DELHI ROAD CRASH REPORT 2023

ROAD CRASH RESEARCH CELL- TRAFFIC

SAFE SUSTAINABLE TRANSPORTATION

YOUR NECESSITY, OUR PRIORITY

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FOREWORD

As per previous years, the Delhi Traffic Police is going to publish 'Delhi Road Crash Report - 2023' as a reflection of our commitment towards enhancing road safety in the National Capital.

The strategic goal that we have set for ourselves is to reduce the crash fatalities, incrementally, every year on Delhi roads. While there has been a subtle decline in percentages, with 21.03% fatality rate in 2023 as against 21.93% in 2022, there is a long way to go before we can achieve the targets that we have set for ourselves.

It is worthwhile mentioning here that as per Global Plan of Action for the United Nations Decade of Road Safety 2021-2030, the objective is to halve road traffic deaths by 2030.

It needs to be kept in mind that the Traffic Police is, at best, one of the constituent contributors towards the larger road safety ecosystem, with its primary role being regulation and enforcement. However, the Delhi Traffic Police undertakes significant efforts towards Road Safety Education, provides assistance in Emergency Response and closely coordinates with the concerned Civic Agencies in providing policy inputs meant to improve Road Engineering. Attendant to the economic vibrancy of the national capital is the consistent rise in the number of vehicles on our roads; a growth which far outpaces capital intensive and long gestation road infrastructural projects. The enforcement data provides corroboration to this aspect of a Traffic Policeman's everyday life.

The Road Crash Research Cell of Delhi Traffic Police conducts a thorough, empirical research every year to publish the 'Delhi Road Crash Report' and the publication this year also is a testament to the professional acumen of the Traffic Management Division. A new section incorporating relevant provisions of Bhartiya Nyaya Sanhita (BNS), relating to road safety, has been added which will enlighten the readers about the new laws that came into effect from 1st July 2024.

I extend my heartfelt appreciation to the personnel of Delhi Traffic Police for the untiring services they offer to our citizenry on a 24X7X365 basis and I am sure this publication will be well received by all the intended stakeholders with whom we are working, in a committed manner, to realise our objectives.

Sanjay Arora, IPS
Commissioner of Police
Delhi

PREFACE

An efficient traffic management system is not restricted to regulation and enforcement only. It is an ecosystem that comprises engineering, education, emergency services, and most importantly, the elimination of road deaths. The task at hand for the Delhi Traffic Police while managing traffic on Delhi roads is to work towards reducing fatalities that occur due to road crashes. Delhi Traffic Police is tirelessly working towards achieving zero fatality on roads and is taking all measures to achieve this objective.

Annual report on crashes on Delhi roads is released by the Delhi Traffic Police's Road Crash Research Cell. The goal is to thoroughly investigate the reasons and develop significant, long-lasting remedies. The eighth greatest cause of deaths worldwide is traffic crashes. It calls for increased awareness and coordinated action from all the stakeholders. It necessitates a vigorous effort on our part to create a strong infrastructure.

Delhi is bracing itself up for an **Intelligent Traffic Monitoring System**, which will prove to be a major game changer. It will enhance surveillance without much human interaction, thereby bringing the violator to book and reducing the frequency of dangerous violations like over-speeding, red light jumping, etc. It will serve as a deterrent for violators indulging in glaring violations on the roads.

I sincerely hope that this report would be of great help to policymakers and civic agencies in devising strategies for creating a safer road environment encompassing all categories of road users, thereby minimising the incidents of road deaths.

AJAY CHAUDHRY, IPS
Special Commissioner of Police
Traffic Management Division- Zone - II

PREFACE

Road traffic fatalities are considered to be preventable, unlike other disasters. It is the responsibility of every stakeholder and citizen to do their bit to prevent road crashes. In fact, each and every small step towards reducing road crashes and deaths is a contribution to the economy because the economic losses arising out of road crashes and the burden that they cause on the household and the family members of the victim leave a scar for life. The trauma associated with a road crash has far-reaching consequences not only for the victims but also for their family members and the nation as a whole.

For every country, whether it is developed or not, safe road infrastructure is a necessity and not a luxury. Hence, roads must be properly planned, designed, constructed; operated to accommodate and safeguard every unit involved in multimodal transportation. A real-time safety network and infrastructure are essential to cater to the needs of common pedestrians, cyclists, slow-moving vehicles, fast-motorized vehicles, heavy vehicles, etc.

On the basis of the study and analysis of crashes made by the Road Crash Research Cell and the suggestions for interventions made by the expert team, Delhi Traffic Police devises strategies to reduce crashes, such as affixing speed calming strips, placing nose protection at flyovers, increasing deployment and enforcement, improvisation in road engineering, the installation of CCTV cameras (RLVD and OSVD), etc., to reduce the number of crashes.

I hope that this "Delhi Road Crash Report 2023" will be extremely beneficial to each one of us in understanding the crash scenario and causes thereof, as well as the road safety status, so as to take concerted action for realisation of the objective of making Delhi roads safer. The report is also available in PDF format on our website, www.delhitrafficpolice.nic.in.

K. JEGADESAN, IPS
Special Commissioner of Police
Traffic Management Division- Zone- I

List of Abbreviations

ABS	*Anti-Lock Braking Systems*
ACP	*Assistant Commissioner of Police*
BIS	*Bureau of Indian Standards*
CCTV	*Closed-Circuit Television*
CPZ	*Crash Prone Zones*
CP	*Connaught Place*
CMVR	*Central Motor Vehicle Rules*
DCP	*Deputy Commissioner of Police*
DTP	Delhi Traffic Police
DTC	*Delhi Transport Corporation*
DDA	*Delhi Development Authority*
DMRC	*Delhi Metro Rail Corporation*
DSIIDC	*Delhi State Industrial and Infrastructure Development Corporation Ltd*
E-Rickshaw	*Electric Rickshaw*
EXTN	*Extension*
FOB	*Foot Over Bridge*
GIS	*Geographic Information Systems*
GNCTD	*Government Of National Capital Territory of Delhi*
G-SEWA	*Gramin Sewa*
HTV	*Heavy Transport Vehicles*
ISBT	*Inter State Bus Terminal or Inter-State Bus Terminus*
ISBT K Gate	*Inter State Bus Terminal or Inter-State Bus Terminus Kashmiri Gate*
ITI	*Industrial Training Institute*
MoRTH	*Ministry Of Road Transport And Highways*
M/Cycles	*Motorcycles*

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MC	*Motorcycles*
Mr	*Marg*
MV ACT	*Motor Vehicles Act*
MMV	*Mechanic Motor Vehicle*
NCAP	*New Car Assessment Programs*
NCRB	*National Crime Records Bureau*
NCT	*National Capital Territory*
NCR	*National Capital Region*
NH	*National Highway*
NDMC	*New Delhi Municipal Corporation*
LGV	*Light Goods Vehicle*
OSVD	*Over Speed Violation Detection*
PWD	*Public Works Department*
PSV	*Public Service Vehicle*
RD	*Road*
RLVD	*Red Light Violation Detection*
RTV	*Rough Terrain Vehicles*
SC	*Scooters*
SC/MC	*Scooters/Motorcycles*
Sgt Nagar	*Sanjay Gandhi Transport Nagar*
TSR	*Three-Seater Auto Rickshaws*
VRU	*Vulnerable Road Users*
WHO	*World Health Organization*

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INTRODUCTION

I. INTRODUCTION

1.1 Introduction

Road crashes, often referred to as traffic crashes or collisions, are incidents involving vehicles that result in damage to property, injuries or fatalities. These events occur on roadways and can involve various types of vehicles including HTVs/goods vehicles, cars, motorcycles, bicycles and pedestrians.

Road crashes are almost inevitable in our lives and they affect us in many aspects. Road crashes can have devastating effects on individuals, families, and communities. Some of the common effects of road crashes include physical injuries, emotional trauma, loss of life, financial burden, disability and reduced mobility, impact on families, social and economic impact.

The causes of road crashes are multifaceted and often involve a combination of multiple factors. Some common causes include like over-speeding, distracted driving, reckless driving, weather conditions, poor road condition, vehicle defects, poor visibility, driving under the influence of alcohol, drugs or medications, driver fatigue, and non-use of safety belts, child restraints and helmets.

The rising demand for mobility is set to overwhelm transport systems, with a growing and increasingly urban global population, particularly those that rely heavily on private vehicles. Yet many countries continue to design and build their mobility systems for motor vehicles, not for people, and not with safety as the main concern, which could slow down efforts to save lives and to protect vulnerable road users. Some of the greatest gains have been made where the safe system approach to road safety (which puts people and safety at the core of mobility systems) is most widely applied.

Adopting the safe system approach emphasizes the importance of system designs that facilitate safe road use, laws governing road user behaviours that are essential to the prevention of crashes, injuries, and deaths. The design and operation of the road transport system therefore takes account of these behaviours through a combination of legislation, enforcement and education.

Road user behaviours are also greatly influenced by vehicle safety features and road infrastructure design, which should take into account the needs of all road users and be implemented in a way that is intuitive and easy to understand, and which ensures that the easiest, most obvious actions are the safest.

1.2 Global Trend on Road Crashes

There were an estimated 1.19 million road traffic deaths in 2021 – a 5% drop when compared to the 1.25 million deaths in 2010. More than half of all United Nations Member States reduced road traffic deaths between 2010 and 2021. The slight overall reduction in deaths occurred despite the global motor vehicle fleet more than doubling, road networks significantly expanding, and the global population rising by nearly a billion. This shows that efforts to improve road safety are working but fall far short of what is needed to meet the target of the United Nations Decade of Action for Road Safety 2021–2030 to halve deaths by 2030.

Road traffic deaths and injuries remain a major global health and development challenge. As of 2019, road traffic crashes are the leading killer of children and youth aged 5 to 29 years and are the 12th leading cause of death when all ages are considered. Two-thirds of deaths occur among people of working age (18–59 years), causing huge health, social and economic harm throughout society.

More than half of the fatalities are among pedestrians, motorcyclists and cyclists. Occupants of four-wheel vehicles account for almost one-third of fatalities. Occupants of vehicles carrying more than 10 people, heavy goods vehicles and "other" users constitute one-fifth of all deaths. Micro-mobility modes such as e-scooters account for 3% of deaths.

Vulnerable road users such as pedestrians, cyclists and motorcyclists remain dangerously exposed. Nearly 80% of all roads assessed do not meet a minimum 3-star rating for pedestrian safety, and as cyclist fatalities increase, just 0.2% of all roads assessed have cycle lanes.

Nine in 10 deaths occur in low- and middle-income countries, while people in low-income countries continue to face the highest risk of death per population. Globally, 28% of all fatalities occur in the WHO South-East Asia Region, 25% in the Western Pacific Region, 19% in the African Region, 12% in the Region of the Americas, 11% in the Eastern Mediterranean Region, and 5% in the European Region.

KEY FACTS FROM WHO: GLOBAL STATUS REPORT ON ROAD SAFETY-2023

- There were an estimated 1.19 million road traffic deaths in 2021; this corresponds to a rate of 15 road traffic deaths per 1,00,000 population.
- As of 2019, road traffic injury remains the leading cause of death for children and young people aged 5–29 years and is the 12th leading cause of death when all ages are considered.
- Globally, four-wheel vehicle occupants represent 30% of fatalities; followed by pedestrians who make up 23% of fatalities; and powered two- and three-wheeler users who make up 21% of fatalities.
- Cyclists account for 6% of fatalities while 3% of deaths are among users of micro-mobility devices such as e-scooters.

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- 92% of deaths occur in low- and middle-income countries.
- The risk of death is three times higher in low-income countries than high-income countries despite these countries having less than 1% of all motor vehicles.
- Globally, the number of road traffic deaths has fallen 5% since 2010.
- The global fatality rate per 1,00,000 population has fallen 16% since 2010 when set against the 13% rise in global population.
- The global fatality rate per 1,00,000 vehicles has fallen 41% since 2010 when set against the 160% increase in the global motor vehicle fleet.
- The global share of fatalities has fallen 1% among four-wheel vehicle users and 2% among two- and three-wheeler users since 2010 but has risen from 5% to 6% among cyclists.

(Source: WHO: Global status report on road safety 2023)

1.3 National Trend on Road Crashes

According to MoRTH report in the year 2022, a total number of 4,61,312 road crashes have been reported in the country, claiming 1,68,491 lives and causing injuries to 4,43,366 persons. Unfortunately, the worst affected age group in road crashes is 18-45 years, which accounts for about 66.5% of total road crash deaths. The number of road crashes in 2022 increased by 11.9% on an average compared to the previous year of 2021. Similarly, the number of deaths and injuries on account of road crashes increased by 9.4% and 15.3%, respectively.

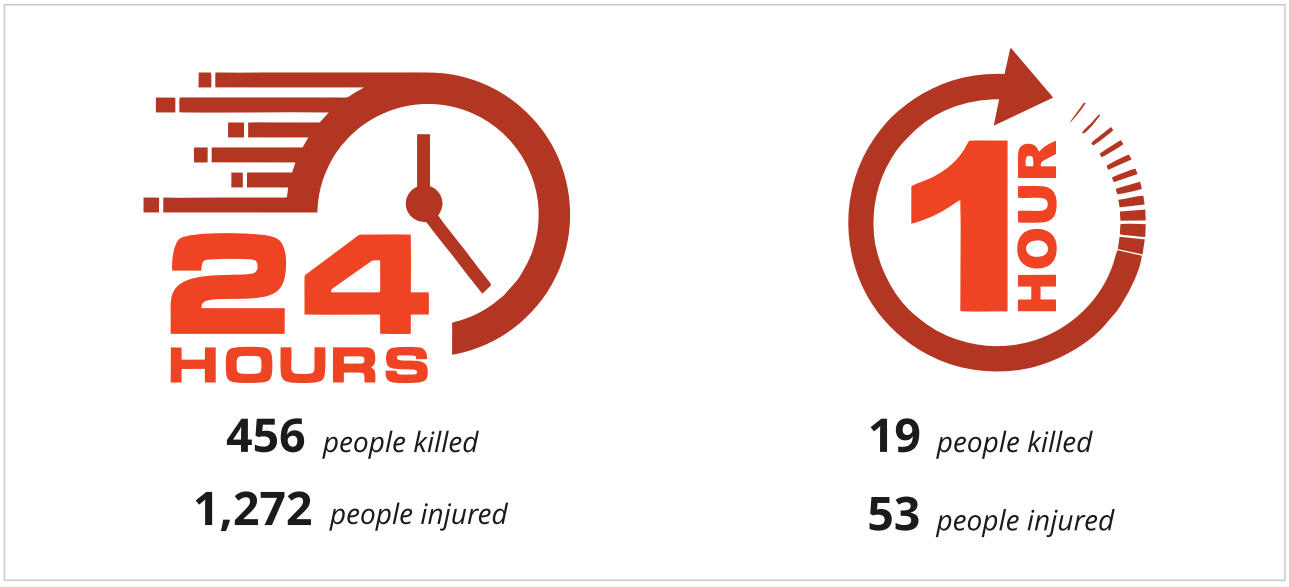


Figure 1.1 Crashes and fatalities on Indian roads

Table 1.1: Total number of road crashes, fatalities and persons injured during 2017 to 2022

Year	Road Crashes	% Change over previous period	Fatalities	% Change over previous period	Persons Injured	% Change over previous period
2017	4,64,910	-	1,47,913	-	4,70,975	-
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
2022	4,61,312	11.9	1,68,491	9.4	4,43,366	15.3

(Source: Road Accidents in India 2022: Ministry of Road Transport and Highways)

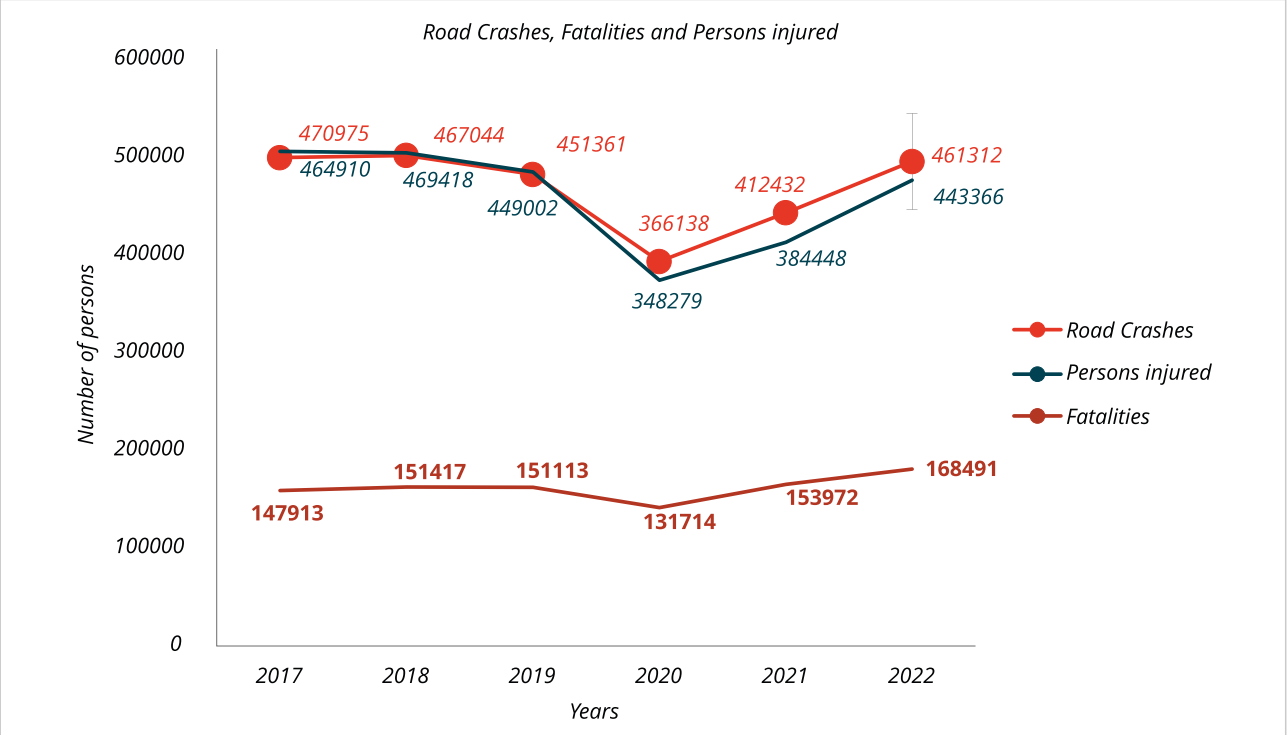
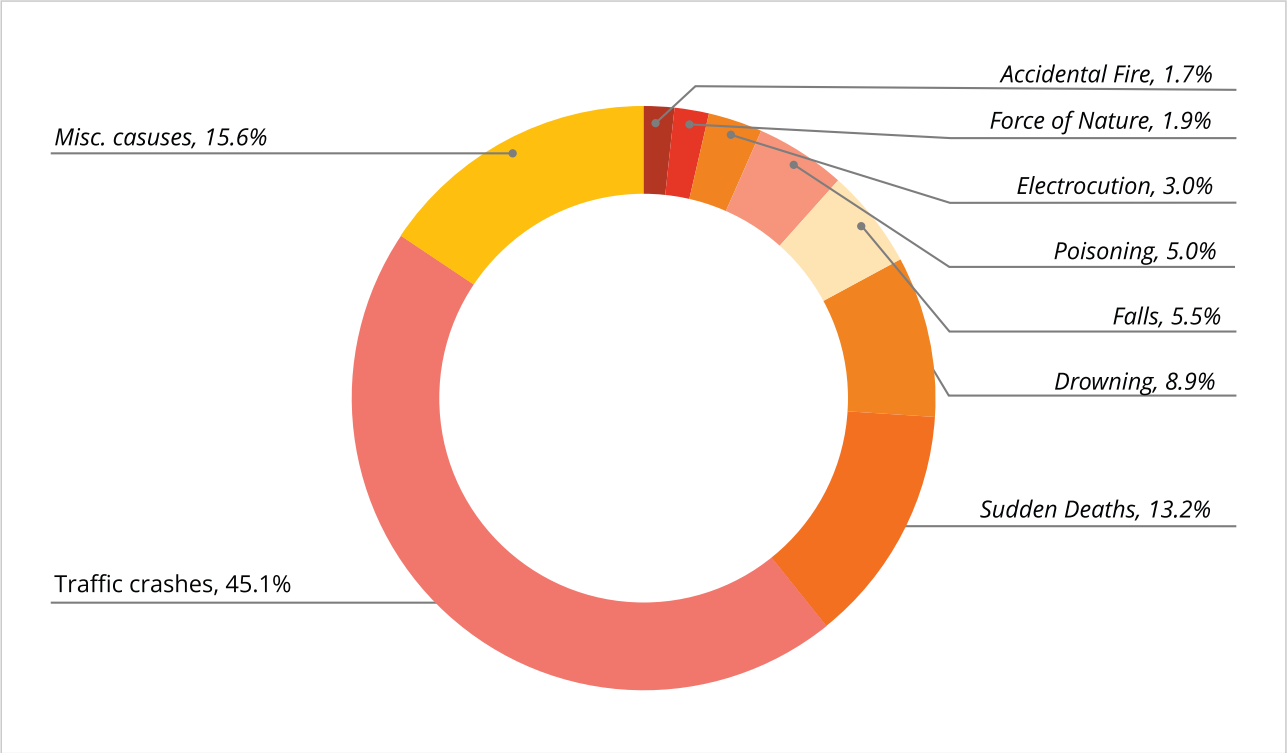


Figure 1.2 Trend of road crashes in India -2017-2022

Based on the 2022 data from the National Crime Records Bureau (NCRB), traffic crashes accounted for the highest proportion of fatalities, representing 45.1% 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.



(Source NCRB: Accidental Deaths and Suicide in India-2022)

Figure 1.3 Percentage share of Various Major Causes of Accidental Deaths during 2022 (Force of Nature and Other causes)

Road Crashes in Million-plus Cities in India

Total number of road crashes and number of persons killed in million-plus cities registered a significant increase. The incidence of road crashes had recorded an increase of 14% in 2022 compared to 2021. Among all million-plus cities in India, Delhi reported the highest number of road crashes death (1461) followed by Bengaluru (772) and Jaipur (765) in 2022. These cities' share of total fatalities is 8.55%, 4.52% and 4.48% respectively. Among all states/ UTs, Delhi ranked 19th in terms of persons killed in road crashes in 2022. Uttar Pradesh ranked 1st, followed by Tamil Nadu at 2nd in terms of road crash deaths in 2022.

1.4 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 flow on Delhi roads based on enforcement action, regulation, education and engineering. Economic development in the city along with increase in population has created pressure on the supporting systems like housing, infrastructure, and transportation. It has also led to increased demand for transportation, and thus, subsequently, to a phenomenal increase in the number of motor vehicles. The heterogeneity and magnitude of vehicle

population, unpredictability of human behaviour, economic constraints, insufficient road markings and signages, defective road designing, deficiencies in vehicle design are some of the factors leading to road crashes in Delhi. In addition to it, drink driving, over speeding, overloading, violation of traffic rules are the common causes of traffic crashes. In the 2023, a total of 5,834 road crashes were reported in Delhi, claiming 1,457 lives and causing injuries to 5,470 persons.

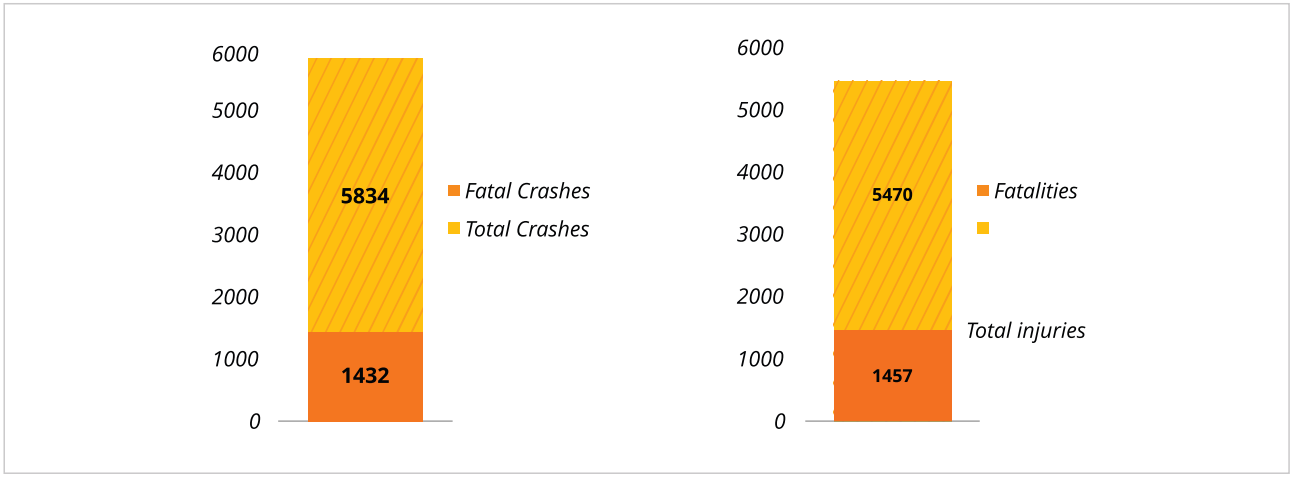
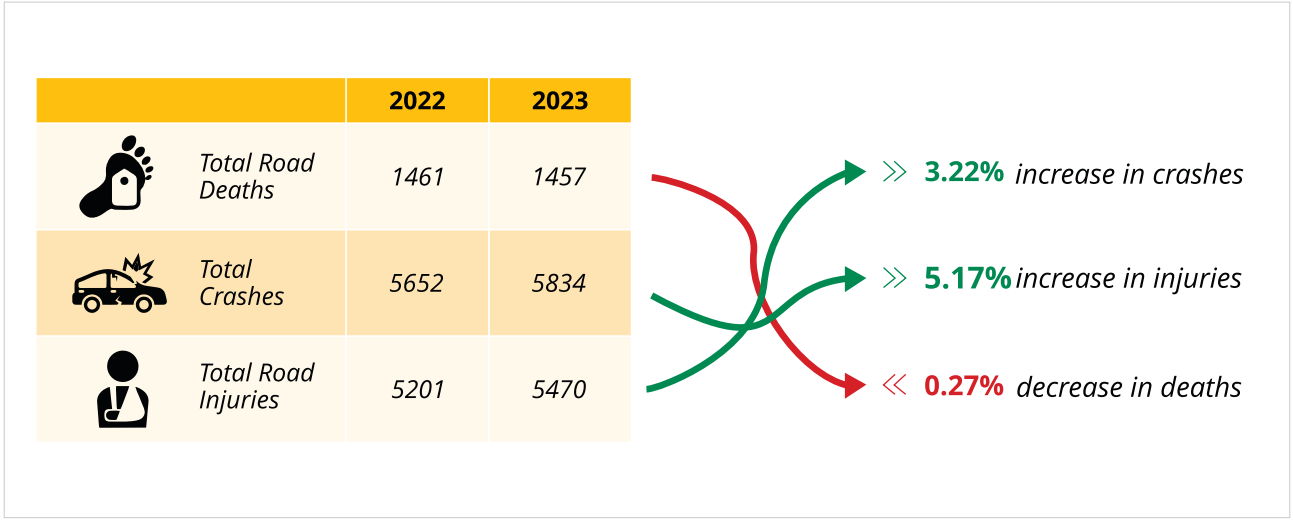


Figure 1.4 Delhi Crash Data 2023

The number of road crashes in Delhi in 2023 increased by 3.22% on an average compared to the previous year 2022. Similarly, the number of injuries from road crashes increased by 5.2 percent while the number of deaths decreased by 0.3 percent. On an average, 16 road crashes caused four deaths every day in Delhi.



	2022	2023
Total Road Deaths	1461	1457
Total Crashes	5652	5834
Total Road Injuries	5201	5470

Figure 1.5 Comparative Delhi Crash Data (2022-2023)

Pedestrians are the most vulnerable victims in road crashes. In 2023, share of pedestrian deaths in road crashes were 43% and motorized two-wheeler riders were the second most vulnerable victims account for 38% of total road crash deaths.

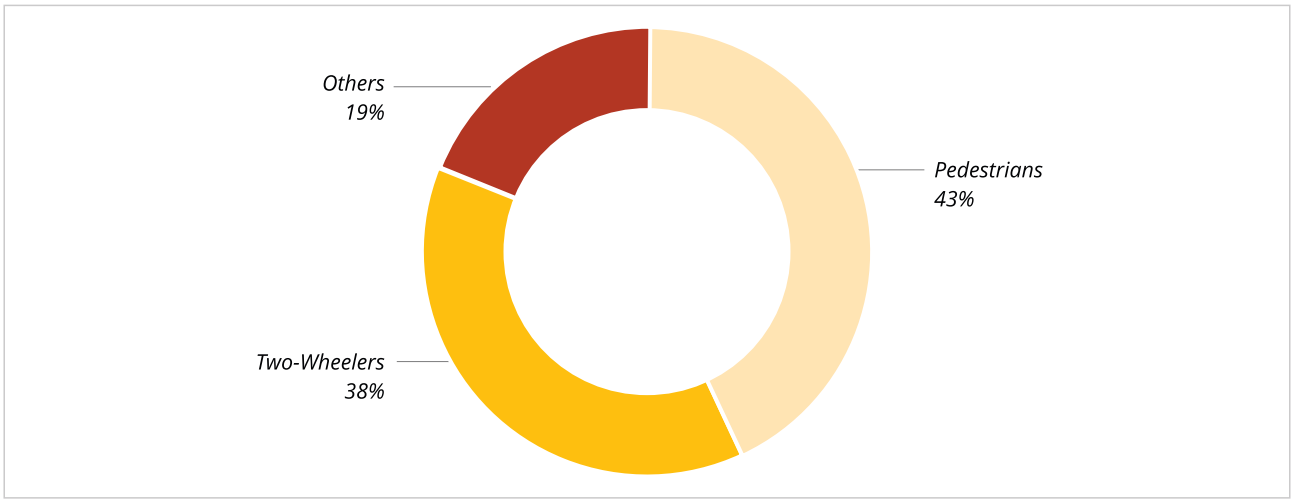


Figure 1.6 Composition of vulnerable victims in road crashes

In 2023, cars/taxis caused 190 fatal crashes accounting for 13.27% of total fatal crashes, Similarly HTVs also caused 190 fatal crashes accounting for 13.27% of total fatal crashes which were the highest crash share by vehicle type, two-wheelers come next with 155 fatal crashes (10.82% share) in 2023.

Crash classification as per day and night show that in 2023, 629 fatal crashes occurred during the day time whereas 803 occurred during the night time.

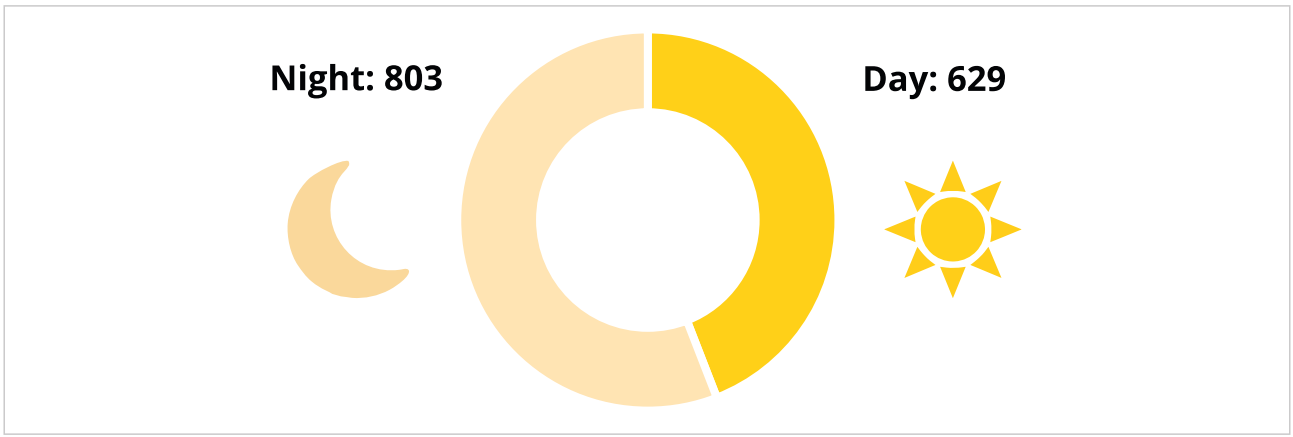


Figure 1.7 Comparison of fatal crashes during day and night 2023

The Delhi Traffic Police has made a spatial analysis of crash spots for the year 2023 to identify the clustering points or crash-prone zones in Delhi. 107 crash prone zones have been identified in the year 2023 as per the criteria of three or more fatal crashes within a radius of 500 meters or ten or more total road crashes in the same region. Top 10 spots having maximum fatal crashes are termed as Blackspots. The Ring Road (20), Outer Ring Road (17) and GT Karnal Road (14) have the maximum number of dangerous stretches.


QBA
BERCO'S
VINTAGE
PARK AVENUE
Clarks
LOUIS PHILIPPE
Levi's
PEDESTRIAN
CROSSING

DELHI
AT A GLANCE

II. 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 1,483 sq. km. and has a population of around 211.15 lakhs (Projected population of Delhi, 2023).

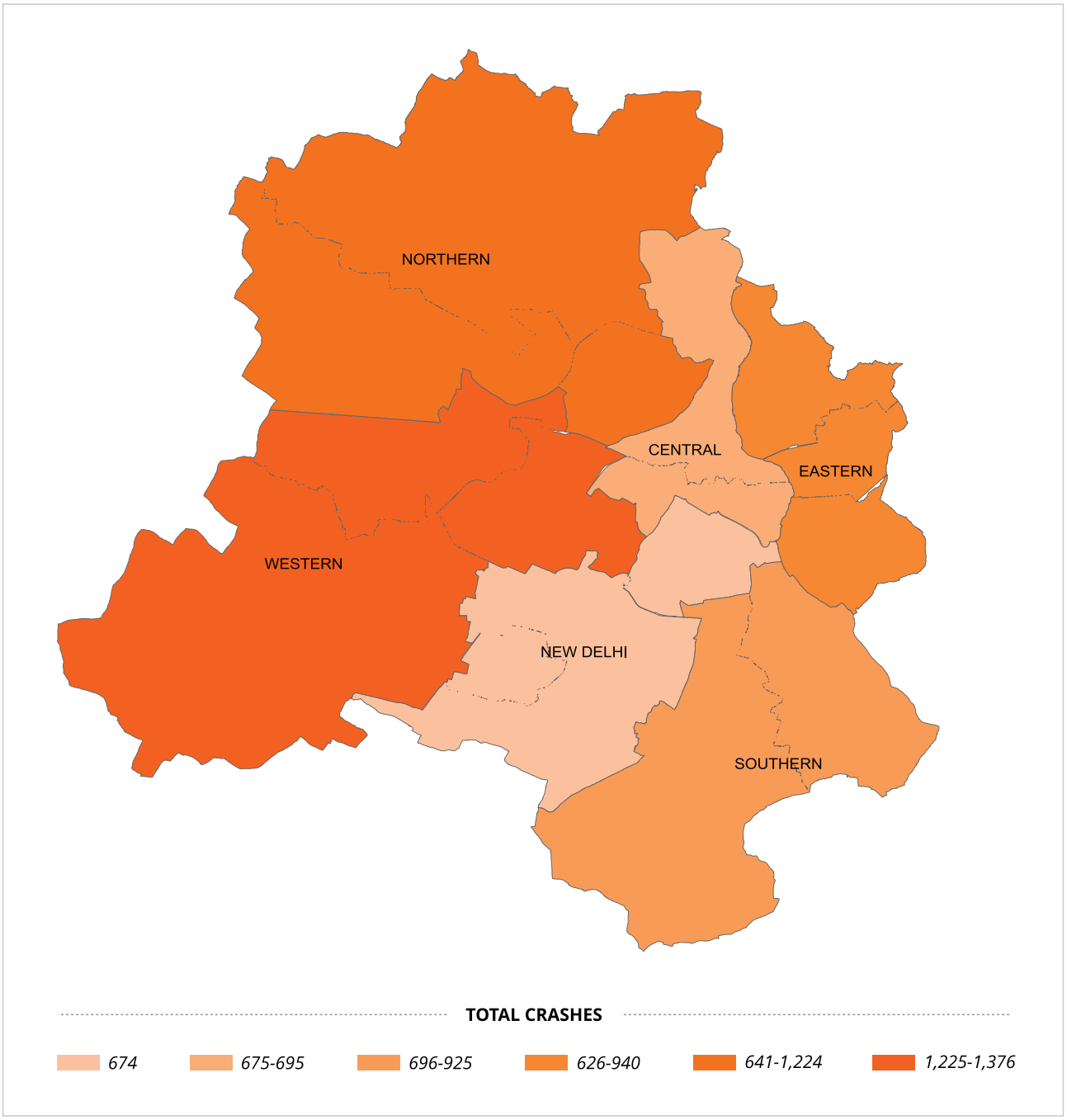
2.1 Demography

Over the years Delhi has witnessed massive 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 211.15 lakhs (approx.) in 2023, 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 Administrative Boundaries in Delhi

This report presents the crash data of Delhi, categorised into 6 traffic ranges, 15 districts, and 50 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.

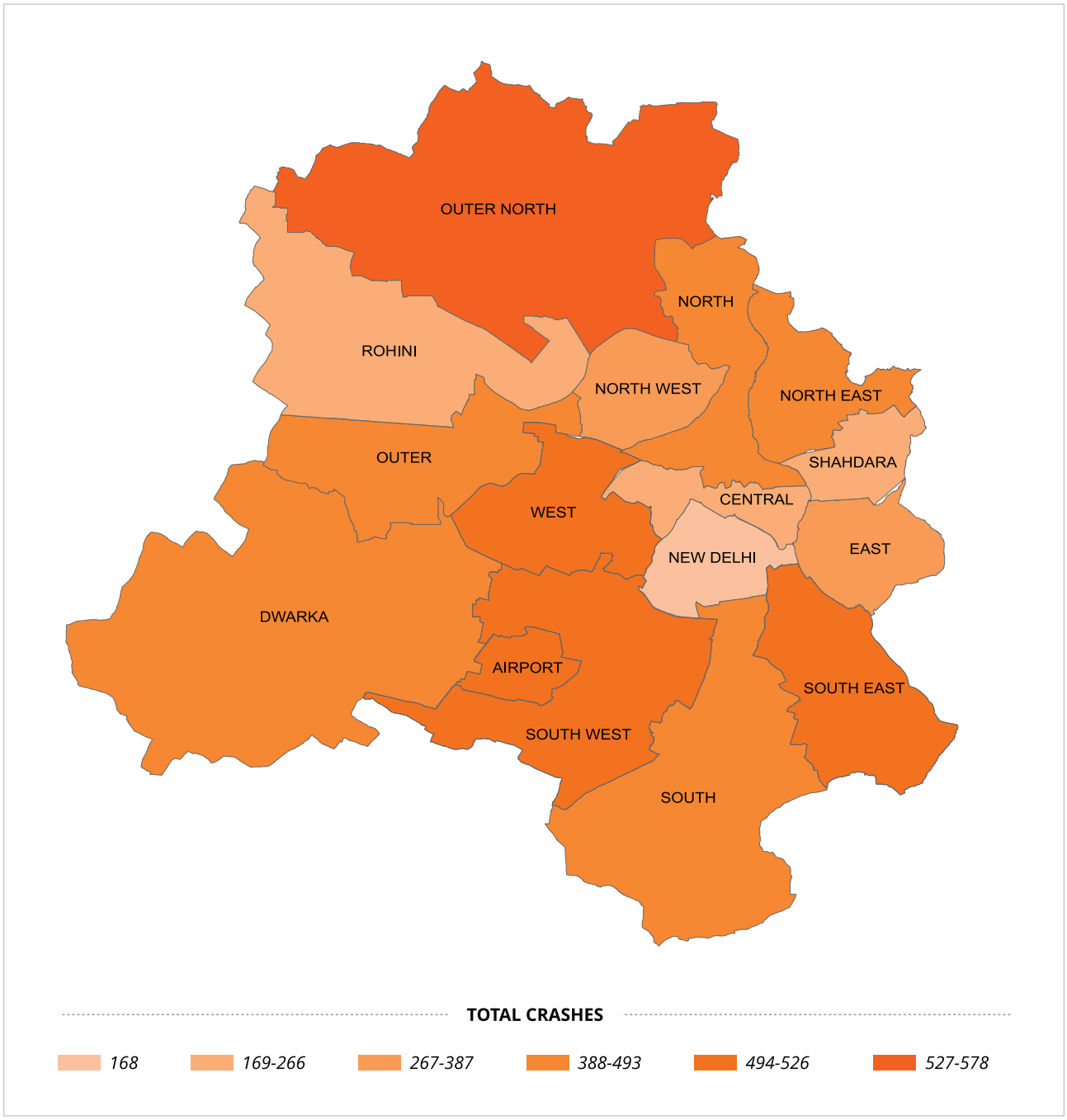
This visual representation assists in identifying high-risk zones, determining the effectiveness of existing road safety measures and prioritising interventions based on the specific needs of each administrative unit.



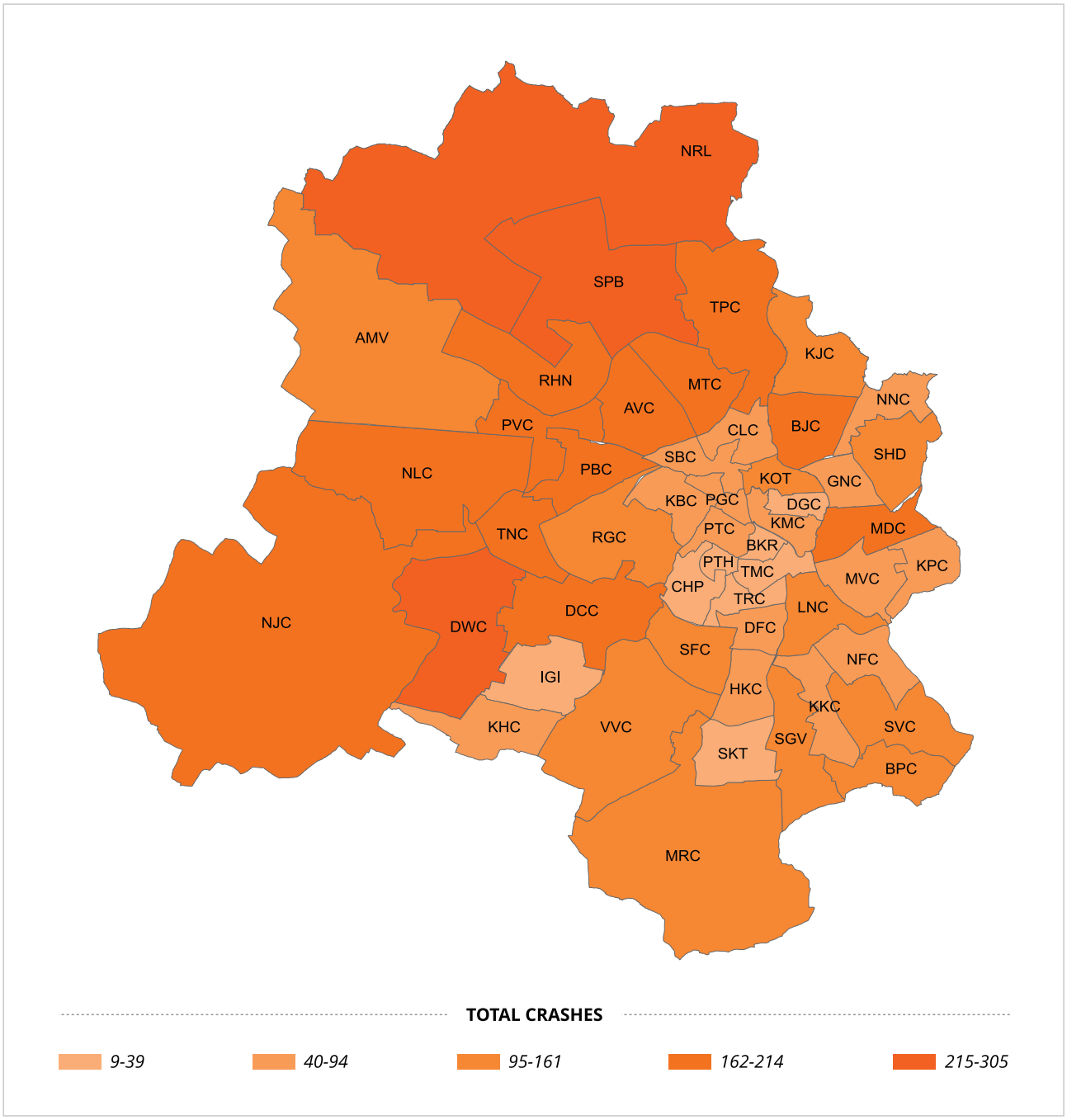
Map 2.1 Traffic ranges of Delhi

Traffic Unit of Delhi police was created in 1975 with the mandate of traffic regulations and enforcement of traffic rules. The unit started with 16 traffic circles, four ACPs and one DCP. Personnel from the Traffic Unit are deployed round-the-clock across the city for ensuring effective traffic management and enforcement of traffic rules.

