not to accommodate the axle length of four-wheeled vehicles, discouraging them from entering the two-wheeler track. This measure will help maintain the dedicated space solely for two-wheeler riders, ensuring their safety and preventing interference from four-wheelers.*

In areas with high two-wheeler traffic or a history of more two-wheeler accidents (such as Two-wheeler Accident Prone Zones), these dedicated tracks can be strategically placed on the far-right lane of a three or four-lane road.

These tracks aim to promote disciplined movement for two-wheelers, guiding them to follow two designated lanes and discouraging any zigzag behavior. Moreover, it prevents other vehicles, specifically four-wheelers, from entering this section, as the ride might be bumpy for them. However, all vehicles can utilize this area during congested or heavy traffic situations.
To test it's effectiveness, the concept of separate two wheeler lane can be implemented in small sections of two-wheeler crash-prone zones like the Madhuban Chowk underpass near Majnu ka Tila on Outer Ring Road, and the results can be observed and assessed.

10.3.2 Strengthening the Intelligent Transport System of Delhi

Intelligent Transport Systems (ITS) technology is emerging to address many of today's traffic challenges. ITS applies information and communication technologies to traffic problems and is part of the global spread of Information Technology (IT). During the past ten years, countries around the world have begun to employ a new set of approaches and technologies to meet the challenges of surface transportation. In addition, introducing ITS applications in developing countries has contributed to mitigating many traffic problems.

Provision for some of the following ITS (Intelligent Transport System) measures should also be implemented during the project's design to improve safety. When the roads are open to traffic, these ITS measures have helped significantly to better traffic management, reduce congestion, and also to catch repeat offenders:

- Close Circuit TV Cameras for Traffic management
- Speed cameras (Enforcement Cameras)
- Loop detectors in the pavement to measure traffic speed, volume, categories of vehicles, and also density.
- Red Light cameras (to catch offenders driving thru red lights)
- Variable Message Signs (Install them at strategic decision-making locations).
- Ramp Meters (RM) to regulate the number of vehicles entering from arterial roads to heavily traveled highways.
- Highway Advisory Radios (HAR)
- Traffic Management Centres (TMCs) in major Cities
- Weigh-in-Motion Stations (to check overweight vehicles while in motion)
- Interceptors (for Speed Enforcement)
- Citywide Traveler information number for the travelling public to call in and get information about traffic conditions, road closed/lanes blocked due to crashes, road construction/maintenance work, and the assigned alternate routes due to closed roads. It also informs the travelling public about the real-time travel time from Point A to Point B.
- Automated Speed Limit Signs and Enforcement

The automation of the traffic records system (as part of the planned RADMS procurement) helps to eliminate the following:

- Managing huge Record books
- Cumbersome manual challans and receipts
- Problems in Identifying the contents of challans
- Difficulty in tracking performance
- Possibility of pilferage

10.3.3 Capacity Building

The Capacity Building refers to investment in staff, stakeholder agencies, and practices that will enable NHAI, PWD, Transport, Police, Health and other partner agencies to achieve their road safety goals and objectives.

In Delhi, setting up good road safety practice is a challenge due to a variety of issues including weak agency capacity and insufficient funding. Institutional management functions must take the highest priority as they are the foundation on which road safety management systems are built. They produce the interventions that achieve the desired results. A functioning and competent lead road safety agency such as Delhi Road Safety Authority can play a critical role in establishing good road safety practices in Delhi.

Capacity Building encompasses three main activities:

1. Skill upgrading

- Safety Audit (Training and accreditation of auditors)
- Design and Operation (Training of Engineers and Police)
- Creating Centres of Excellence and training

2. Procedural improvements by Interdisciplinary coordination and data sharing among

- Road/ Transport Authorities, Police, Trauma care Centres
- Crash data and analysis for improving design
- Traffic Management/ Incident management for safe operation

3. Organisational strengthening

- Strengthening the Road Safety Engineering Cell in Delhi and Centre of Excellence at one of the academic institutions

10.3.4 Campaigns for Road Safety Awareness

As part of Education initiatives, we have to continuously upgrade the skills and technical capabilities of our Engineers and Officials working on road safety. Also, our school children, travelling public and also the drivers need to be educated on road safety issues. In addition to education, enforcement also plays a major role in making our citizens follow the rules and regulations of the roads.
Several NGO's, schools and other organisations/agencies can play a significant role in spreading the message of drive safe initiatives and also saving lives of the crash victims.

Some of these organisations are:

1. NGO's
2. Rotary Club
3. Lions Club
4. Schools
5. Citizen groups
6. Red Cross
7. Automobile Association of Delhi Chapter
8. Institution of Engineers

For all the safety awareness campaigns, a part of the Transport and Police Department budget portion of the money from Road Safety Fund should be earmarked and can be utilised. Also, if approached, many of the big corporate groups will also sponsor awareness campaigns as part of their Corporate Social Responsibility (CSR) program.

Strategies for awareness campaigns:

- During the Annual National Road Safety Week celebrated in January every year, the Transport Department and Police along with other stakeholder agencies continue to actively involve Schools, Colleges and NGO's and highlight the importance of road safety.
- Produce Road Safety videos (crashes & consequences) compulsorily play them in theatres and during the telecast of major sporting events on televisions networks. Showing these road safety clippings repeatedly, will have a big impact on viewers and will encourage them to follow rules and regulations of the road.
- Have one of the famous Movie/sports personalities of Delhi as a brand ambassador who can convey the Road Safety Messages very effectively to the general public via Radio, TV and banners.
- Use of FM radio with safety related messages to convey to the public.
- Officers of Transport and Police Departments attend the college and school events and open booths displaying road safety videos, brochures, banners etc. and educating the children and youth about road safety (speeding, helmet, seat belt, riding on the wrong side of the road).
- Free eye checkups, BP & Diabetes checkup programs should be arranged during national/state road safety events.
- Road Safety subject should be included as part of the high school curriculum.
- Raahgiri Day should be conducted more frequently as community activity and fostering awareness
- Delhi Police week serves as a tool to initiate workshops regarding sustainable mobility
- National and International Road Safety Week to promote road safety awareness campaigns and serve as a platform for conducting medical check-ups of bus drivers

10.4 DELHI ROAD SAFETY ACTION PLAN (DRSAP)

The Delhi Police developed the Delhi Road Safety Action Plan (DRSAP). This citywide plan addresses the "4 E's" of safety – Engineering, Enforcement, Education, and Emergency Care. Delhi Police will be the nod al agency for implementing this action plan with significant support and coordination from Road owing agencies, Education, Health and the National Highway Authority of India.
As recommended by the Sundar Committee, a Road Safety & Traffic Management Board (Delhi Road Safety Authority) may be established at the city level by the Government of Delhi.

The Vision of the Delhi Road Safety Action Plan is as follows:
"Towards Zero Traffic Deaths- No loss of life on roads is acceptable."

The Mission of the Delhi Road Safety Action Plan is:
"Continue to strengthen the initiatives in engineering, enforcement, education, and emergency medical services to reduce crashes, injuries, and deaths on streets and roads of Delhi."

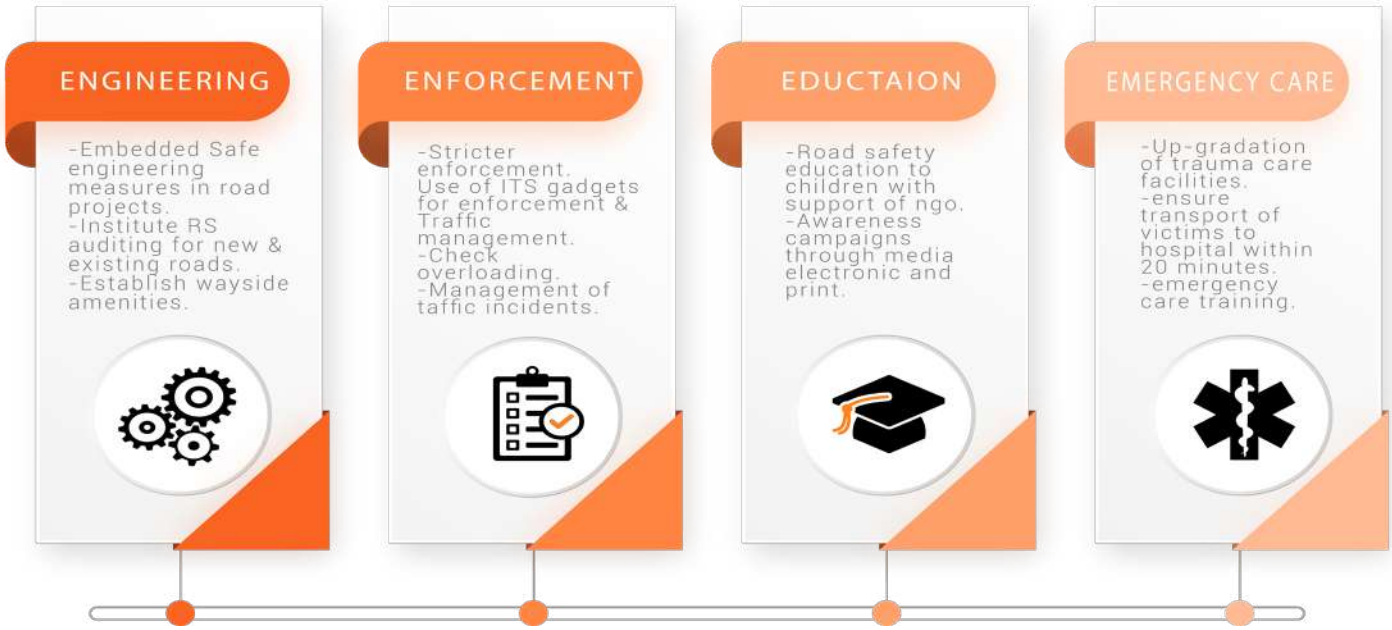


FIGURE 10.4 4 Es (Engineering, Enforcement, Education and Emergency Care)

10.4.1 DRSAP Guiding Principles

- The action plan should be Stakeholders Driven
- The proposed strategies should be data and evidence-based
- DRSAP should be comprehensive and inclusive of the Four Safety "E's."
- It should be professionally supported and systematically conducted in Delhi

10.4.2 DRSAP Adoption Process

- DRSAP should Gain Leadership Support and Initiative, and an Executive Committee would be established under the chairmanship of Special CP.
- The Executive Committee members should include Principal Secretaries/ Commissioners of all stakeholder agencies to steer the implementation of DRSAP.
- There would be a working Group/Coordination Committee under each area of the 4 E's – Engineering, Education, Enforcement, and Emergency Care.
- Entrust Coordination responsibility to the Traffic Police Department.
- It should be initiated in the form of the Delhi Road Safety Action Plan Workshop & Safety Summit
- The Delhi Traffic Police would gather data through the Creation of a Crash Database System, and analyze data, conduct crash analysis with the support of Expert agencies.
- The action plan should bring Safety Partners Together through DRSAP Workshop, DRSAP Quarterly meetings, and Annual Safety Summits.
- The committee will review and Update the DRSAP regularly.