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 districts 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, 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-44 (Earlier NH-1), NH-2, NH-48 (Earlier NH-8), NH-9 (Earlier NH-10) & NH-9 (Earlier 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.

The significant growth experienced due to rapid development and urbanisation in the National Capital Region has led to the development of satellite towns surrounding Delhi such as Noida, Gurugram, Rohtak, Manesar, Sonipat, and others. 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.

2.4 Vehicles in Delhi

There were over 79.45 lakh registered vehicles of all categories in Delhi in the year 2023. The yearly compounding growth of vehicular population for the year 2023 was 2.66%. The estimated total population of Delhi is 211.15 Lakhs at the end of the year 2023. Hence, the population density in Delhi is more than 14,238 persons per sq. km. Likewise, the per capita registered vehicles in Delhi comes close to one vehicle for every two persons in the city.

Although, the number of motor vehicles on Delhi roads has increased by approx. 21 times between 1981 to 2023, the road length has only doubled, from 15,487 km to 33,198 km, during the period. Thus, the vehicle density per Sq. km has increased manifold.

Private transport viz. private cars and two wheelers constitute 92.7% of all registered vehicles in Delhi. Buses of all categories, which are the major source of public transportation, constitute 0.21% 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, 2014-2023

Year	Private Cars	M/Cycle Scooters	Taxis	TSRs	Goods Vehicles Delivery Vans and Others	Buses (Mini, Pvt. And others)	Total Motor Vehicles
2014	26,29,343	52,97,697	78,686	91,840	1,54,654	40,947	82,93,167
2015	27,90,566	56,81,265	79,606	81,633	1,61,821	32,540	88,27,431
2016	29,86,579	61,04,070	91,073	1,98,137	2,81,159	43,723	97,04,741
2017	31,52,710	67,07,891	1,48,434	1,74,000	2,31,767	38,265	1,04,82,757
2018	33,34,298	71,85,033	1,56,793	1,88,173	2,71,017	39,273	1,12,04,277
2019	32,49,670	75,56,002	1,09,780	1,13,240	3,30,641	32,218	1,13,91,551
2020	33,11,579	79,59,753	1,22,476	1,14,891	3,50,876	33,302	1,18,92,877
2021	33,84,736	82,39,550	1,12,401	1,14,869	3,68,500	33,294	1,22,53,350
2022	20,57,657	51,35,821	85,079	92,149	3,51,381	17,282	77,39,369
2023	20,71,115	52,94,900	83,278	93,654	3,85,417	17,232	79,45,596

(Source : Delhi Statistical Handbook, 2023)

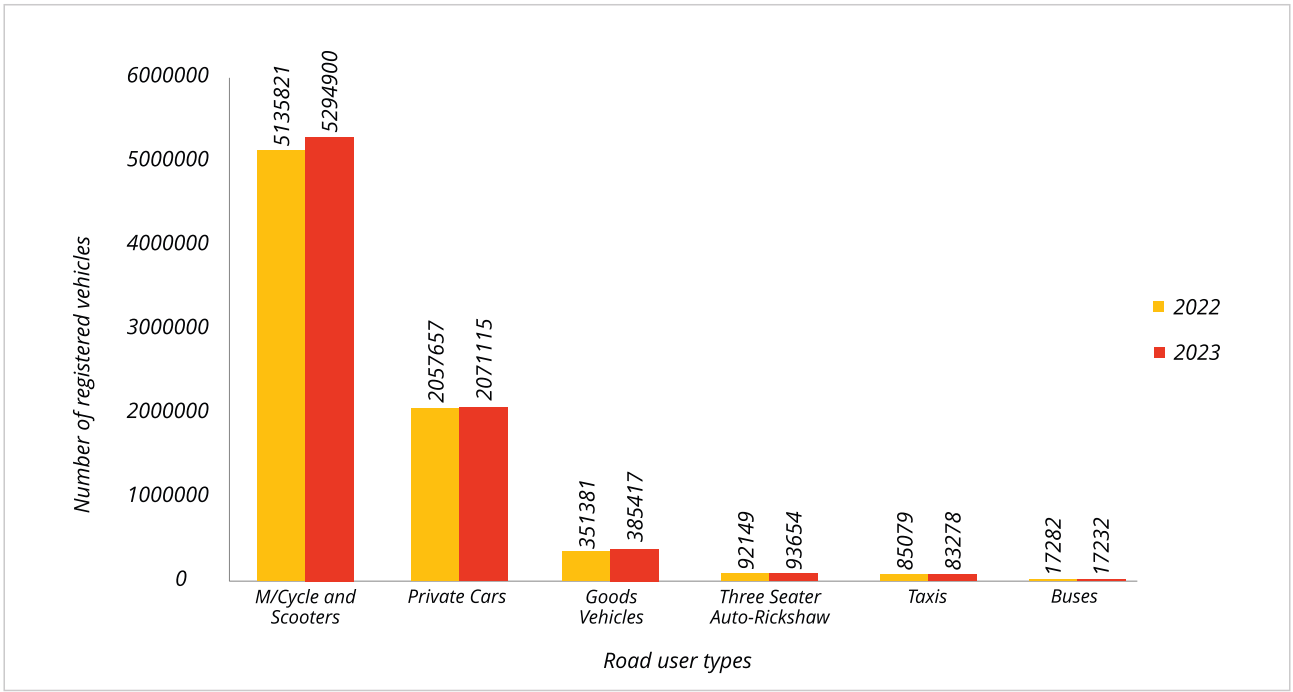


Figure 2.1 Total motor vehicles registered in Delhi 2022-2023

Capturing 66.63% vehicle share on Delhi roads, two-wheelers constitute a bulk of the vehicular traffic in the city. The private cars/jeeps constitute 26.06% share of total registered motorized vehicles. In other words, private vehicles constitute around 92 % of total registered vehicles in Delhi. In contrast, buses and Three-seater auto-riskshaw (TSRs) constitute only 0.21% and 1.17% of the total vehicles respectively.

Table 2.2: Growth/decline in motor vehicle registration, 2014-2023

Year	Private Cars	M/Cycles Scooters	Taxis	TSRs	Goods Vehicles Delivery Vans and Others	Buses (Mini, Pvt. And others	Total Motor Vehicles	Yearly Growth (%)
2014	*1,55,256*	*3,35,190*	*8,351*	*5,002*	*13,712*	*1,253*	*5,18,764*	*6.67*
2015	*1,61,223*	*3,83,568*	*920*	*(-)10,207*	*7,167*	*(-)8,407*	*5,34,264*	*6.44*
2016	*1,96,013*	*4,22,805*	*11,467*	*1,16,504*	*1,19,338*	*11,183*	*8,77,310*	*9.93*
2017	*1,66,131*	*6,03,821*	*57,361*	*(-) 24,137*	*(-) 49,392*	*(-) 5,458*	*7,78,016*	*8.01*
2018	*1,81,588*	*4,77,142*	*8,359*	*14,173*	*39,250*	*1,008*	*7,21,520*	*6.88*
2019	*-84,628*	*3,70,969*	*-47,013*	*-74,933*	*59,624*	*-7,055*	*1,87,274*	*1.67*
2020	*61,909*	*4,03,751*	*12,696*	*1,651*	*20,235*	*1,084*	*5,01,326*	*4.40*
2021	*73,157*	*2,79,797*	*-10,075*	*-22*	*17,624*	*-8*	*3,60,473*	*3.03*
2022	*-13,27,079*	*-31,03,729*	*-27,322*	*-22,720*	*-17,119*	*-16,012*	*-45,13,981*	*-36.83*
2023	**13,458**	**1,59,079**	**-1,801**	**1,505**	**34,036**	**-50**	**2,06,227**	**2.66**

Note: The increase and decrease is the increase/decrease of motor vehicle registrations as compared to the previous year.

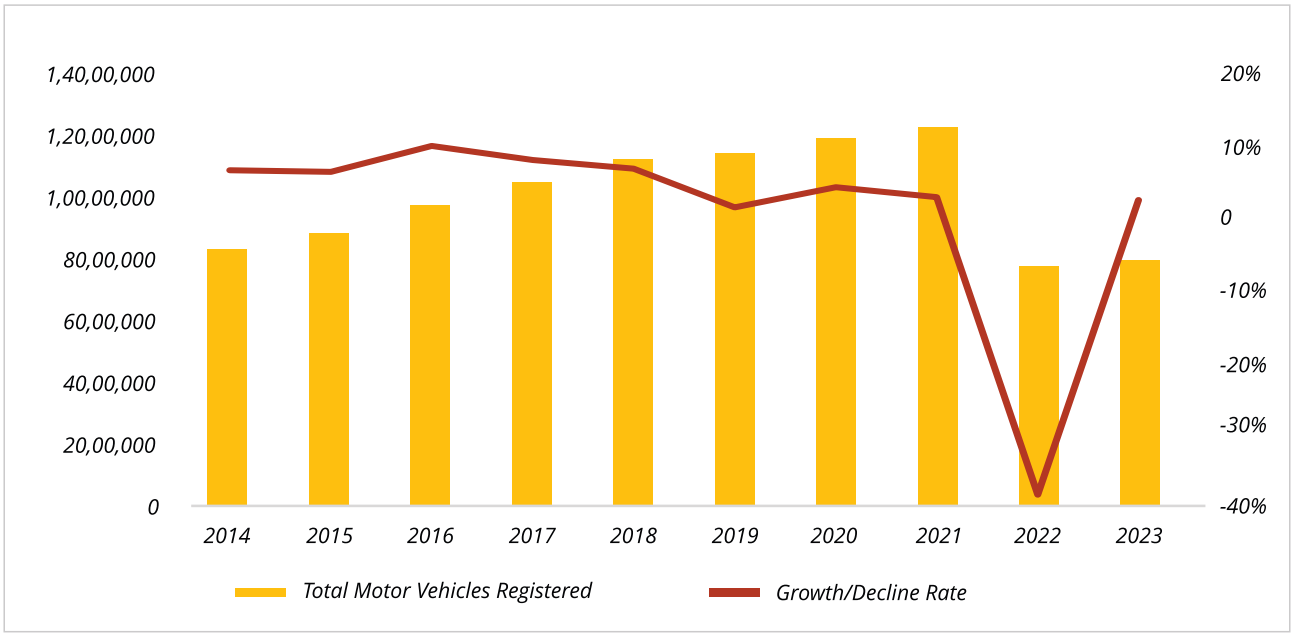


Figure 2.2 Total motor vehicles registered in Delhi 2022-2023

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 393 km (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 are slowly pushing the population to depend on the use of motorised 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 (Census 2011). 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 2014, 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

Year	Population (Cumulative)	Motor Vehicles (Cumulative)	Fatal Crashes	Total Crashes (All Types)	Road Deaths (Per Year)	Deaths Rate		Crash Severity*
						Per one lakh population	Per 10,000 Vehicles	
2014	*1,78,30,242*	*82,93,167*	*1,629*	*8,623*	*1,671*	*9.37*	*2.01*	*19.37*
2015	*1,81,67,233*	*88,27,431*	*1,582*	*8,085*	*1,622*	*8.93*	*1.84*	*20.06*
2016	*1,85,10,594*	*97,04,741*	*1,548*	*7,375*	*1,591*	*8.59*	*1.63*	*21.57*
2017	*1,88,60,444*	*1,04,82,757*	*1,565*	*6,673*	*1,584*	*8.39*	*1.51*	*23.73*
2018	*1,92,16,906*	*1,12,04,277*	*1,657*	*6,515*	*1,690*	*8.79*	*1.50*	*25.94*
2019	*1,95,80,105*	*1,13,91,551*	*1,433*	*5,610*	*1,463*	*7.47*	*1.28*	*26.07*
2020	*1,99,52,126*	*1,18,92,877*	*1,163*	*4,178*	*1,196*	*5.99*	*1.00*	*28.62*
2021	*2,03,41,192*	*1,22,53,350*	*1,206*	*4,720*	*1,239*	*6.09*	*1.01*	*26.25*
2022	*2,07,23,606*	*77,39,369*	*1,428*	*5,652*	*1,461*	*7.04*	*1.88*	*25.84*
2023	**2,11,15,282**	**79,45,596**	**1,432**	**5,834**	**1,457**	**6.90**	**1.83**	**24.97**

*(Note: - * Crash Severity: Road crash deaths per 100 crashes)*

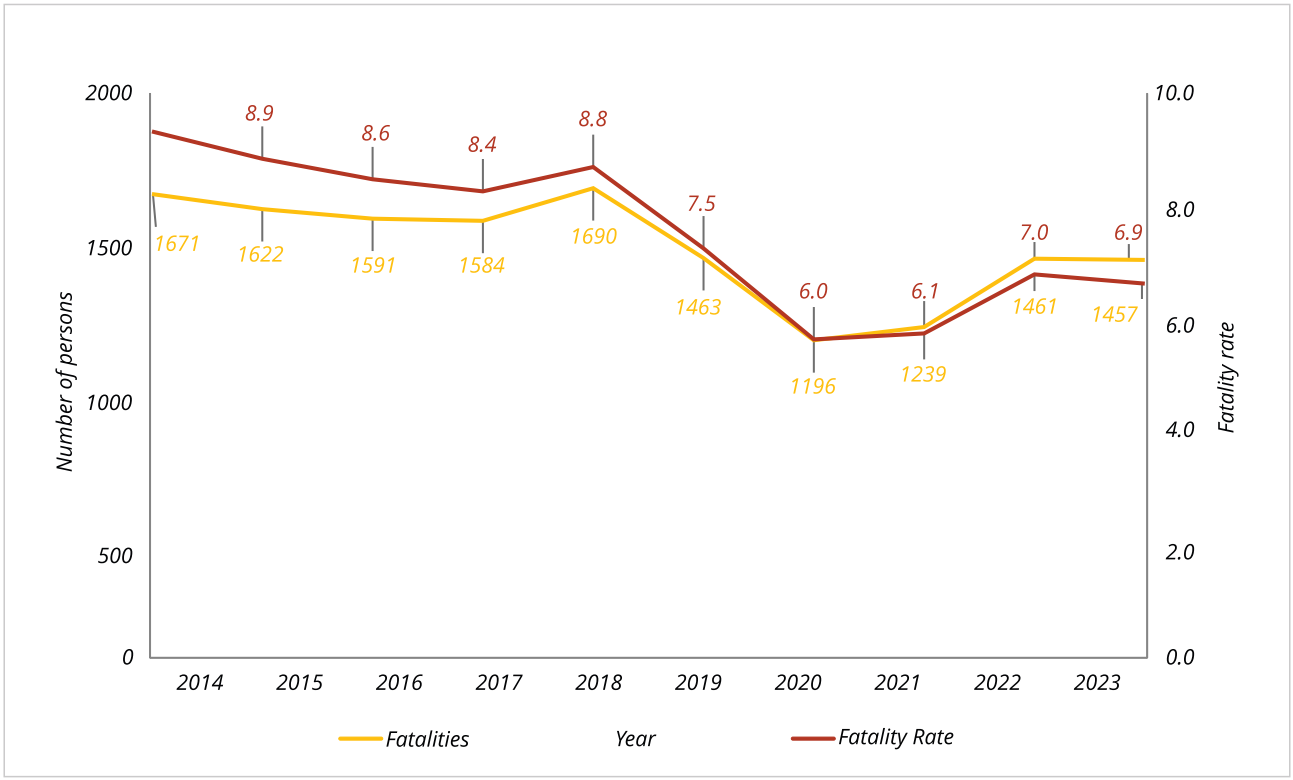


Figure 2.3 Road crash fatalities and Fatality rates

2.6 Safe Road Infrastructure

Safe road infrastructure is key for safety. Road infrastructure should be designed and operated to eliminate or reduce risks for all road users. In addition to improving safety, road infrastructure can enhance accessibility, including for persons with disabilities, and facilitate transfers from one transport mode to another. Infrastructure safety can be maximized for new roads as well as existing roads.

(Source: WHO: Global Status Report on Road safety-2023)

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. prioritising 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 pedestrians' 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.

Delhi Traffic Police Amidst G-20 Summit

During the G-20 Summit, the Delhi Traffic Police emerged as a pivotal player, adeptly managed the intricate web of roadways. They had strategically delineated responsibility zones, efficiently curbing congestion and ensuring seamless flow.

ROAD CRASH VICTIM

III. ROAD CRASH VICTIMS

3.1 Road Crash Victims

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.

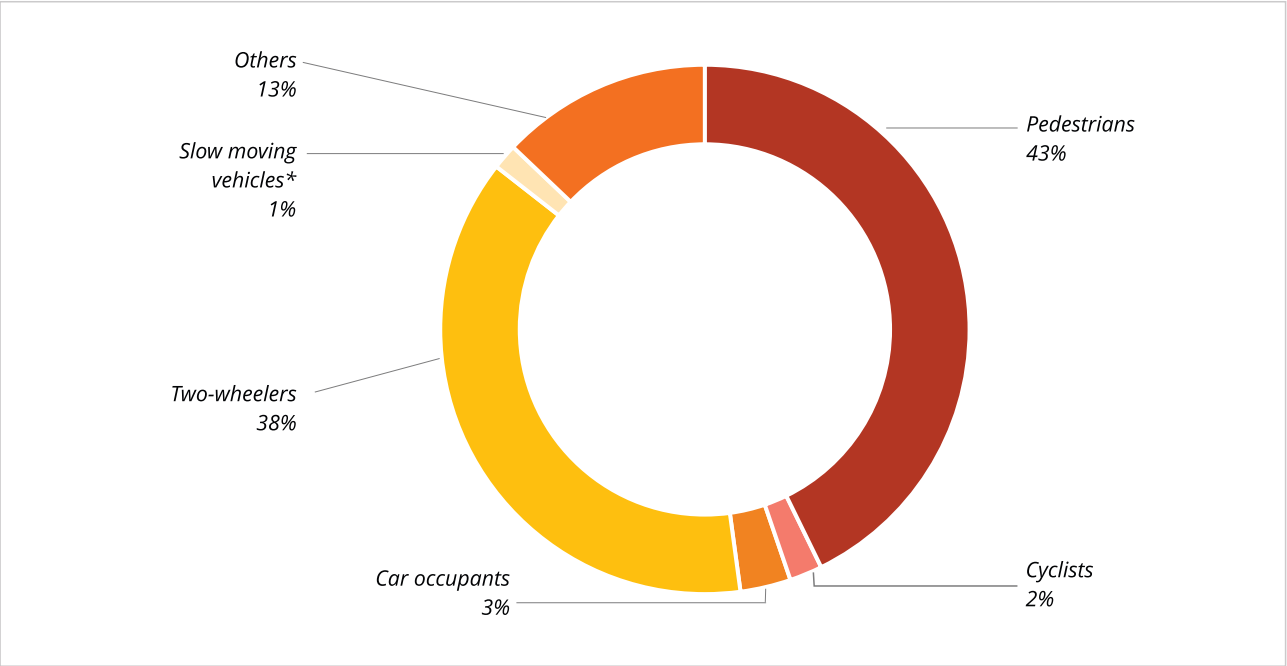
Table 3.1: Victims killed and injured

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	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
2019	*678*	*1,887*	*36*	*108*	*39*	*281*	*496*	*2,110*	*5*	*30*	*26*	*151*	*1*	*10*	*182*	*575*	*1,463*	*5,152*
2020	*505*	*1,241*	*48*	*115*	*37*	*184*	*441*	*1,613*	*5*	*18*	*21*	*110*	*2*	*9*	*132*	*372*	*1,196*	*3,662*
2021	*504*	*1,536*	*45*	*123*	*42*	*158*	*472*	*1,868*	*3*	*12*	*18*	*145*	*0*	*7*	*155*	*424*	*1,239*	*4,273*
2022	**629**	**1,777**	**48**	**134**	**39**	**227**	**552**	**2,263**	**3**	**25**	**26**	**200**	**1**	**2**	**163**	**573**	**1,461**	**5,201**
2023	**622**	**1,941**	**30**	**118**	**45**	**234**	**549**	**2,356**	**0**	**18**	**24**	**203**	**3**	**7**	**184**	**593**	**1,457**	**5,470**

**Hand Cart, Electric Rickshaw And Cycle Rickshaw*

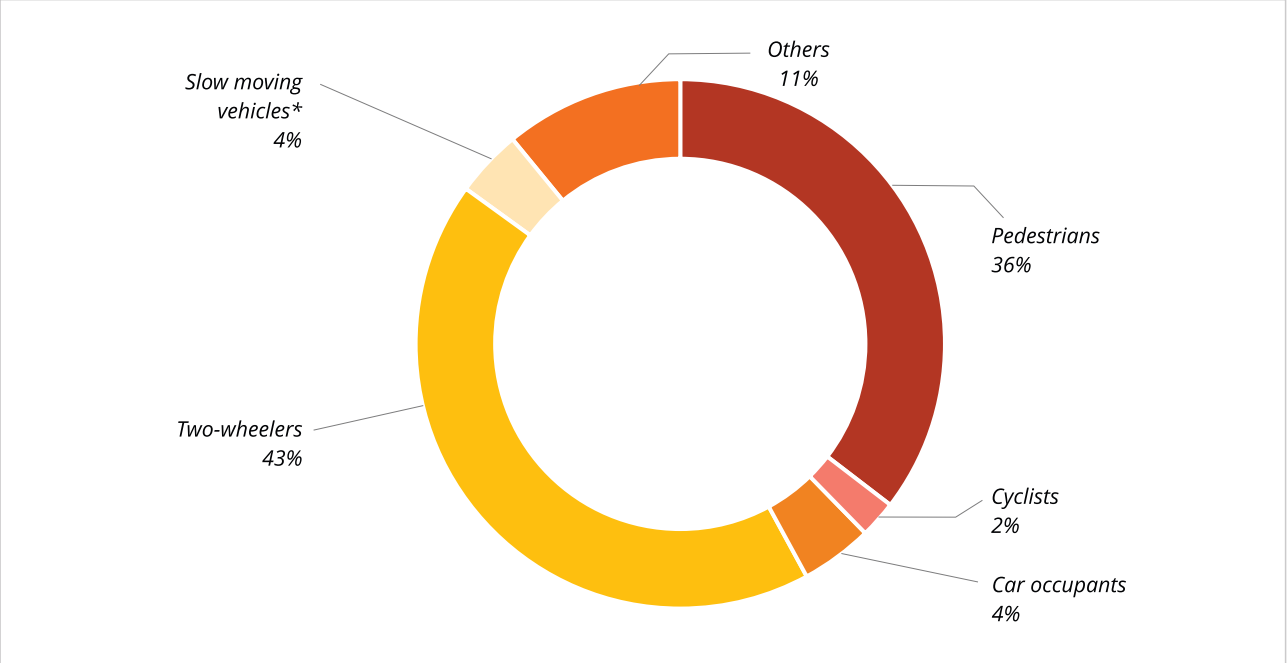
3 .2 Vulnerable Road Users in Road Crashes

Pedestrians comprised 43% of the total victims killed, while motorcyclists accounted for 38%. When considering the injured victims, motorcyclists represented 43% of the total, while pedestrians accounted for 35%. These two groups make up 78% of the injured and 81% of the killed victims and are categorised as vulnerable road users.



*Hand Cart, Electric Rickshaw And Cycle Rickshaw

Figure 3.1: Type of road users killed in road crashes



*Hand cart, electric rickshaw and cycle rickshaw.

Figure 3.2: Type of road users 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 2023, 622 pedestrians lost their lives and 1941 were injured, compared to 629 pedestrians who lost their lives and 1,777 pedestrians who were injured in 2022. This represents 42.7% of all victims killed in the year 2023 as compared to 43.05% in 2022.

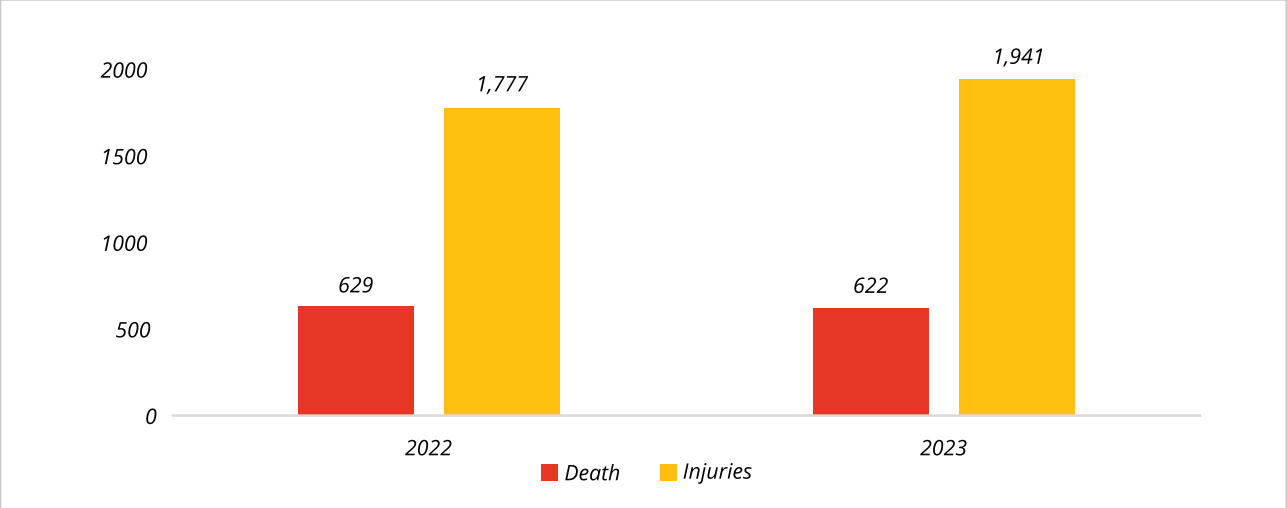
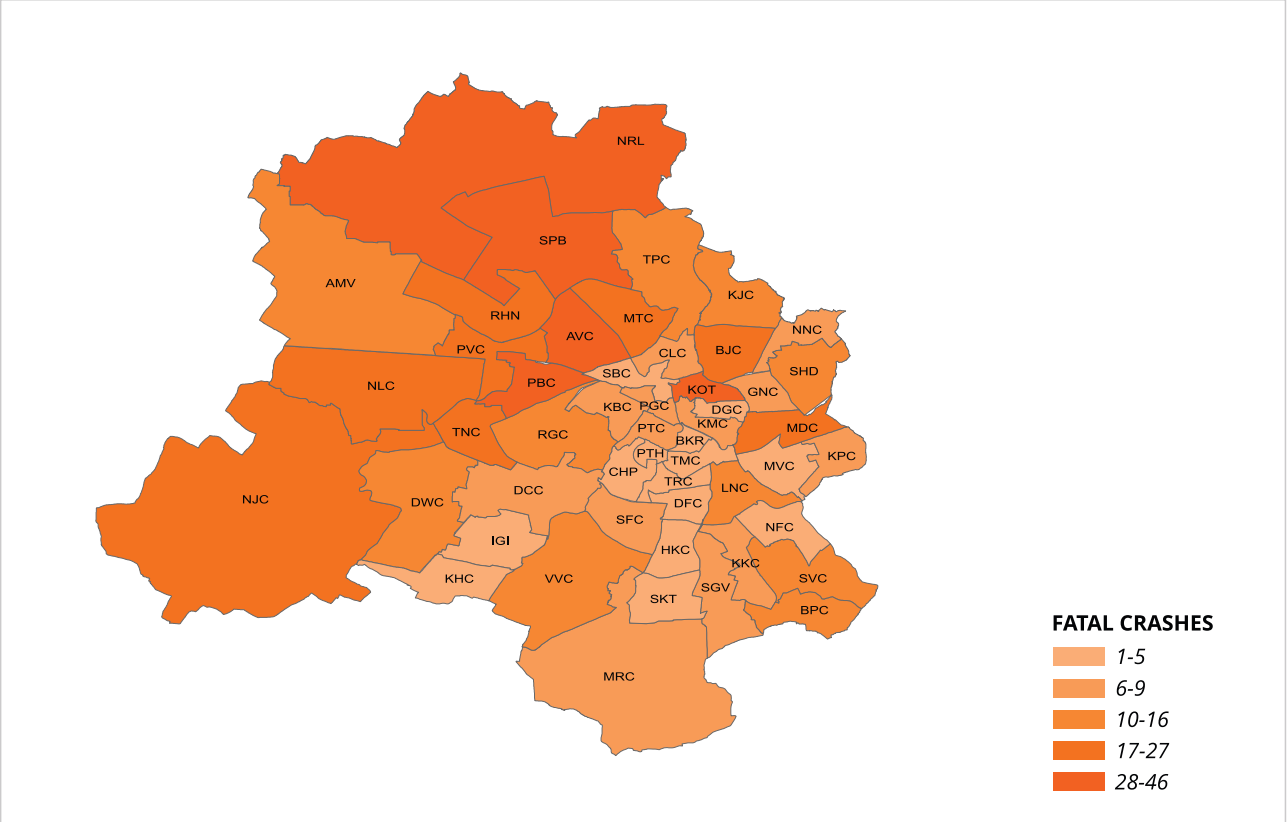
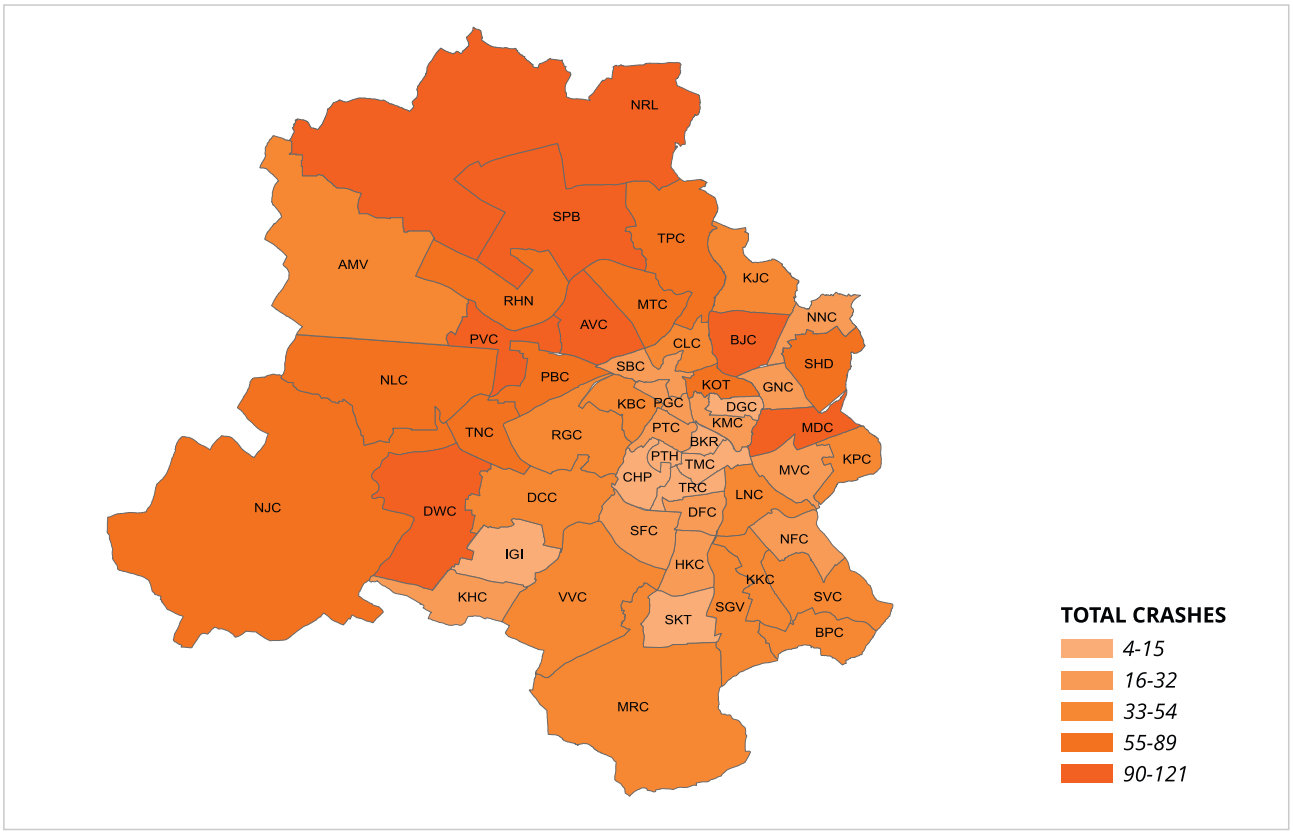


Figure 3.3 Pedestrians killed and injured in road crashes

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 crashes.



Map 3.1 Fatal crashes involving pedestrians



Map 3.2 Total crashes involving pedestrians

Motorcyclists:

After pedestrians, motorcyclists are the next most vulnerable category of victims, accounting for 549 (37.68%) of all fatal road crashes in Delhi and 2,356 (43.07%) injured victims in 2023. In 2023, fatal crashes involving two-wheeler riders marginally decreased. Two-wheeler riders injured in road crashes rose from 2,263 in 2022 to 2,356 in 2023.

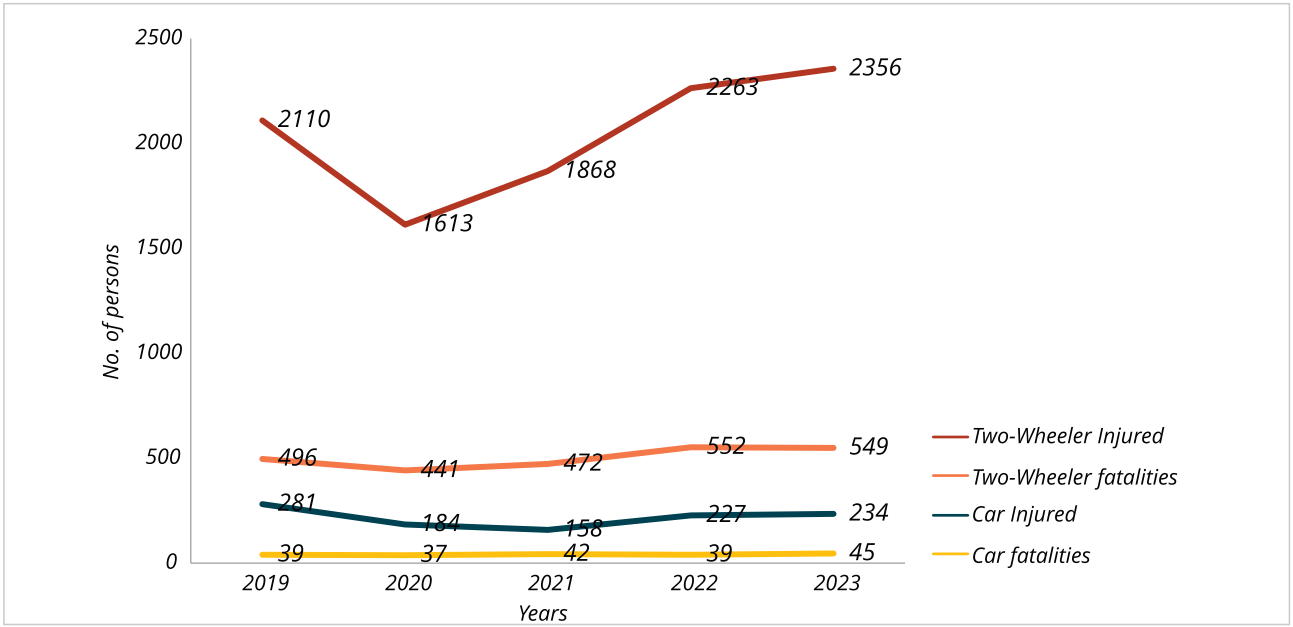
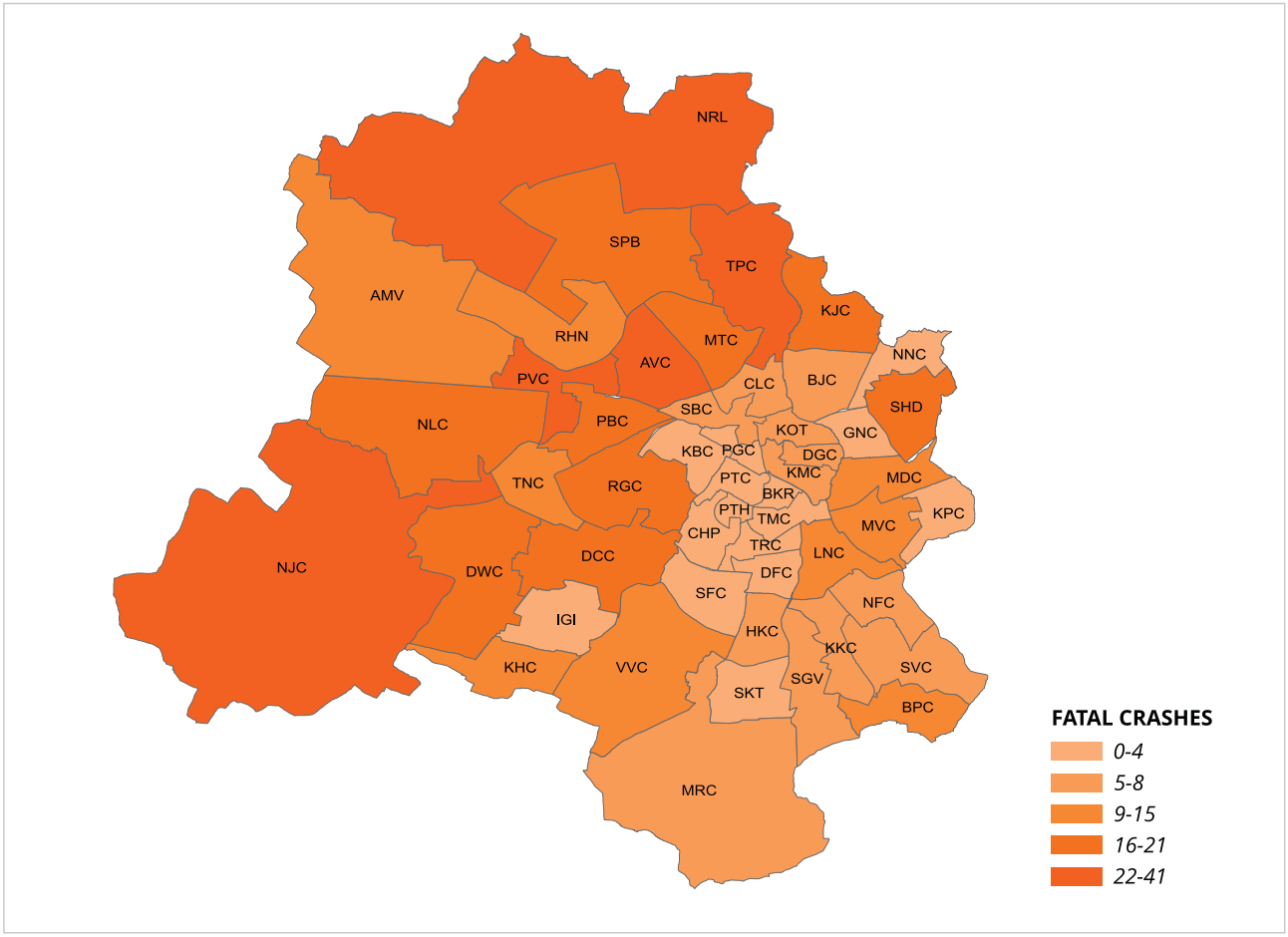


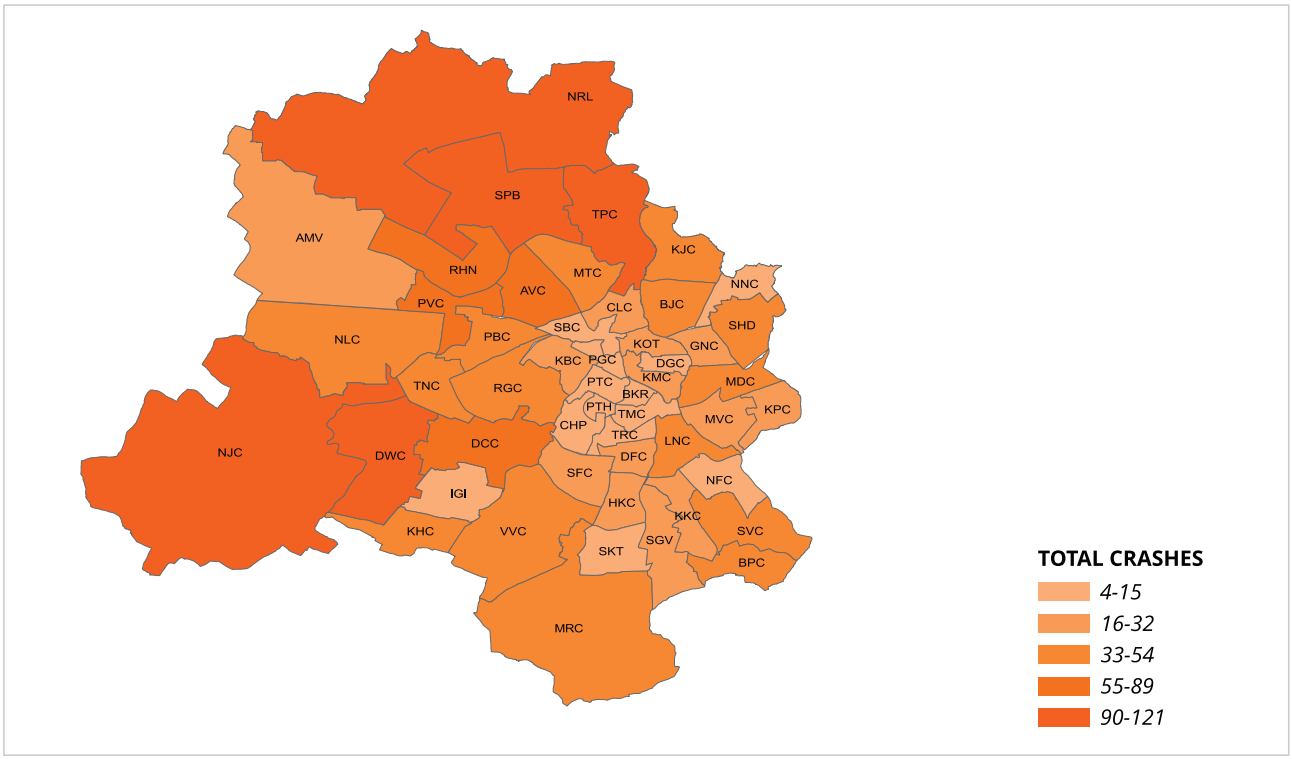
Figure 3.4 Two-wheeler fatalities, two-wheeler injured, car fatalities and car injured

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 2.66% (2022) to 3.08% (2023). In the case of non-fatal injuries, it has remained between 4% and 8% over the years.

The vulnerability of two-wheeler victims in fatal crashes was higher in Narela, Ashok Vihar, Timarpur and Paschim Vihar circles. On the other hand, the total number of crashes involving two-wheelers was higher in Narela, Dwarka, Najafgarh, Timarpur, Samaypur Badali and Paschim Vihar circles.