STRATEGIC GOAL

Delhi RSAP's goal is to reduce crash fatalities by one-third every year on Delhi's Roads.Stakeholder Agencies & Organisations in Delhi for Road Safety Initiatives

Government Agencies: *Police, NHAI, PWD, Transport, ULB, Health, Education and Forests*

Other Partners: *NGOs, CSR companies, Transport Operators, Institutions of Engineers, Towing companies, the general public, Rickshaw operators, cyclists, pedestrians, Schools, Insurance companies, Contractors, Consultants, Concessionaires, Vehicle manufacturers, Media, Roadside advertisers, Rotary Clubs, Lions Club.*

10.4.3 Short-term Policy (0-2 Years) - (2023-2025):

"Make Road Safety a Humanitarian Priority for the State of Delhi"

Policy # 1:

The Delhi Police will establish the Delhi Road Safety Committee. They will spell out the institutional responsibilities of the various departments and stakeholders of road safety and take appropriate measures to ensure that the required legal, institutional, and financial environment for road safety is implemented. The reforms in these areas will take into-account an active and extensive participation of the community at large and of private and business sectors as well as of NGOs for raising awareness about road safety issues, the human factor, issues of risk perception and also building up of the environment for a minimum acceptable level of safe road user behavior.

Strategies to implement the policy

- Strengthening nodal agency and the City level Road Safety Council to oversee and coordinate all activities relating to road safety with dedicated funds and dedicated staff to monitor and implement the Road Safety goals identified under the DRSAP.
- Establishment of the Dedicated Road Safety Fund for successful implementation of DRSAP.
- Implement safety engineering measures and required road safety audit throughout project phase.

Policy # 2:

The Government will establish a Road Crash Database Management system within the Police Dept. with the help of the Transport Department and Health Department to collect, store, analyze, and disseminate the data for implementing the identified road safety measures. Dedicated personnel in each agency with proper training will be entrusted with uploading the data into the database.

Strategies to implement the policy

- Improve the reporting of important details at the scene of the crash immediately after the occurrence of the crash. Standardized crash reporting forms should be made mandatory to collect information uniformly statewide.
- Improve the storage and accessibility of all the data relevant to a crash, such as vehicles involved, road environment, etc.
- Development of a comprehensive road safety information database needed for operating effective safety management systems/programs at the State and City levels.
- Provide the necessary training to the respective staff in Police, Transport, Health, and PWD, who are responsible for documenting the necessary data into the database and analyzing the data for taking the required corrective measures.

Policy # 3:

The Delhi Police will take appropriate measures to assist various agencies to strengthen and improve the quality of enforcement to ensure effective and uniform implementation of safety laws. The police will actively encourage establishing and strengthening dedicated highway police patrolling on National Highways and State Highways in cooperation with District Collectors and Local Governments as appropriate.

Strategies to implement the policy

- To take appropriate measures to improve the capacity to improve driver and vehicle testing to the required standards.
- To take appropriate steps to ensure that the Police Department is adequately manned, trained, equipped, and empowered to carry out its function, ensuring safe road use and orderly traffic flow
- To set up a city-level Traffic Police Training Institute to serve, motivate and provide incentive and necessary help to Delhi Police to set up modern police training schools within their jurisdiction.
- Establish citywide Traffic Incident Management Teams (Committees) and local Traffic Incident Management Teams (Committees) with representatives from all stakeholders. Also, start a Road Ranger Assistance Program in all urban areas.
- Establish Highway Patrol police to cover most of the National Highways and major roads with dedicated funding, vehicles, and human resources. (Police & NHAI).

Policy # 4:

Road Safety knowledge and awareness will be created among the population through education, training, and publicity campaigns. Road safety education will also focus on school children and college-going students, while road safety publicity campaigns will be used to propagate good road safety practices among the community. The Government will encourage all professionals undertaking road design, road construction, road network management, traffic management, and law enforcement to attain adequate knowledge of road safety issues.

Strategies to implement the policy

- Encourage the inclusion of road safety awareness as part of the educational curriculum for students of various age groups (in High Schools).

- To develop and implement road safety publicity campaigns using the creative resources of the Government, professional agencies, and NGOs for various target groups per their respective requirements.
- Planning and implementing community-based road safety programs to engage local and non-governmental partners in the areas of road traffic safety that most affect their daily lives.
- Planning, designing, and implementing training programs for various specific groups involved in road safety management tasks, e.g., Traffic Personnel, Highway Engineers, School Teachers, Town Planners, Villagers, Shopkeepers on National & state highways, NGOs, etc.

Policy # 5:

The Delhi Police will strive to achieve its target that all persons involved in road crashes benefit from speedy and effective trauma care and health management. The essential functions of such a service would include the provision of rescue operations and the administration of first aid at the crash site and transporting the victim from the crash site to an appropriate nearby hospital.

Strategies to implement the policy

- To improve the communication system available with the police and other emergency services to reduce response times and assist in planning and implementing the Traffic Aid Post Scheme.
- To train police, fire, and other emergency service personnel, such as those on ambulances and paramedics, in basic first aid for road crash victims.
- To develop local and regional trauma plans based on a study of post-crash assistance and consequences for road traffic crash casualties

The road safety action plan stresses creating two types of committees. The Steering Committee/State Road Safety Council will oversee and monitor the progress of implementation of the action plan strategies by different stakeholders.

The Working Committees will be responsible for implementing the action plan strategies. The Road Safety Action Plan will be implemented under five pillars, viz.

1. Pillar 1. Road Safety Management –Institution & Capacity Building.
2. Pillar 2 – Safer Roads & Mobility
3. Pillar 3 – Safer Vehicles
4. Pillar 4A – Improvement in Enforcement of Traffic Regulations
5. Pillar 4B – Education
6. Pillar 5 – Emergency Care.

Under these pillars are action items with specific performance measures, proposed timelines, and associated costs. The plan also outlines a list of short-term and long-term policies that need to be enacted by the Government of Delhi to implement the action plan strategies in the field successfully. Establishing an authoritative agency such as the Delhi Road Safety Authority, which will have complete power over all the stakeholder agencies with dedicated staff and funding to develop, implement, monitor, enforce, and evaluate Delhi's Road Safety Action Plan.

A dedicated Road Fund and an effective Road Crash Database Management System have been proposed. There will be an emphasis on Traffic Incident Management, the Establishment of Automated vehicle driving test tracks, Dedicated Highway Police Patrol, the Road Ranger Program, and Public Education and Awareness programs targeting schools, communities, and vulnerable road user groups. The Transport Department and PWD will continue to work closely with the Ministry of Road Transport and Highways in New Delhi on joint road safety campaigns and initiatives. There will be a stronger focus on the road net work to ensure that infrastructure plays its part in reducing crashes and their consequences.

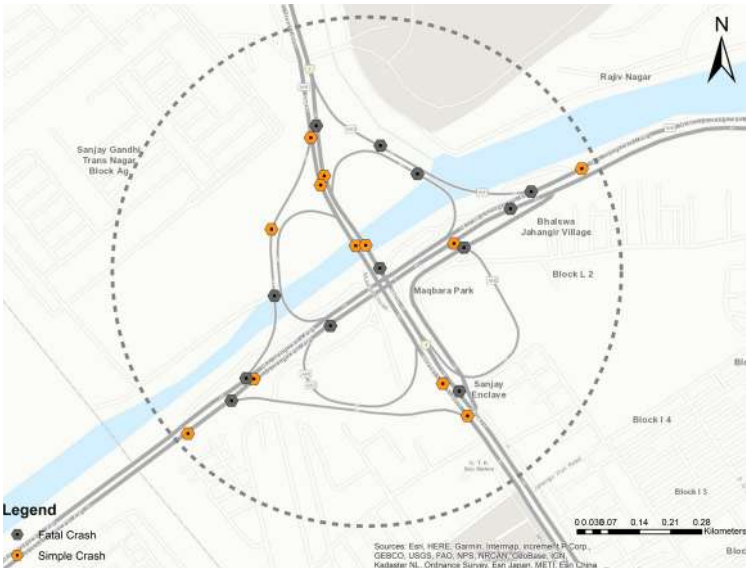
The emphasis is on Enforcement measures using ITS technologies like speeding, mobile phone use, and drunken driving. The success of this new Road Safety Action Plan will depend upon close cooperation among many agencies, including voluntary groups, business organisations, media, and the public. All the stakeholder agencies can make Delhi a safe driving City in India by working together.

ANNEXURE

Drive Responsibly

Safeguard Lives

MUKARBA CHOWK



Top Offending Vehicles	
Vehicle at fault	Total
Car	2
2 Wheelers	1
3 Wheelers	1

Top Victims	
Victims	Total
2 Wheelers	9
3 Wheelers	0

Day Night Wise		
Day-Night	Fatal	Total
Day	7	12
Night	5	11

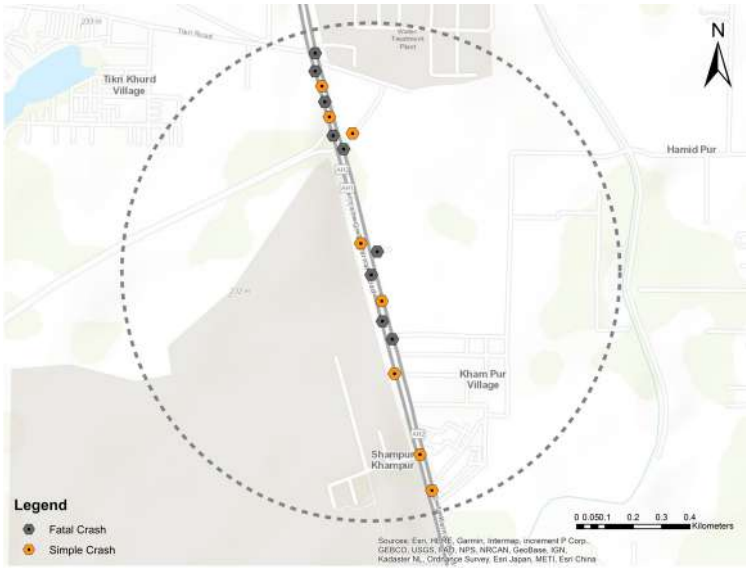
ISSUES

- There is discontinuity in pedestrian infrastructure,
- Absence of Gore area demarcation in the form of Chevron Markings, Solar Studs and Flexible bollards.
- Lift is Dysfunctional on the Hedgewar Marg.
- There is lack of speed control measures at the intersection.