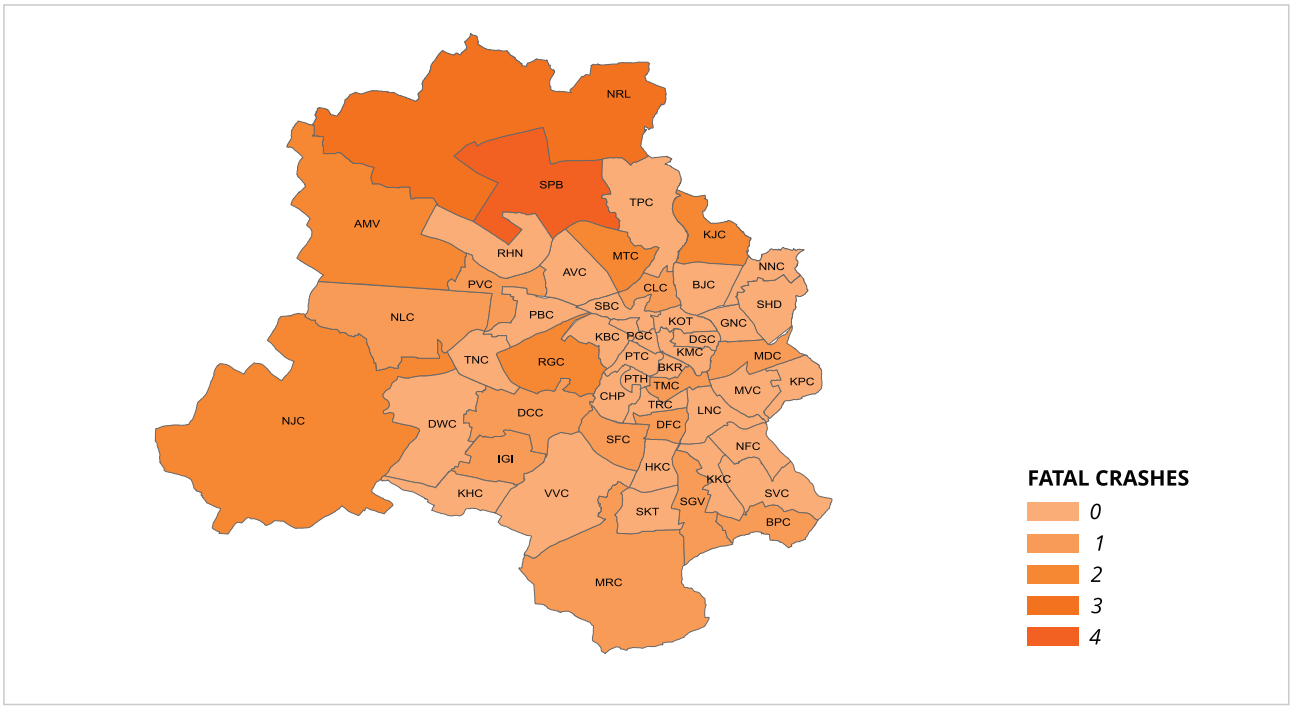
Map 3.3 Two-wheeler fatal crashes



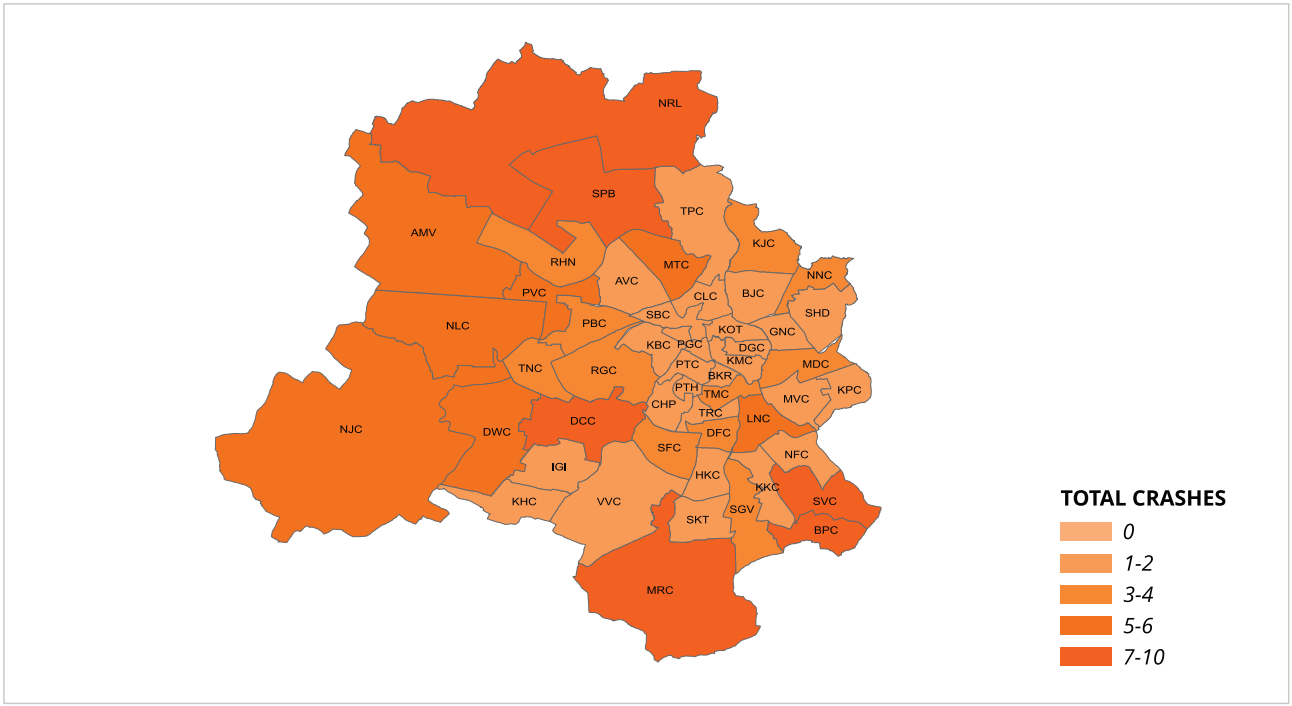
Map 3.4 Two-wheeler total crashes

Cyclists:

The cyclists' 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 2.06 % in 2023. In 2023, The proportion of cyclists killed (2.06% in 2022 against 3.2% in 2022) and injured (2.16% in 2023 against 2.57% in 2022) is less in 2022.



Map 3.5 Cyclist fatal crashes



Map 3.6 Cyclist total crashes

The vulnerability of cyclist victims in total crashes were higher in Samaypur Badali, Narela, Mehrauli, Badarpur, Delhi Cantt and Sarita Vihar circles.

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 15 fatal crashes and 103 simple crashes in 2023, resulting in the death of 15 persons and 160 injuries.

Demographic Classification of All Victims:

Demographic classification of road crashes 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, 1,312 male and 145 female adults died, while 4,646 male and 824 female adults were injured in road traffic crashes in the year 2023. Of the total minor victims of crashes, 56 boys and 18 girls were killed, whereas 335 boys and 160 girls were injured.

The fatalities and injuries of simple crashes were highest in 2019 and started decreasing until 2021.

So far in the last 5 years, 268 young males and 93 young females are killed in road crashes, whereas a total of 5929 adult males and 526 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
2019	*67*	*22*	*307*	*89*	*1,262*	*112*	*4,200*	*556*
2020	*40*	*21*	*187*	*51*	*1,049*	*86*	*3,060*	*364*
2021	*48*	*12*	*221*	*75*	*1,092*	*87*	*3,536*	*441*
2022	*57*	*20*	*303*	*106*	*1,270*	*114*	*4,145*	*647*
2023	*56*	*18*	*335*	*160*	*1,256*	*127*	*4,311*	*664*

For the year 2023, the number of males accounted for 68% of road crash injuries and females for 32% of injuries below the age of 18. Male fatality rate below the age group of 18 years accounted for 76% of road crash fatalities, while females accounted for 24%.

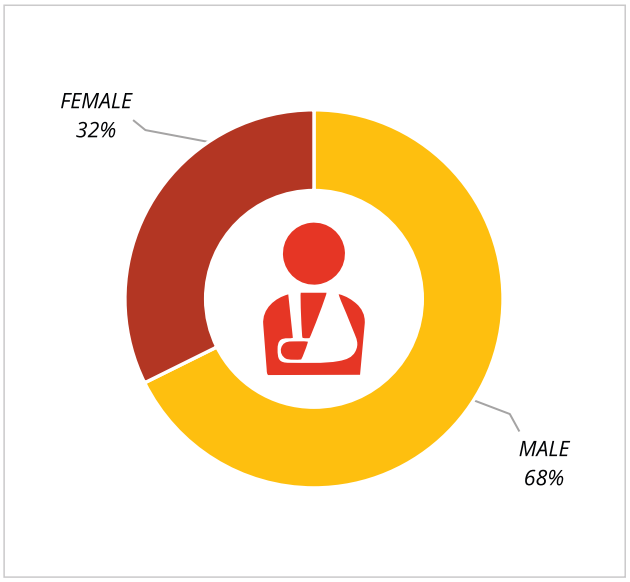


Figure 3.5: Crash injuries by gender (below-18 years)

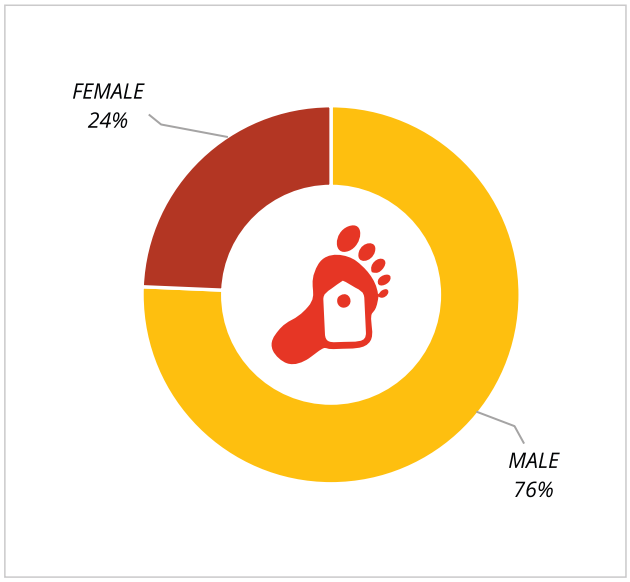


Figure 3.6: Crash deaths by gender (below-18 years)

The below figure shows that males accounted for 91% of the road crash death victims, whereas 87% of males were involved in road injuries for 2023 for the age group of 18 years and above.

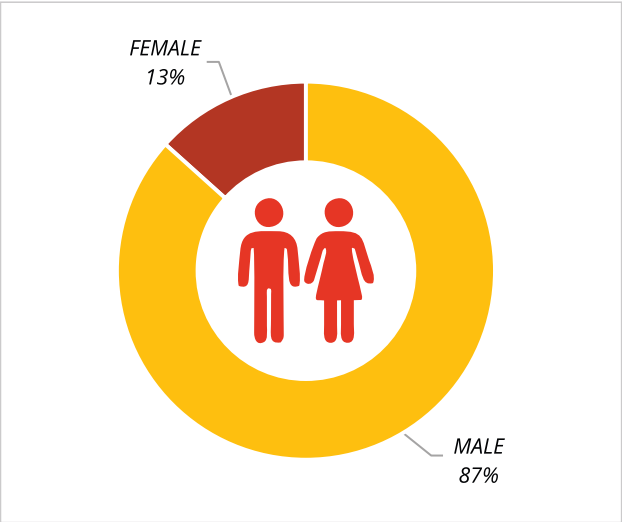


Figure 3.8: Crash injuries by gender (above-18 years)

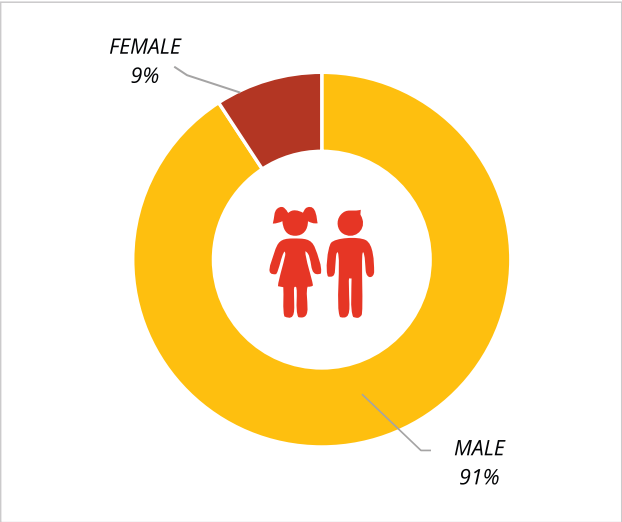


Figure 3.7: Crash deaths by gender (above-18 years)

The below figure shows that the age group of 19-30 years had the highest number of male fatalities, while females above the age of 40 years experienced the highest fatalities. The high number of deaths indicates that they may be more vulnerable to the consequences of road crashes, emphasizing the need for targeted safety measures and awareness campaigns for this age group.

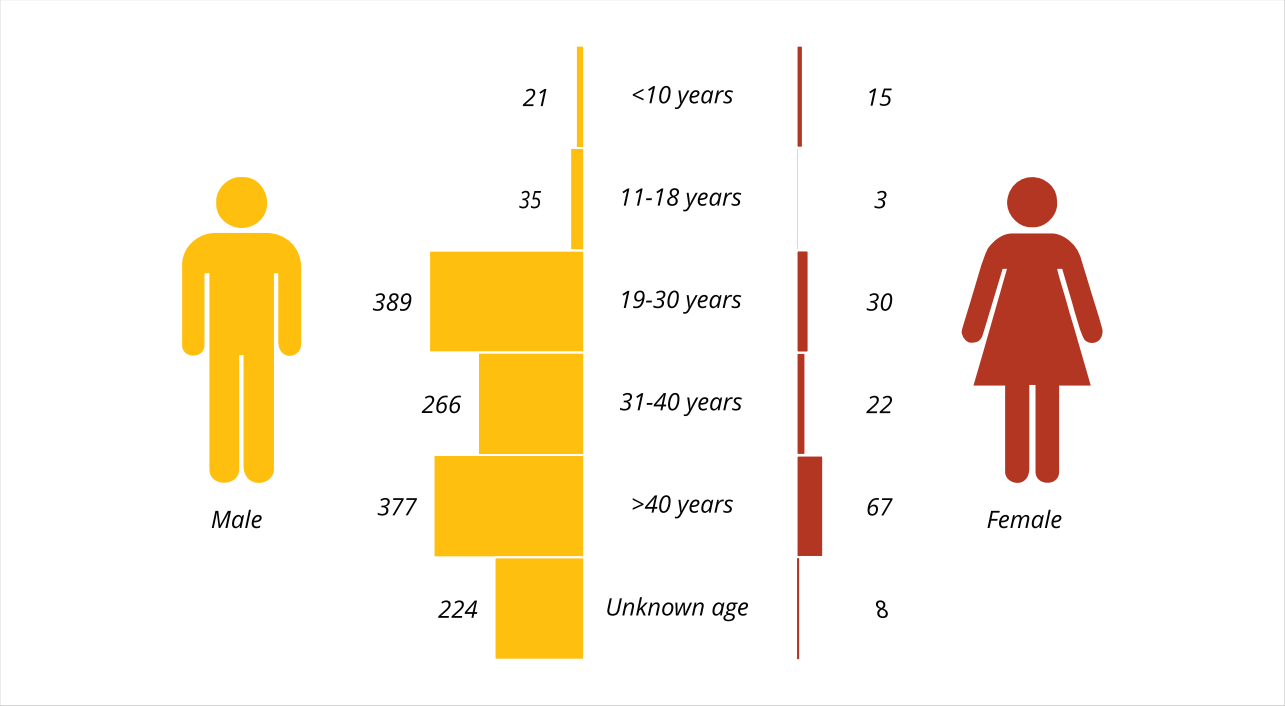


Figure 3.9: Crash deaths by age and gender

The below figure 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.

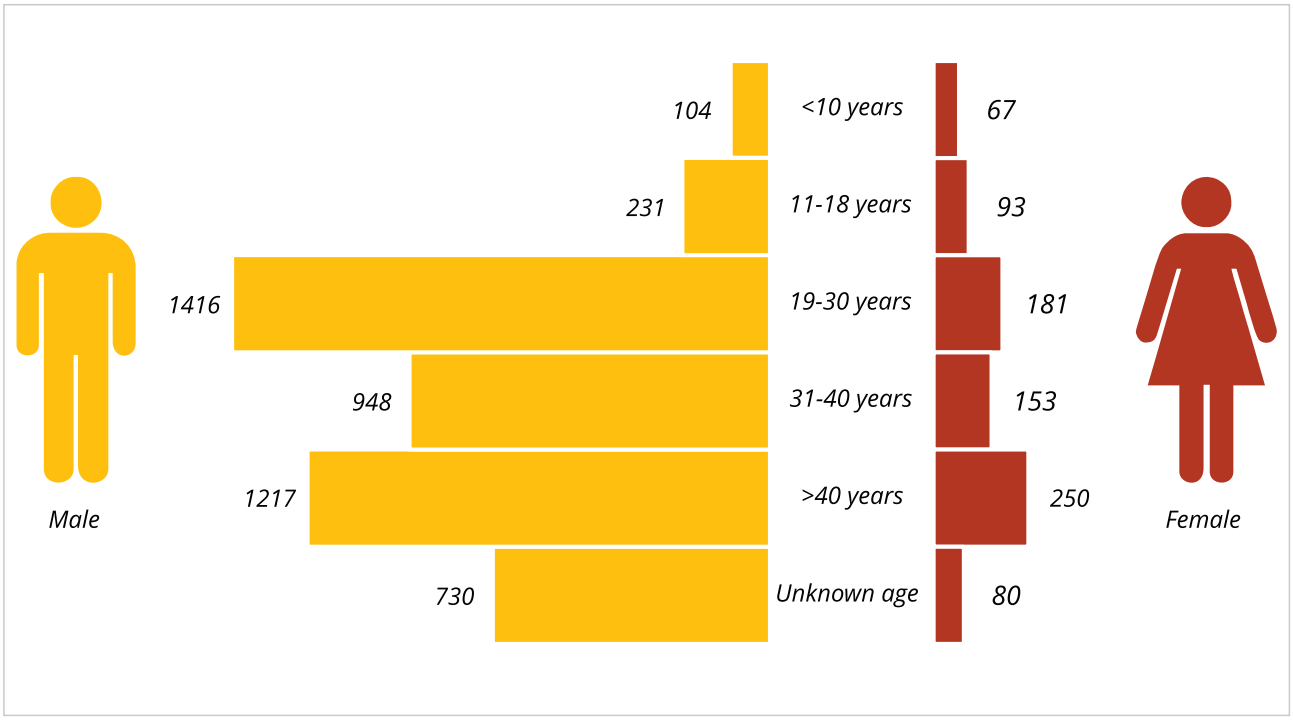


Figure 3.10: Crash injuries by age and gender

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 persons with disabilities, 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 crossings 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 the safety of riders.

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. There is also a need to create safe crossings for them at signals.

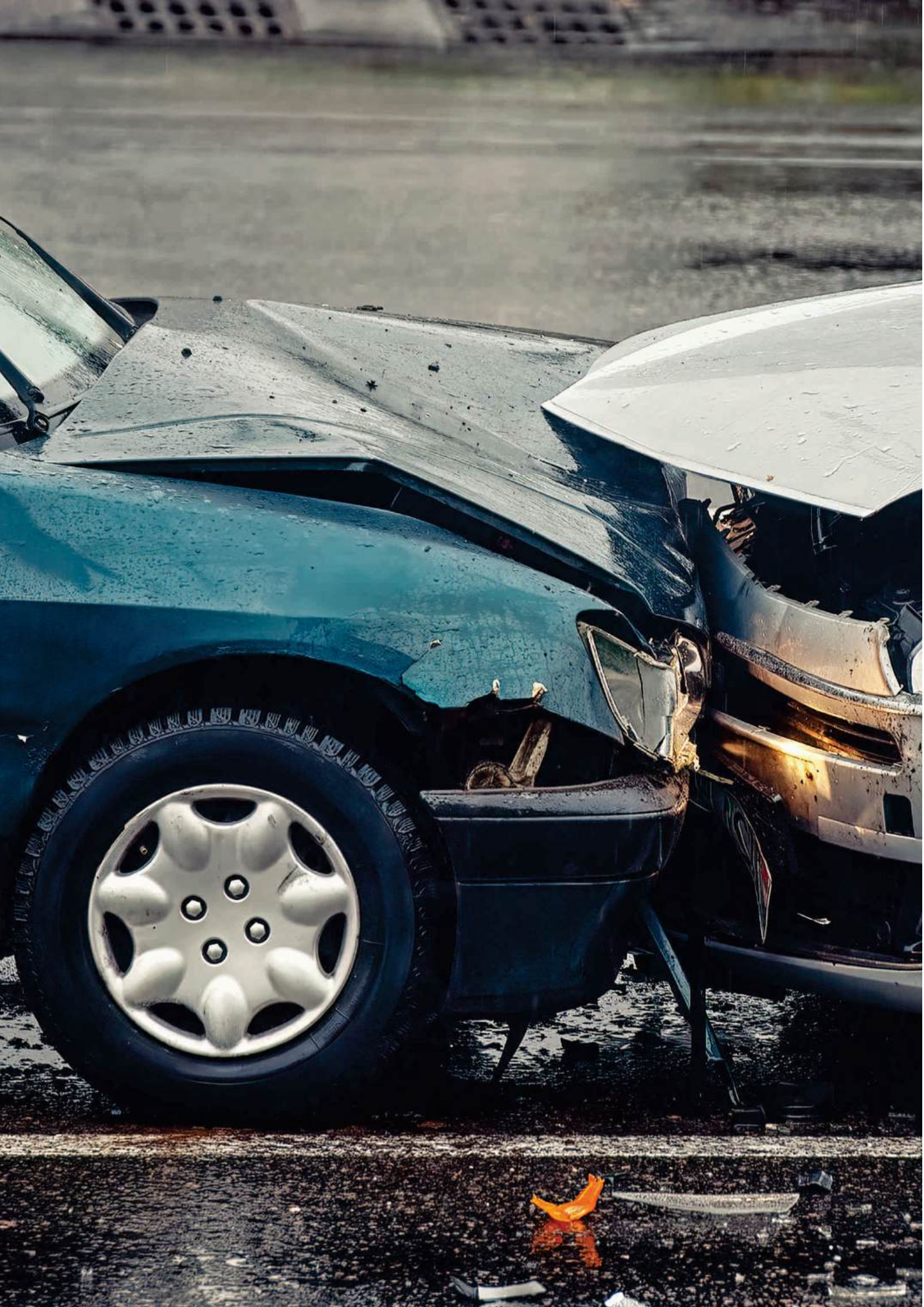
By implementing these road design methods and initiatives, we can create a safer and more accommodating environment for cyclists. The safe cycle infrastructure, in turn, will encourage active transportation and help to reduce the risks associated with cycling on roads shared with motor vehicles. It is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

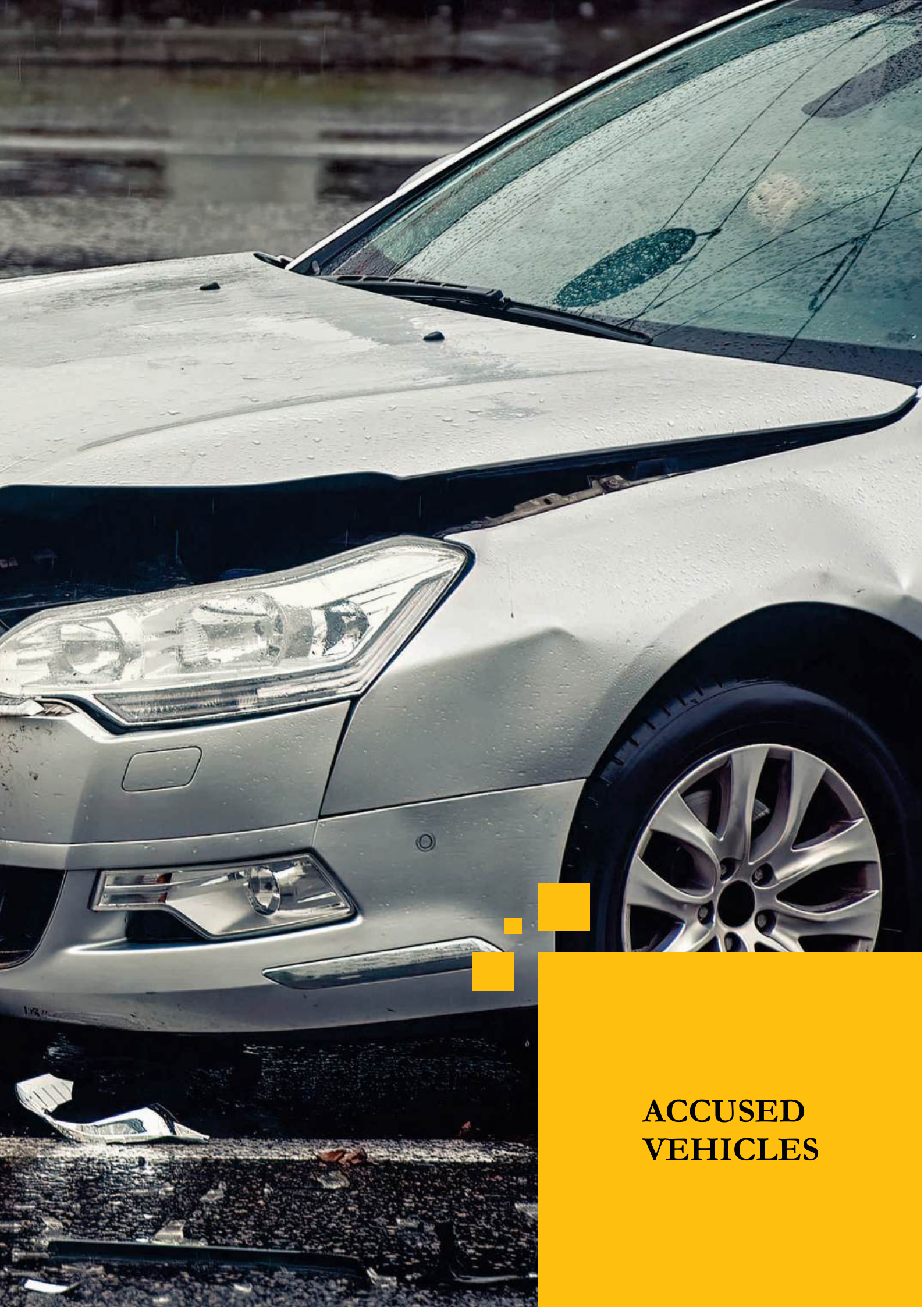
3.5 Road Safety for Two-wheelers

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 riders in Delhi. It is imperative to wear appropriately fitting ISI-certified helmets that securely fasten to provide adequate head protection in the event of a crash. 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 crashes involving two-wheelers. Using headlights, taillights, and reflectors, particularly during low-light conditions, helps other road users spot the rider and maintain safe distance. One of the root causes of pedestrian and motorcyclist fatalities is speeding. For example lowering down the speed in pedestrian-heavy areas would result to safer roads.

Furthermore, avoiding distracted riding, such as using mobile phones while riding, is paramount. Maintaining focus, avoiding distractions, and prioritising 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 crashes and fostering a safer environment for two-wheeler riders in Delhi.





ACCUSED VEHICLES

IV. ACCUSED VEHICLES

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 vehicle plays a critical role both 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 those inside and those outside them. To improve vehicle safety, different features can be integrated into vehicle design either to avoid crashes (active safety) or to reduce the injury risk for occupants and other road users when a crash occurs (passive safety).

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. An increase in traffic volume on both major and minor roads, as well as 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 is a relevant determinant of the extent of damage and severity of crashes. With improvements in technology, the individual/private vehicles have become safer for passengers.

Managing speed 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 the effectiveness of other safety interventions. Speed management interventions are possible across a range of road safety arenas, including road design and engineering.

Over the years, vehicles have improved and become safer for passengers with features such as airbags, Anti-lock Braking Systems (ABS), strong and non-collapsing bodies, protective internal designs, and safe exits in case of mishaps.

However, it is 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 2021 to year 2023 shows an increasing trend in total crashes caused by maximum mode of vehicles except ambulance, cycle-rickshaws, mini buses, road roller vehicles. **Moreover, there is significant increasing trend shows in total crashes caused by e-rickshaws from 66 in the year 2022 to 118 in 2023, goods carrier from 419 in 2022 to 480 in 2023 and two-wheelers from 789 in 2022 to 932 in 2023.**

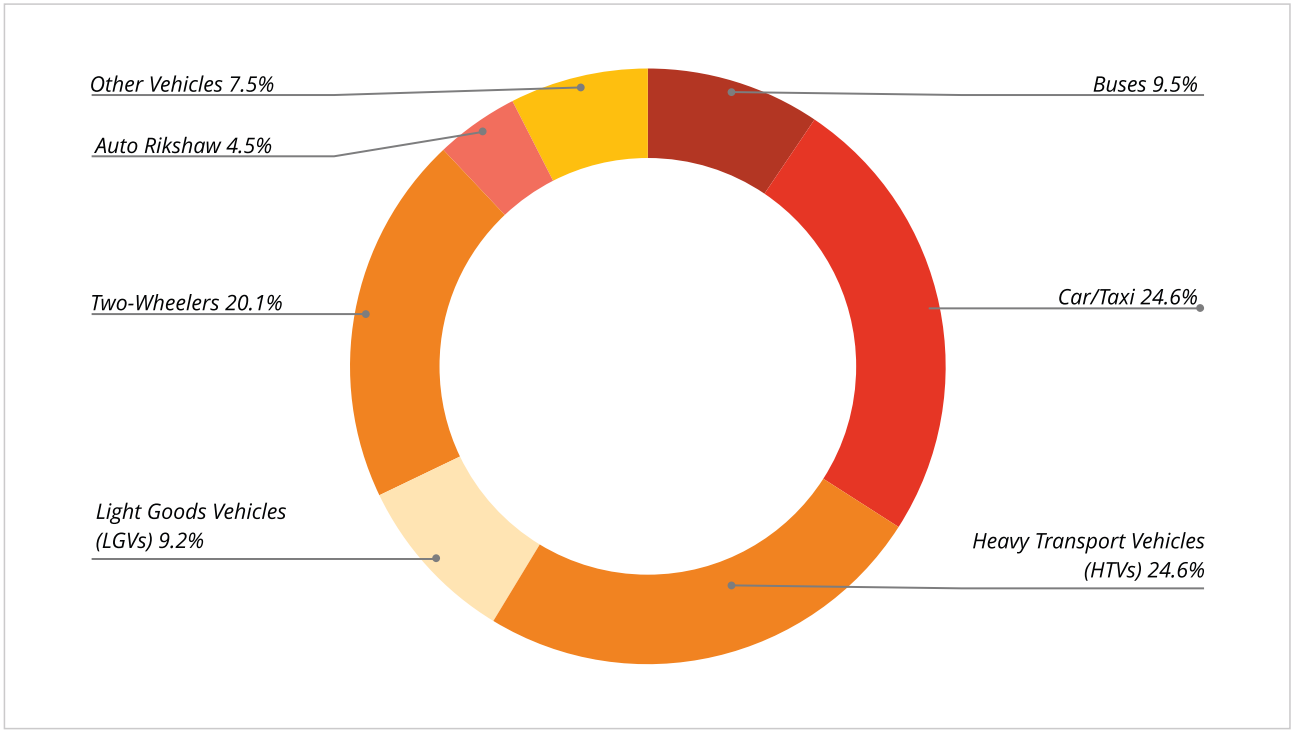
Table 4.1: Profile of vehicle at fault (2021-2023)

Type of Vehicle	Fatal Crashes			Simple Crashes			Total Crashes		
	2021	2022	2023	2021	2022	2023	2021	2022	2023
Unknown Vehicle	555	668	660	1,035	1,104	1,091	1,590	1,772	1,751
Private Car	168	196	184	1,003	1,275	1,314	1,171	1,471	1,498
Scooter/M. Cycle	114	144	155	562	645	777	676	789	932
Goods Carrier *	142	178	182	190	241	298	332	419	480
Tempo	72	65	71	172	229	233	244	294	304
TSR	23	28	35	143	176	142	166	204	177
E-Rickshaw	10	8	18	45	58	100	55	66	118
Cluster Bus	29	22	28	69	85	75	98	107	103
Private Bus	12	23	20	38	68	66	50	91	86
DTC Bus	17	37	16	66	89	67	83	126	83
Delivery Van	13	14	10	45	68	64	58	82	74
Taxi	8	10	6	51	59	57	59	69	63
Tractor	17	12	15	18	35	29	35	47	44
Crane	8	6	13	15	25	17	23	31	30
Gramin Sewa	5	1	0	16	19	21	21	20	21
Tanker	3	3	8	9	8	13	12	11	21
Mini Bus	7	7	3	13	24	13	20	31	16
Other State Bus	1	5	3	3	4	8	4	9	11
School Bus	0	0	3	1	1	7	1	1	10
Ambulance	2	1	1	13	9	6	15	10	7
Military Veh.	0	0	1	0	0	1	0	0	2

(Contd.)

Type of Vehicle	Fatal Crashes			Simple Crashes			Total Crashes		
	2021	2022	2023	2021	2022	2023	2021	2022	2023
Call Centre Cab	0	0	0	1	1	1	1	1	1
Cycle Rickshaw	0	0	0	4	0	0	4	0	0
Police Veh.	0	0	0	0	0	2	0	0	0
Road Roller	0	0	0	1	1	0	1	1	0
Tonga/Rehra	0	0	0	1	0	0	1	0	0

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



**The above doughnut chart does not include the unknown at fault vehicles.*

Figure 4.1 At-fault vehicles resulting in fatal crashes (2023)

The above figure depicts that in 2023, 46% of vehicles accounting for 660 fatal crashes remain unreported/unknown, cars/taxis caused 190 fatal crashes accounting for 13% of total fatal crashes and HTVs/Goods also 190 fatal crashes accounting for 13% of total fatal crashes both are the almost equal share by the vehicle type, as compared to 2022 wherein car/taxi accounted for 206 (14.42%) fatal crashes and HTVs come next with 181 fatal crashes (12.67%) in year 2022. Two-wheelers caused 10.8% of total fatal crashes in 2023 while for 2022, it was 10.1%.

As compared to 2022, where car/taxis caused 31.6% of all simple crashes in non-fatal crashes, in 2023 they caused 31.14% simple crashes. Two-wheeler riders (scooters/motorcycles) were next with 17.65% of simple crashes this year, whereas share in 2022, was 15.26%.

Maximum fatal crashes caused by trucks occurred in Nangloi, Samaypur Badali, Narela, Sarita Vihar and Shalimar Bagh Circles.

Maximum fatal crashes caused by cars occurred in Samaypur Badli, Delhi Cantt, Punjabi Bagh, Rajouri Garden circles.

Maximum fatal crashes caused by buses occurred in Narela, Madhu Vihar, Lajpat Nagar, Delhi Cantt and Sarita Vihar 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: At fault and victim vehicles (total crashes-2023)

Victims	At Fault Vehicles								
	HTVs	LGVs	Bus	Car/Taxi /Jeep	TSR	SC/MC	Unknown Vehicle	Others	Total
SC/MCs	*227*	*144*	*122*	*733*	*50*	*245*	*699*	*124*	*2,344*
Pedestrians	*109*	*82*	*91*	*455*	*71*	*491*	*924*	*115*	*2,338*
Car/Taxi/Jeep	*62*	*25*	*25*	*129*	*6*	*9*	*30*	*8*	*294*
Self	*8*	*8*	*5*	*32*	*27*	*126*	*1*	*29*	*236*
TSRs	*22*	*9*	*12*	*78*	*8*	*5*	*26*	*6*	*166*
Cyclist	*16*	*8*	*7*	*45*	*3*	*27*	*31*	*4*	*141*
Others	*48*	*16*	*13*	*25*	*5*	*8*	*25*	*7*	*147*
E-rickshaw	*6*	*10*	*11*	*54*	*5*	*18*	*10*	*4*	*118*
Cycle-rickshaw	*3*	*2*	*7*	*10*	*2*	*3*	*5*	*2*	*34*
Passengers	*0*	*0*	*16*	*0*	*0*	*0*	*0*	*0*	*16*
Total	**501**	**304**	**309**	**1,561**	**177**	**932**	**1,751**	**299**	**5,834**

733 Scooters/Motorcycles hit by cars

455 Pedestrians hit by cars

62 Cars hit by Heavy Transport Vehicles

924 Pedestrians hit by unknown sources

122 Scooters/motorcycle hit by buses

54 E-rickshaws hit by cars

Crashes towards motorised two-wheeler riders are mostly caused by car/taxi/jeep that are 730 crashes in year 2023 followed by crashes by unknown vehicles that are 699 in number. Out of 2,338 total crashes towards pedestrians, unknown vehicles account for 924 crashes, 491 crashes are caused by two- wheelers, 455 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.

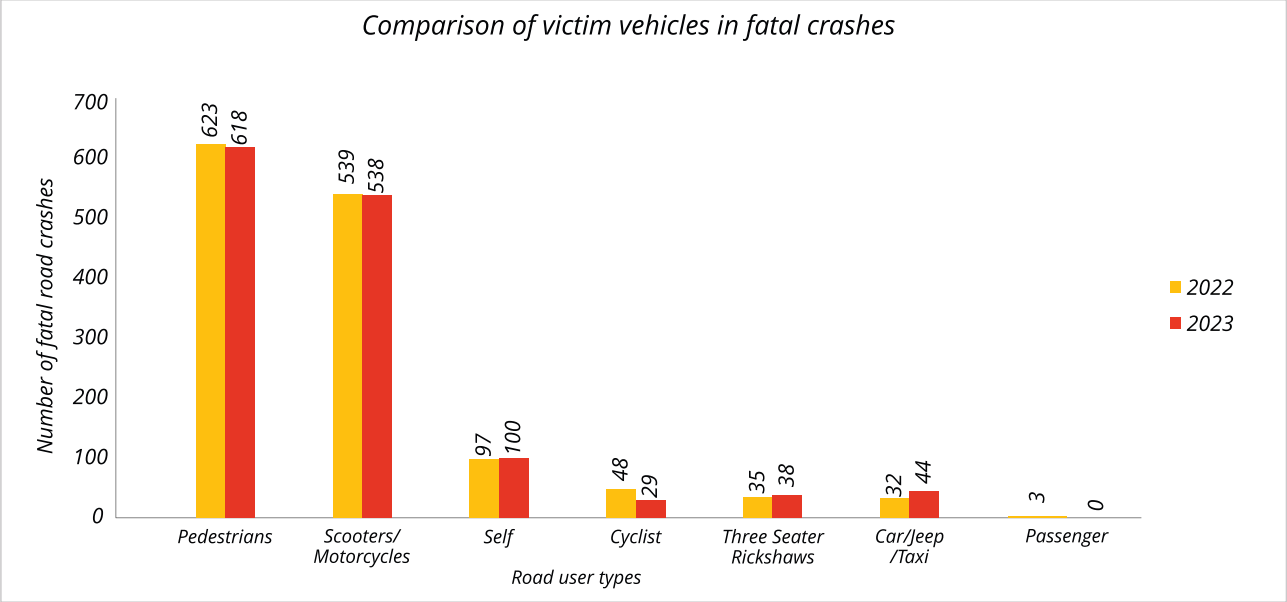


Figure 4.2 Comparison of victim vehicles in fatal crashes

The above figure depicts victim vehicles' analysis of years 2022 and 2023. It shows an increasing trend in fatal crashes of Self, TSRs, Car/Jeep/Taxi and others. Data also shows a slight decrease in fatal crashes towards, Pedestrians, two-wheelers, and passenger in the year 2023 when compared to year 2022. However, the number of cyclists fatal crashes has decreased from 48 in the year 2022 to 29 in 2023.

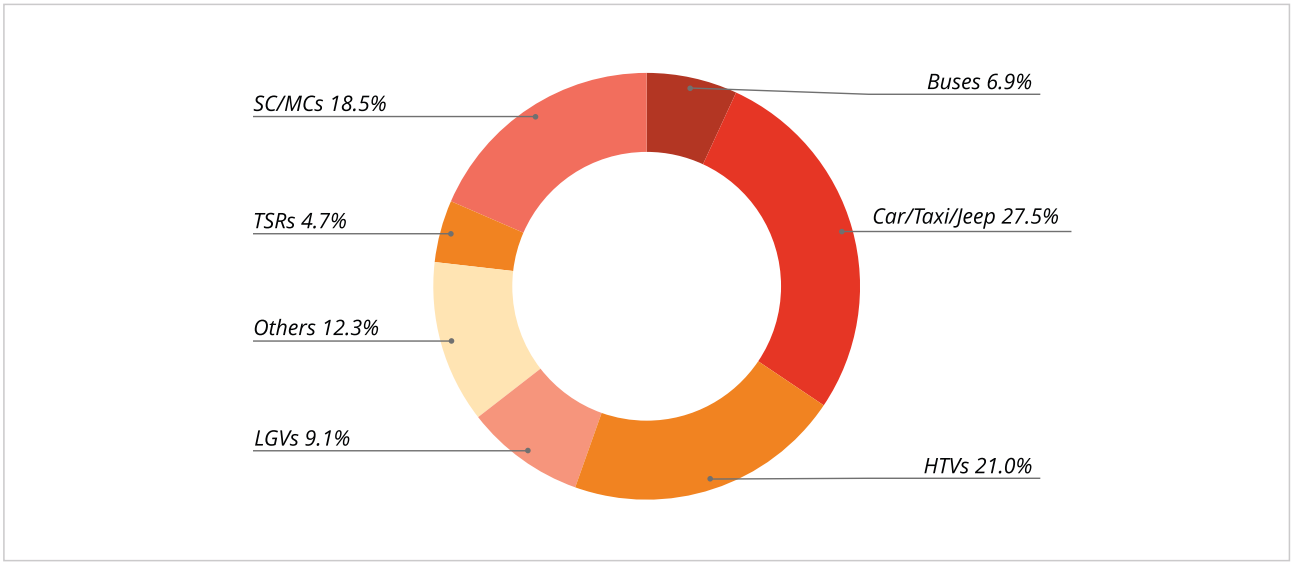
It can be inferred from the above figure that there is the need to integrate an efficient and safe pedestrian infrastructure on roads to reduce the number of rising pedestrian victims and other vulnerable road users in fatal road crashes. As 39.52% unknown vehicles account for total crashes towards pedestrians, measures for robust identification of vehicles should be considered.

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

Table 4.3: At fault and victim vehicles (fatal crashes-2023)

Victims	At Fault Vehicles								
	HTVs	LGVs	Bus	Car/Taxi /Jeep	TSR	SC/MC	Unknown Vehicle	Others	Total
SC/MCs	*227*	*144*	*122*	*733*	*50*	*245*	*699*	*124*	*2344*
Pedestrians	*109*	*82*	*91*	*455*	*71*	*491*	*924*	*115*	*2338*
Car/Taxi/Jeep	*62*	*25*	*25*	*129*	*6*	*9*	*30*	*8*	*294*
Self	*8*	*8*	*5*	*32*	*27*	*126*	*1*	*29*	*236*
TSRs	*22*	*9*	*12*	*78*	*8*	*5*	*26*	*6*	*166*
Others	*48*	*16*	*13*	*25*	*5*	*8*	*25*	*7*	*147*
Cyclist	*16*	*8*	*7*	*45*	*3*	*27*	*31*	*4*	*141*
E-rickshaw	*6*	*10*	*11*	*54*	*5*	*18*	*10*	*4*	*118*
Cycle-rickshaw	*3*	*2*	*7*	*10*	*2*	*3*	*5*	*2*	*34*
Passengers	*0*	*0*	*16*	*0*	*0*	*0*	*0*	*0*	*16*
TOTAL	**501**	**304**	**309**	**1561**	**177**	**932**	**1751**	**299**	**5834**

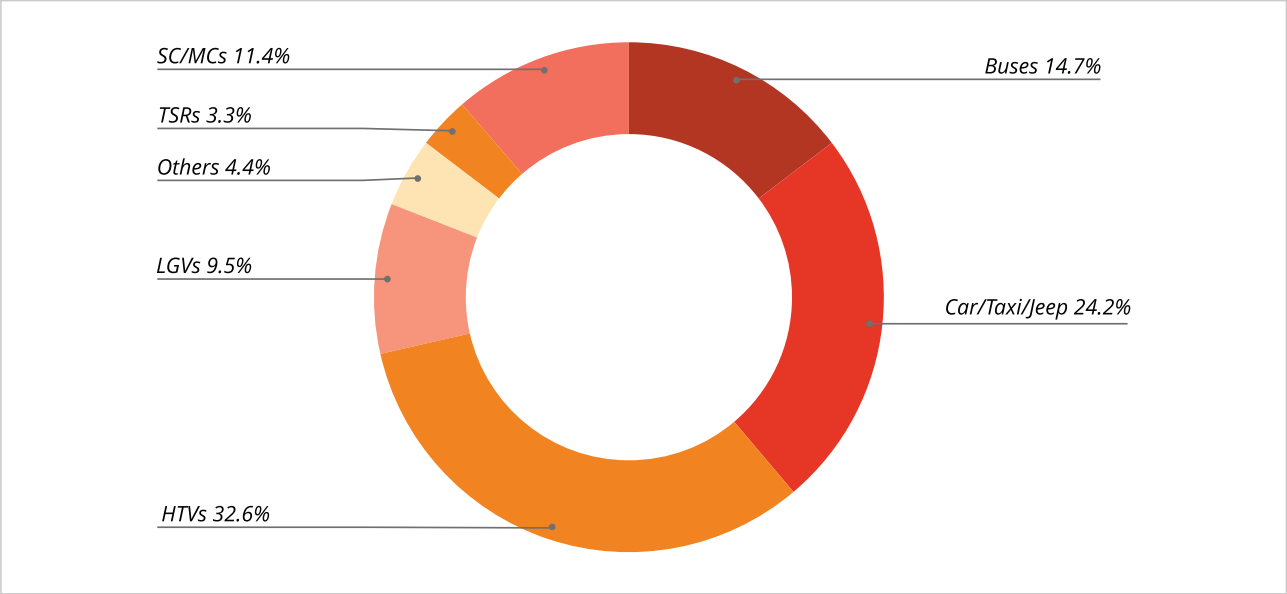
In 2023, 622 pedestrians died in 618 fatal crashes caused by all types of vehicles as compared to 629 pedestrian deaths in 2022. The pedestrian casualties due to car/jeep/taxis have increased to 76 this year compared to 69 in 2022. Two-wheelers caused 51 pedestrian fatal crashes in 2023 against 54 in 2022. 342 fatal crashes towards pedestrians were caused by unknown vehicles in 2023 against 358 in 2022. HTVs were responsible for 58 fatal crashes in 2023 against 52 in 2022. (Source Data 2022: Delhi Road Crash Report-2022). **The least number of fatal crashes towards pedestrians has been caused by other mode of vehicles (34), LGVs (25), Buses (19), and TSR (13) respectively.**



Note: The above doughnut chart does not include the unknown accused vehicles towards pedestrians

Figure 4.3 Accused vehicles causing fatal crashes towards pedestrians

The above figure depicts the fatal crashes involving pedestrians in year 2023. Out of 618 fatal crashes involving pedestrians, 342 fatal crashes which accounts for 55% crashes are caused by unidentified vehicles. The fatal crashes by unknown vehicles suggests hit and run cases. Car/Taxi/Jeep accounted for 12% fatal crashes involving pedestrians emerging as second most accused vehicles. HTVs and Two-Wheelers account for 10% and 8 % fatal crashes towards pedestrians respectively.



Note: The above doughnut chart does not include the unknown accused vehicles towards two wheelers.

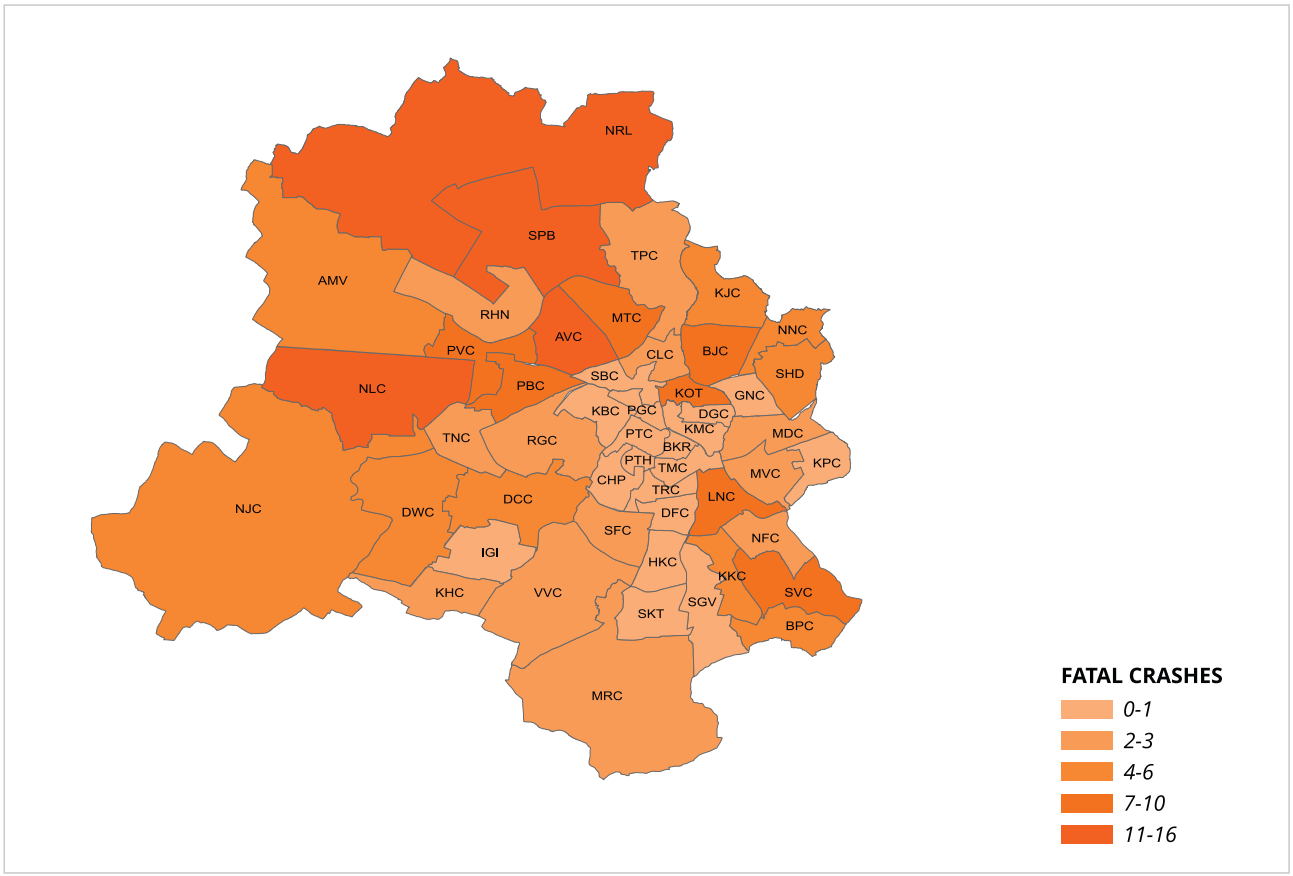
Figure 4.4 Accused vehicles causing fatal crashes towards two-wheeler

Two-wheeler riders have emerged as second most fatal crash-prone victims. The above figure shows 538 fatal crashes of two-wheelers in 2023 as compared to 539 in 2022. These two-wheelers were the worst hit by Heavy Vehicles (HTVs) (89) followed by Car/Jeep/Taxis (66) in 2023. A total of 265 riders have been victims to fatal crashes by unknown vehicles this year, which is higher than 250 recorded in 2022.

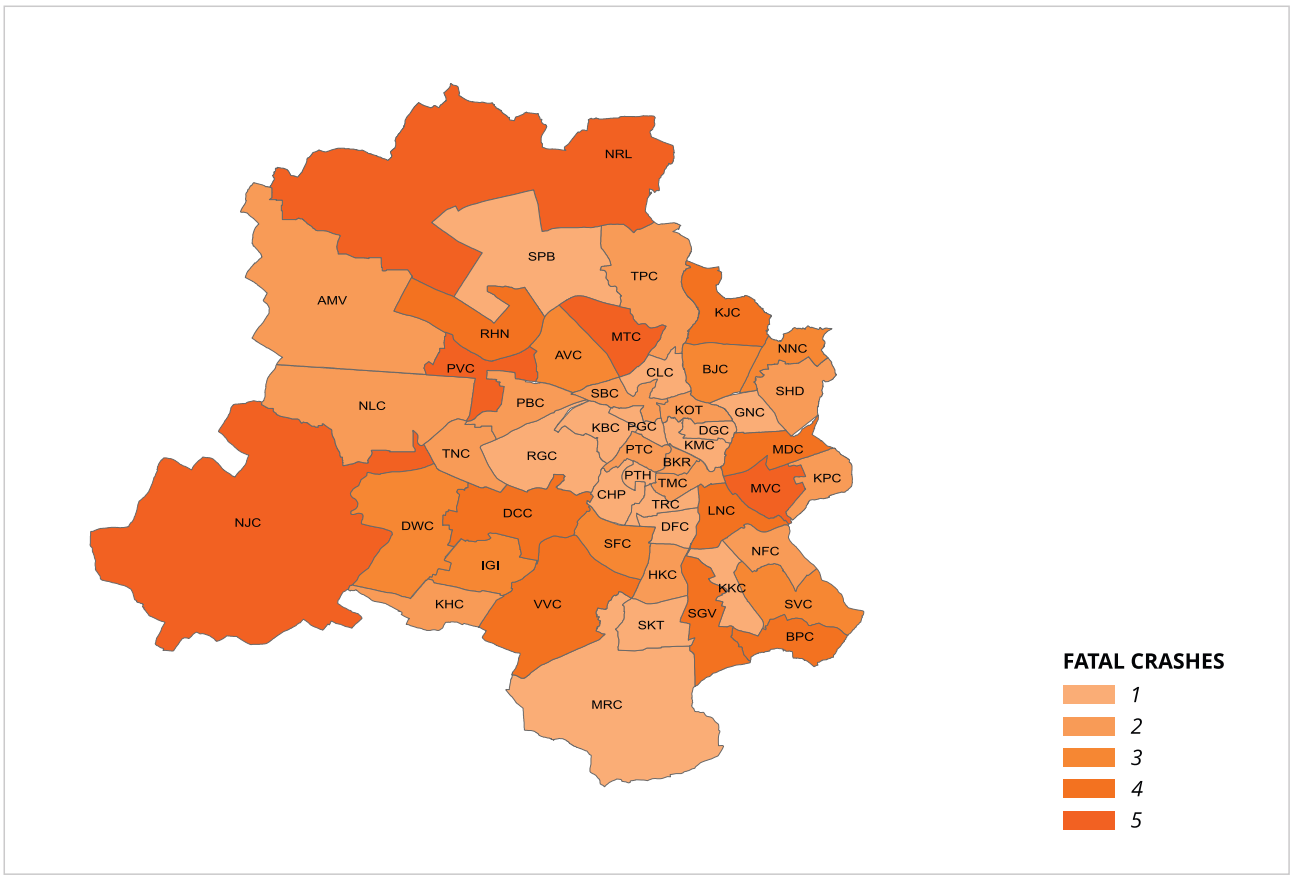
Fatal crashes by self-hit accounted for 100 crashes in 2023 as against 97 in 2022. Further two-wheeler riders top this category, 69 in 2023 as against 63 in 2022. Cars/jeeps/taxis and other occupants are the next higher number of victims of fatal crashes due to self-hit.

There has been decrease in cyclist related fatal crashes during 2023 (29) over 2022 (48).

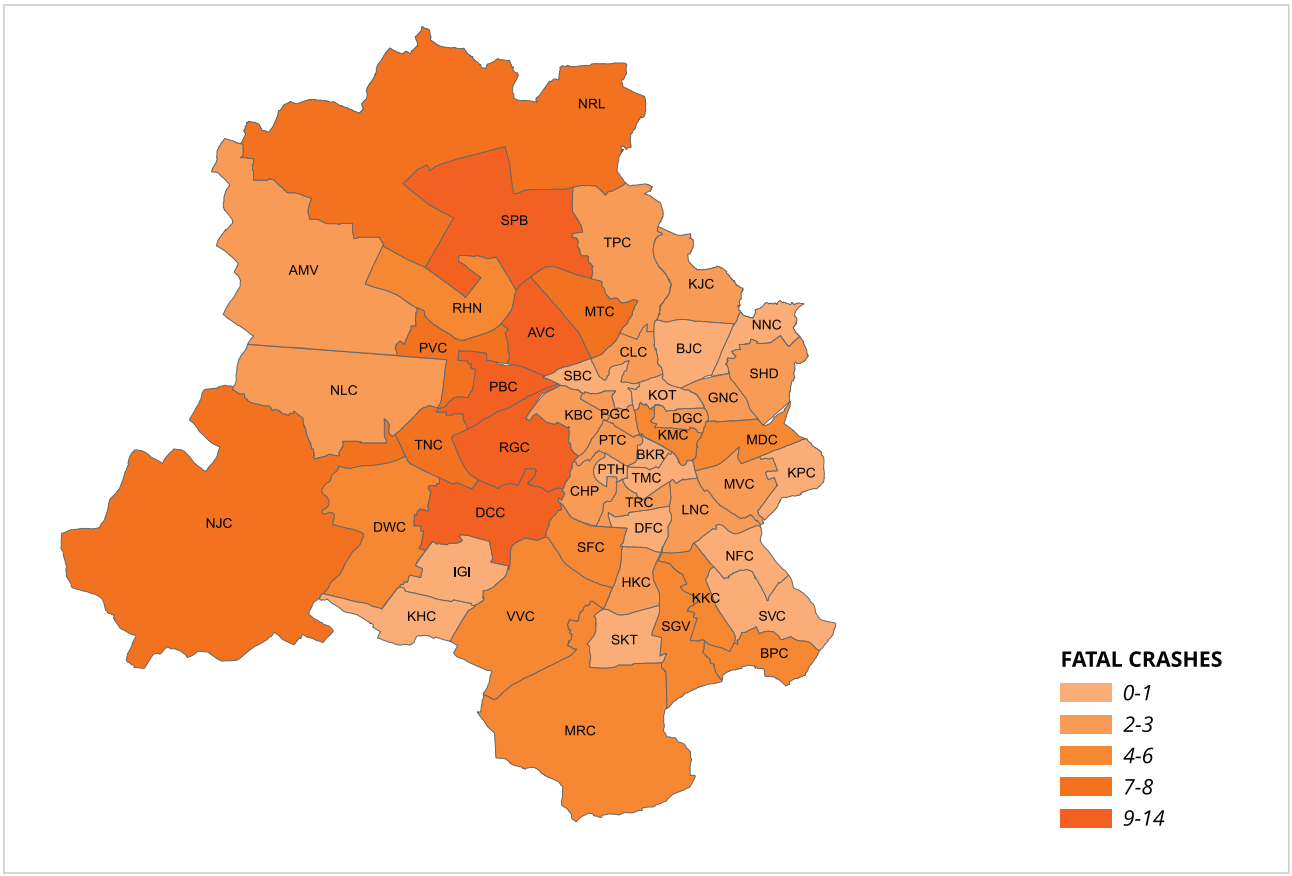
(Source for data 2022. Delhi Road Crash Report 2022)



Map 4.1 Accused Heavy Transport Vehicle involved in fatal crashes



Map 4.2 Accused buses involved in fatal crashes



Map 4.3 Accused cars involved in fatal crashes

4 .3 State-wise Classification of Accused Vehicles and Victims

As per the data, vehicles registered in Delhi caused more fatal crashes. (65.5 % of the vehicles with registration details) followed by those registered in Haryana (20.89 %), and in Uttar Pradesh (5.97%). This scenario is similar to that of the year 2022. During the year 2023 ,in case of simple crashes, accused vehicles are not known in 1,850 cases against the total 4,283 simple crash cases. Out of those cases in which the registration number of offending vehicles is known, Delhi stands at 73.4% (1,786 Cases), Haryana at 15.4 %, and Uttar Pradesh at (7.23%). HTVs registered in Haryana were involved in 81 (52.59%) fatal crash cases. The data shows that 50 buses registered in Delhi caused fatal crashes (92.59% 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
Arunachal Pradesh	*0*	*1*	*0*	*1*	*4*	*0*
Assam	*0*	*1*	*0*	*1*	*1*	*0*
Bihar	*0*	*4*	*3*	*7*	*8*	*3*
Chandigarh	*0*	*2*	*2*	*4*	*3*	*2*
Gujarat	*0*	*1*	*0*	*1*	*1*	*0*
Haryana	*30*	*375*	*126*	*531*	*501*	*132*
Himachal Pradesh	*2*	*6*	*3*	*11*	*7*	*3*
Jammu And Kashmir	*0*	*3*	*1*	*4*	*3*	*1*
Jharkhand	*0*	*0*	*2*	*2*	*0*	*2*
Karnataka	*0*	*1*	*0*	*1*	*1*	*0*
Kerala	*0*	*1*	*0*	*1*	*2*	*0*
Madhya Pradesh	*0*	*3*	*0*	*3*	*4*	*0*
Maharashtra	*1*	*7*	*1*	*9*	*7*	*1*
Meghalaya	*0*	*1*	*0*	*1*	*2*	*0*
Nagaland	*2*	*5*	*3*	*10*	*8*	*3*
Punjab	*0*	*15*	*6*	*21*	*26*	*6*
Rajasthan	*1*	*30*	*23*	*54*	*40*	*24*
Tamil Nadu	*0*	*1*	*0*	*1*	*1*	*0*
Tripura	*0*	*1*	*0*	*1*	*1*	*0*
Uttar Pradesh	*13*	*176*	*36*	*225*	*259*	*38*
Uttarakhand	*1*	*13*	*2*	*16*	*19*	*2*
Delhi	*63*	*1786*	*395*	*2244*	*2373*	*405*
State Unknown	*6*	*1850*	*829*	*2685*	*2199*	*835*

Out of 1,457 deaths in 2023, 835 deaths were caused by vehicles with state registration not known, 405 deaths were caused by vehicles registered in Delhi, 132 were killed by vehicles belonging to Haryana and 38 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 a marginal decreasing trend in 2023 as compared to last year 2022(668 in the year 2022 to 660 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 1104 in 2022 to 1091 in 2023 (24.78 %). 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 crash spot is another crucial reason. The cameras should be of state of the art technology goes to be truly effective.

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 5834 crashes in year 2023, 46.02% of crashes are caused by vehicles belonging to state unknown, followed by 38.46% of vehicles registered in Delhi, 9.1% of vehicles belonging to Haryana, 3.9 % belonging to state of Uttar Pradesh and 2.52 % 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 (872 viz. 38.86%), followed by scooters/ motorcycles (613 viz. 27.31%). In all, 145 'self-crashes' were caused by Delhi registered vehicles.

Table 4.5: State-wise registered vehicles at fault (all crashes)

State	At-Fault Vehicle								
	Two-Wheelers	TSRs	Car/Taxi/ Jeeps	Buses	LGVs	HTVs	Unknown Vehicles	Others	Total
Arunachal Pradesh	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*1*
Assam	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Bihar	*3*	*0*	*4*	*0*	*0*	*0*	*0*	*0*	*7*
Chandigarh	*0*	*0*	*3*	*0*	*1*	*0*	*0*	*0*	*4*
Delhi	*613*	*108*	*872*	*205*	*230*	*114*	*6*	*96*	*2,244*
Gujarat	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*1*
Haryana	*28*	*6*	*216*	*18*	*23*	*205*	*2*	*33*	*531*
Himachal Pradesh	*0*	*0*	*8*	*0*	*0*	*3*	*0*	*0*	*11*
Jammu and Kashmir	*1*	*0*	*2*	*0*	*0*	*1*	*0*	*0*	*4*

(Contd.)

State	At-Fault Vehicle								
	Two-Wheelers	TSRs	Car/Taxi/ Jeeps	Buses	LGVs	HTVs	Unknown Vehicles	Others	Total
Jharkhand	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*2*
Karnataka	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*
Kerala	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*
Madhya Pradesh	*1*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*3*
Maharashtra	*2*	*0*	*4*	*0*	*0*	*3*	*0*	*0*	*9*
Meghalaya	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Nagaland	*0*	*0*	*1*	*0*	*0*	*7*	*0*	*2*	*10*
Punjab	*2*	*0*	*6*	*1*	*1*	*10*	*0*	*1*	*21*
Rajasthan	*2*	*0*	*3*	*5*	*3*	*33*	*1*	*7*	*54*
Tamil Nadu	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Tripura	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*
Uttar Pradesh	*27*	*6*	*113*	*22*	*12*	*32*	*1*	*12*	*225*
Uttarakhand	*3*	*0*	*12*	*0*	*0*	*1*	*0*	*0*	*16*
State Unknown	*248*	*57*	*312*	*57*	*33*	*89*	*1,741*	*148*	*2,685*
Total	**932**	**177**	**1,561**	**309**	**304**	**501**	**1,751**	**299**	**5,834**

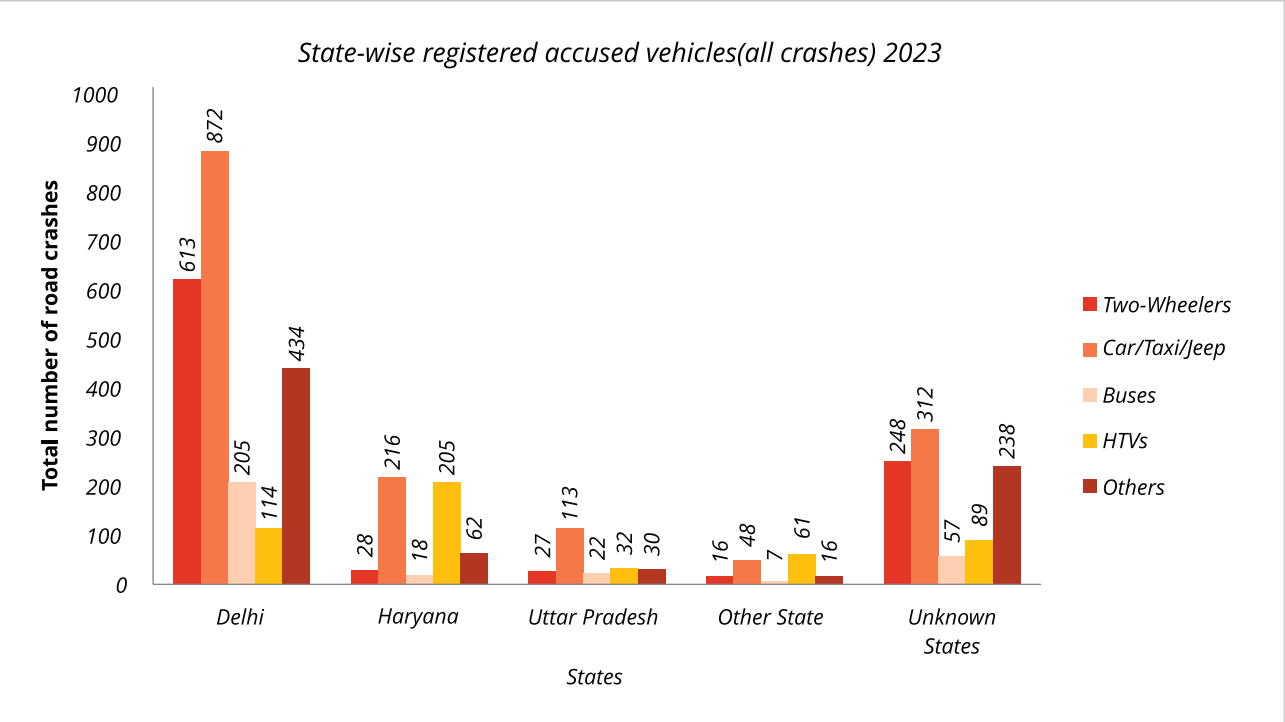


Figure 4.5 State-wise registered accused vehicles (all crashes)-2023

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 2023, vehicles belonging to Delhi accounts for 38.46%, Haryana accounts for 9.1% and Uttar Pradesh accounts for 3.8% of crashes respectively. Vehicles belonging to unknown states are responsible for 46.2% of total crashes.

Out of 5,834 total crashes, 2,244 crashes were caused by Vehicles belonging to Delhi which accounts for 38.46% total road crashes. Out of total crashes caused by vehicles belonging to Delhi, 872 crashes were caused by Car/Taxi/Jeep, 613 crashes were caused by two wheelers, and Buses accounted to 205 crashes whereas HTVs and other vehicles accounted for 114 and 440 crashes respectively.

Table 4.6: State-wise registered vehicles at fault (fatal crashes)-2023

State	At-Fault Vehicle								
	Two-Wheelers	TSRs	Car/Taxi	Buses	LGVs	HTVs	Unknown Vehicles	Others	Total
Bihar	*2*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*3*
Chandigarh	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*2*
Delhi	*111*	*22*	*108*	*50*	*54*	*40*	*0*	*10*	*395*
Haryana	*5*	*0*	*22*	*5*	*4*	*81*	*1*	*8*	*126*
Himachal Pradesh	*0*	*0*	*2*	*0*	*0*	*1*	*0*	*0*	*3*
Jammu and Kashmir	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Jharkhand	*0*	*0*	*1*	*0*	*0*	*1*	*0*	*0*	*2*
Maharashtra	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*
Nagaland	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*2*	*3*
Punjab	*1*	*0*	*0*	*1*	*0*	*3*	*0*	*1*	*6*
Rajasthan	*0*	*0*	*1*	*2*	*2*	*14*	*0*	*4*	*23*
Uttar Pradesh	*4*	*2*	*7*	*6*	*2*	*12*	*0*	*3*	*36*
Uttarakhand	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*2*
State Unknown	*32*	*11*	*43*	*9*	*9*	*36*	*659*	*30*	*829*
Total	**155**	**35**	**190**	**73**	**71**	**190**	**660**	**58**	**1,432**

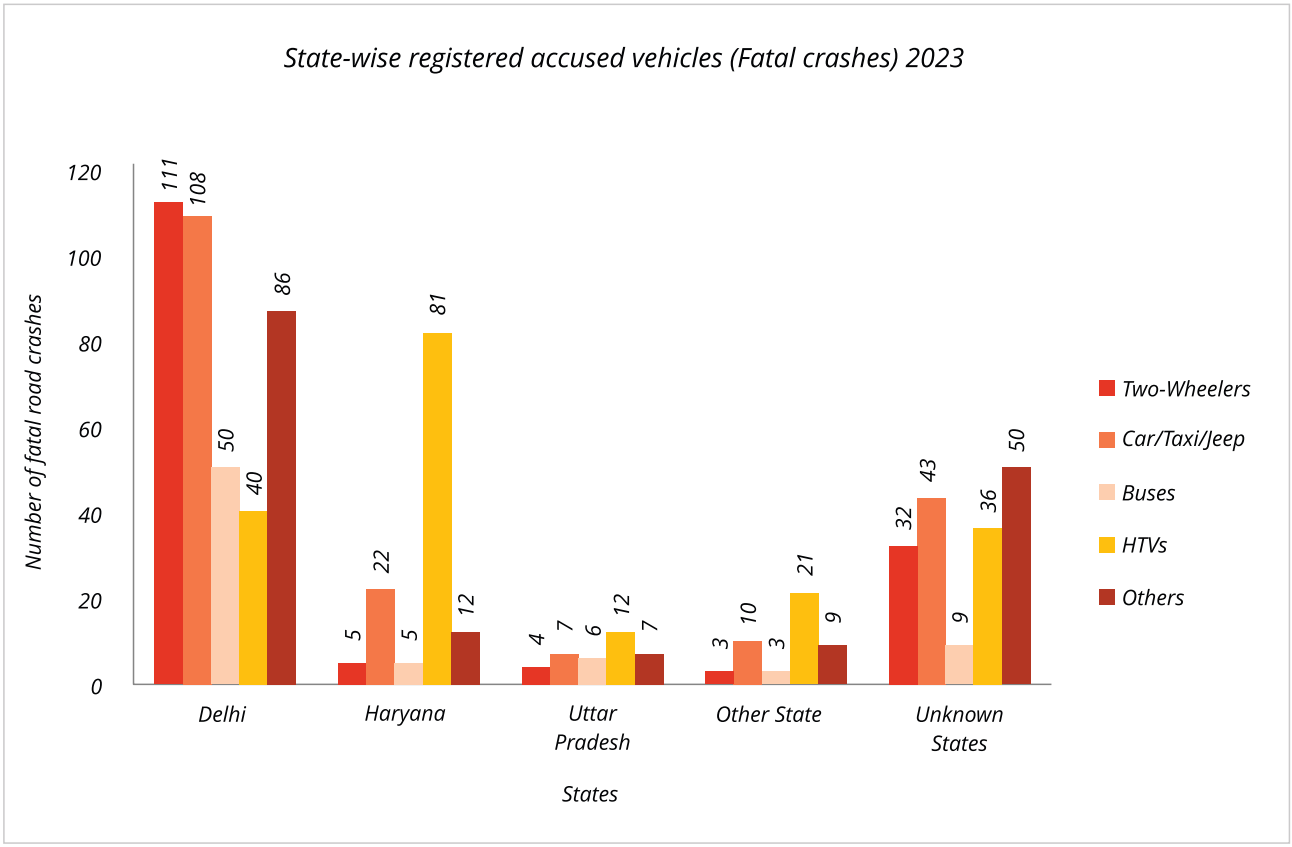


Figure 4.6 State-wise registered accused vehicles (fatal crashes)-2023

The above figure depicts that the accused vehicles belonging to Delhi state, Two-Wheeler were responsible for most of the fatal crashes (111 i.e. 28.10%) followed by Car/Taxi (108 i.e. 27.34%) and buses (50 i.e.12.66%).

Out of all accused vehicles belonging to Haryana, it is found that HTVs were responsible for most of the fatal crashes (81 i.e 64.29%) followed by Car/Taxi (22 i.e 17.47%) and Buses (5 i.e 3.97%).Uttar Pradesh accused vehicles analysis shows that HTVs are responsible for fatal crashes (13 i.e 33%) followed by Buses (6 i.e 16.67%).

4.6 State vs Victims

State vs victim 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) - 2023

State	Victims										
	Cyclists	Cycle Rickshaws	Electric Erickshaws	Two-Wheelers	Pedestrians	Passengers	Self	TSRs	Cars/Taxis	Others	Total
Arunachal Pradesh	0	0	0	0	0	0	1	0	0	0	1
Assam	0	0	0	1	0	0	0	0	0	0	1
Bihar	1	0	0	3	1	0	1	0	1	0	7
Chandigarh	1	0	0	2	0	0	0	1	0	0	4
Delhi	52	18	68	890	798	7	145	72	139	55	2,244
Gujarat	0	0	0	0	1	0	0	0	0	0	1
Haryana	23	2	9	2	125	1	11	23	65	35	531
Himachal Pradesh	0	0	1	237	3	0	1	1	2	1	11
Jammu and Kashmir	0	0	0	3	1	0	0	0	0	0	4
Jharkhand	0	0	0	2	0	0	0	0	0	0	2
Karnataka	0	0	0	0	1	0	0	0	0	0	1
Kerala	0	0	0	1	0	0	0	0	0	0	1
Madhya Pradesh	0	0	0	2	1	0	0	0	0	0	3
Maharashtra	0	0	0	3	3	0	0	0	1	2	9
Meghalaya	0	0	0	0	0	0	0	0	1	0	1
Nagaland	1	0	0	2	3	0	0	0	4	0	10
Punjab	1	0	2	10	8	0	0	0	0	0	21
Rajasthan	2	0	0	20	17	0	3	3	6	3	54
Tamil nadu	0	0	0	1	0	0	0	0	0	0	1
Tripura	0	0	0	1	0	0	0	0	0	0	1
Uttar Pradesh	4	2	4	94	62	0	9	15	22	13	225
Uttarakhand	1	0	2	7	2	0	0	2	2	0	16
State Unknown	55	12	32	1,063	1,312	8	65	49	51	38	2,685
Total	141	34	118	2,344	2,338	16	236	166	294	147	5,834

The above table depicts that the highest number of victims in total crashes belong to Delhi (2,244) followed by Haryana (531) and Uttar Pradesh (225) after this victims of state unknown i.e 2,685 in number. Vehicles registered in Delhi and Haryana were involved in the total crashes of about 34.13% and 5.35% pedestrians respectively. 37.97 % and 10.11% of two-wheelers were victims to vehicles registered in Delhi and Haryana respectively.

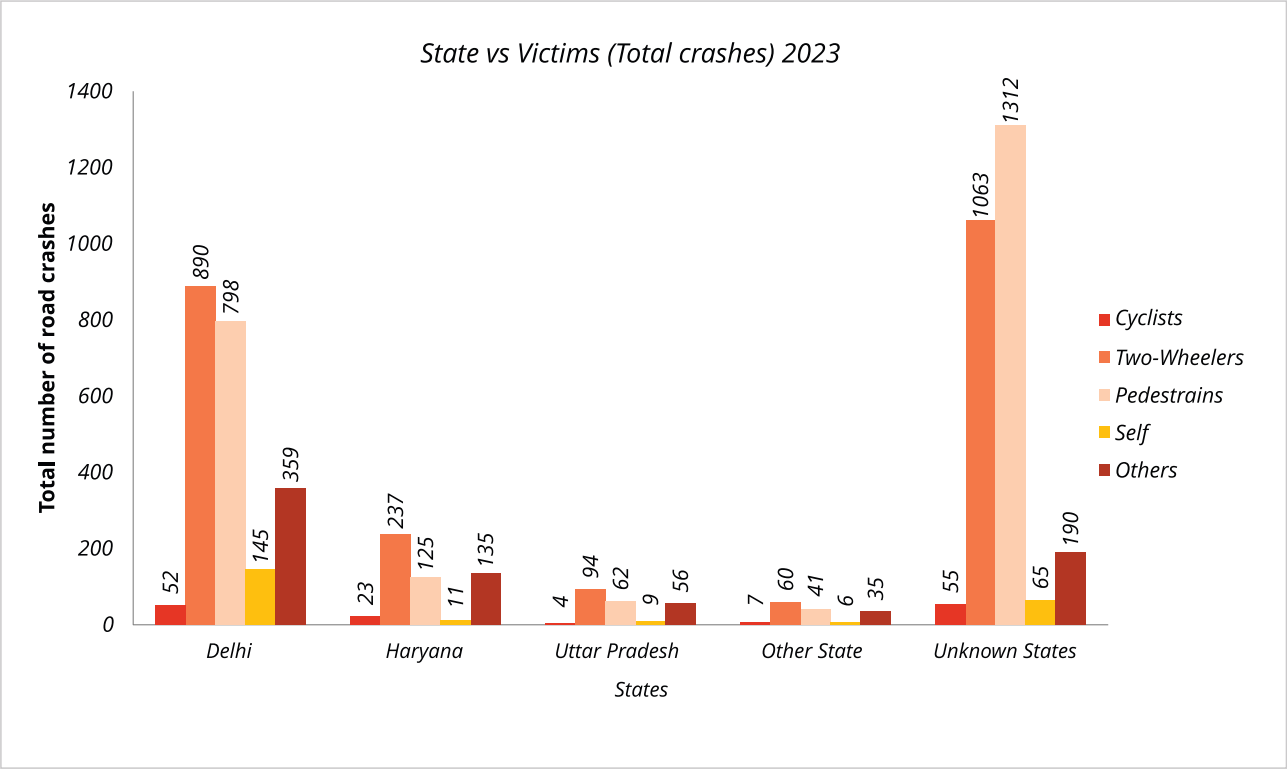


Figure 4.7 State vs Victims (total crashes)-2023

State vs victim total crashes analysis shows that the state with the highest victim vehicles belong to Delhi which are 2,244 in number after State unknown followed by Haryana, Uttar Pradesh.

Out of 2,244, crashes caused by vehicles registered in Delhi, 890 victims are two-wheeler riders followed by 798 pedestrian victims, 556 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)

	Victims									
State	**Cyclists**	**Cycle Rickshaws**	**Electric Rickshaws**	**Two-Wheelers**	**Pedestrians**	**Self**	**TSRs**	**Car/Taxi**	**Others**	**Total**
Bihar	*0*	*0*	*0*	*1*	*0*	*1*	*0*	*1*	*0*	*3*
Chandigarh	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*2*
Delhi	*10*	*2*	*8*	*130*	*142*	*67*	*13*	*13*	*10*	*395*
Haryana	*2*	*0*	*1*	*58*	*36*	*4*	*4*	*7*	*14*	*126*
Himachal Pradesh	*0*	*0*	*0*	*0*	*1*	*0*	*1*	*1*	*0*	*3*
Jammu and Kashmir	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*
Jharkhand	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*2*
Maharashtra	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*1*
Nagaland	*0*	*0*	*0*	*1*	*2*	*0*	*0*	*0*	*0*	*3*
Punjab	*0*	*0*	*0*	*2*	*4*	*0*	*0*	*0*	*0*	*6*
Rajasthan	*1*	*0*	*0*	*6*	*10*	*2*	*1*	*2*	*1*	*23*
Uttar Pradesh	*0*	*0*	*1*	*8*	*13*	*4*	*5*	*1*	*4*	*36*
Uttarakhand	*0*	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*2*
State Unknown	*15*	*3*	*5*	*327*	*408*	*22*	*14*	*19*	*16*	*829*
Total	**29**	**5**	**15**	**538**	**618**	**100**	**38**	**44**	**45**	**1,432**

The above table depicts that the highest number of victims in fatal crashes belong to Delhi (395) followed by Haryana (126) and Uttar Pradesh (36) after victims of state unknown i.e 829 in number. Vehicles registered in Delhi and Haryana were involved in the fatal crashes of about 22.98 % and 5.82 % pedestrians respectively.

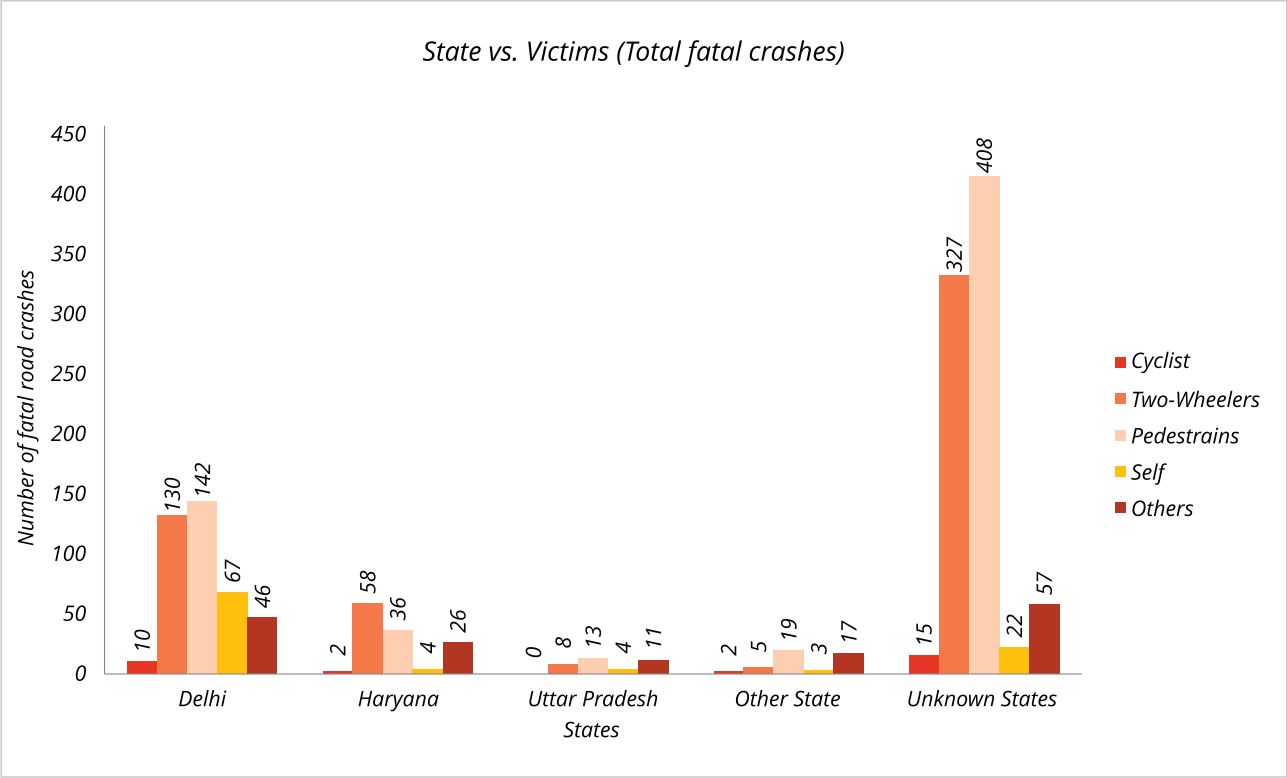


Figure 4.8 State vs Victims (total crashes)

60.78 % two-wheeler riders were victims of fatal crashes by vehicles whose registration state could not be traced; 24.16 % and 10.78 % 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 crashes caused in Delhi by vehicles registered in different states.

Most victims of the crashes caused by the vehicles registered in Delhi were pedestrians (142 i.e., 35.9%) followed by scooter/motor cyclists (130 i.e., 32.9%). Vehicles registered in Delhi were involved in 67 self-hit fatal crashes. In case of crashes by vehicles registered in Haryana, 58 i.e 46.03% victims of fatal crashes were two-wheeler riders and 36 i.e 28.6 % were pedestrians. The percent share of Two-wheeler victims is more than the percent share of pedestrian victims, in case of crashes by vehicles registered in Haryana state when compared to Delhi and Uttar Pradesh. Vehicles with registration state not-known caused 408 fatal crashes towards pedestrians, which accounted for 66.01% of all pedestrians killed in the year 2023.

TEMPORAL CRASH DATA

V. 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 help 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 crashes in 2023 have increased almost all week days in comparison to 2023. A significant increase in crashes on each day is seen in the year 2023 when compared to the year 2022.