PROPOSALS/RECOMMENDATIONS

- There is requirement of the provision of footpath to ensure safer commute for pedestrians along the road.
- Speed calming measures are required on the junction for reducing the speed of vehicles.
- Chevron markings, solar studs and flexible bollards are needed for the better road markation.
- The maintenance of lift is required on Hedgewar Marg.

KHAMPUR VILLAGE



Top Offending Vehicles		
	Fatal	Total
Un-Known Vehicle	6	11
HTV/Goods	2	3

Top Victims		
	Fatal	Total
Scooter/M.Cycle	4	6
Pedestrian	3	8

Day Night-Wise Accidents		
	Fatal	Total
Night	6	9
Day	4	10

ISSUES

- The metal crash barrier is away from the edge of the footpath: it can lead to burst of tyre sidewall.
- Metal crash barrier is not tied to concrete crash barrier.

PROPOSALS/RECOMMENDATIONS

- Need for the retaining the Exit point from the NH-44
- Need for the provision of FOB at Khatu Sham Mandir area on NH-44 coupled with the increase of Median height to 2m.
- Metal crash barriers should be placed at the outer edge of kerb stone to avoid tyre bursting and it should be well tied with concrete crash barriers to avoid any mishap.
- There is a requirement of FOB (Foot Over Bridge) at Khatu shayam mandir area.
- The median height should be increased to prevent people crossing the highway.

BHALSWA CHOWK

Top Offending Vehicles		
Vehicle At Fault	Fatal	Total
Car Pvt	1	2
HTV/Goods	1	2
Scooter/M. Cycle	1	2
Tempo	1	1
Unknown vehicle	3	11

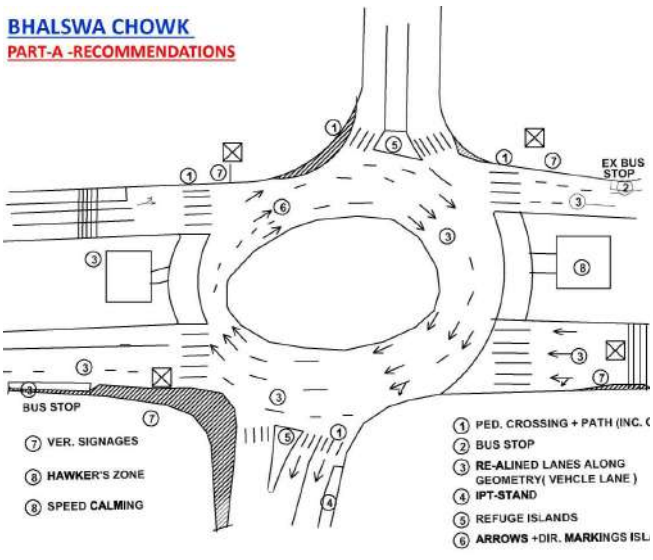
Top Victims		
Victims	Fatal	Total
E Rickshaw	1	3
Pedestrian	2	8
Scooter/M.Cycle	4	10

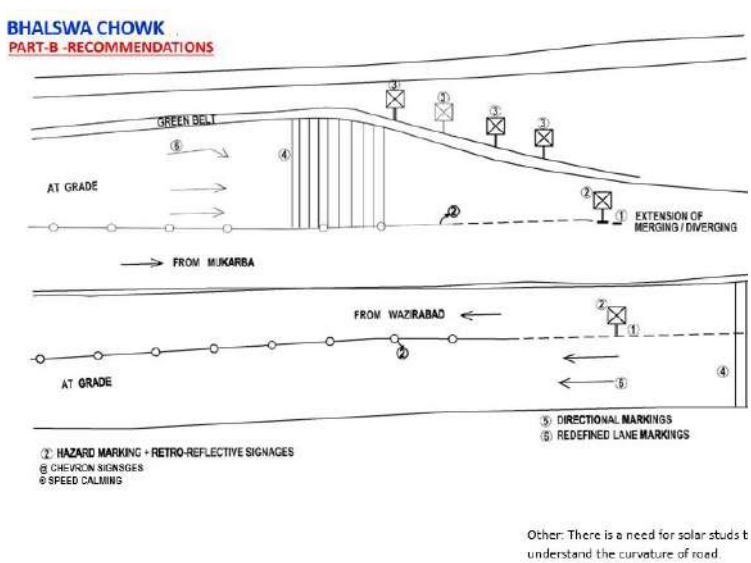
Day Night Wise		
Day-Night	Fatal	Total
Day	6	16
Night	1	5

ISSUES

- Zebra crossing at wrong locations.
- Absence of speed calming measures near the round about as its leading collision issues.
- No dedicated space for Hawkers and vendors near the slip lanes.
- IPT line up around all left turns.
- Bus stop to be proposed closer to the intersection.
- Wide carriageway leads to ambiguity of movement; thereis no lane markings.
- Absence of refuge islands for pedestrians.
- Absence of vertical signages and carriageway markings.
- Conflict point due to sudden merging/ diverging of traffic.
- Sudden change in geometry; absence of warning signages.
- Absence of road studs/ delineators to differentiate between flyover and at grade approach at night.
- High speed traffic; absence of speed calming measures.
- Absence of chevron signages.