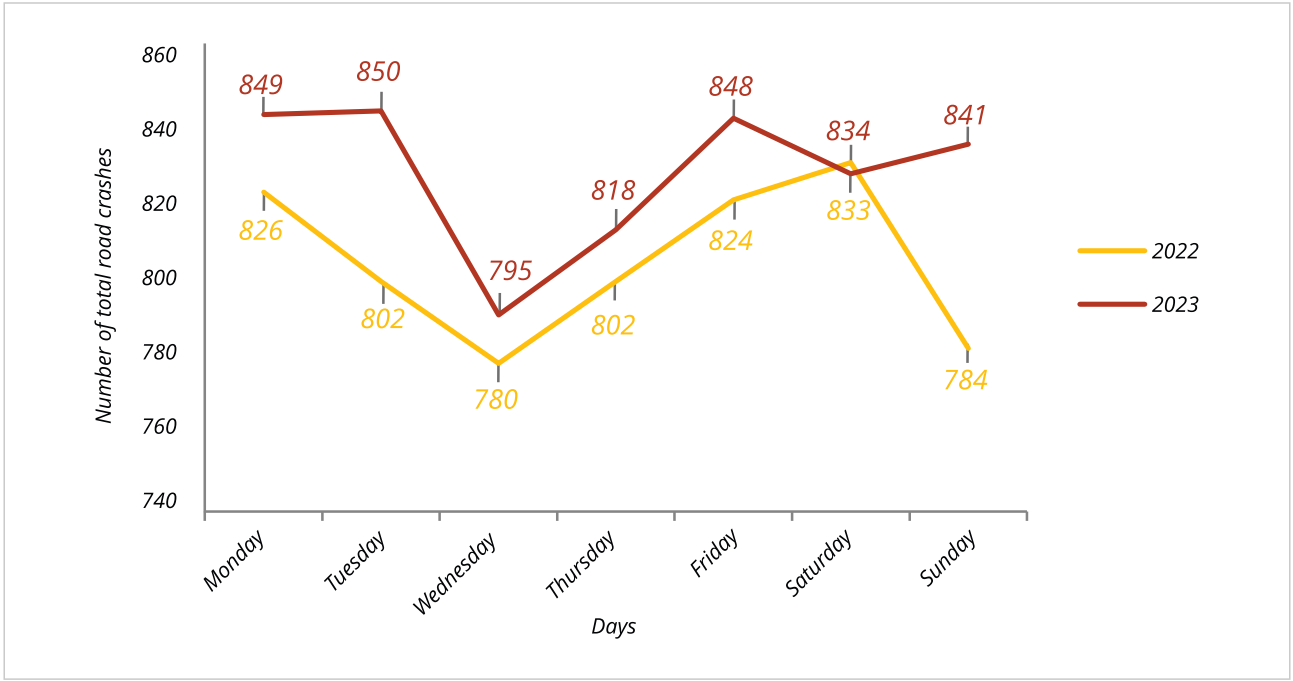


Figure 5.1 Comparison of total crashes by days of the week (2022 & 2023)

From the above figure, it can be understood that the number of total crashes has been the highest on Tuesday followed by Monday and Friday in the year 2023. Wednesday has witnessed the lowest crashes in the year 2022 as well as year 2023. **The increase in crashes is maximum on Sunday, Tuesday and Monday.**

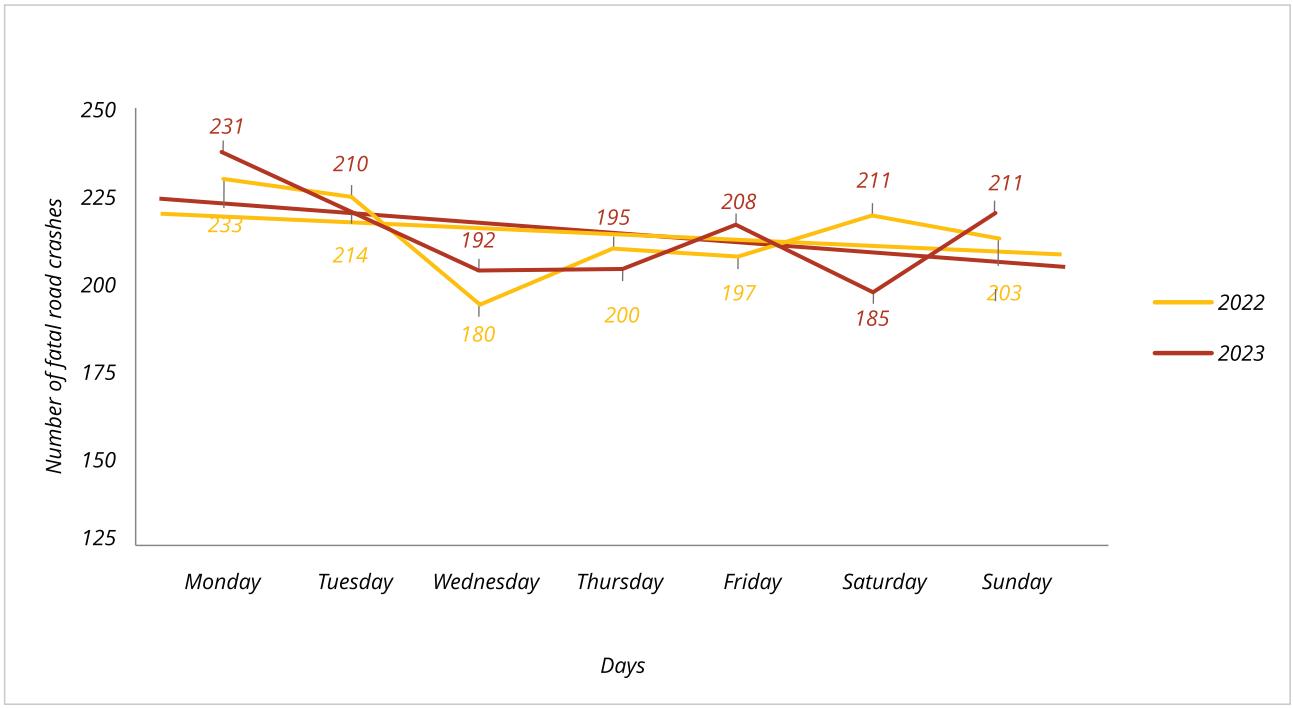


Figure 5.2 Comparison of fatal crashes by days of the week, 2022 & 2023

Fatal crashes trend on different days of the week, highlights a significant increase in fatal crashes on Monday followed by Sunday in 2023, when compared to fatal crashes in 2022. In 2023, Monday (231) accounted for the highest number of fatal crashes followed by Sunday (211) and Friday (208). Saturday witnessed the lowest fatal crashes in the year 2023. Wednesday had the lowest number of fatal crashes in the year 2022.

Table 5.1: Crashes by days of the week (2022-2023)

Types Of Crash	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Total	
	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
Fatal	*223*	*231*	*214*	*210*	*180*	*192*	*200*	*195*	*197*	*208*	*211*	*185*	*203*	*211*	*1,428*	*1,432*
Non-Fatal	*603*	*618*	*588*	*640*	*600*	*603*	*602*	*623*	*627*	*640*	*623*	*648*	*581*	*630*	*4,224*	*4,402*
Total	*826*	**849**	*802*	**850**	*780*	**795**	*802*	**818**	*824*	**848**	*834*	**833**	*784*	**841**	*5,652*	**5,834**

5.2 Crashes by Month

In 2023, Month- wise crashes data represents an increase in crashes each month except the month of March, April and July when compared to 2022. September and August have recorded higher number of total crashes in 2023. September and August have witnessed the highest percentage increase of total crashes in 2023 compared to 2022.

Table 5.2: Crashes by month (2022-2023)

Month	Fatal		Injury		Non-Injury		Total	
	2022	2023	2022	2023	2022	2023	2022	2023
January	113	114	301	313	10	11	424	438
February	111	112	309	317	10	12	430	441
March	130	132	314	291	7	9	451	432
April	118	124	388	334	12	12	518	470
May	114	128	355	366	5	14	474	508
June	127	100	322	350	9	14	458	464
July	128	116	349	349	8	7	485	472
August	130	136	327	386	7	9	464	531
September	93	119	326	379	3	6	422	504
October	133	132	377	408	10	4	520	544
November	117	114	348	369	7	9	472	492
December	114	105	416	421	4	12	534	538
Total	**1,428**	**1,432**	**4,132**	**4,283**	**92**	**119**	**5,652**	**5,834**

The above table depicts month-wise fatal, injury and non- injury crashes for the years 2022 and 2023. There has been an increase in injury except month of April and March. The total crashes show an increasing trend in all the months in the year 2023 when compared to 2022 except the month of March, April and July.

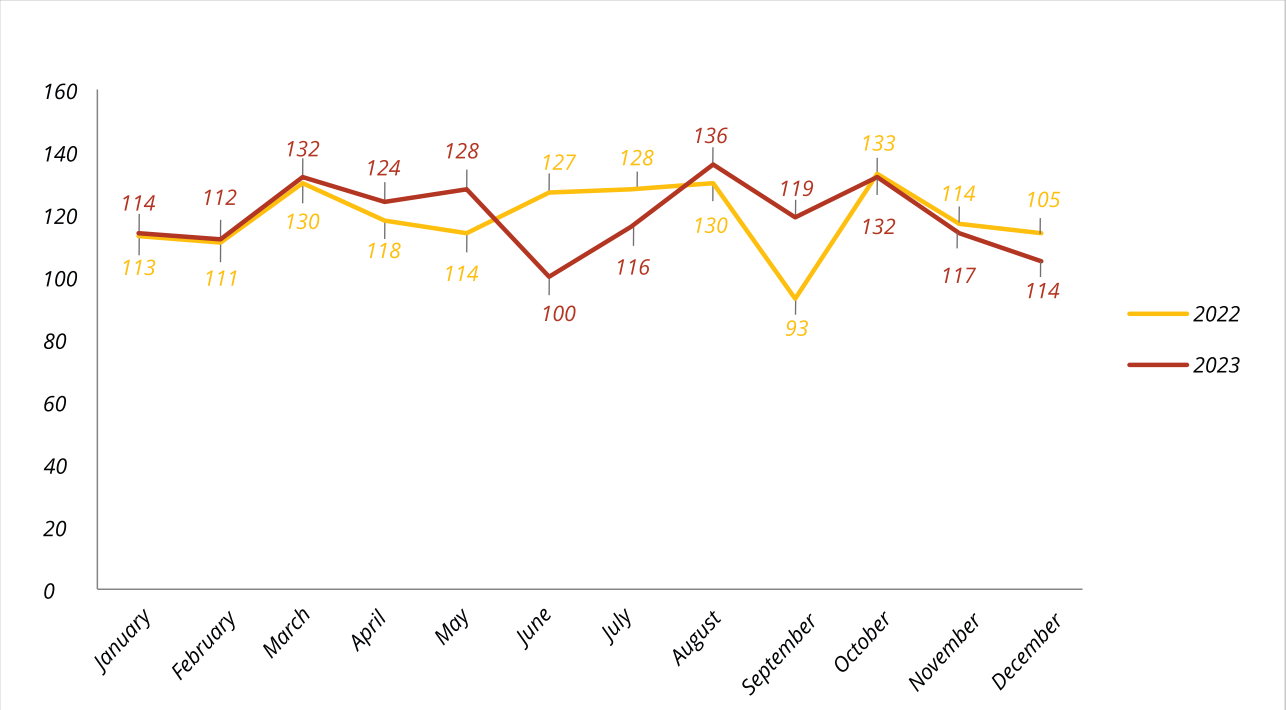


Figure 5.3 Comparison of fatal crashes by month (2022 & 2023)

In 2023, maximum fatal crashes occurred in the months of August (136) and March & October (132 each) whereas a lesser number of fatal crashes occurred in June (100), December (105). There has been a noticeable decrease in fatal crashes in the month of June from 127 fatal crashes in 2022 to 100 fatal crashes in 2023, July from 128 in 2022 to 116 in 2023 and December from 114 in 2022 to 105 in 2023.

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 (2019-2023)

Year	Fatal		Injury		Non-Injury		Total	
	Day	Night	Day	Night	Day	Night	Day	Night
2019	*656*	*777*	*2,474*	*1,651*	*23*	*29*	*3,153*	*2,457*
2020	*551*	*612*	*1,851*	*1,146*	*8*	*10*	*2,410*	*1,768*
2021	*561*	*645*	*2,098*	*1,382*	*14*	*20*	*2,673*	*2,047*
2022	*622*	*806*	*2,472*	*1,660*	*41*	*51*	*3,135*	*2,517*
2023	**629**	**803**	**2,581**	**1,702**	**63**	**56**	**3,273**	**2,561**

The above table shows a decreasing trend in fatal crashes during day and night from year 2019 to 2020 and increasing trend from year 2021 onwards in day but marginal decrease in 2023 compared to previous year during night. There is an increasing trend in injury, non-injury and total crashes.

Crash classifications in the below figure according to day and night shows that in 2023, 803 fatal crashes occurred during the night time whereas 629 occurred during the day time. In 2022, there were 622 fatal crashes during the day time and 806 during the night time.

Fatal crashes in day time were uniformly fewer than those in night time in all the years from 2019 to 2023. This shows that during the day, due to higher traffic volume on roads speed does not high, 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. Higher fatal crashes at night also suggests a 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 & 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 (66) onwards to peak by 2400 hrs (110) 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 restrictions 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 contributes to making them unsafe and prone to more crashes.

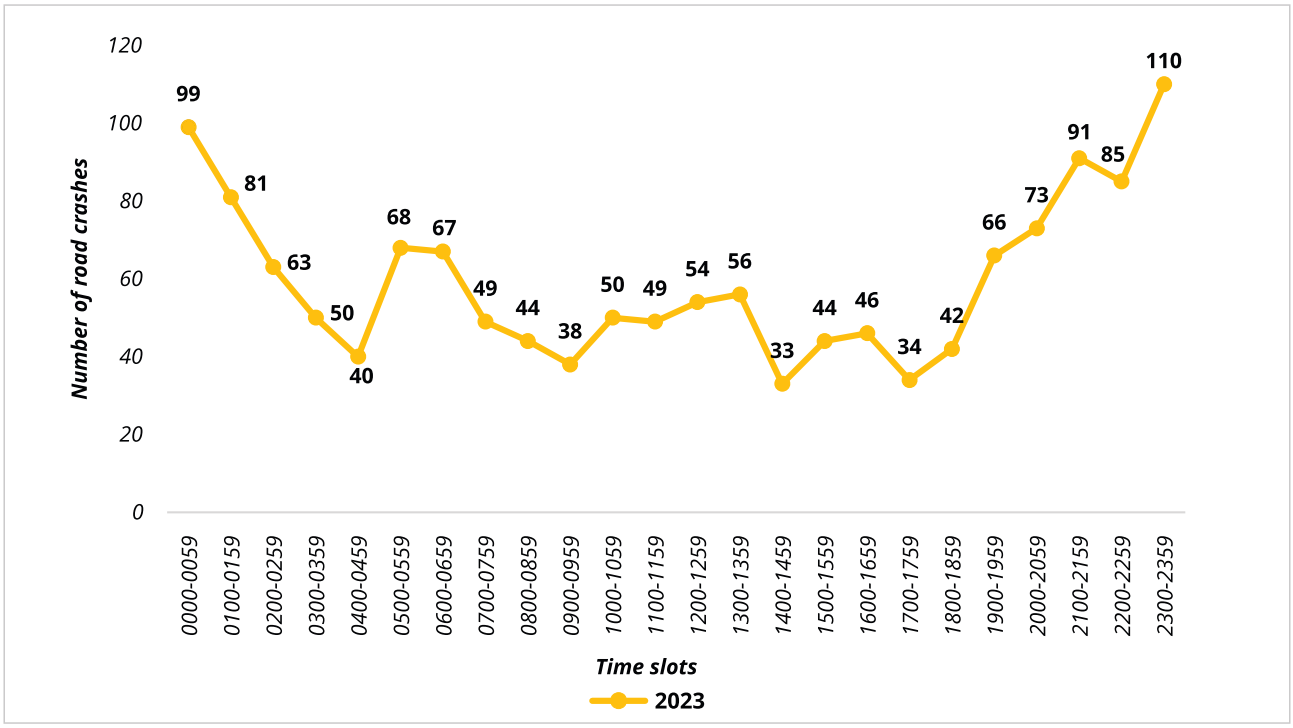


Figure 5.5 Time-wise fatal crashes 2023

Thereafter, fatal crashes decreased gradually from 0100 hours to 0500 hrs (40). The trend again continued to remain low till 0900-1000 hrs with 38 fatal crashes from 0500-0600 hrs (68), it started rising after 1100 hrs. The same trend persisted in the year 2022 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 occurrence

Time	Simple Crashes			Fatal Crashes		
	2021	2022	2023	2021	2022	2023
0000-0059	*132*	*167*	*192*	*78*	*95*	*99*
0100-0159	*100*	*129*	*134*	*54*	*82*	*81*
0200-0259	*62*	*99*	*112*	*30*	*59*	*63*
0300-0359	*61*	*70*	*73*	*33*	*42*	*50*
0400-0459	*45*	*79*	*74*	*30*	*58*	*40*
0500-0559	*84*	*95*	*95*	*40*	*55*	*68*
0600-0659	*101*	*135*	*129*	*43*	*48*	*67*
0700-0759	*116*	*145*	*161*	*41*	*45*	*49*
0800-0859	*140*	*149*	*178*	*45*	*49*	*44*
0900-0959	*139*	*213*	*223*	*30*	*37*	*38*

(Contd.)

Time	Simple Crashes			Fatal Crashes		
	2021	2022	2023	2021	2022	2023
1000-1059	171	177	185	47	39	50
1100-1159	164	149	185	33	44	49
1200-1259	134	188	207	39	38	54
1300-1359	132	201	210	30	49	56
1400-1459	150	189	169	38	52	33
1500-1559	139	177	180	40	50	44
1600-1659	159	176	203	40	47	46
1700-1759	152	201	203	32	39	34
1800-1859	190	209	207	44	48	42
1900-1959	197	219	247	64	64	66
2000-2059	245	265	247	79	66	73
2100-2159	256	286	282	77	97	91
2200-2259	248	276	287	96	112	85
2300-2359	197	230	219	123	113	110
Total	**3,514**	**4,224**	**4,402**	**1,206**	**1,428**	**1,432**

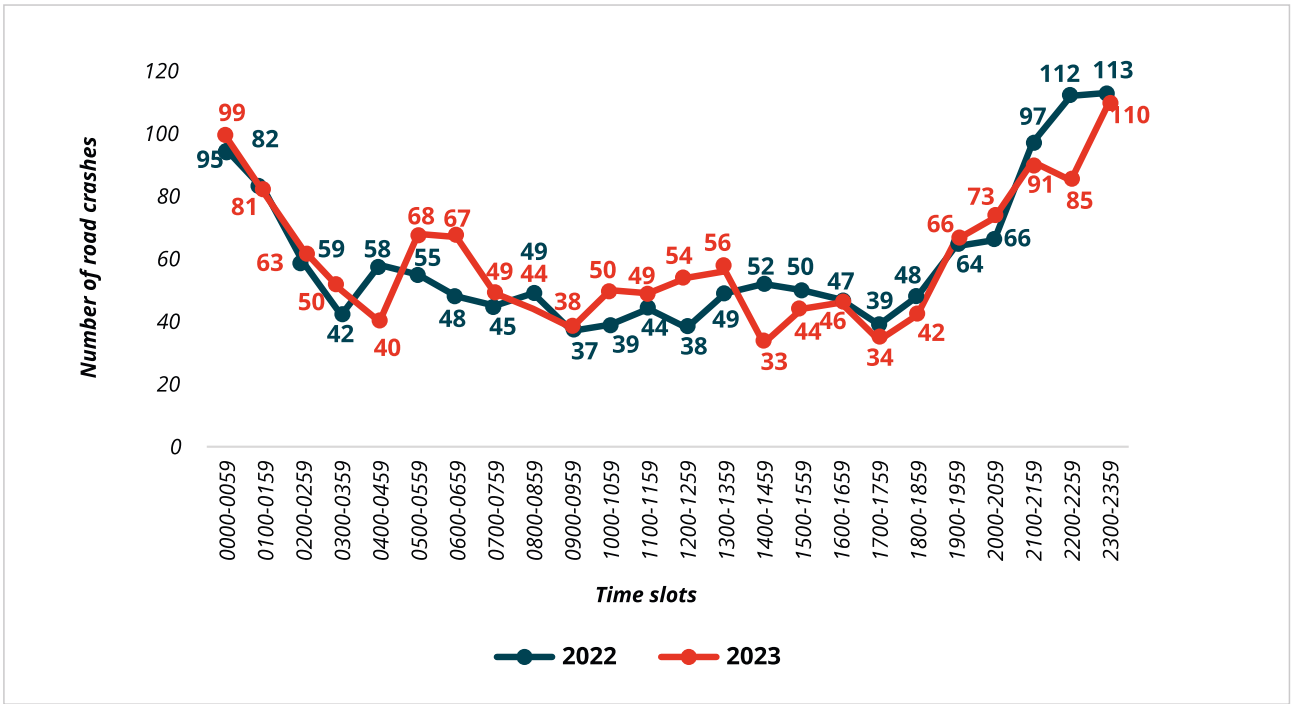


Figure 5.6 Time-wise fatal crashes 2022 & 2023

5.4 Time-wise 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 2023, in 660 (46.09 %) cases of fatal crashes, registration number of accused vehicles were unknown (hit and run cases), as against 668 (46.77 %) in 2022. 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, the need for better enforcement, adequate police visibility and and hesitation of citizens/eyewitnesses to report the crashes.

HTVs committed fatal crashes are at almost all hours. However, the number of crashes were highest between 2200 and 0200 hrs. Cars were involved in fatal crashes at all hours of the day and higher during the night time. Maximum crashes by cars were caused during 1900-2200 hrs.

Table 5.5: Time-wise vehicle at fault (fatal crashes) (2023)

Time	At Fault Vehicle								
	Buses	TSRs	Two Wheelers	Car/Taxi	LGVs	HTVs	Unknown Vehicle	Others	TOTAL
0000-0059	1	3	6	5	4	21	54	5	99
0100-0159	0	0	10	10	4	10	45	2	81
0200-0259	0	1	8	12	2	5	34	1	63
0300-0359	2	0	4	5	1	10	26	2	50
0400-0459	1	0	3	7	1	8	20	0	40
0500-0559	4	3	6	6	3	14	31	1	68
0600-0659	3	2	4	7	3	8	39	1	67
0700-0759	2	1	5	10	5	5	19	2	49
0800-0859	4	2	6	4	2	3	19	4	44
0900-0959	8	0	2	5	2	3	15	3	38
1000-1059	4	1	6	4	0	8	21	6	50
1100-1159	3	2	4	9	4	11	12	4	49
1200-1259	4	1	7	7	7	6	22	0	54
1300-1359	4	2	5	3	6	9	23	4	56
1400-1459	3	1	4	4	1	8	10	2	33
1500-1559	6	3	2	12	3	6	12	0	44
1600-1659	4	0	6	10	3	3	17	3	46

(Contd.)

Time	At Fault Vehicle								
	Buses	TSRs	Two Wheelers	Car/Taxi	LGVs	HTVs	Unknown Vehicle	Others	TOTAL
1700-1759	*2*	*3*	*3*	*5*	*0*	*6*	*13*	*2*	*34*
1800-1859	*0*	*3*	*6*	*7*	*2*	*2*	*21*	*1*	*42*
1900-1959	*1*	*2*	*10*	*14*	*2*	*5*	*27*	*5*	*66*
2000-2059	*2*	*2*	*13*	*13*	*1*	*5*	*34*	*3*	*73*
2100-2159	*7*	*1*	*13*	*11*	*4*	*4*	*50*	*1*	*91*
2200-2259	*2*	*0*	*13*	*6*	*4*	*15*	*40*	*5*	*85*
2300-2359	*6*	*2*	*9*	*14*	*7*	*15*	*56*	*1*	*110*
Total	**73**	**35**	**155**	**190**	**71**	**190**	**660**	**58**	**1,432**

5 .5 Time-wise 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 2000 – 0100 hrs.

Time between 2100-0100 hrs is the most vulnerable for occurrence of crashes involving motorized two-wheelers. Most single vehicle crashes occurred during 1900-0300 hrs. Cyclists accounted as the most vulnerable users of roads between 1900-2300hrs

Table 5.6: Time-wise victim (fatal crashes) (2023)

Victims										
Time	Cycle	Cycle-rickshaw	E-rickshaw	Two-Wheelers	Pedestr-ians	TSRs	Car/ Taxi	Self	Other	Total
0000-0059	1	0	1	43	36	2	7	6	3	99
0100-0159	0	0	0	30	34	2	2	9	4	81
0200-0259	0	0	1	28	18	2	3	8	3	63
0300-0359	0	0	0	16	21	3	2	6	2	50
0400-0459	0	0	0	14	14	2	5	2	3	40
0500-0559	1	1	0	21	26	5	5	4	5	68
0600-0659	3	0	1	19	32	4	0	3	5	67
0700-0759	1	0	1	13	25	2	2	3	2	49
0800-0859	3	0	1	14	23	0	2	0	1	44
0900-0959	0	0	0	17	20	1	0	0	0	38
1000-1059	5	0	0	16	22	0	0	5	2	50
1100-1159	0	0	0	21	22	2	0	3	1	49
1200-1259	1	2	0	17	29	0	1	4	0	54
1300-1359	0	0	1	27	25	1	0	1	1	56
1400-1459	0	0	0	12	16	3	0	1	1	33
1500-1559	0	0	1	22	15	3	0	0	3	44
1600-1659	1	0	1	20	18	1	1	3	1	46
1700-1759	0	0	2	16	14	1	0	1	0	34
1800-1859	2	0	0	10	25	1	1	2	1	42
1900-1959	3	0	1	24	27	1	2	8	0	66
2000-2059	2	1	0	22	34	1	1	11	1	73
2100-2159	3	0	1	33	41	0	5	8	0	91
2200-2259	2	0	0	34	41	0	1	4	3	85
2300-2359	1	1	3	49	40	1	4	8	3	110
Total	**29**	**5**	**15**	**538**	**618**	**38**	**44**	**100**	**45**	**1,432**

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

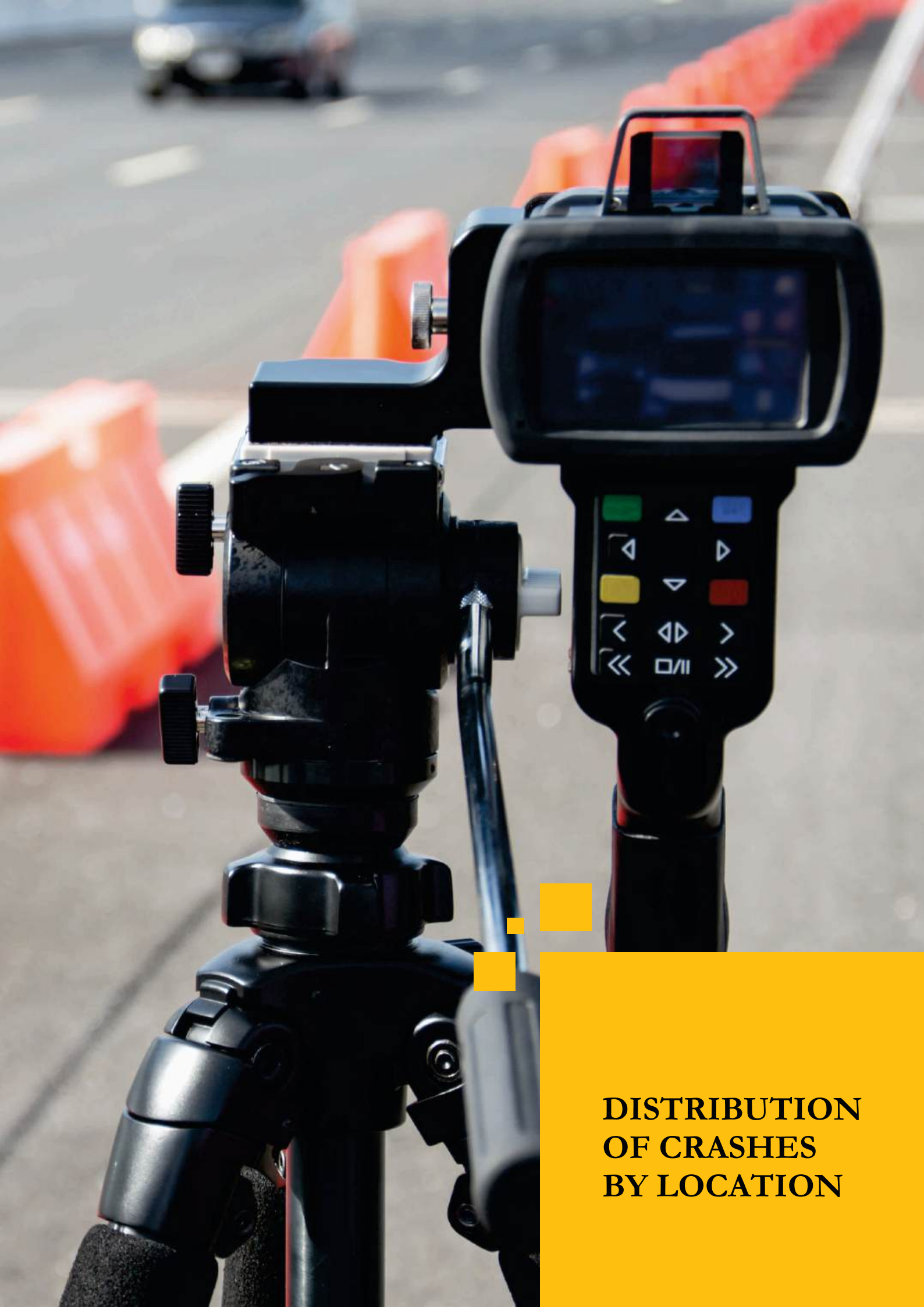
A well-maintained vehicle will allow for safer driving at night and reduce the risks for vehicle occupants and road users. Use of reflectors on cycle and other vehicles specially during breakdown and the use of reflective jackets by cyclist can help in preventing night time crashes.

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, reflective night studs, activated edges, more check- points at night, more police presence/visibility at night can help in reducing the road crashes at night.



DISTRIBUTION OF CRASHES BY LOCATION

VI. DISTRIBUTION OF CRASHES BY LOCATION

Understanding the spatial trend of crashes is crucial for effective road safety measures. By analyzing the distribution of crashes. 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.

6.1 Crash Data as per Traffic Ranges

The provided map illustrates the crash record in Delhi, categorised into 6 Traffic Ranges. In 2023, the Northern Range witnessed the highest fatal crashes, totaling 368 incidents. Following closely, the Western Range recorded 351 fatal crashes, while the Eastern Range reported 221 fatal crashes. When considering the total number of crashes, the Western range took the lead with 1,376 incidents in 2023. The Northern Range followed closely with 1,195 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 crashes. 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-2023

Traffic range	Fatal Crashes	Simple Crashes	Non-injury Crashes	Total Crashes
Western range	*351*	*1,009*	*16*	*1,376*
Northern range	*368*	*829*	*27*	*1,224*
Eastren range	*221*	*704*	*15*	*940*
Southern range	*180*	*713*	*32*	*925*
Central range	*164*	*521*	*10*	*695*
New delhi range	*148*	*507*	*19*	*674*
Total	**1,432**	**4,283**	**119**	**5,834**

On the other hand, the New Delhi Range of Delhi recorded the lowest number of crashes, with 148 fatal crashes and 507 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 crashes. Meanwhile the lower number of crashes in the New Delhi and Central Ranges highlights the effectiveness of existing measures and provides insights for further improvement in other areas.

6.2 Crash Data as per Traffic District

In 2023, 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 139, North-West District 124, Outer district with 121, South East district with 115, and North district with 115. Comparing these numbers to the previous year, 2022, the districts with the higher rates of fatal crashes were Outer North (172), West (136), South-West (131) Outer (119), South-East (114) and North-West (114) 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 District-2023

Traffic districts	Fatal Crashes	Simple Crashes	Non-injury Crashes	Total Crashes
Dwarka district	*91*	*394*	*6*	*491*
North district	*115*	*323*	*6*	*444*
North east district	*94*	*295*	*2*	*391*
East district	*79*	*243*	*9*	*331*
Central district	*49*	*198*	*4*	*251*
New Delhi district	*39*	*124*	*5*	*168*

(Contd.)

Traffic districts	Fatal Crashes	Simple Crashes	Non-injury Crashes	Total Crashes
Outer North District	*172*	*389*	*17*	*578*
South East District	*115*	*388*	*23*	*526*
South West District	*109*	*383*	*14*	*506*
West District	*139*	*351*	*5*	*495*
South District	*65*	*325*	*9*	*399*
Outer District	*121*	*264*	*5*	*390*
North West District	*124*	*253*	*3*	*380*
Rohini District	*72*	*187*	*7*	*266*
Shahdara District	*48*	*166*	*4*	*218*
Total	**1,432**	**4,283**	**119**	**5,834**

When considering the total number of road crashes in 2023, the Outer North district had the highest incidence with 578 crashes, followed by the South East district with 526, the South West District with 506, and the West District with 495. These districts consistently showed a higher occurrence of crashes throughout the year.

Regarding the most injurious crashes, the Dwarka district recorded the highest number with 394 incidents, followed by the Outer North with 389 and the South East with 388 and the South-West district with 383.

6.3 Crash Data as per Traffic Circles

Delhi has 50 traffic circles. In 2023, Narela Circle recorded the highest number of fatal crashes with (91) incidents, followed by Samaypur Badli with 81, Ashok Vihar with 73, Paschim Vihar with 67, Najafgarh and Punjabi Bagh with 57 each, Nangloi with 54 and Model Town with 51 Circle. These circles stood out as areas with a higher risk of fatal crashes. When considering the total number of crashes in Delhi during the same year, Narela circle had the highest incidence with 305 crashes, followed by Dwarka with 277, Samaypur Badli with 273, Paschim Vihar and Najafgarh with 214 each, Bhajan Pura with 209 and Ashok Vihar with 205. 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 crashes in these peripheral areas is crucial.

Table 6.3: Type of crashes by traffic circle-2023

S.No.	Traffic Circles	Fatal Crashes	Simple Crashes	Non-Injury Crashes	Total Crashes
1.	Narela	91	208	6	305
2.	Dwarka	34	240	3	277
3.	Najafgarh	57	154	3	214
4.	Bhajan Pura	39	168	2	209
5.	Ashok Vihar	73	130	2	205
6.	Madhu Vihar	46	135	3	184
7.	Nangloi	54	118	4	176
8.	Model Town	51	123	1	175
9.	Delhi Cantt	37	124	1	162
10.	Lajpat Nagar	35	100	6	141
11.	Khajuri Khas	37	86	0	123
12.	Mehrauli	23	95	4	122
13.	Badarpur	33	87	2	122
14.	Kotwali	40	67	1	108
15.	Aman Vihar	34	63	3	100
16.	Civil Lines	14	78	2	94
17.	Kapashera	20	66	1	87
18.	Kalkaji Circle	17	62	5	84
19.	Karol Bagh	10	69	1	80
20.	Gandhi Nagar	10	64	1	75
21.	Kamla Market	16	58	0	74
22.	Defence Colony	9	64	1	74
23.	Mayur Vihar	21	48	5	74
24.	Kalyan Puri	12	60	1	73
25.	Hauz Khas	12	56	1	69
26.	Nand Nagri	18	41	0	59
27.	Chanakya Puri	7	31	1	39
28.	Darya Ganj	8	25	1	34
29.	IGI Airport	4	20	1	25
30.	Bara Khamba Road	7	10	0	17

(Contd.)

S.No.	Traffic Circles	Fatal Crashes	Simple Crashes	Non-injury Crashes	Total Crashes
31.	Samay Pur Badli	81	181	11	273
32.	Paschim Vihar	67	146	1	214
33.	Punjabi Bagh	57	120	0	177
34.	Timarpur	48	125	2	175
35.	Tilak Nagar	39	125	2	166
36.	Rohini	38	124	4	166
37.	Rajouri Garden	43	106	3	152
38.	Shahdara	38	102	3	143
39.	Vasant Vihar	29	102	2	133
40.	Sarita Vihar	19	90	5	114
41.	Sangam Vihar	16	85	3	104
42.	Safdarjung Enclave	19	71	9	99
43.	Sadar Bazar	13	53	1	67
44.	New Friends Colony	11	49	5	65
45.	Pahar Ganj	15	46	2	63
46.	Parliament Street	13	43	1	57
47.	Saket	5	25	0	30
48.	Tilak Marg	6	21	0	27
49.	Tughlak Road	4	12	3	19
50.	Parliament House	2	7	0	9
	Total	**1,432**	**4,283**	**119**	**5,834**

6.4 Top 10 Crash Prone Roads

Among the roads in Delhi, the top 10 fatal crash-prone roads in 2023 are Ring Road with 122 fatal crashes, Outer Ring Road with 106, GTK Road with 74, Rohtak Road with 56, Najafgarh Road with 39, Pusta Road with 28, Grand Trunk Road with 25, Wazirabad Road and Mathura Road with 23 each, Bawana Road with 21.

In terms of total crashes, the top 10 crash-prone roads are as follows: Ring Road with 396, Outer Ring Road 326, GTK Road with 205, Rohtak Road with 166, Najafgarh Road 161, Grand Trunk Road 103, Pusta Road with 99, Wazirabad Road with 96, Mathura Road with 93,and Bawana Road with 79.

Table 6.4: Top ten fatal crash prone roads

S.No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	*Ring Road*	*122*	*396*	*125*
2.	*Outer Ring Road*	*106*	*326*	*109*
3.	*GTK Road*	*74*	*205*	*82*
4.	*Rohtak Road*	*56*	*166*	*57*
5.	*Najaf Garh Road*	*39*	*161*	*39*
6.	*Pusta Road*	*28*	*99*	*28*
7.	*Grant Trunk Road*	*25*	*103*	*27*
8.	*Wazirabad Road*	*23*	*96*	*25*
9.	*Mathura Road*	*23*	*93*	*23*
10.	*Bawana Road*	*21*	*79*	*21*

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 2021 to 2023.

The data highlights various inferences on the crash data from 2021 to 2023. Major roads such as the Ring Road, Outer Ring Road, GTK Road, Rohtak Road, Najafgarh Road, Pusta Road, Grand Trunk Road, Wazirabad Road and Bawana Road have consistently shown a higher number of crashes throughout 2023.

Additionally, specific roads have witnessed a notable increase in the number of crashes. For example, Ring Road had 349 in 2022 but the number rose to 47 in 2023, similarly Najafgarh Road recorded 120 crashes in 2022, which increase to 41 in 2023. Pusta Road saw an increase from 65 crashes in 2022 to 99 crashes in 2023, Mehrauli Gurgaon Road had 33 crashes in 2022 but the number escalate to 66 in 2023. other road like Kanjhawala, GTK, Mehrauli Badarpur, Rani Jhansi, Bhati Mine have also experienced 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, NH-24 had 93 in 2022 which decreased to 53 in 2023. similarly, Rohtak Road had 191 in 2022 which decreased to 166 in 2023. Outer Ring Road also showed improvement, with number of crashes decreased from 349 in 2022 to 326 in 2023. Lessons learned from these roads can be applied to other crash-prone roads in Delhi to reduce the number of crashes effectively.

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

Table 6.5: Crashes classified according to place of occurrence (roads)

S. No	Road Name	Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
		2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
1.	Africa Avenue	0	0	0	5	7	8	0	0	2	5	7	10
2.	Alipur Road	0	1	2	2	10	7	0	0	0	2	11	9
3.	Anand Mai Marg	5	8	6	15	32	13	2	2	2	22	40	21
4.	Aruna Asaf Ali Marg	1	0	2	7	6	5	0	0	0	8	6	7
5.	Asaf Ali Road	1	1	0	3	1	2	0	0	0	4	2	2
6.	August Kranti Marg	0	0	0	4	2	2	0	0	0	4	2	2
7.	Aurobindo Marg	3	6	2	15	17	23	0	1	0	18	24	25
8.	Bahadur Shah Zr Marg	1	1	0	7	6	4	0	0	0	8	7	4
9.	Bawana Road	19	28	21	28	50	56	0	1	2	47	79	79
10.	Bhati Mine Marg	0	0	6	1	0	11	0	0	0	1	0	17
11.	Boulevard Road	2	1	2	14	8	11	0	0	0	16	9	13
12.	Captain Gaur Marg	1	1	6	3	3	9	0	0	0	4	4	15
13.	Chhatarpur Road	1	0	1	0	6	8	0	0	0	1	6	9
14.	Dhansa Road	8	8	9	8	7	10	0	2	0	16	17	19
15.	Desh Bandu Gupta Road	3	10	3	11	16	10	1	0	0	15	26	13
16.	Dr. Amr.Road	2	0	0	2	0	3	0	0	0	4	0	3
17.	DSIIDC Narela Road	0	1	2	1	7	7	0	0	0	1	8	9
18.	Dwarka Road			0			0			0			0
19.	Faiz Road	0	1	0	1	1	0	0	0	0	1	2	0
20.	Ghuman Hera Marg	2	1	1	2	0	1	0	0	0	4	1	2
21.	Grand Trunk Road	21	25	25	57	71	75	0	2	3	78	98	103
22.	GTK Road	44	65	74	90	117	1,266	0	1	5	134	183	205
23.	Gurgaon Road	0	0	0	1	0	0	0	0	0	1	0	0
24.	ISBT Road		0	0		1	0		0	0		1	0
25.	Jawahar Lal Nehru Road	1	6	2	14	11	12	0	0	0	15	17	14
26.	Jharoda Road	7	7	2	1	13	10	0	0	0	8	20	12
27.	Kanjhawala Road	6	10	16	25	20	38	0	0	1	31	30	55
28.	Lala Lajpat Rai Path	2	5	1	24	21	15	0	1	3	26	27	19

(Contd.)

S. No	Road Name	Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
		2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
29	Loni Road	2	3	5	11	14	5	0	1	0	13	18	10
30	Mahipal Pur Road	3	3	6	11	15	13	0	1	0	14	19	19
31	Mandoli Road	0	1	1	5	5	4	0	0	0	5	6	5
32	Mathura Road	14	27	23	66	86	65	0	4	5	80	117	93
33	Mayapuri Marg	4	6	1	4	11	5	1	0	0	9	17	6
34	Mehrauli Badarpur Road	18	20	14	54	24	52	0	1	0	72	45	66
35	Mehrauli Gurgaon Road	11	9	7	12	24	23	0	0	3	23	33	66
36	Najafgarh Road	28	24	39	78	94	121	1	2	1	107	120	161
37	Najafgarh Nangloi Road	10	4	6	28	25	22	0	0	0	38	29	28
38	Nangloi Sultanpuri Road	0	0	0	0	0	1	0	0	0	0	0	1
39	Naraina Road	0	1	0	3	3	3	0	0	0	3	4	3
40	Narela Road	9	9	10	12	20	22	0	0	0	21	29	32
41	Nelson Mandela Marg	0	2	0	6	2	9	0	0	0	6	4	9
42	New Rohtak Road	11	5	5	12	20	27	0	0	1	23	25	33
43	NH-24	15	25	16	32	68	35	0	0	2	47	93	53
44	NH-8	26	29	18	56	55	73	3	0	1	85	84	92
45	Noida DND Road	4	2	2	6	8	4	0	0	0	10	10	6
46	Old Gurgaon Road	2	4	2	3	5	3	0	0	0	5	9	5
47	Old Rohtak Road	2	4	0	6	3	3	0	0	0	8	7	3
48	Olof Palme Marg	0	0	0	0	0	1	0	1	0	0	1	1
49	Outer Circle C. Place	0	4	0	0	4	5	0	0	0	0	8	5
50	Outer Ring Road	95	102	106	182	239	214	3	8	6	280	349	326
51	Palam Dabri Road	0	2	0	1	14	3	0	0	0	1	16	3
52	Palla Road	0	5	1	3	8	2	0	0	0	0	13	3
53	Panchkuian Road	3	2	3	10	2	2	0	1	0	13	5	5
54	Pankha Road	9	9	11	15	19	24	0	0	1	24	28	36
55	Patel Road	4	7	12	23	23	30	0	0	0	27	30	42
56	Patpar Ganj Road	1	3	4	8	6	11	0	1	1	9	10	16

(Contd.)

S. No	Road Name	Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
		2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
57	Press Enclave Marg	2	4	1	6	5	6	0	0	0	8	9	7
58	Prithvi Raj Road	1	1	0	4	9	1	0	0	0	5	10	1
59	Qutab Road	2	1	0	1	2	1	0	0	0	3	3	1
60	Raja Ram Marg	2	4	3	7	5	2	1	0	0	10	9	5
61	Rama Road	1	3	2	3	7	5	0	0	0	4	10	7
62	Rani Jhansi Road	1	0	9	12	5	14	0	0	0	13	5	23
63	Rao Tula Ram Marg	2	3	3	6	10	13	1	2	1	9	15	17
64	Ravi Das Marg	1	1	1	7	18	8	0	0	0	8	19	9
65	Ring Road	85	119	122	192	223	261	3	7	13	280	349	396
66	Rithala Road	0	0	0	1	2	3	0	0	0	1	2	3
67	Road No 13	0	0	0	2	0	0	0	0	0	2	0	0
68	Road No 37	2	1	1	1	3	2	0	0	0	3	4	3
69	Road No 40	1	2	3	4	14	2	0	0	0	5	16	5
70	Road No 41	6	2	2	10	5	4	0	0	1	16	7	7
71	Road No 56	9	15	18	14	23	28	0	0	1	23	38	47
72	Road No 57	4	6	5	11	20	30	1	1	1	16	27	36
73	Road No 66	5	0	1	9	11	5	0	0	0	14	11	6
74	Rohtak Road	46	63	56	89	126	107	1	2	3	136	191	166
75	Roshanara Road	0	3	0	10	9	4	0	0	0	10	12	4
76	Shanti Path	0	0	0	0	0	5	0	0	0	0	2	5
77	Station Road	3	1	1	6	7	6	1	1	0	10	9	7
78	Todapur Road (Dps Marg)	8	4	8	8	14	9	0	0	0	16	18	17
79	Vikas Marg	5	9	10	30	33	45	1	0	0	36	42	55
80	Viveka Nand Marg	0	0	1	1	2	0	0	0	4	1	2	5
81	Wazirabad Road	21	25	23	80	78	73	0	2	0	101	105	96
82	Yamuna Pusta Road	8	12	6	15	18	9	0	0	0	23	30	16
83	Road No 13A	6	6	8	17	12	23	0	0	2	23	18	33
84	B.K.S Marg	6	3	2	6	10	4	0	0	0	12	13	6

(Contd.)

S. No	Road Name	Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
		2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
85	Bawana Auchandi Road	0	5	3	2	2	5	0	0	1	2	7	9
86	Bijwasan Road	9	7	8	12	13	13	0	0	0	21	20	21
87	Burari Road	5	6	4	17	9	19	0	1	0	22	16	23
88	Chhawla Road	0	1	2	3	3	2	0	0	0	3	4	4
89	DDU Marg	1	1	2	2	5	5	0	0	0	3	6	7
90	Jai Singh Road	0	0	0	1	0	0	0	0	0	1	0	0
91	Jail Road	3	1	0	7	7	1	0	0	0	10	8	1
92	Jaitpur Road	2	4	0	9	0	3	0	0	0	11	4	3
93	Janpath	2	2	0	4	5	1	0	0	0	6	7	1
94	Kotla Road	3	4		9	4	2	0	0	0	12	8	2
95	Lodi Road	0	0	3	6	2	2	0	1	0	6	3	5
96	Maharaja Sur.Road	0	0	0	1	3	0	0	0	0	1	3	0
97	Pusa Road	1	2	0	12	6	10	0	0	0	13	8	10
98	Pusta Road	7	10	28	29	53	71	0	1	0	36	65	99
99	Qutab Garh Road	0	2	0	4	2	1	0	0	0	4	4	1
100	Ramdev Marg	1	0	0	0	2	0	0	0	0	1	2	0
101	Ridge Road	3	2	1	3	2	7	0	1	0	6	5	8
102	Sardar Patel Marg	3	5	0	4	5	8	0	0	0	7	10	8
103	S. P. M Marg	4	4	5	0	1	6	0	0	0	0	5	11

Table 6.6: Road Crashes on National Highways, 2023

NATIONAL HIGHWAYS				
Road Name	**Fatal Crashes**	**Simple Crashes**	**Non-Injury Crashes**	**Total Crashes**
NH-1 (now NH-44) (G.T. Karnal road)	*74*	*126*	*5*	*205*
NH-10 (now NH-9) (Rohtak road)	*56*	*107*	*3*	*166*
NH-2 (Mathura road)	*23*	*65*	*5*	*93*
NH-24 (Now NH-9)	*16*	*35*	*2*	*53*
NH-58 (G.T. Road)	*25*	*75*	*3*	*103*
NH-8 (Now NH-48)	*18*	*73*	*1*	*92*
	212	*481*	*19*	*712*

In 2023, the ring road and outer ring road in Delhi witnessed 396 and 326 Crahes respectively. 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 2022 the ring road recorded 349 crashes, which rose to 396 crashes in 2023. Notably, the Dhaula Kuan to I.P. Depot stretch specifically saw an increase of 31 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 crashes in the mentioned stretch.

Table 6.7: Road Crashes on Ring Road from 2021 to 2023

S. No	Road	Ring Road											
		Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
		2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
1	*Azadpur To Dhaula Kuan*	*38*	*59*	*55*	*62*	*72*	*90*	*0*	*3*	*1*	*100*	*134*	*146*
2	*Dhaula Kuan To I. P. Depot*	*21*	*29*	*34*	*68*	*76*	*96*	*3*	*3*	*9*	*92*	*108*	*139*
3	*I.P. Depot To I. P. College*	*18*	*18*	*24*	*41*	*50*	*57*	*0*	*0*	*2*	*59*	*68*	*83*
4	*I. P. College To Azad Pur*	*8*	*13*	*9*	*21*	*25*	*18*	*0*	*1*	*1*	*29*	*39*	*28*

In 2023, the outer ring road in Delhi witnessed 326 crashes reflecting an increase compared to the 349 crashes recorded in 2022. 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 2023. with 186 incidents. This particular road segment carries a greater risk in terms of road safety.

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 6.8: Road Crashes on Outer Ring Road from 2021 to 2023

S. No	Road	Outer Ring Road											
		Fatal Crashes			Injury Crashes			Non-Injury Crashes			Total Crashes		
		2021	2022	2023	2021	2022	2023	2021	2022	2023	2021	2022	2023
1	*Outer Ring Road (West)*	*12*	*23*	*21*	*14*	*49*	*45*	*0*	*1*	*1*	*26*	*73*	*67*
2	*Outer Ring Road (North)*	*70*	*63*	*68*	*126*	*128*	*116*	*1*	*1*	*2*	*197*	*192*	*186*
3	*Outer Ring Road (South)*	*13*	*16*	*17*	*42*	*62*	*53*	*2*	*6*	*3*	*57*	*84*	*73*

6.6 Crash Prone Roads with More than 10 Deaths

Apart from the previously mentioned roads, ten other roads in Delhi recorded ten or more deaths in 2023. These roads include NH-8, Road No 56, Kanjhawala Road, NH-24, Mehrauli Badarpur Rd,201 No. Road, Patel Road, Pankha Road, Vikas Marg, and Narela Road. These roads accounted for 138 fatalities and 537 crashes in a year.

The 20 major crash prone roads of Delhi are responsible for 2,261 crashes (approx. 38.76% crashes) in 2023. 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 712 crashes in the year 2023, accounting for 12.20% of crashes on all major roads. The Ring Road and Outer Ring Road collectively witnessed 12.37% of the total crashes while the remaining 12 roads encountered 14.18% of the crashes on major roads. The most critical road is NH-1 (G.T. Karnal Road) having 205 crashes in 2023 and 183 crashes in 2022.

Table 6.9: Crash prone roads with more than 10 deaths

S. No.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	Ring Road	122	396	125
2.	Outer Ring Road	106	326	109
3.	GTK Road	74	205	82
4.	Rohtak Road	56	166	57
5.	Najaf Garh Road	39	161	39
6.	Pusta Road	28	99	28
7.	Grant Trunk Road	25	103	27
8.	Wazirabad Road	23	96	25
9.	Mathura Road	23	93	23
10.	Bawana Road	21	79	21
11.	NH-8	18	92	18
12.	Road No 56	18	47	18
13.	Kanjhawala Road	16	55	16
14.	NH-24	16	53	16
15.	Mehrauli Badarpur Rd	14	66	14
16.	201 No. Road	13	59	13
17.	Patel Road	12	42	12
18.	Pankha Road	11	36	11
19.	Vikas Marg	10	55	10
20.	Narela Road	10	32	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, GTK Road and, Rohtak Road, collectively contributing to 218 crashes during the daytime and 176 crashes during the night time. Specifically, the Ring Road accounts for 61 pedestrian crashes, of which 33 are fatal at night. Following closely, the Outer Ring Road recorded 25 fatal crashes and 45 crashes involving pedestrians.

Table 6.10: Top 25 pedestrian crash prone roads

S.No	Road Name	Simple Crashes		Fatal Crashes		Total Crashes	
		Day	Night	Day	Night	Day	Night
1.	Ring Road	51	28	15	33	66	61
2.	Outer Ring Road	40	20	12	25	52	45
3.	GTK Road	34	21	14	21	48	42
4.	Rohtak Road	33	16	19	12	52	28
5.	Najaf Garh Road	45	23	6	10	51	33
6.	Road No. 56	11	8	4	7	15	15
7.	Grand Trunk Road	21	6	3	7	24	13
8.	Bawana Road	12	7	6	4	18	11
9.	Patel Road	8	8	4	6	12	14
10.	Kanjhawala Road	10	3	5	5	15	8
11.	Pusta Road	17	11	2	7	19	18
12.	Wazirabad Road	18	8	4	4	22	12
13.	Pankha Road	11	3	6	2	17	5
14.	Mathura Road	11	8	1	4	12	12
15.	Vikas Marg	9	5	5	0	14	5
16.	NH-24	7	1	2	3	9	4
17.	Rani Jhansi Road	3	1	2	3	5	4
18.	SPM Marg	1	2	2	3	3	5
19.	Mehrauli Badarpur Road	12	13	1	3	13	16
20.	201 No. Road	9	2	2	2	11	4
21.	New Rohtak Road	10	1	1	3	11	4
22.	Road No. 13A	5	4	3	1	8	5
23.	Loni Road	2	1	1	3	3	4
24.	Road No. 57	11	3	3	0	14	3
25.	Mahipal Pur Road	7	1	1	2	8	3

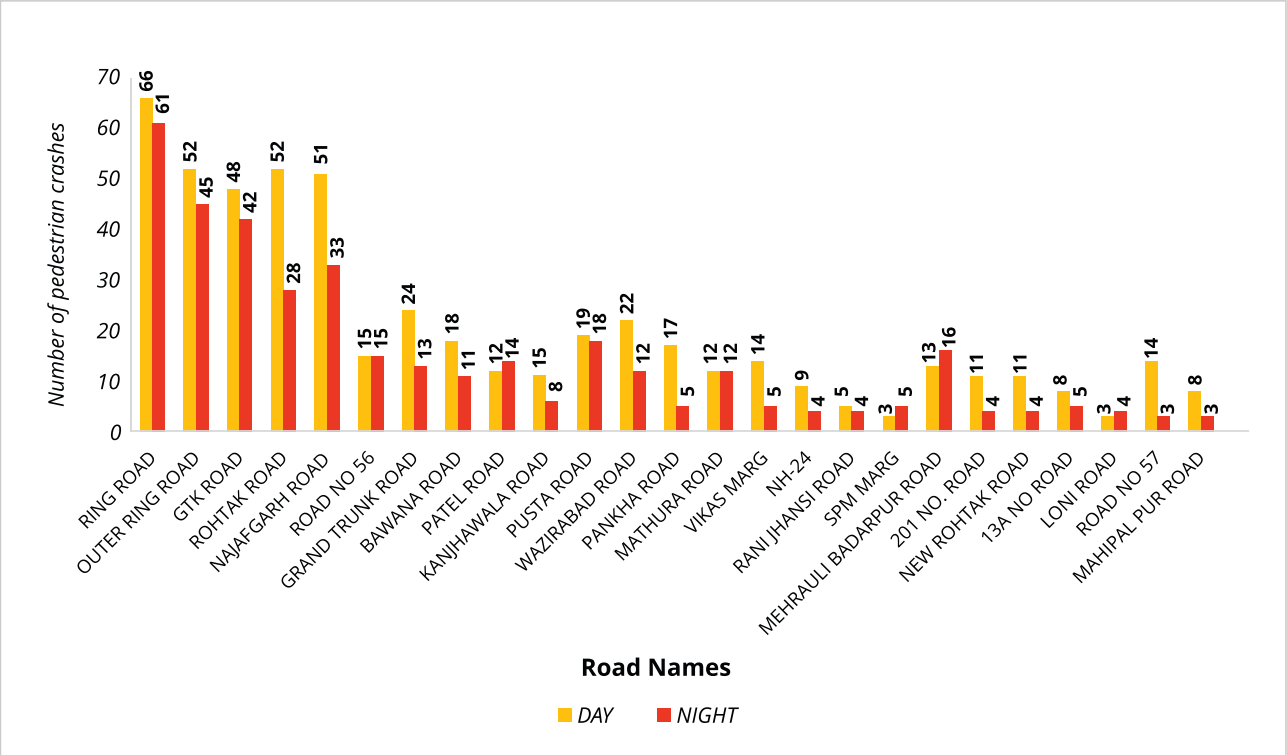


Figure 6.1 Total pedestrian crashes by day and night

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 road for two-wheelers by time

S.No	Road Name	Simple Crashes		Fatal Crashes		Total Crashes	
		Day	Night	Day	Night	Day	Night
1.	Ring Road	70	54	18	33	88	87
2.	Outer Ring Road	64	46	24	24	88	70
3.	GTK Road	27	23	12	13	39	36
4.	Najaf Garh Road	20	17	6	12	26	29
5.	Rohtak Road	23	8	8	9	31	17
6.	Mathura Road	18	14	3	12	21	26
7.	Pusta Road	18	10	2	9	20	19
8.	NH-8	15	18	5	4	20	22
9.	Wazirabad Road	18	14	6	3	24	17
10.	201 No.Road	16	8	2	6	18	14

(Contd.)

S.No	Road Name	Simple Crashes		Fatal Crashes		Total Crashes	
		Day	Night	Day	Night	Day	Night
11.	Bawana Road	15	8	4	4	19	12
12.	NH-24	16	6	4	4	20	10
13.	Mehrauli Badarpur Road	7	10	4	4	11	14
14.	Grand Trunk Road	18	10	2	4	20	14
15.	Kanjhawala Road	16	5	5	1	21	6
16.	Road No 56	4	4	2	4	6	8
17.	Vikas Marg	14	11	1	4	15	15
18.	Bijwasan Road	7	4	2	3	9	7
19.	Narela Road	5	4	3	2	8	6
20.	Dansha Road	1	1	4	1	5	2
21.	Burari Road	4	5	1	3	5	8
22.	Rani Jhansi Road	2	5	1	3	3	8
23.	Captain Gaur Marg	2	0	1	3	3	3
24.	Mehrauli Gurgaon Road	6	6	3	0	9	6
25.	13A No Road	6	6	3	0	9	6

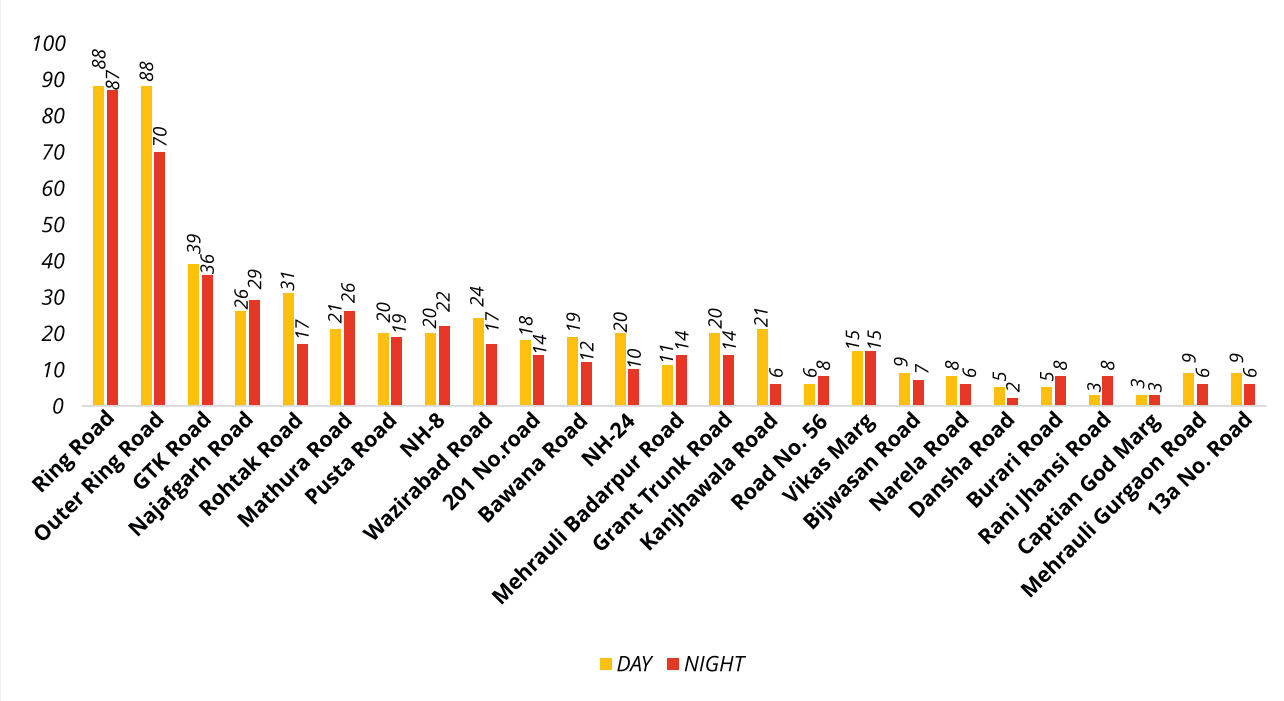


Figure 6.2 Total crashes two-wheelers by day and night

The Ring Road experiences the highest number of two-wheeler crashes during daytime (88) and night time (87), with 33 fatal crashes occurring specifically during night time. The Outer Ring Road follows closely with 158 crashes in both daytime and night time, in which 24 during day time and 24 fatal crashes occurred during night time.

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 3 in day time and 7 in night time, followed by Ring Road witnessing 3 Crashes in day time and 5 in night time and Outer Ring Road witnessing 6 crashes in daytime and 1 in night time.

Table 6.12: Crash prone road for cyclist by time

S.No.	Road Name	Simple Crashes		Fatal Crashes		Total Crashes	
		Day	*Night*	*Day*	*Night*	*Day*	*Night*
1.	*Mathura Road*	*2*	*6*	*1*	*1*	*3*	*7*
2.	*Outer Ring Road*	*5*	*0*	*1*	*1*	*6*	*1*
3.	*GTK Road*	*3*	*0*	*1*	*1*	*4*	*1*
4.	*Ring Road*	*3*	*4*	*0*	*1*	*3*	*5*
5.	*Mehrauli Gurgaon Road*	*2*	*2*	*0*	*0*	*2*	*2*
6.	*Wazirabad Road*	*1*	*2*	*0*	*0*	*1*	*2*
7.	*Mehrauli Badarpur Road*	*1*	*1*	*0*	*0*	*1*	*1*
8.	*Kanjhawala Road*	*1*	*1*	*0*	*0*	*1*	*1*
9.	*13A No Road*	*1*	*1*	*0*	*0*	*1*	*1*

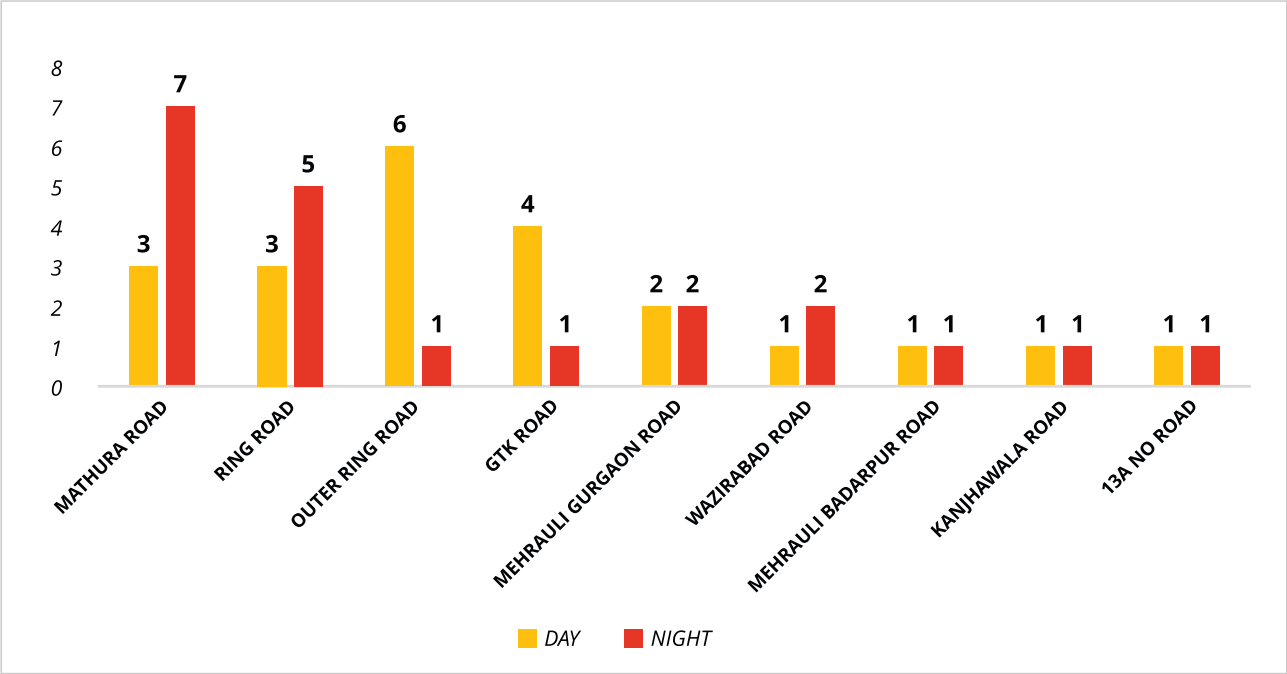


Figure 6.3 Total crashes cyclist by day and night

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

CENTRAL DISTRICT: In the Central District, Ring Road witnessed the highest number of crashes with 48 incidents, resulting in 14 fatalities in 2023. Followed by Patel Road recorded 27 Crashes resulting seven fatalities during the same period.

Table 6.13: Central District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	*Ring Road*	*13*	*48*	*14*
2.	*Patel Road*	*7*	*27*	*7*
3.	*Rani Jhansi Road*	*6*	*15*	*6*
4.	*New Rohtak Road*	*4*	*27*	*5*
5.	*Vikas Marg*	*4*	*15*	*4*
6.	*Desh Bandu Gupta Road*	*3*	*13*	*3*
7.	*Jawar Lal Nehru Rd*	*2*	*14*	*2*
8.	*Ddu Marg*	*2*	*7*	*2*
9.	*Shankar Road*	*1*	*3*	*1*
10.	*Ajmal Khan Road*	*1*	*2*	*1*

DWARKA DISTRICT: *In the Dwarka district of Delhi, Najafgarh Road has recorded the highest number of crashes totaling 79 incidents in 2023. Unfortunately, these crashes have resulted in 16 fatalities. Followed by Road No. 201, which has experienced 33 crashes and seven fatalities. Additionally, Dansha Road has experienced 19 crashes resulting in 9 fatalities.*

Table 6.14: Dwarka District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	Najafgarh Road	16	79	16
2.	Dansha Road	9	19	9
3.	201 No. Road	7	33	7
4.	Jharoda Road	2	12	3
5.	Chhawla Road	2	4	2
6.	Najafgarh Nangloi Road	1	5	1
7.	Ghuman Hera Marg	1	2	1
8.	Old Gurgaon Road	1	1	1
9.	Dabri-Nasirpur Road	0	4	0
10.	Palam Dabri Road	0	3	0

EAST DISTRICT: *NH 24 has recorded many crashes in the East district of Delhi, with 50 incidents occurring in 2023. Tragically, these crashes have resulted in 16 fatalities. Road No. 56 follows with 35 crashes and 11 fatalities during the same period.*

Table 6.15: East District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	NH-24 (now NH-9)	16	50	16
2.	Road No 56	11	35	11
3.	Vikas Marg	6	40	6
4.	Yamuna Pusta Road	5	11	5
5.	Noida Road	4	15	4
6.	Patpar Ganj Road	3	12	3
7.	Road No 57	2	13	2
8.	Narwana Road	2	10	2
9.	Kotla Road	0	2	0
10.	Khudi Ram Bose Marg	0	1	0

NEW DELHI DISTRICT: *Mathura Road stands out as a critical road stretch within the New Delhi district, with 7 crashes recorded in 2023. Unfortunately, these crashes have resulted in 3 fatalities. Panchkuian Road and Firoz Shah Road closely follow, with 3and 2 fatalities, respectively.*

Table 6.16: New Delhi District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	Mathura Road	3	7	3
2.	Panchkuian Road	3	5	3
3.	Firoz Shah Road	2	7	2
4.	Baba Kharak Singh Marg	2	6	2
5.	Barakhamba Road	2	3	2
6.	Mother Teresa Road	2	2	2
7.	Ashoka Road	1	7	1
8.	Ridge Road	1	6	1
9.	C-Hexagon	1	5	1
10.	Bhairon Road	1	4	1

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 95 incidents recorded in 2023. Tragically, these crashes have resulted in 31 fatalities. Following is the Ring Road, which has witnessed 48 crashes and 14 fatalities during the same period.*

Table 6.17: North District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	Outer Ring Road	30	95	31
2.	Ring Road	14	48	14
3.	SPM Marg	5	11	5
4.	Rani Jhansi Road	3	8	3
5.	Road No 40	3	5	3
6.	Bulovard Road	2	13	2
7.	Burari Road	2	11	2
8.	Rajpur Road	2	9	2
9.	Wazirabad Road	2	7	2
10.	Netaji Subhash Marg	2	5	2

NORTH-EAST DISTRICT: In the North Eastern District of Delhi, Pusta Road is a significant road stretch with 99 recorded crashes in 2023. Tragically, these crashes have resulted in 28 fatalities. Following closely are Wazirabad Road and Grand Trunk Road, which have witnessed 89 and 77 crashes, respectively.

Table 6.18: North East District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	*Pusta Road*	*28*	*99*	*28*
2.	*Wazirabad Road*	*21*	*89*	*23*
3.	*Grant Trunk Road*	*17*	*77*	*19*
4.	*Loni Road*	*5*	*10*	*5*
5.	*Karawal Nagar Road*	*1*	*7*	*1*
6.	*Road No 66*	*1*	*6*	*1*
7.	*Mandoli Road*	*1*	*3*	*1*
8.	*Braham Puri Road*	*0*	*2*	*0*
9.	*100 Foota Road*	*0*	*2*	*0*
10.	*Netaji Subhash Marg*	*2*	*5*	*2*

SHAHDARA DISTRICT: *Within the Shahdara district of Delhi, Grand Trunk Road has experienced 26 crashes in 2023. Tragically, these crashes have resulted in 8 fatalities. Followed by Road No.56 and Road No. 57 which have witnessed 12 and 23 crashes respectively during the same period.*

Table 6.19: Shahdara District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	*Grand Trunk Road*	*8*	*26*	*8*
2.	*Road No 56*	*7*	*12*	*7*
3.	*Road No 57*	*3*	*23*	*3*
4.	*Raja Ram Kohli Marg*	*3*	*3*	*3*
5.	*71 No Road*	*2*	*3*	*2*
6.	*Yamuna Pusta Road*	*1*	*4*	*1*
7.	*Patpar Ganj Road*	*1*	*4*	*1*
8.	*Raja Ram Marg*	*1*	*1*	*1*
9.	*Master Somanath Marg*	*1*	*1*	*1*
10.	*Maharaja Surajmal Road*	*0*	*5*	*0*

NORTH-WEST DISTRICT: Within the North West district of Delhi, Ring Road has experienced 64 crashes in 2023. Tragically, these crashes have resulted in 33 fatalities. Following closely is Outer Ring Road which has witnessed 31 fatalities out of 71 total road crashes and GTK Road which have witnessed 14 fatalities during the same period.

Table 6.20: North West District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	*Ring Road*	*32*	*64*	*33*
2.	*Outer Ring Road*	*31*	*71*	*31*
3.	*GTK Road*	*14*	*41*	*14*
4.	*51 No Road*	*4*	*16*	*4*
5.	*Burari Road*	*2*	*9*	*2*
6.	*Road No 41*	*2*	*7*	*2*
7.	*Swami Narain Marg*	*2*	*3*	*2*
8.	*Lawrance Road*	*2*	*3*	*2*
9.	*Road No 37*	*1*	*3*	*1*
10.	*Shalimar Bagh Road*	*1*	*1*	*1*

OUTER DISTRICT: *In the Outer District of Delhi, Rohtak Road stands out as a critical road stretch, accounting for 120 recorded crashes in 2023. Tragically, these crashes have resulted in 35 fatalities. Following is the Outer Ring Road, with 61 crashes, and Najafgarh Nangloi Road, with 23 crashes during the same period.*

Table 6.21: Outer District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	*Rohtak Road*	*34*	*120*	*35*
2.	*Outer Ring Road*	*21*	*61*	*22*
3.	*Kanjhawala Road*	*8*	*16*	*8*
4.	*Najafgarh Nangloi Rd*	*5*	*23*	*5*
5.	*Road No 30*	*1*	*2*	*1*
6.	*Road No 44*	*1*	*1*	*1*
7.	*Road No 43*	*1*	*1*	*1*
8.	*Road No 42*	*0*	*1*	*0*
9.	*Nangloi Sultan Puri Road*	*0*	*1*	*0*
10.	*Mota Singh Road*	*0*	*1*	*0*

OUTER-NORTH DISTRICT: When considering the total number of road crashes in 2023, the Outer North district had the highest incidence with 578 crashes. In which GTK Road has been identified as a critical road stretch in the Outer North district of Delhi, witnessing 159 recorded crashes in 2023. Tragically, these crashes have resulted in 68 fatalities. Following closely is Bawana Road, which has seen 77 crashes and 19 fatalities during the same period.

Table 6.22: Outer-North District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	GTK Road	60	159	68
2.	Bawana Road	19	77	19
3.	Narela Road	10	32	10
4.	Bawana Auchandi Road	3	9	3
5.	DSIIDC Narela Road	2	9	2
6.	Alipur Road	2	9	2
7.	Holambi Road	2	5	2
8.	Ram Dev Marg	2	2	2
9.	Kanjhawala Road	1	6	1
10.	Palla Road	1	3	1

ROHINI DISTRICT: Within the Rohini district of Delhi, Kanjhawala Road has been identified as a critical road stretch, recording 33 crashes in 2023. Tragically, these crashes have resulted in 7 fatalities. Following is Bhagwan Mahavir Marg, which has also witnessed 24 crashes, resulting in 6 fatalities during the same period.

Table 6.23: Rohini District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	Kanjhawala Road	7	33	7
2.	Bhagwan Mahavir Marg	6	24	6
3.	Bawana Road	2	2	2
4.	Ram Murti Passi Road	1	1	1
5.	Mangol Pur Road	1	1	1
6.	Kirari Road	1	1	1
7.	Dinbandhu Chhote Ram Marg	1	1	1
8.	Maharaja Agarsen Road	0	5	0
9.	Rithala Road	0	3	0
10.	Palla Road	1	3	1

SOUTH DISTRICT: Mehrauli Badarpur Road has been identified as a critical stretch, recording 44 crashes and resulting in 6 fatalities. Following is Mehrauli Gurgaon Road, with 33 crashes and 6 fatalities. Additionally, Outer Ring Road has witnessed 24 crashes, resulting in 6 fatalities.

Table 6.24: South District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	*Mehrauli Gurgaon Road*	7	33	7
2.	*Mehrauli Badarpur Rd*	6	44	6
3.	*Outer Ring Road*	6	24	6
4.	*Bhatti Mine Marg*	6	17	6
5.	*Lal Bahadur Shastri Marg*	3	6	3
6.	*Anuvrat Road*	3	5	3
7.	*Aurobindo Marg*	2	25	2
8.	*Ring Road*	2	20	2
9.	*Chhattarpur Road*	1	9	1
10.	*Press Enclave Marg*	1	7	1

SOUTH-EAST DISTRICT: Mathura Road has been identified as a critical crash-prone road in the South East District of Delhi, witnessing 86 recorded crashes in a year. Tragically, these crashes have resulted in 20 fatalities. Following closely is Ring Road, which has seen 73 crashes and 19 fatalities during the same period.

Table 6.25: South-East District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	*Mathura Road*	20	86	20
2.	*Ring Road*	19	73	19
3.	*13A No Road*	8	33	8
4.	*Mehrauli Badarpur Rd*	8	22	8
5.	*Anand Mai Marg*	6	21	7
6.	*Captian God Marg*	6	15	6
7.	*Agra Canal Road*	4	18	4
8.	*Outer Ring Road*	3	24	3
9.	*Noida DND Road*	2	6	2
10.	*Lala Lajpat Rai Path*	1	14	1

SOUTH-WEST DISTRICT: *Within the South West district of Delhi, NH-8 is a critical road with 92 recorded crashes in a year. Tragically, these crashes have resulted in 18 fatalities. Following is Ring Road, which has witnessed 70 crashes and 20 fatalities during the same period.*

Table 6.26: South-West District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	Ring Road	20	70	20
2.	NH-8	18	92	18
3.	Outer Ring Road	8	25	9
4.	Bijwasan Road	8	21	8
5.	201 No. Road	6	26	6
6.	Mahipal Pur Road	6	19	6
7.	Rao Tula Ram Marg	3	17	3
8.	Aruna Asaf Ali Marg	2	7	2
9.	Parade Road	2	5	2
10.	Munirka Road	2	3	2

WEST DISTRICT: *In the West District of Delhi, Najafgarh Road emerges as a critical stretch yet again, witnessing 82 recorded crashes. Tragically, these crashes have resulted in 23 fatalities. Following closely is Ring Road, which has seen 72 crashes and 23 fatalities and Rohtak Road has witnessed 46 crashes and 22 fatalities during the same period.*

Table 6.27: West District

S.no.	Road Name	Fatal Crashes	Total Crashes	Persons Killed
1.	Najafgarah Road	23	82	23
2.	Ring Road	22	72	23
3.	Rohtak Road	22	46	22
4.	Pankha Road	11	35	11
5.	Dev Prakash Shastri Road	8	17	8
6.	Outer Ring Road	6	24	6
7.	Patel Road	5	15	5
8.	Jail Road	4	9	4
9.	Rama Road	2	7	2
10.	Guru Ram Singh Road	1	6	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 stretch is 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 crashes in these vulnerable zones

6.9 Crash Prone Zones

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

The Criteria adopted to define such Crash-Prone Zones are: Three or more fatal crashes within the diameter of 500 meters or ten or more total crashes 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 2023.

107 cluster points were identified as Crash-Prone Zones in 2023, as per the above-mentioned criteria. Around 25.56% of total fatal crashes (366 out of 1,432) occurred in the road-stretch at crash prone zones which is about 60 km in length.

6.10 Crash Prone Zones 2023

Delhi has a total of 107 crash-prone zones, which have collectively witnessed 1,063 crashes. Out of these, 697 crashes were classified as simple crashes, while 366 crashes were identified as fatal crashes.

Table 6.28: Crash prone zones – 2023

Categories of Crashes		Simple Crashes	Fatal Crashes	Total Crashes
Crashes in 2023		*4,402*	*1,432*	*5,834*
Crashes at crash prone zones	*Number*	*697*	*366*	*1,063*
	Percentage	*15.83%*	*25.56%*	*18.22%*

Table 6.29: Road crash prone zones of the year – 2023

FATAL DESCENDING

S.No.	Raod Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes	Road Name
1.	ISBT Kashmiri Gate	12	7	19	Ring Road
2.	Mukarba Chowk	11	7	18	GTK Road
3.	Libaspur Bus Stand	11	7	18	GTK Road
4.	Kashmiri Gate Chowk Boulevard Road	12	6	18	Boulevard Road
5.	Britannia Chowk	9	6	15	Ring Road
6.	Burari Chowk	8	6	14	Outer Ring Road
7.	Bhalswa Chowk	5	6	11	Outer Ring Road
8.	Wazir Pur Depot	4	6	10	Ring Road
9.	Round About Mori Gate	2	6	8	Hamilton Road
10.	Gandhi Vihar Bus Stand	11	5	16	Outer Ring Road
11.	Anand Vihar Isbt	11	5	16	Road No.56
12.	Okhla Mandi	6	5	11	Captain Gaud Marg
13.	Sgt Nagar	6	5	11	GTK Road
14.	Akshardham Mandir	5	5	10	NH-24
15.	Shalimar Bagh	5	5	10	Ring Road
16.	Metro Station Haider Pur	5	5	10	Outer Ring Road
17.	Loni Road Crossing	5	5	10	Wazirabad Road
18.	Metro Station Madipur	4	5	9	Rohtak Road
19.	Raja Harishchander Hospital	2	5	7	DSIIDC Narela Road
20.	Shamshan Ghat Punjabi Bagh	2	5	7	Ring Road
21.	Haryana Maitri Bhawan	1	5	6	Road No 43
22.	Shastri Park/It Park	20	4	24	G.T.Road
23.	Rajouri Garden	12	4	16	Ring Road
24.	Swaroop Nagar	10	4	14	GTK Road
25.	Modi Mill Flyover	10	4	14	Outer Ring Road
26.	Punjabi Bagh Chowk	9	4	13	Ring Road
27.	Metro Station Shivaji Park	7	4	11	Rohtak Road
28.	Kings Way Camp Chowk	6	4	10	Ring Road
29.	Round About Paharganj	6	4	10	Rani Jhansi Road
30.	West Enclave Red Light	5	4	9	Outer Ring Road

(Contd.)

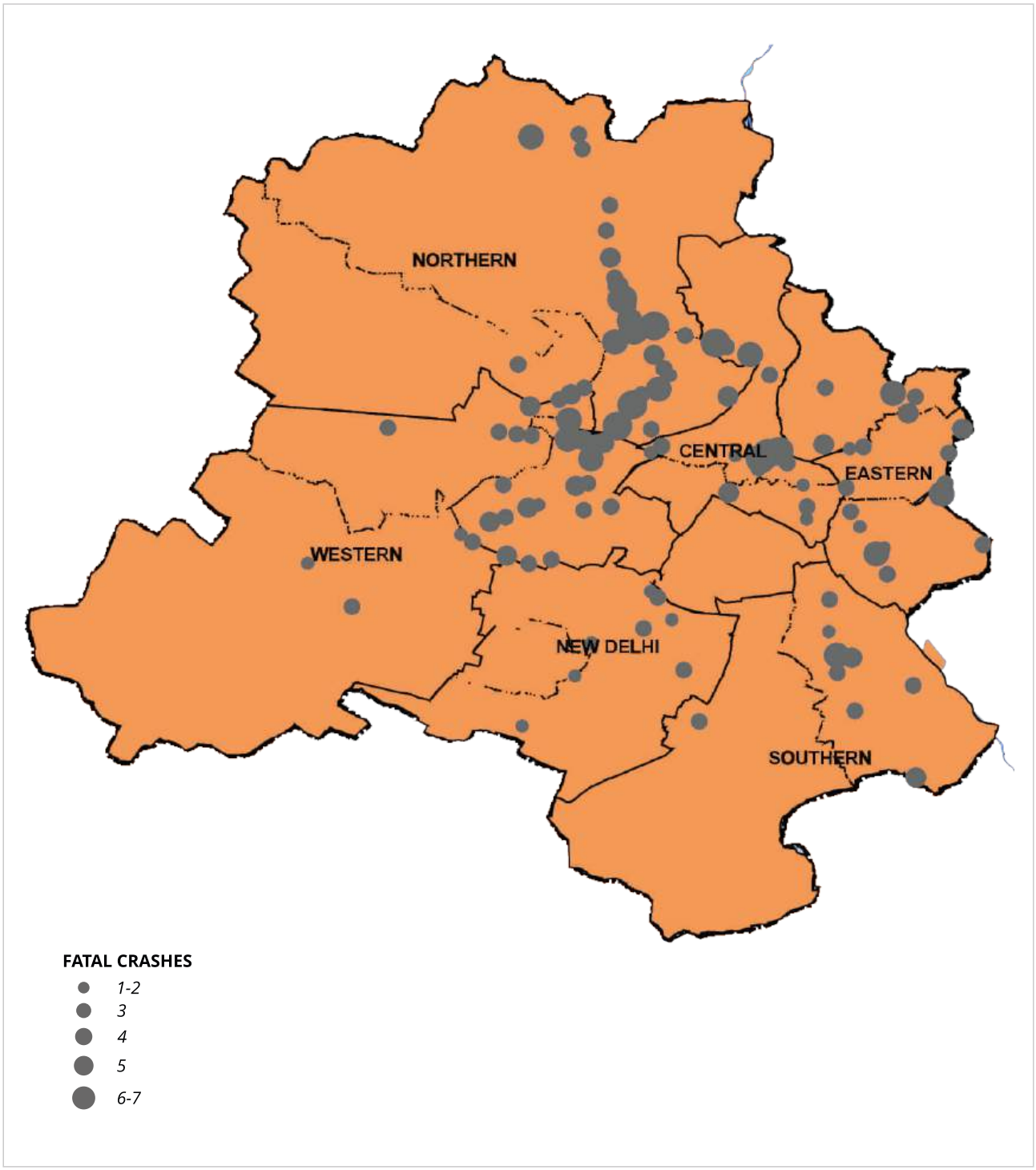
S.No.	Raod Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes	Road Name
31.	Azadpur Sabzi Mandi	5	4	9	GTK Road
32.	Tilak Nagar Flyover	5	4	9	Najafgarh Road
33.	Nathu Colony Chowk Nand Nagri	4	4	8	Road No 68
34.	Dabri Flyover	3	4	7	Pankha Road
35.	Saraswati Vihar Bus Stand	3	4	7	Outer Ring Road
36.	District Center Janakpuri	3	4	7	Najafgarh Road
37.	Nangli Poona	3	4	7	GTK Road
38.	Cng Pump/Jain Mandir NH-1	2	4	6	GTK Road
39.	Toll Plaza Badarpur	2	4	6	Mathura Road
40.	Round About Seemapuri	1	4	5	Road No 68
41.	Peeragarhi Chowk	13	3	16	Outer Ring Road
42.	Khajoori Chowk	11	3	14	Wazirabad Road
43.	Madhuban Chowk	11	3	14	Outer Ring Road
44.	Udyog Nagar	10	3	13	Rohtak Road
45.	Wazirabad	10	3	13	Outer Ring Road
46.	Mukundpur Chowk	10	3	13	Outer Ring Road
47.	Maya Puri Chowk	9	3	12	Ring Road
48.	Shani Mandir Nh-1	9	3	12	GTK Road
49.	Ber Sarai Flyover	9	3	12	Outer Ring Road
50.	Sagarpur Bus Stand	9	3	12	Pankha Road
51.	Kanhiya Nagar Metro Station	9	3	12	VIR Banda Bairagi Mr
52.	Metro Station Welcome	8	3	11	G.T.Road
53.	Dtc Bus Depot Nand Nagri	8	3	11	Wazirabad Road
54.	Sai Baba Mandir Nh-1	7	3	10	GTK Road
55.	Lado Sarai Crossing	7	3	10	Mehrauli Badarpur Rd
56.	Shaheen Bagh Road No-13a	7	3	10	Road No 13a
57.	Tilak Pul Dabri	6	3	9	Pankha Road
58.	Tikri Khurd Bus Stand	6	3	9	GTK Road
59.	Kalkaji Mandir	5	3	8	Outer Ring Road
60.	Rajghat	5	3	8	Ring Road

(Contd.)

S.No.	Raod Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes	Road Name
61.	Deepali Chowk	5	3	8	Outer Ring Road
62.	Metro Station Paschim Vihar	5	3	8	Rohtak Road
63.	ITI Dheerpur	5	3	8	Outer Ring Road
64.	Nigam Bodh Ghat	4	3	7	Ring Road
65.	Metro Station Inderlok	4	3	7	VIR Banda Bairagi Mr
66.	Keshopur T Point	4	3	7	Outer Ring Road
67.	Mundka	4	3	7	Rohtak Road
68.	Metro Station Ramesh Nagar	4	3	7	Najafgarh Road
69.	Rtr Flyover Vasant Vihar	4	3	7	Outer Ring Road
70.	DSIIDC Red Light NH-1	4	3	7	GTK Road
71.	Adarsh Nagar	4	3	7	GTK Road
72.	Arsd College Ring Road	3	3	6	Ring Road
73.	Sarai Kale Khan	3	3	6	Ring Road
74.	Round About Okhla Estate	3	3	6	Anand Mai Marg
75.	Anand Vihar Railway Flyover	3	3	6	Road No.56
76.	Vijay Vihar Rohini	3	3	6	Rithala Road
77.	Delhi Cantt Flyover	2	3	5	Jail Road
78.	Shakarpur Red Light	2	3	5	Yamuna Pusta Road
79.	Geeta Colony Flyover	2	3	5	Yamuna Pusta Road
80.	Loha Mandi	1	3	4	Girdhari Lal Marg
81.	Siraspur	1	3	4	GTK Road
82.	Janak Puri East	1	3	4	Najafgarh Road
83.	Mayur Vihar Extension	1	3	4	Noida Link Road
84.	Pul Mithai Spm Marg	1	3	4	SPM Marg
85.	Paper Market Gajipur	1	3	4	Paper Market Road
86.	Goyla Village Najafgarh	1	3	4	Goyla Dairy Road
87.	Near Haldi Ram Wazirpur	0	3	3	Ring Road
88.	Surya Nagar Red Light	0	3	3	Road No.56
89.	Ig Indoor Stadium	13	2	15	Ring Road
90.	Seelampur T Point	13	2	15	G.T.Road

(Contd.)