PROPOSALS/RECOMMENDATIONS





GANDHI VIHAR BUS STAND

Top Offending Vehicles		
Vehicle At Fault	Fatal	Total
Delivery Van	1	1
HTV/Goods	1	1
Tractor	1	1
Unknown vehicle.	4	12

Top Victims		
Victims	Fatal	Total
Pedestrian	1	4
Scooter/M.Cycle	5	17
TSR	1	2

Day Night Wise		
Day-Night	Fatal	Total
Day	2	13
Night	5	12

ISSUES

Sothern Carriageway

- The sub-way entry/ exit is at very low and slopy gradient.
- There is no dedicated lane for autos stand, which is blocking the traffic movement.
- There is no dedicated space for bus stops.
- There is poor road geometry observed from the minor lane entering on National Highway.

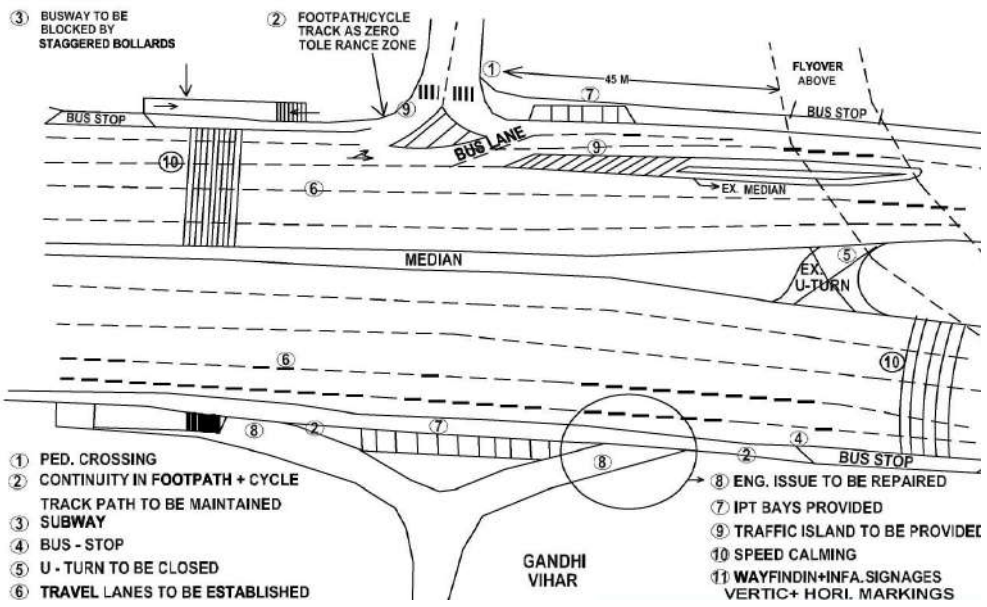
Around Petrol/CNG Pump

- There are multiple entry/exit for petrol pumps on the national highway.
- The u turn in front of the petrol pump is leading to wrong side traffic movement.
- The u turn in front of the petrol pump is leading to wrong side traffic movement.

Nothern Carriageway

- No dedicated space for bus stop.
- No dedicated lane for autos stand, which is blocking the traffic movement.
- Subway is being used by two-wheelers, which is causing conflict point.
- The vehicles approaching the minor lane have poor vision because of: poor road geometry and encroachment of the hawking area.
- Greenbelt segregation
- There is poor road geometry observed.

PROPOSALS/RECOMMENDATIONS



- There should be pedestrian crossings and subways.
- There should be continuity in footpath & cycle track.
- There is need of regulated bus stops.
- Unnecessary U-Turn needs to be closed.
- IPT bays should be provided.
- Traffic island should be provided.
- There is need of service lane in front of petrol pump.

DHAULA KUAN

Top Offending Vehicles		
Vehicle At Fault	Fatal	Total
Bus Other	1	2
Car Pvt	1	2
HTV/Goods	1	3
Unknown vehicle	5	7

Top Victims		
Victims	Fatal	Total
Pedestrian	3	5
Scooter/M.Cycle	4	7

Day-Night Wise		
Day-Night	Fatal	Total
Day	5	8
Night	3	9

ISSUES






- There is lack of visibility at Spiltter island.
- There are conflicts due to merger of traffic.
- The subways are in dilapidated conditions.
- There is lack of signages at the intersection.
- The escalators on the foot over bridge are not working.
- Autos at the metro exit, crosses the high speed traffic across the carriageway to take right turn.
- Autos and cabs are being parked along the carriageway.

PROPOSALS/RECOMMENDATIONS

- The gore area should be more visible and protected with reflective tape and hazard markers to alert the users for diversion of traffic.
- The merging lane should be re-designed to avoid conflict at merging points.
- The user information and signages should be added at the intersection for timely action taken.
- There should be adequate light, ventilation and cameras in the subway so that it becomes more accessible and safe.