S.No.	Raod Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes	Road Name
91.	Moti Bagh Flyover	12	2	14	Ring Road
92.	Ashram Chowk	12	2	14	Ring Road
93.	Shakarpur Chungi	11	2	13	Vikas Marg
94.	Dhaula Kuan	10	2	12	Ring Road
95.	Khaira More Najafgarh	10	2	12	Najafgarh Dwarka Rd
96.	Azadpur Chowk	10	2	12	GTK Road
97.	Mahipalpur Flyover	9	2	11	NH-8
98.	Uttam Nagar	8	2	10	Najafgarh Road
99.	Shankar Vihar	8	2	10	NH-8
100.	Shanti Van	8	2	10	Ring Road
101.	Zakhira Flyover	13	1	14	Rohtak Road
102.	Subhash Nagar Metro Station	11	1	12	Najafgarh Road
103.	Under Pass Patparganj	9	1	10	Patparganj Road
104.	Rajoukari Flyover	9	1	10	NH-8
105.	Baraf Khana Chowk	9	1	10	Rani Jhansi Road
106.	Mool Chand	15	0	15	Ring Road
107.	Outer Circle Cp Near Minto Road	10	0	10	Outer Circle Cp



Map 6.1 Crash Prone Zones in Delhi (107)

6.11 Crash Data Analysis - Traffic Range-Wise

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

Table 6.30: Traffic range wise crash prone zones – 2023

S. No.	Traffic Range	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1.	Central Range	15	110	57	167
2.	Eastern Range	18	115	59	174
3.	New Delhi Range	10	76	21	97
4.	Northern Range	25	147	104	251
5.	Southern Range	10	70	30	100
6.	Western Range	29	179	95	274

The map below presents the data on crash-prone zones across different traffic ranges, with the Western traffic range having the highest number of recorded crash-prone zones. Among the traffic ranges, Western Range (29), Northern Range (25), Eastern Range (18), and Central Range (15), have the highest concentration of crash prone zones. On the other hand, the New Delhi and Southern traffic range have reported the lowest number of crash-prone zones, 10 each in the year 2023.

6.12 Crash Data Analysis - Traffic District-Wise

Table 6.31: Traffic districts wise crash prone zones – 2023

S. No.	Traffic Districts	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1.	Central District	3	24	9	33
2.	Dwarka District	2	11	5	16
3.	East District	8	43	25	68
4.	New Delhi District	1	10	0	10
5.	North District	12	86	48	134
6.	North East District	7	69	24	93
7.	North West District	13	83	57	140
8.	Outer District	9	57	31	88
9.	Outer North District	11	61	44	105
10.	Rohini District	1	3	3	6

(Contd.)

S. No.	Traffic Districts	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
11.	Shahdara District	3	3	10	13
12.	South District	1	7	3	10
13.	South East District	9	63	27	90
14.	South West District	9	66	21	87
15.	West District	18	111	59	170

Among the Traffic Districts, West (18), North-West (13), North (12), and Outer North (11) have maximum crash prone zones. Rohini, New Delhi and South recorded the lowest number of crash prone zones.

6.13 Crash Data Analysis - Traffic Circle-Wise

Table 6.32: Traffic circles wise crash prone zones – 2023

S. No.	Circle Name	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1.	Ashok Vihar Circle	6	32	28	60
2.	Badarpur Circle	1	2	4	6
3.	Bhajan Pura Circle	3	41	9	50
4.	Darya Ganj Circle	1	5	3	8
5.	Delhi Cantt Circle	3	20	7	27
6.	Gandhi Nagar Circle	1	2	3	5
7.	Kalkaji Circle	2	11	8	19
8.	Kalyan Puri Circle	1	1	3	4
9.	Kamla Market Circle	1	13	2	15
10.	Kapashera Circle	1	9	1	10
11.	Khajuri Khas Circle	1	11	3	14
12.	Kotwali Circle	6	39	27	66
13.	Lajpat Nagar Circle	3	30	5	35
14.	Madhu Vihar Circle	4	27	13	40
15.	Mayur Vihar Circle	3	15	9	24
16.	Model Town Circle	7	51	29	80
17.	Najafgarh Circle	2	11	5	16
18.	Nand Nagri Circle	3	17	12	29
19.	Nangloi Circle	2	14	6	20

(Contd.)

S. No.	Circle Name	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
20.	Narela Circle	3	17	11	28
21.	New Friends Colony Circle	1	10	4	14
22.	Pahar Ganj Circle	1	6	4	10
23.	Parliament Street Circle	1	10	0	10
24.	Paschim Vihar Circle	7	43	25	68
25.	Punjabi Bagh Circle	6	39	22	61
26.	Rajouri Garden Circle	4	27	14	41
27.	Rohini Circle	1	3	3	6
28.	Sadar Bazar Circle	2	13	4	17
29.	Safdarjung Enclave Circle	1	9	3	12
30.	Saket Circle	1	7	3	10
31.	Samay Pur Badli Circle	8	44	33	77
32.	Sarita Vihar Circle	2	10	6	16
33.	Shahdara Circle	2	1	7	8
34.	Tilak Nagar Circle	8	45	23	68
35.	Timarpur Circle	4	34	17	51
36.	Vasant Vihar Circle	4	28	10	38

The roads of Samaypur Badli (8) and Tilak Nagar (8) circles have maximum crash prone zones. The 64 crash prone zones falling under 11 different circles accounted for 218 fatal crashes in the year 2023.

6.14 Road-Wise Crash Prone Zone-2023

Table 6.33: Road wise crash prone zones – 2023

S. No.	Circle Name	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1.	Ring Road	20	153	69	222
2.	Outer Ring Road	17	123	64	187
3.	GTK Road	14	89	55	144
4.	Najafgarh Road	6	32	17	49
5.	Rohtak Road	6	43	19	62
6.	Wazirabad Road	3	24	11	35
7.	NH-8	3	26	5	31
8.	Road No.56	3	14	11	25
9.	Pankha Road	3	18	10	28
10.	G.T. Road	3	41	9	50
11.	Yamuna Pusta Road	2	4	6	10
12.	Rani Jhansi Road	2	15	5	20
13.	Road No 68	2	5	8	13
14.	VIR Banda Bairagi Mr	2	13	6	19
15.	Mehrauli Badarpur RD	1	7	3	10
16.	Goyla Dairy Road	1	1	3	4
17.	DSIIDC Narela Road	1	2	5	7
18.	Captain Gaud Marg	1	6	5	11
19.	Hamilton Road	1	2	6	8
20.	Jail Road	1	2	3	5
21.	Boulevard Road	1	12	6	18
22.	Mathura Road	1	2	4	6
23.	Girdhari Lal Marg	1	1	3	4
24.	Najafgarh Dwarka RD	1	10	2	12
25.	NH-24	1	5	5	10
26.	Anand Mai Marg	1	3	3	6
27.	Outer Circle CP	1	10	0	10
28.	Paper Market Road	1	1	3	4

(Contd.)

S. No.	Circle Name	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
29.	Patparganj Road	1	9	1	10
30.	Rithala Road	1	3	3	6
31.	Road No 13A	1	7	3	10
32.	Road No 43	1	1	5	6
33.	SPM Marg	1	1	3	4
34.	Vikas Marg	1	11	2	13
35.	Noida Link Road	1	1	3	4

Top ten roads have 78 crash prone zones and 270 fatal crashes occurred at these crash prone zones in 2023. The Ring Road (20), Outer Ring Road (17), and GT Karnal Road (14) have the maximum number of dangerous stretches.

6.15 Pedestrian Crash Prone Zones

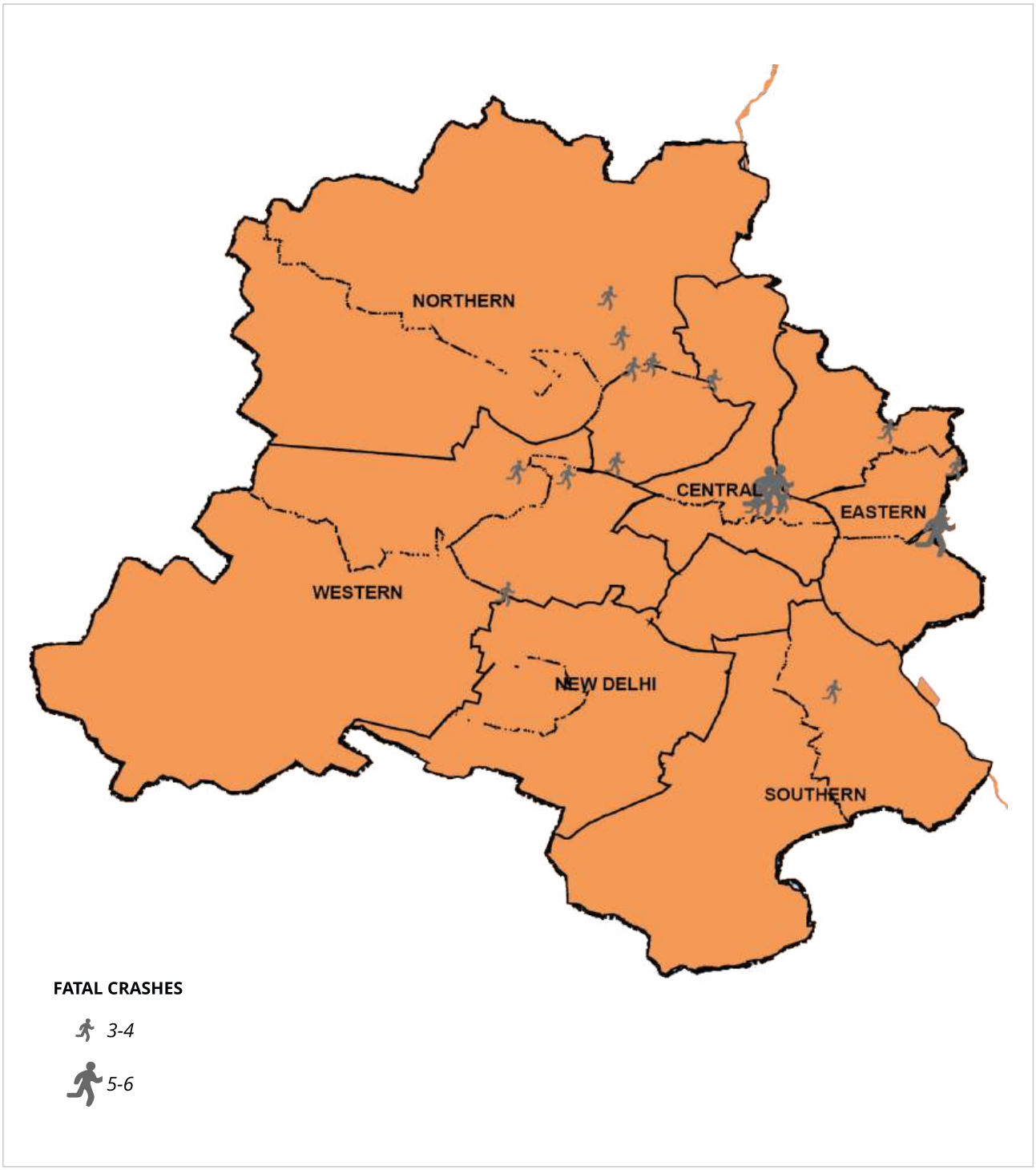
Out of the 107 crash prone zones, 19 are identified as pedestrian crash prone zones based on the criteria of three or more fatal or ten or more total pedestrian crashes within the range of 500-meter diameter.

Table 6.34: Pedestrian crash prone zones – 2023

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1.	ISBT K Gate	4	6	10
2.	Kashmiri Gate Chowk	10	5	15
3.	Anand Vihar ISBT	7	5	12
4.	Libas Pur Bus Stand	4	4	8
5.	Round About Mori Gate	2	4	6
6.	Bhalswa Chowk	1	4	5
7.	Mukarba Chowk	1	4	5
8.	Peera Garhi Chowk	5	3	8
9.	Okhla Mandi	5	3	8
10.	Britannia Chowk	5	3	8
11.	Metro Station Madipur	2	3	5
12.	Loni Road Crossing	2	3	5
13.	Nangli Poona	1	3	4

(Contd.)

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
14.	*Pul Mithai Spm Marg*	*1*	*3*	*4*
15.	*Round About Seemapuri*	*0*	*3*	*3*
16.	*Dabri Flyover*	*0*	*3*	*3*
17.	*Burari Chowk*	*0*	*3*	*3*
18.	*Nigam Bodh Ghat*	*0*	*3*	*3*
19.	*Anand Vihar Railway Flyover*	*0*	*3*	*3*



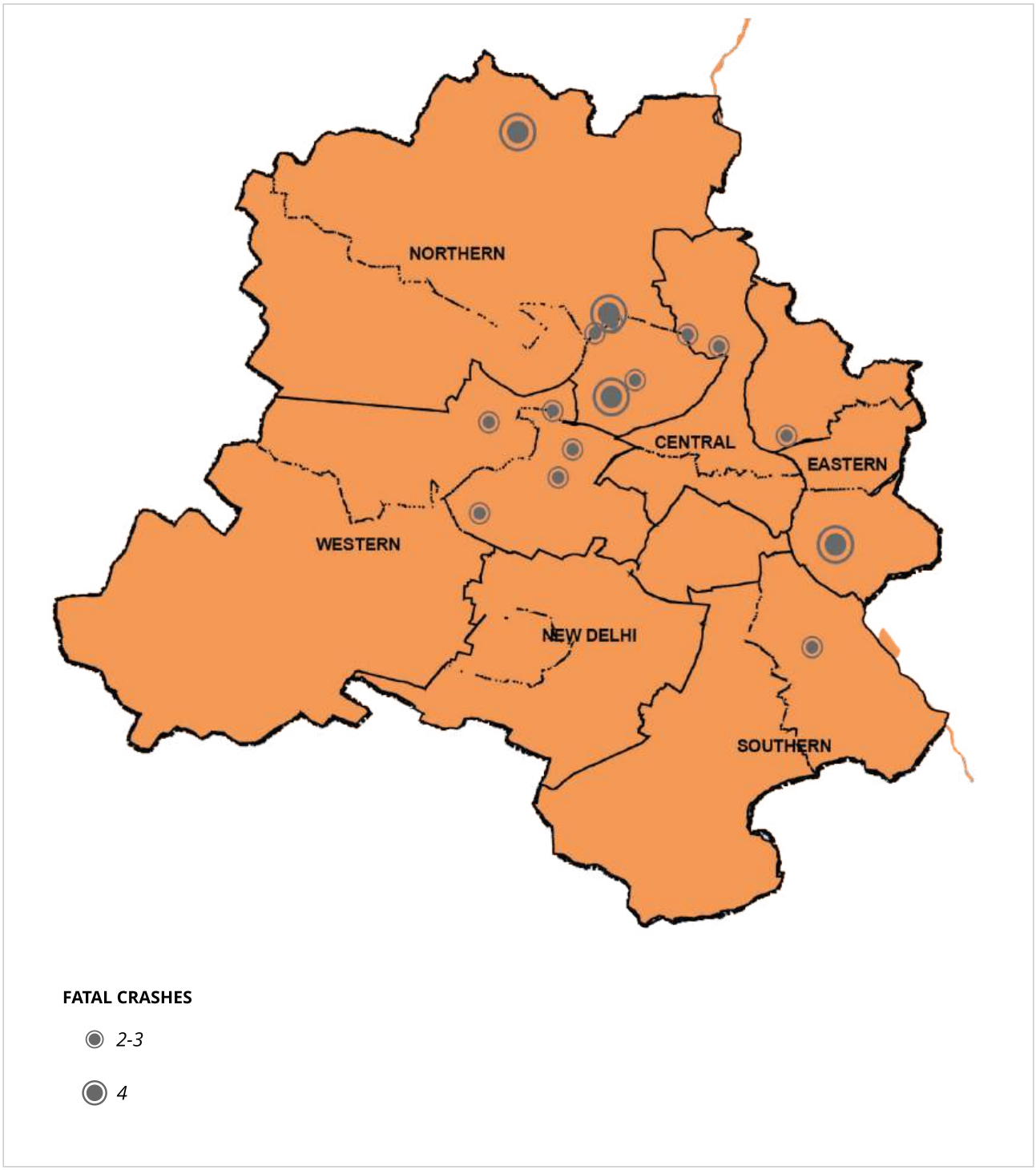
Map 6.2 Pedestrians crash prone zones

6.16 Two-wheeler Crash Prone Zones

Out of the 107 crash prone zones, 16 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 6.35: Two-wheeler crash prone zones 2023

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1.	Wazirpur Depot	4	4	8
2.	Akshardham Mandir	3	4	7
3.	Sgt Nagar	3	4	7
4.	Raja Harishchander Hospital	1	4	5
5.	Mukarba Chowk	8	3	11
6.	Udhog Nagar	6	3	9
7.	Gandhi Vihar Bus Stand	5	3	8
8.	Rajouri Garden	4	3	7
9.	Burari Chowk	4	3	7
10.	District Center Janakpuri	3	3	6
11.	Shalimar Bagh	2	3	5
12.	Shamshan Ghat Punjabi Bagh	2	3	5
13.	Metro Station Haider Pur	2	3	5
14.	Modi Mill Flyover	1	3	4
15.	Haryana Maitri Bhawan	0	3	3
16.	Shastri Park/It Park	8	2	10



Map 6.3 Two-wheelers crash prone zones

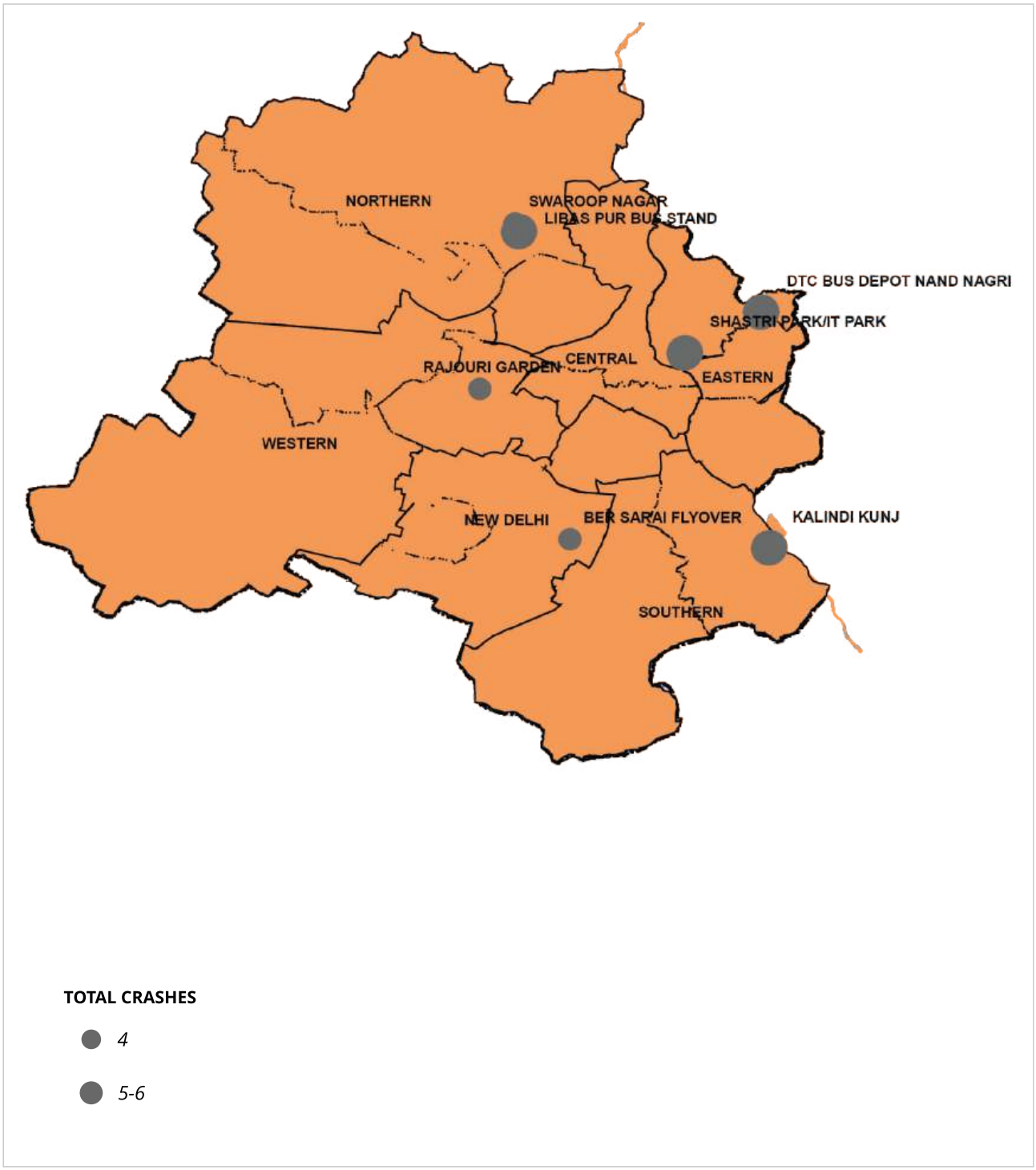
6.17 HTVs Crash Prone Zones

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

Table 6.36: HTVs crash prone zones – 2023

S. No.	Crash Prone Zone	Simple Crashes	Fatal Crashes	Total Crashes
1.	*DTC Bus Depot Nand Nagri*	*2*	*3*	*5*
2.	*Rajouri Garden*	*1*	*3*	*4*
3.	*Libaspur Bus Stand*	*3*	*2*	*5*
4.	*Ber Sarai Flyover*	*2*	*2*	*4*
5.	*Shastri Park/IT Park*	*5*	*1*	*6*
6.	*Swaroop Nagar*	*3*	*1*	*4*

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



Map 6.4 HTVs crash prone zones

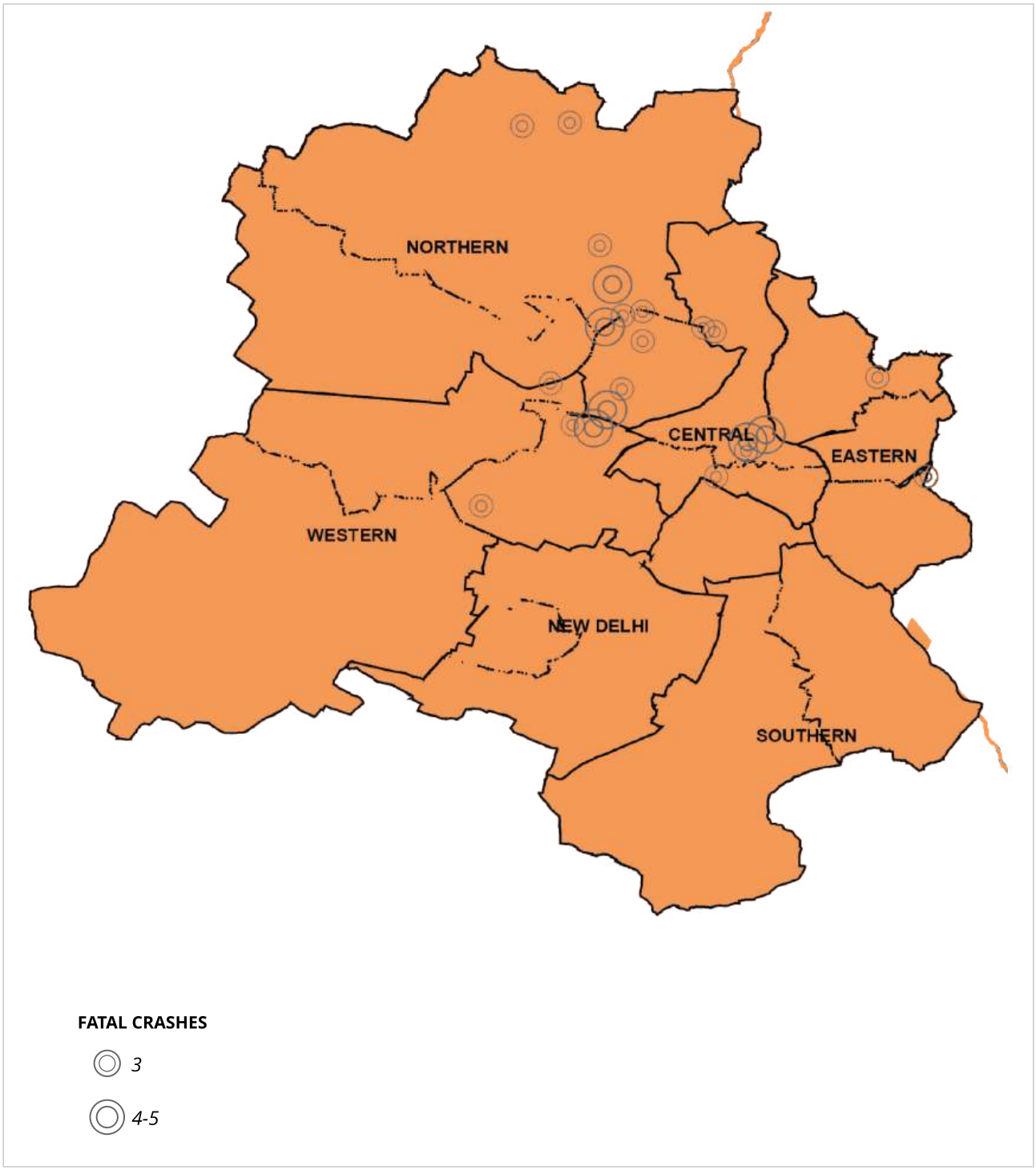
6.18 Hit and Run Crash Prone Zones:

22 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 ambulance 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 6.37: Hit and run crash prone zones – 2023

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1.	Round About Mori Gate	0	5	5
2.	Libas Pur Bus Stand	4	4	8
3.	ISBT K Gate	4	4	8
4.	Britannia Chowk	3	4	7
5.	Punjabi Bagh Chowk	3	4	7
6.	Metro Station Haider Pur	1	4	5
7.	Mukarba Chowk	5	3	8
8.	Bhalswa Chowk	2	3	5
9.	Deepali Chowk	2	3	5
10.	District Center Janakpuri	2	3	5
11.	Loni Road Crossing	2	3	5
12.	Metro Station Shivaji Park	2	3	5
13.	Wazir Pur Depot	1	3	4
14.	Anand Vihar ISBT	1	3	4
15.	Burari Chowk	1	3	4
16.	Raja Harishchander Hospital	1	3	4
17.	Azadpur Sabzi Mandi	1	3	4
18.	DSIIDC Red Light	0	3	3
19.	Nangli Poona	0	3	3
20.	Pul Mithai Spm Marg	0	3	3
21.	Round About Paharganj	0	3	3
22.	ITI Dheerpur	0	3	3

The major roads affected by these incidents are Ring Road, Outer Ring Road, GTK Road. Notably, Libaspur Bus Stand, ISBT Kashmiri Gate, and Mukarba Chowk are identified as critical crash-prone zones for hit-and-run cases, with 8 incidents each. Enhancing enforcement measures and implementing stricter monitoring systems is crucial to deter and control hit-and-run cases in these areas.



Map 6.5 Hit and run crash prone zones

6.19 Day-time Crash Prone Zones:

19 crash prone zones were identified as more vulnerable zones during day time. Day time crashes are mostly recorded in the Northern and Western range in Delhi.

Table 6.38: Day-time crash prone zones 2023

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1.	Britannia Chowk	5	4	9
2.	Metro Station Haiderpur	2	4	6
3.	Gandhi Vihar Bus Stand	6	3	9
4.	Mukarba Chowk	5	3	8
5.	Nathu Colony Chowk Nand Nagri	4	3	7
6.	Metro Station Madipur	4	3	7
7.	Burari Chowk	3	3	6
8.	Wazirpur Depot	2	3	5
9.	Loni Road Crossing	2	3	5
10.	Dabri Flyover	2	3	5
11.	Mayur Vihar Extn	1	3	4
12.	Haryana Maitri Bhawan	1	3	4
13.	Round About Seemapuri	0	3	3
14.	Vijay Vihar Rohini	0	3	3
15.	Shastri Park/IT Park	11	2	13
16.	Kashmiri Gate Chowk	9	2	11
17.	Seelampur T Point	8	2	10
18.	Sagarpur Bus Stand	8	2	10
19.	Udhog Nagar	8	2	10

Map 6.6 Day-time wise crash prone zones

6.20 Night-time Crash Prone Zones:

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

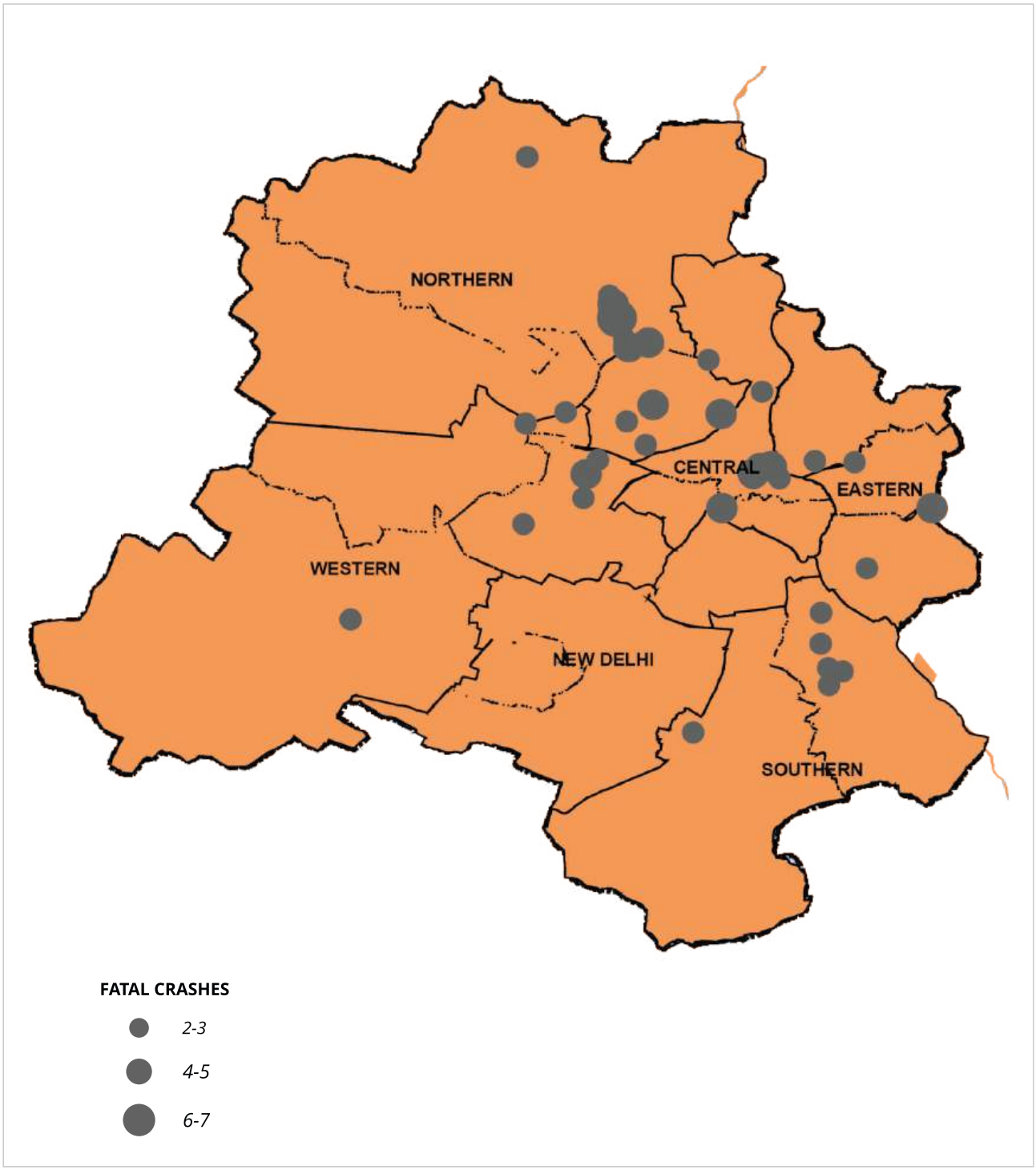
Table 6.39: Night-time crash prone zones – 2023

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
1.	Libaspur Bus Stand	4	7	11
2.	ISBT K Gate	6	5	11
3.	Round About Mori Gate	1	5	6
4.	Swaroop Nagar	7	4	11
5.	Mukarba Chowk	6	4	10
6.	Anand Vihar ISBT	4	4	8
7.	Round About Paharganj	4	4	8
8.	Kashmiri Gate Chowk	3	4	7
9.	Bhalswa Chowk	2	4	6
10.	Shalimar Bagh	2	4	6
11.	Shamshan Ghat Punjabi Bagh	1	4	5
12.	Kings Way Camp Chowk	1	4	5
13.	Burari Chowk	5	3	8
14.	Kanhiya Nagar Metro STN	5	3	8
15.	Modi Mill Flyover	4	3	7
16.	SGT Nagar	4	3	7
17.	Wazirabad	3	3	6
18.	Lado Sarai Crossing	3	3	6
19.	Wazirpur Depot	2	3	5
20.	Kalkaji Mandir	2	3	5
21.	Saraswati Vihar Bus Stand	2	3	5
22.	Punjabi Bagh Chowk	2	3	5
23.	Metro Station Ramesh Nagar	2	3	5
24.	Metro Station Welcome	2	3	5
25.	Raja Harishchander Hospital	2	3	5
26.	Sarai Kale Khan	1	3	4
27.	Nigam Bodh Ghat	1	3	4

(Contd.)

S. No.	Crash Prone Zones	Simple Crashes	Fatal Crashes	Total Crashes
28.	Tilak Nagar Flyover	1	3	4
29.	West Enclave Red Light	1	3	4
30.	Okhla Mandi	1	3	4
31.	Akshardham Mandir	0	3	3
32.	Siraspur	0	3	3
33.	Goyla Village Najafgarh	0	3	3
34.	CNG Pump/Jain Mandir	0	3	3
35.	Shastri Park/IT Park	9	2	11
36.	Ashram Chowk	8	2	10

The highest number of night time crashes in Delhi is observed in the Northern and Western Ranges. 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 6.7 Day-time wise crash prone zones

6.21 Crash Prone Zones Types

Table 6.40: Zone types crash prone zones – 2023

S. No.	Zone Types	Number Of Crash Prone Zones
1.	*Multi-Level Intersection*	*24*
2.	*Intersection*	*19*
3.	*T-Intersection*	*12*
4.	*Road Streach*	*10*
5.	*Metro Station*	*10*
6.	*Bus-Stand*	*6*
7.	*Round About*	*5*
8.	*Staggered Intersection*	*5*
9.	*Highway Village*	*5*
10.	*Flyover*	*5*
11.	*Exchange Hub*	*5*
12.	*Hospital*	*1*
	Total	**107**

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.

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 crashes. 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 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 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.*

6.22 Blackspot:

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 6.41: Top-10 blackspots of the year 2023

S. No.	Blackspot	Non-Injury Crashes	Simple Crashes	Fatal Crashes	Total Crashes	Persons Killed	Persons Injured
1.	ISBT Kashmiri Gate (Ring Road)	1	1	7	19	7	12
2.	Mukarba Chowk*	0	0	7	18	7	17
3.	Libaspur Bus Stand	0	0	7	18	7	16
4.	Kashmiri GateChowk (Boulevard Road)	0	0	6	18	6	14
5.	Britannia Chowk *	0	0	6	15	6	10
6.	Burari Chowk	0	0	6	14	7	17
7.	Bhalswa Chowk*	1	1	6	11	6	5
8.	Wazirpur Depot	0	0	6	10	6	6
9.	Round About Mori Gate	0	0	6	8	6	3
10.	Gandhi Vihar Bus Stand*	1	1	5	16	5	13

**In 2022; Mukarba Chowk, Gandhi Vihar bus stand, Bhalswa Chowk, and Britania Chowk were at Serial No. 2, 5,6 and 9 respectively.*

The table above presents the ten most critical blackspots in Delhi. Among them, ISBT Kashmiri Gate (Ring Road) has recorded 19 crashes, followed by Mukarba Chowk, Libaspur Bus Stand and Kashmiri Gate (Boulevard Road) with 18 Crashes in each stretch, Gandhi Vihar Bus stand with 16 crashes, Britania Chowk with 15 crashes, Burari Chowk with 14, Bhalswa Chowk with 11 crashes, Wazirpur Depot with 10 crashes, and Round about Mori Gate with 8 crashes. When considering fatal crashes specifically, ISBT Kashmiri Gate (Ring Road) Mukarba Chowk, Libaspur Bus Stand emerges as the most critical blackspots with 7 fatal crashes each, followed by Kashmiri Gate (Boulevard Road), Britania Chowk , Burari Chowk, Bhalswa Chowk, Wazirpur Depot, and Round about Mori Gate with 6 fatal crashes each and Gandhi Vihar Bus Stand with 5 fatal crashes in 2023 .These ten blackspots have resulted in 113 injuries and 63 deaths. The cumulative number of crashes reported on these blackspots is 147.

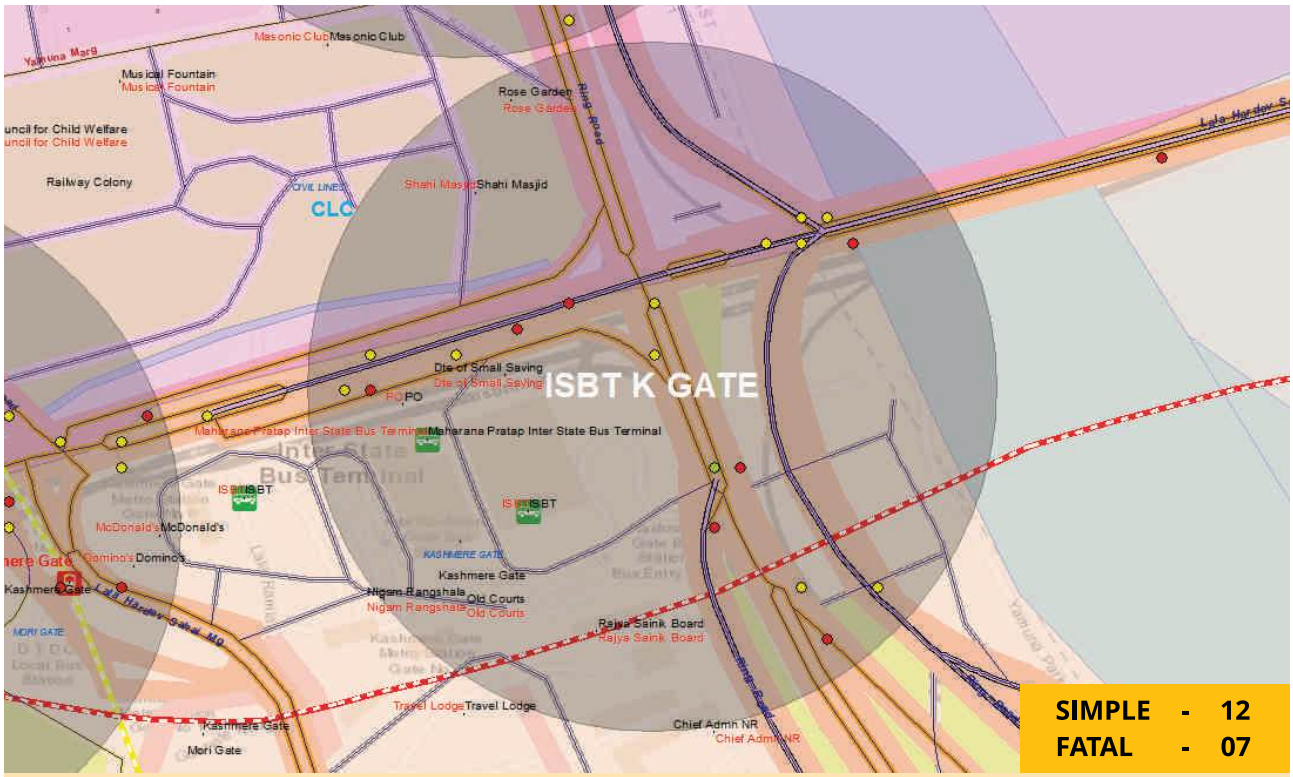
Table 6.42: Comparative status of blackspots – 2022

S.No.	Blackspot	Simple Crashes		Fatal Crashes		Total Crashes		Persons Injured		Persons Killed	
		2022	2023	2022	2023	2022	2023	2022	2023	2022	2023
1	Mukarba Chowk	11	11	12	7	23	18	12	17	14	7
2	Khampur Village	9	7	10	1	19	8	10	5	12	1
3	Dhaula Kuan	9	10	8	2	17	12	8	11	13	2
4	Mayapuri Chowk	8	9	8	3	16	12	8	8	14	3
5	Gandhi Vihar Bus Stand	18	11	7	5	25	16	7	13	23	5
6	Bhalswa Chowk	14	5	7	6	21	11	7	5	17	6
7	Peera Garhi Chowk	9	13	7	3	16	16	7	15	14	3
8	Punjabi Bagh Chowk	8	9	7	4	15	13	7	13	11	4
9	Britannia Chowk	7	9	7	6	14	15	7	10	9	6
10	Ashram Chowk	7	12	7	2	14	14	7	12	9	2

In above table, comparing the data from the previous year, it is evident that particular blackspots have experienced notable changes in their status. Khampur Village, for instance, has witnessed a significant decrease in crashes, from 19 crashes in 2022 to 8 crashes in 2023. Similarly, Gandhi Vihar Bus stand has also seen decreasing trend from 25 in 2022 to 16 in 2023, Mukarba Chowk has also seen a decreasing trend from 23 in 2022 to 18 in 2023 in total crashes and Dhaula Kuan, Mayapuri Chowk and Bhalswa Chowk have seen a decreasing trends as capered to previous year. Marginal increasing from 14 in 2022 to 15 in 2023 at Britania Chowk.

ISBT Kashmiri Gate (Ring Road)

It is situated on Ring Road. It includes terminal area of ISBT, the ISBT flyover crossing Yamuna River and the connecting flyover Loops. Now, there are more crashes on ISBT flyover road. Most fatal crashes are hit and run cases. Pedestrian (10), Two-Wheeler (5) are main victims. Pedestrians waiting at unofficial Bus-stand/auto stand at the end of the flyover have been victim in crashes. More crashes occurred during the night hours.



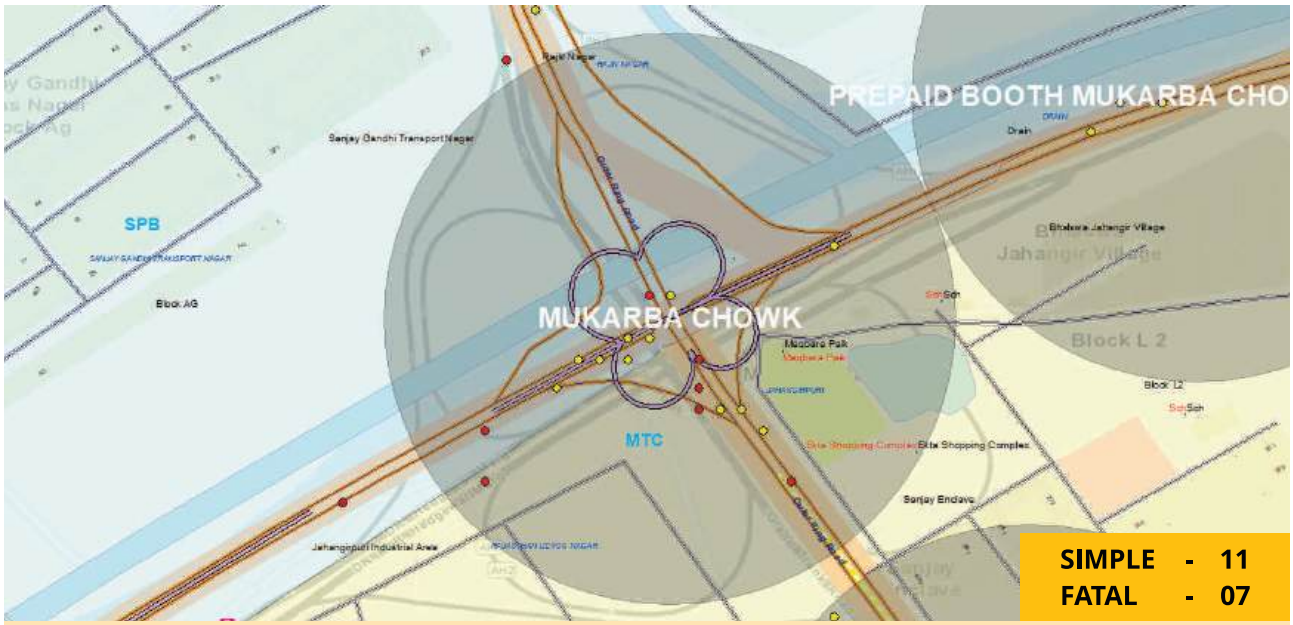
Comparative Road crashes					
Year	Simple crashes	Fatal crashes	Total crashes	Persons Injured	Persons Killed
2022	5	1	6	6	2
2023	12	7	19	12	7

Comparative Road crashes			Most Vulnerable Period		
	Fatal	Total		Fatal	Total
Day	2	8	0300-0800	5	6
Night	5	11	1000-1600	2	5

Top Offending Vehicles			Top Victims		
	Fatal	Total		Fatal	Total
Unknown Vehicle	4	8	Pedestrian	5	6
Car/Pvt	0	5	Scooter/M.Cycle	2	5
Tempo	2	2			

Mukarba Chowk

This spot is the region 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. Out of seven fatal crashes three were hit and run cases. Primarily, Cars and Tempos were the offending vehicles. Two-wheeler riders were victim in three fatal and eight simple crashes. Pedestrians were victims in four fatal crashes out of 5 total crashes. Most of the fatal crashes occurred in the day hours.