MAYAPURI CHOWK

Top Offending Vehicles		
Vehicle At Fault	Fatal	Total
Car Pvt	1	2
HTV/Goods	2	4
Scooter/M. Cycle	1	2
Unknown vehicle	4	6

Top Victims		
Victims	Fatal	Total
Pedestrian	2	5
Scooter/M.Cycle	5	9
Tempo	1	1

Day Night Wise		
Day-Night	Fatal	Total
Day	2	5
Night	6	11

ISSUES



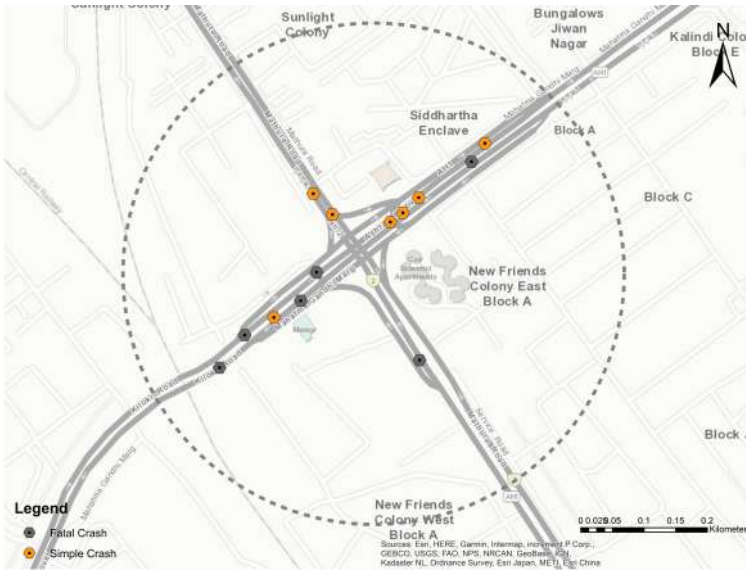



- There is long walking distance on the intersection for the pedestrians.
- Pedestrian crossings are encroached by vehicles.
- Pedestrian crossing is ending up on the carriageway, there is insufficient space on the refuge islands.
- The footpaths are encroached and dilapidated.
- There is absence of chevron marking at diverging points and speed calming measures are missing
- The area has insufficient lightning during night time.

PROPOSALS/RECOMMENDATIONS

- The illegal encroachments should be removed to make pedestrian friendly intersections.
- The intersection should be compact and it should have continuous footpaths and pedestrian crossings with regular refuge islands for safe pedestrian landings.
- There should be speed calming measures with necessary chevron markings and reflective measures to alert vehicle users of upcoming diversions.
- The street lights should be added more to avoid dark spots at intersections and make it safe during night.

ASHRAM CHOWK



Top Offending Vehicles		
Vehicle At Fault	Fatal	Total
HTV/Goods	2	2
Scooter/M. Cycle	1	2
Tempo	1	1
Trailer/Container	1	1
Unknown vehicle	2	7

Top Victims		
Victims	Fatal	Total
Pedestrian	2	5
Scooter/M.Cycle	4	7
Self	1	1

Day Night Wise		
Day-Night	Fatal	Total
Day	1	4
Night	6	10

ISSUES






- There is heavy traffic due to ongoing construction of Ashram Flyover.
- The turning radius on intersections is less which causes disturbance in traffic.
- Demarcation such as chevron markings and signanges are missing at the merging points.
- The infrastructure for bus stops is insufficient.
- Footpaths are being used by two-wheelers, which creates obstruction for pedestrians.

PROPOSALS/RECOMMENDATIONS

- There is a need to improve the turning radius and island correction for better movement of heavy vehicles.
- There should be directional and advanced signages for better user information at the intersection.
- The hazard markers and chevron marking should be there at merging and demerging points.
- Due to unavailability of proper infrastructure at bus stop, people stand on carriage way and hence blocking the vehicle movement and causing risk to their lives, therefore the bus stand should be made with shaded seating space and user information.

PUNJABI BAGH CHOWK

Top Offending Vehicles		
Vehicle At Fault	Fatal	Total
Bus DTC	1	1
HTV/Goods	1	3
Scooter/M. Cycle	1	1
TSR	1	1

Top Victims		
Victims	Fatal	Total
Delivery Van	1	1
Pedestrian	3	4
Scooter/M.Cycle	2	8

Day Night Wise		
Day-Night	Fatal	Total
Day	1	2
Night	6	13

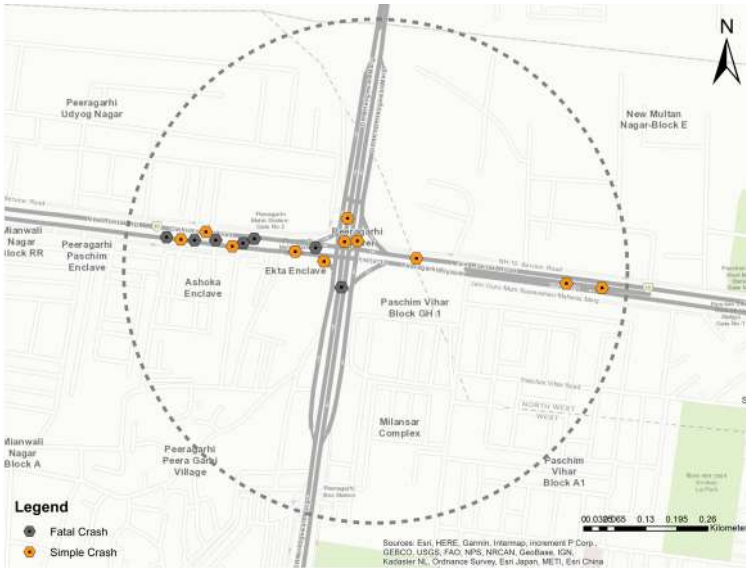
ISSUES

- The condition of footpaths and subways are dilapidated, which results in pedestrians using carriageway.
- The subways are inaccessible.
- The lack of road markings and barriers poses a significant safety hazard on road.
- There are no directional signage on roads.
- There are multiple conflict points on juction.

PROPOSALS/RECOMMENDATIONS

- There is a need to revamp the subway condition to make it accessible for pedestrians.
- There should be reflective lane marking and signages to alert the user of the upcoming movement and hazards.
- The user information including all signage should be installed as per IRC standards.
- There is a need for geometry correction to make the merging and demerging points safer.

PEERAGARHI CHOWK



Top Offending Vehicles		
Vehicle At Fault	Fatal	Total
Crane	1	1
HTV/Goods	2	3
Scooter/M. Cycle	1	2
Trailer/Container	1	1
Unknown vehicle	2	8

Top Victims		
Victims	Fatal	Total
Pedestrian	4	8
Scooter/M.Cycle	2	5
Self	1	1

Day Night Wise		
Day-Night	Fatal	Total
Day	4	11
Night	3	5

ISSUES



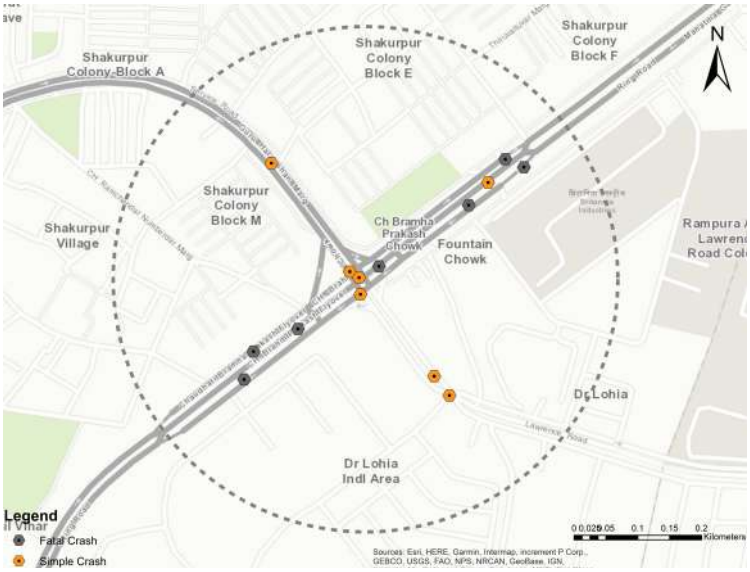



- There is ecroachment on carriageway by autos.
- There is lack of pedestrian facilities.
- The footpaths in the area are in dilapidated condition.
- The carriageway is encroached by abutting property owners.

PROPOSALS/RECOMMENDATIONS

- There is a need for removal of encroached vending zones and shops from footpaths and carriageways.
- The intersection should be made pedestrian friendly with a continuous safe walkway.
- The footpaths should be made continuous and universally accessible.
- A designated space should be provided for autos, bus and taxi stands.

BRITANNIA CHOWK

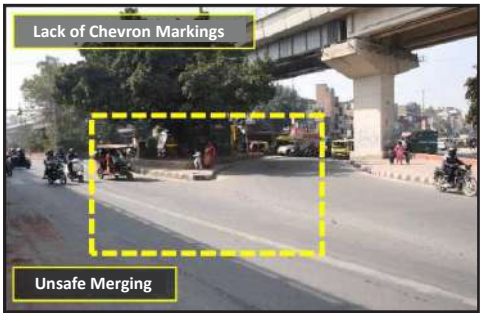


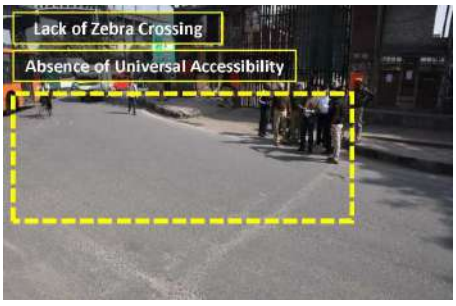
Top Offending Vehicles		
Vehicle At Fault	Fatal	Total
Car Pvt	1	3
HTV/Goods	1	2
Unknown vehicle	5	7

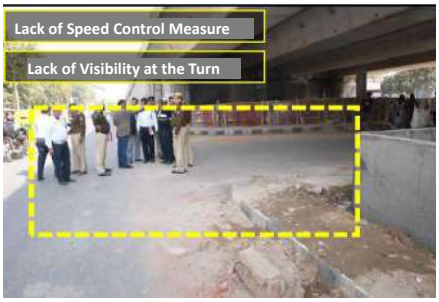
Top Victims		
Victims	Fatal	Total
Pedestrian	5	9
Scooter/M. Cycle	2	2

Day Night Wise		
Day-Night	Fatal	Total
Day	3	7
Night	4	7

ISSUES







- There is discontinuity in footpaths.
- The footpaths in the area are in dilapidated condition.
- There is lack of speed control measures at the intersection. road signages and indicators,
- Visibility at turns is absent
- There is lack of zebra crossings, chevron markings, road markings and barriers
- Unsafe merging at certain location has been observed

PROPOSALS/RECOMMENDATIONS

- There should be continuous footpaths for safe pedestrian movement.
- The intersection should be protected with speed calming measures with necessary signages and reflective measures.
- The edges of islands should be protected with chevron markings and hazard markers.

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भारत 2023 INDIA

BIG RESPONSIBILITY, BIGGER AMBITIONS

SHRI. NARENDRA DAMODARDAS MODI

PRIME MINISTER OF INDIA

PREPARED BY:

TRAFFIC POLICE
DELHI

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