Fatal crashes *Simple crashes*

Comparative Road crashes					
Year	**Simple crashes**	**Fatal crashes**	**Total crashes**	**Persons Injured**	**Persons Killed**
2022	*11*	*12*	*23*	*14*	*12*
2023	*11*	*7*	*18*	*17*	*7*

Day Night Wise crashes			Most Vulnerable Period		
	Fatal	**Total**		**Fatal**	**Total**
Day	*3*	*8*	*0500-1300*	*5*	*10*
Night	*4*	*10*	*1600-2100*	*2*	*3*

Top Offending Vehicles			Top Victims		
	Fatal	**Total**		**Fatal**	**Total**
Unknown Vehicle	*3*	*8*	**Pedestrian**	*4*	*5*
Car/Pvt	*2*	*3*	**Scooter/M.Cycle**	*3*	*11*
Tempo	*1*	*4*			

Libaspur Bus Stand

It is the point of GT Karnal Road. It is 8 lane highway NH-1. An underpass is provided at this place for the crossing of the vehicles. There is heavy truck and high-speed car movement on the highway and also in the underpass. Out of Seven fatal crashes four were hit and run cases. Pedestrians (08) and Two wheelers (05) are the main victims in total crashes. Main offending vehicles are HTVs. The most vulnerable time slot are 0000-0600 hrs and 1900-2200hrs hence, more crashes occurred during night hours.

Fatal crashes *Simple crashes*

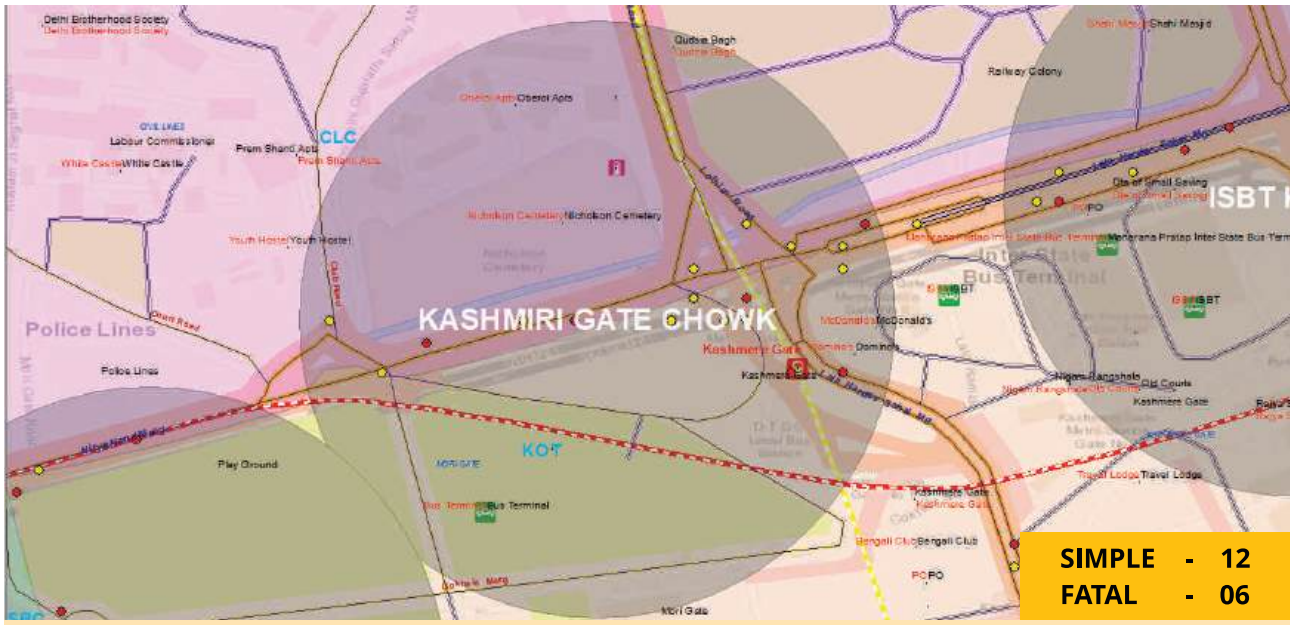
Comparative Road crashes					
Year	**Simple crashes**	**Fatal crashes**	**Total crashes**	**Persons Injured**	**Persons Killed**
2022	*5*	*4*	*9*	*9*	*6*
2023	*11*	*7*	*18*	*16*	*7*

Day Night Wise crashes			Most Vulnerable Period		
	Fatal	**Total**		**Fatal**	**Total**
Day	*0*	*7*	*0000-0600*	*6*	*7*
Night	*7*	*11*	*1900-2200*	*1*	*3*

Top Offending Vehicles			Top Victims		
	Fatal	**Total**		**Fatal**	**Total**
Unknown Vehicle	*4*	*8*	**Pedestrian**	*4*	*8*
Car/Pvt	*1*	*2*	**Scooter/M.Cycle**	*1*	*5*
HTV/Goods	*2*	*5*			

Kashmiri Gate Chowk Boulevard Road

This is the point on Boulevard Road that connects Mori gate bus terminal and ISBT Kashmiri gate. Both of these heavily congested areas. There is high volume of DTC buses, Clusters buses, HTVs, LGVs and LMVs, RTVs, TSRs and Two Wheelers on Boulevard Road. Pedestrians (15) and Two wheelers (01) are the main victims in total crashes. The main offending vehicle are HTVs. More crashes occurred during Night hours.



Fatal crashes *Simple crashes*

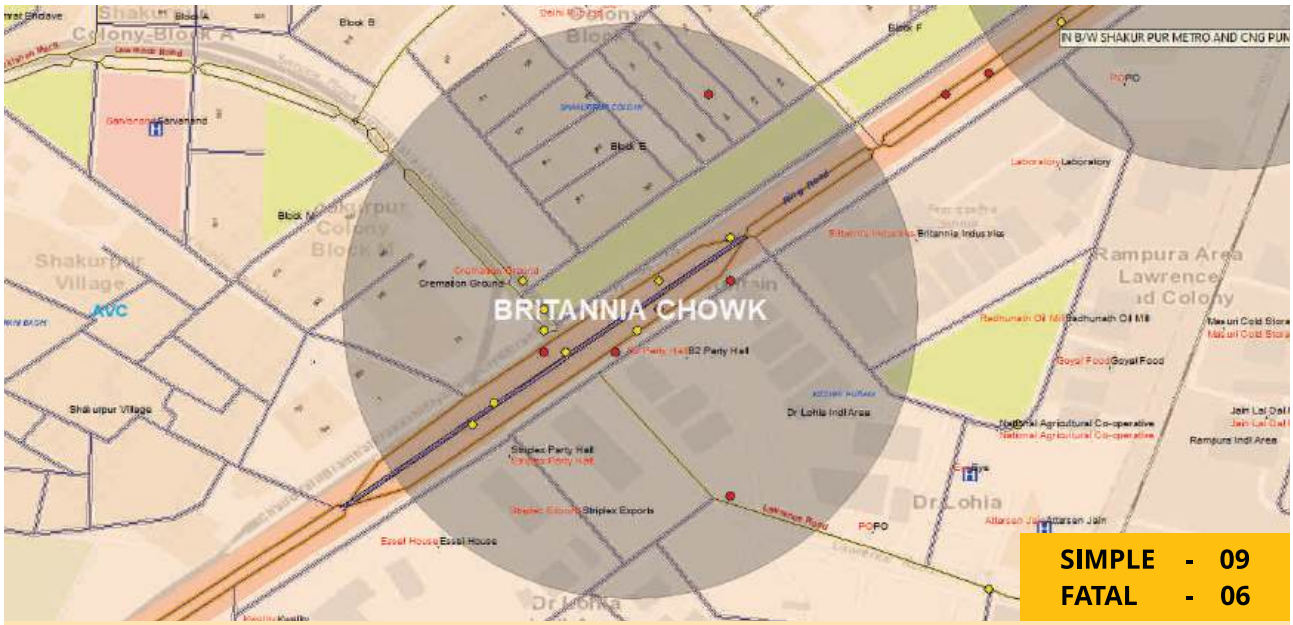
Comparative Road crashes					
Year	**Simple crashes**	**Fatal crashes**	**Total crashes**	**Persons Injured**	**Persons Killed**
2022	*10*	*1*	*11*	*11*	*1*
2023	*12*	*6*	*18*	*14*	*6*

Day Night Wise crashes			Most Vulnerable Period		
	Fatal	**Total**		**Fatal**	**Total**
Night	*4*	*7*	*1000-1300*	*2*	*5*
Day	*2*	*11*	*2200-0100*	*4*	*4*

Top Offending Vehicles			Top Victims		
	Fatal	**Total**		**Fatal**	**Total**
HTV/Goods	*2*	*2*	**Pedestrian**	*5*	*15*
Scooter/M.Cycle	*1*	*4*	**Scooter/M.Cycle**	*1*	*1*
Unknown	*1*	*3*			

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 Six fatal crashes four were hit and run cases. HTVs were the main offending vehicles. Pedestrians were victims in three fatal crashes and Two-wheeler riders were victims in five total crashes. More fatal crashes occurred during day time.



● *Fatal crashes* ● *Simple crashes*

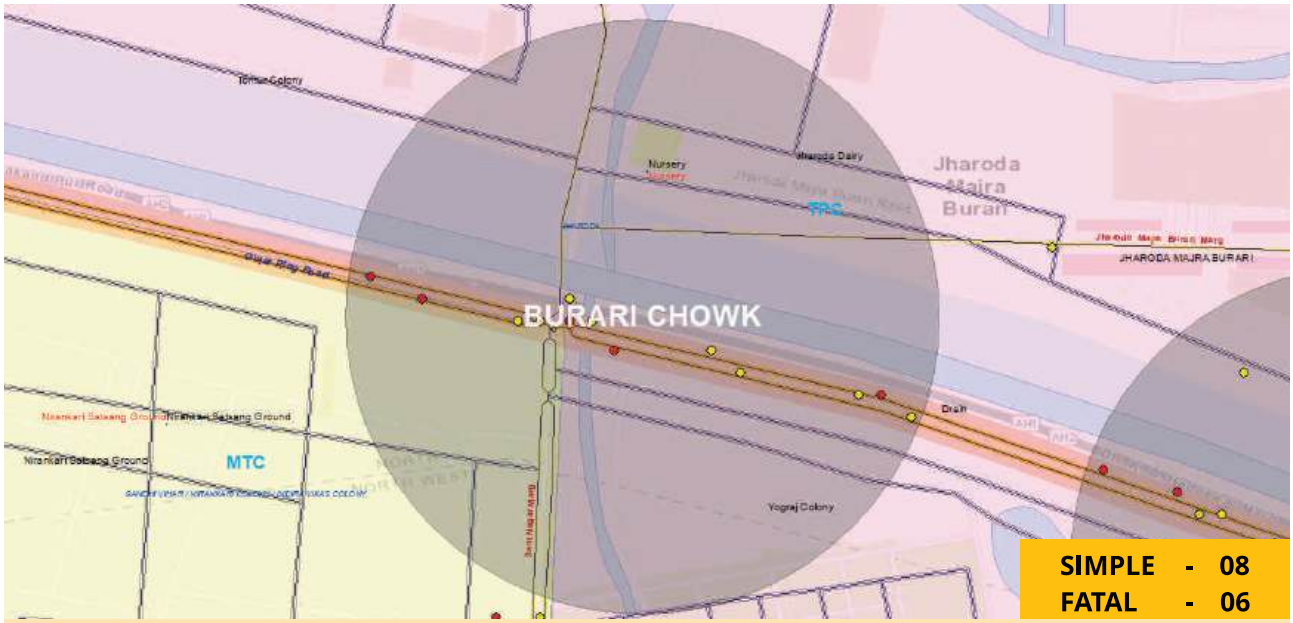
Comparative Road crashes					
Year	**Simple crashes**	**Fatal crashes**	**Total crashes**	**Persons Injured**	**Persons Killed**
2022	*7*	*7*	*14*	*9*	*7*
2023	*9*	*6*	*15*	*10*	*6*

Day Night Wise crashes			Most Vulnerable Period		
	Fatal	**Total**		**Fatal**	**Total**
Night	*2*	*6*	*0300-1300*	*2*	*5*
Day	*4*	*9*	*1900-2200*	*2*	*3*

Top Offending Vehicles			Top Victims		
	Fatal	**Total**		**Fatal**	**Total**
Unknown Vehicle	*2*	*2*	**Pedestrian**	*3*	*8*
HTV/Goods	*1*	*4*	**Scooter/M.Cycle**	*1*	*5*

Burari Chowk

This is an intersection on Outer Ring Road near Burari Village. There is a minor road that connects Burari village to the Outer Ring Road. This intersection has heavy movement of pedestrians, two-wheelers and other vehicles. Vehicle volume on Outer Ring Road is very high. Out of six fatal crashes, three were hit and run cases. Main offending vehicles were HTVs and Car Pvt. Out of 14 total crash cases, two-wheeler riders and pedestrians were victims in 10 cases. Most of the crashes occurred in the Day and Night hours equally.



Fatal crashes *Simple crashes*

Comparative Road crashes					
Year	**Simple crashes**	**Fatal crashes**	**Total crashes**	**Persons Injured**	**Persons Killed**
2022	*9*	*2*	*11*	*16*	*2*
2023	*8*	*6*	*14*	*17*	*7*

Day Night Wise crashes			Most Vulnerable Period		
	Fatal	**Total**		**Fatal**	**Total**
Night	*3*	*8*	*2100-0300*	*2*	*6*
Day	*3*	*6*	*0600-1200*	*2*	*3*

Top Offending Vehicles			Top Victims		
	Fatal	**Total**		**Fatal**	**Total**
HTV/Goods	*3*	*4*	**Pedestrian**	*3*	*3*
Scooter/M.Cycle	*1*	*2*	**Scooter/M.Cycle**	*3*	*7*
Unknown	*1*	*2*			

Bhalswa Chowk

Bhalswa Chowk is situated on 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 six fatal crashes, three were hit and run cases. Two-wheeler riders were victim in 2 fatal and 4 simple crashes. Four Pedestrians were lost their lives in four fatal crashes. Most of the fatal crashes occurred during the Night time.

● *Fatal crashes* ● *Simple crashes*

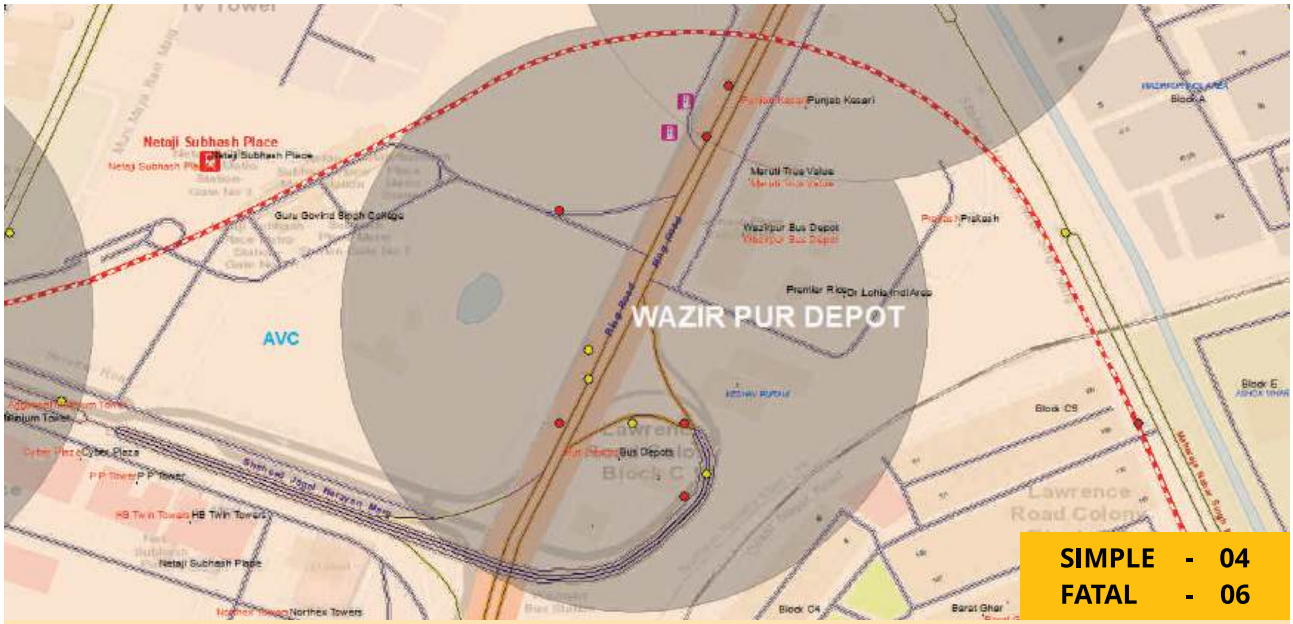
Comparative Road crashes					
Year	**Simple crashes**	**Fatal crashes**	**Total crashes**	**Persons Injured**	**Persons Killed**
2022	*14*	*7*	*21*	*17*	*7*
2023	*4*	*6*	*11*	*5*	*6*

Day Night Wise crashes			Most Vulnerable Period		
	Fatal	**Total**		**Fatal**	**Total**
Night	*2*	*6*	*2200-0500*	*3*	*3*
Day	*4*	*9*	*0700-1000*	*2*	*3*

Top Offending Vehicles			Top Victims		
	Fatal	**Total**		**Fatal**	**Total**
Unknown Vehicle	*3*	*5*	**Pedestrian**	*4*	*5*
Car/Pvt	*2*	*3*	**Scooter/M.Cycle**	*2*	*6*

Wazir Pur Depot

Wazirpur Depot is the region around the junction point of Ring Road and Lala Jagat Narayan Marg. There is high speed vehicular movement on Ring Road, including HTVs and other heavy motor vehicles. Out of six fatal crashes 3 were hit and run cases. Unknown Vehicles, D.Van and Tanker were the main offending vehicles. Two-wheeler riders were victims in Four fatal crashes and Pedestrians were victims in two fatal crashes. Fatal crashes occurred during day and night.



● *Fatal crashes* ● *Simple crashes*

Comparative Road crashes					
Year	**Simple crashes**	**Fatal crashes**	**Total crashes**	**Persons Injured**	**Persons Killed**
2022	*6*	*5*	*11*	*7*	*5*
2023	*4*	*6*	*10*	*6*	*6*

Day Night Wise crashes			Most Vulnerable Period		
	Fatal	**Total**		**Fatal**	**Total**
Night	*3*	*5*	*0500-0700*	*2*	*3*
Day	*3*	*5*	*2000-2400*	*2*	*2*

Top Offending Vehicles			Top Victims		
	Fatal	**Total**		**Fatal**	**Total**
Unknown Vehicle	*3*	*4*	**Pedestrian**	*2*	*2*
D.Van	*1*	*1*	**Scooter/M.Cycle**	*4*	*8*
Tanker	*1*	*1*			

Round About Mori Gate Chowk

This point is situated at Round about Mori gate that connects Hamilton Road, Gokhale road, Kacheri Road and Mori gate road that connects. This is heavily congested area. There is high volume of DTC buses, Clusters buses, LGVs and LMVs, RTVs, TSRs and Two Wheelers on Boulvred Road. Out of six fatal crashes Pedestrians were victims in four fatal crashes, E-rickshaw and car were in 1 each fata crashes. The main offending vehicle are Unknown Vehicle and HTVs. More crashes occurred **during Night hours.**

● *Fatal crashes* ● *Simple crashes*

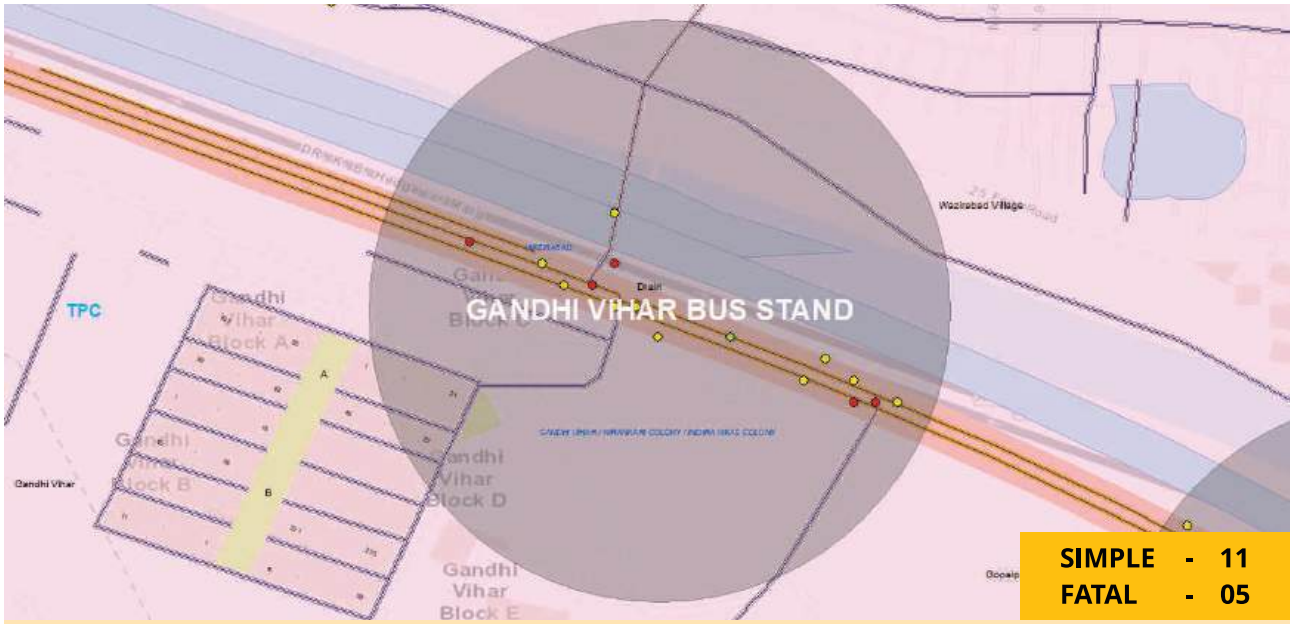
Comparative Road crashes					
Year	**Simple crashes**	**Fatal crashes**	**Total crashes**	**Persons Injured**	**Persons Killed**
2022	*0*	*0*	*0*	*0*	*0*
2023	*2*	*6*	*8*	*3*	*6*

Day Night Wise crashes			Most Vulnerable Period		
	Fatal	**Total**		**Fatal**	**Total**
Night	*5*	*6*	*0500-0600*	*3*	*3*
Day	*1*	*2*	*1500-1700*	*1*	*2*

Top Offending Vehicles			Top Victims		
	Fatal	**Total**		**Fatal**	**Total**
Unknown Vehicle	*5*	*5*	**Pedestrian**	*4*	*6*
Car/Pvt	*1*	*1*	**E-rickshaw**	*1*	*1*
			Car Pvt.	*1*	*1*

Gandhi Vihar Bus Stand

Gandhi Vihar Bus stand is situated on Outer Ring Road. There is heavy movement of pedestrians. Outer Ring Road witness movement of high speed as well as heavy vehicles including HTVs, etc. Out of five fatal crashes two were hit and run cases. HTVs are the main offending vehicles. Two-wheeler riders were victims in three fatal crashes and hand cart was victims in one fatal crash. More number of fatal crashes occurred during day hours.



Fatal crashes *Simple crashes*

Comparative Road crashes					
Year	**Simple crashes**	**Fatal crashes**	**Total crashes**	**Persons Injured**	**Persons Killed**
2022	*18*	*7*	*25*	*23*	*7*
2023	*11*	*5*	*16*	*13*	*5*

Day Night Wise crashes			Most Vulnerable Period		
	Fatal	**Total**		**Fatal**	**Total**
Night	*2*	*7*	*1700-1900*	*2*	*4*
Day	*3*	*9*	*2100-2300*	*2*	*3*

Top Offending Vehicles			Top Victims		
	Fatal	**Total**		**Fatal**	**Total**
Unknown Vehicle	*2*	*3*	**Scooter/M.Cycle**	*3*	*8*
HTV/Goods	*1*	*2*	**Hand Cart**	*1*	*1*

6.23 Correcting Crash Prone Zones/Blackspots:

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 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 crashes 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.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ROAD CRASH CAUSES

VII. ROAD CRASH CAUSES

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 cause 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 crashes. 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, 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 crashes 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 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 exist on roads which are not congenial to smooth and safe road traffic and that may lead to crashes. 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 not see road hazards, road signs, other road occupants difficult.

- **Weather condition:** It refers to adverse weather conditions such as high winds, extreme temperatures, precipitation affecting driver's capabilities, hampering vehicles' 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 visibility 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.

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 crashes. 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 contribute 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.

Other Reasons: -

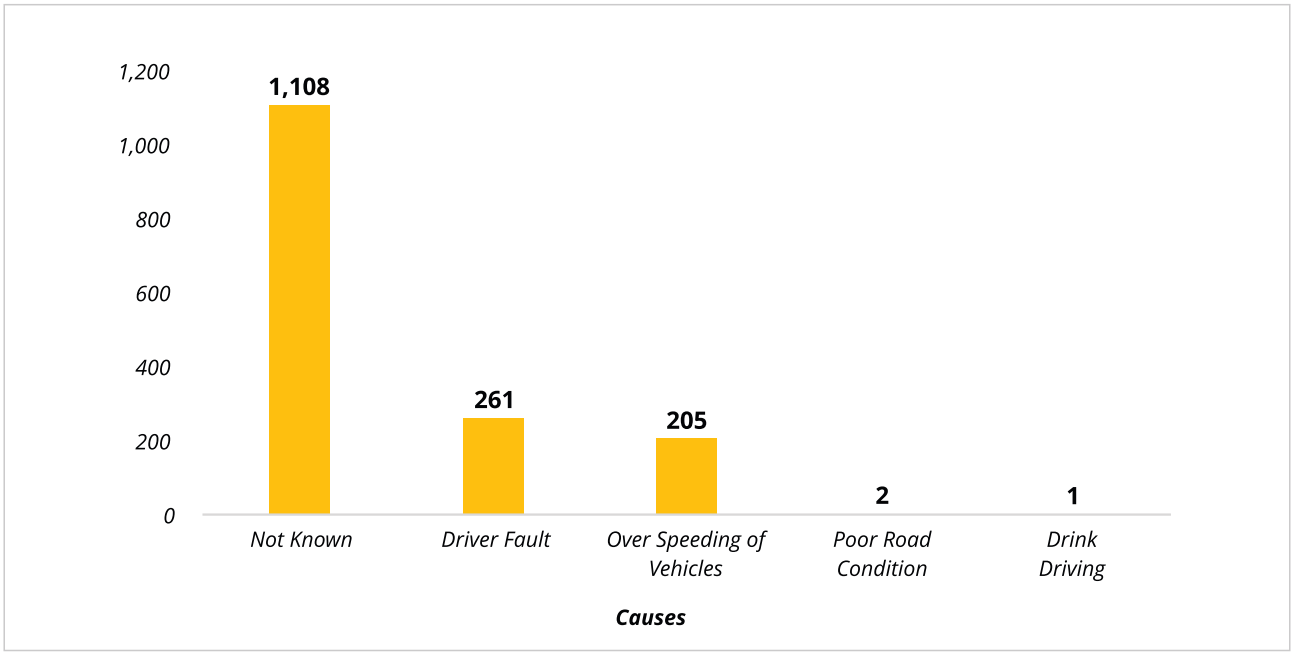

Figure 7.1 Reported road crash causes

After analysing the causes of fatal road crashes that occurred in 2023, it was discovered that approximately 70.26% of the actual reasons behind these crashes remained unidentified. Out of 469 fatal crashes, causes were reported for some, but in many cases, no causes were mentioned for the remaining 1,108 fatal crashes. To effectively implement strategies aimed at reducing fatal crashes, understanding the causes be hind 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.


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ENFORCEMENT & PROSECUTION DATA

VIII. ENFORCEMENT AND PROSECUTION DATA

8.1 Enforcement of Traffic Laws

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

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' behavior 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 drink-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.

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.

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.

8.2 Use of Helmets

As per section 129 of the Motor Vehicles Act 1988, every two-wheeler rider including pillion rider is mandated to wear a good quality BIS approved helmet in a proper manner while riding a two-wheeler. As per section 194 of the MV Act, riders violating the provision of wearing helmets would be subjected to a fine of maximum Rs 1,000 and disqualified for holding a license 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 2023, a total of 1,98,164 riders and 49,711 pillion riders were prosecuted by Delhi Traffic Police for not using helmets.

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 worn properly.

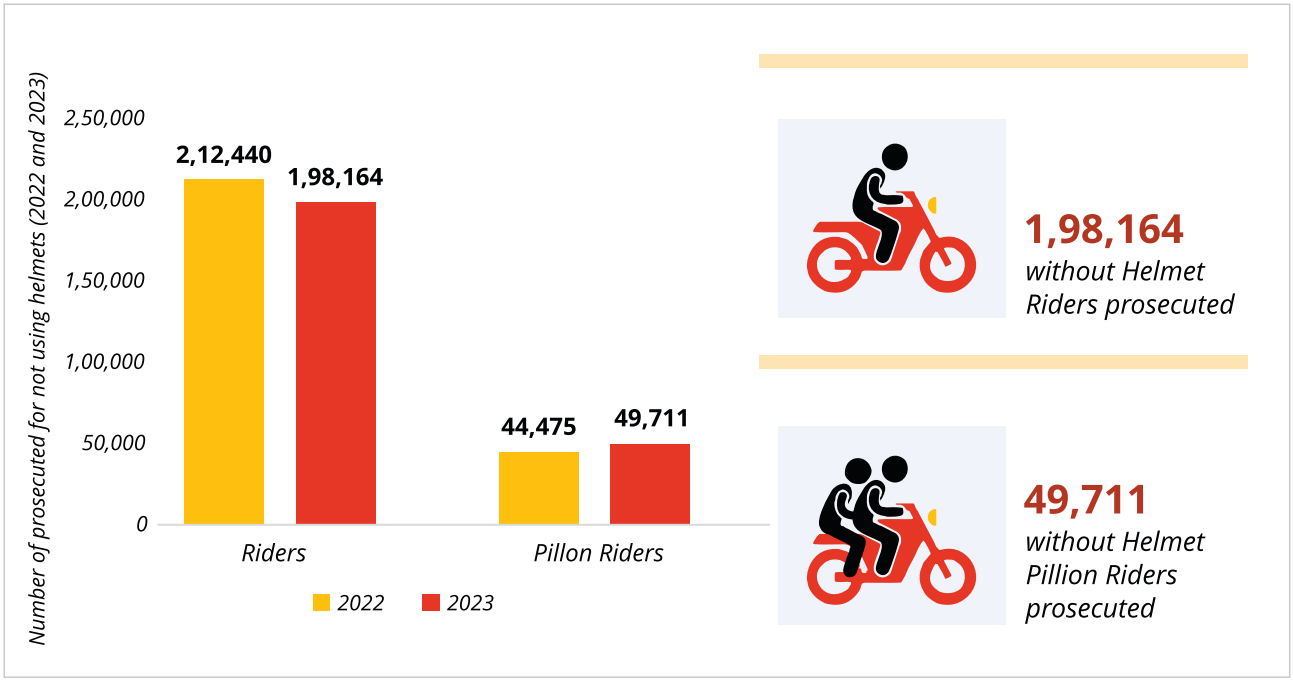


Figure 8.1 Riders and pillion riders prosecuted for not using helmets (2022-2023)

8.3 Seat Belt Use

Seat belts have been made a compulsory fitment in four-wheeler 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 section138 (3) Central Motor Vehicle Rules 1989. As per sub-section (1) of Section 194 of Motor Vehicle Act, 1988, a fine of Rs 1,000 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 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.

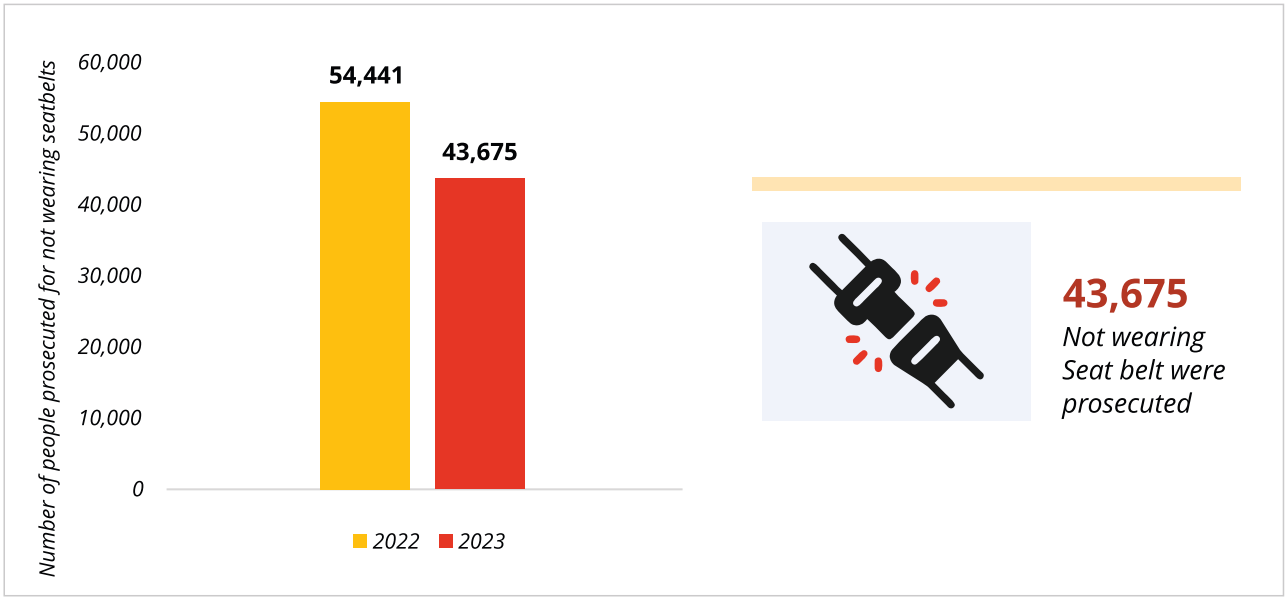


Figure 8.2 People prosecuted for not wearing seat belt (2022-2023)

In the year 2023, 43,675 people were prosecuted by Delhi Traffic Police for driving without seat belt, as against 54,441 in 2022. 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 violators for not wearing seat belts. Need for awareness regarding rear seat belts' significance is also felt.

8.4 Drink Driving

Driving under the influence of liquor/drugs is a punishable offence under section 185 Motor Vehicle Act 1988. Drink driving has proved to be one of the major causes of traffic crashes. According to the law, the punishment for a drink driving is liable up to an imprisonment for six months and a fine of Rs 2,000 or both. Moreover, 660 out of 1,432 fatal crashes which is around 46.08% of fatal crash cases are 'hit and run' cases, in which the causes of crash 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 drink driving by increasing the prosecution of drivers driving under the influence of alcohol.

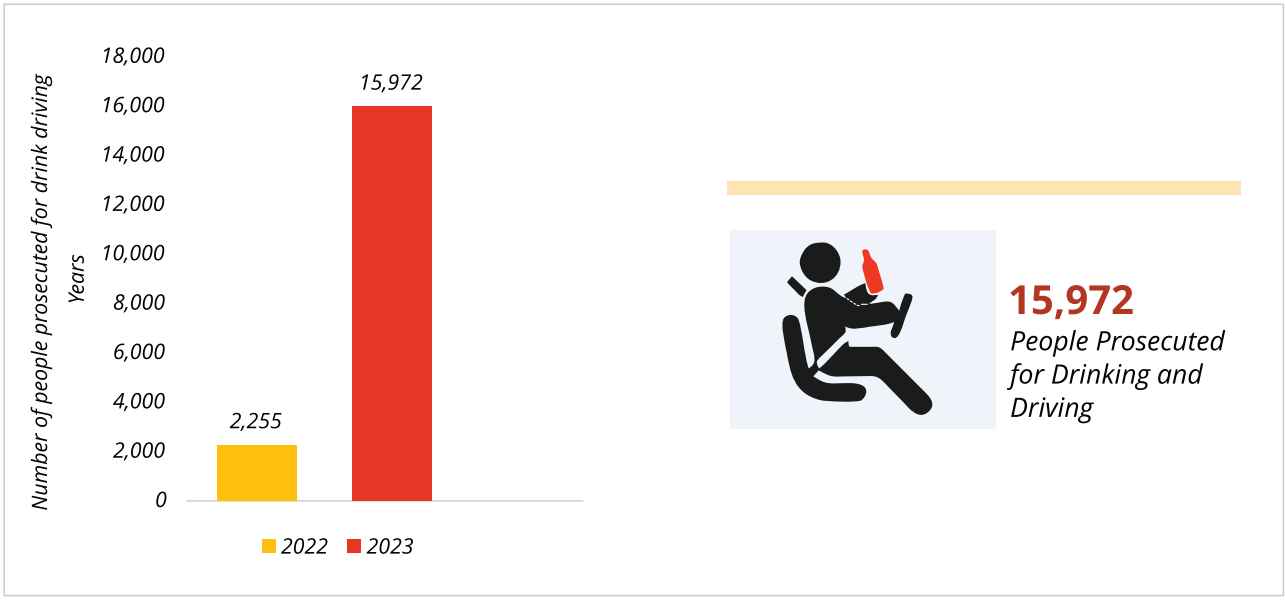


Figure 8.3 People prosecuted for drink driving

In 2023, 15,972 persons were prosecuted on this account, which is 13,717 more than the number of persons prosecuted in 2022.

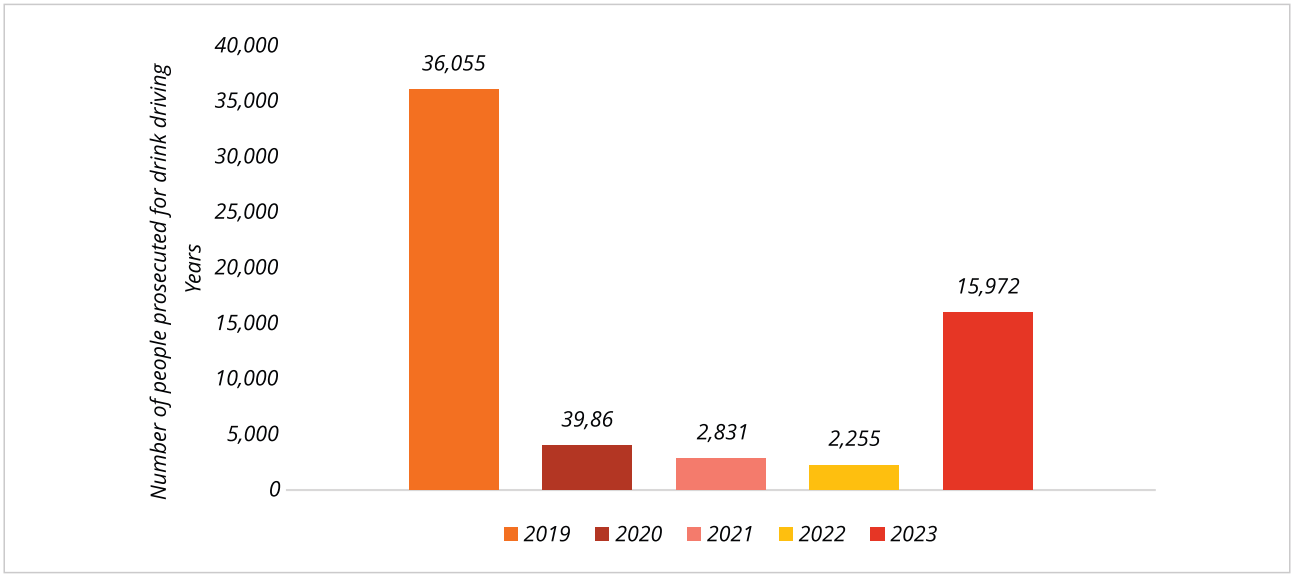


Figure 8.4 People prosecuted for drinking and driving (2019-2023)

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

8.5 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.

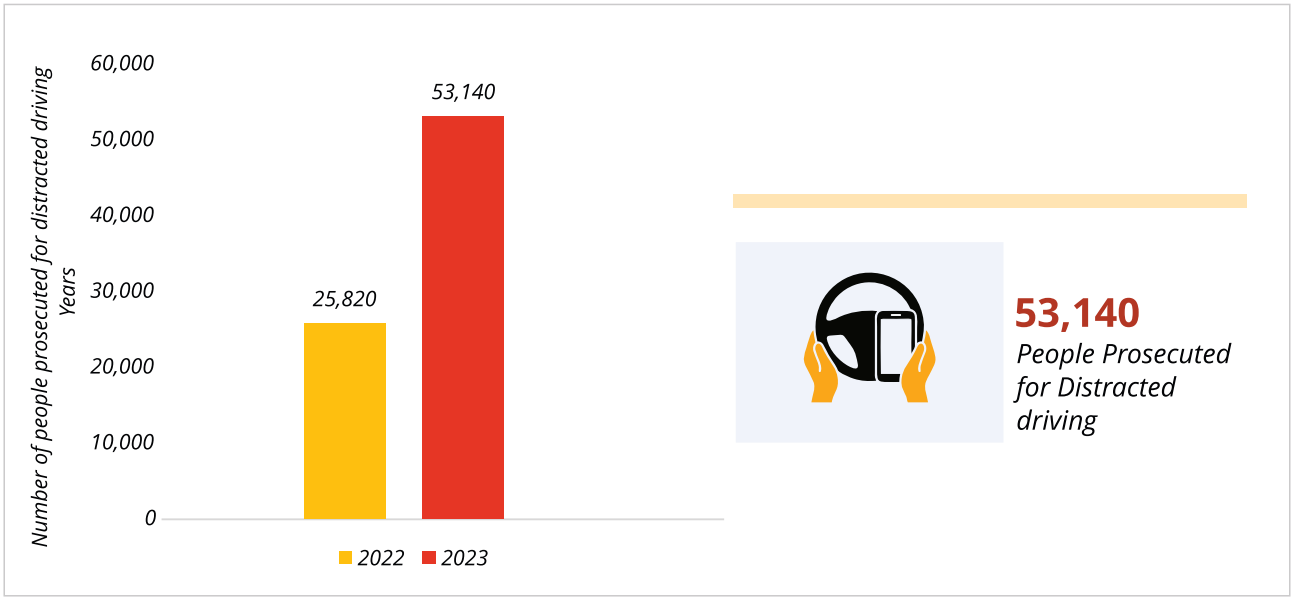


Figure 8.5 People prosecuted for distracted driving (2022-2023)

In the year 2023, 53,140 people were prosecuted on the spot by Delhi Traffic Police for distracted driving as against 25,820 in 2022. 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.

8.6 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.

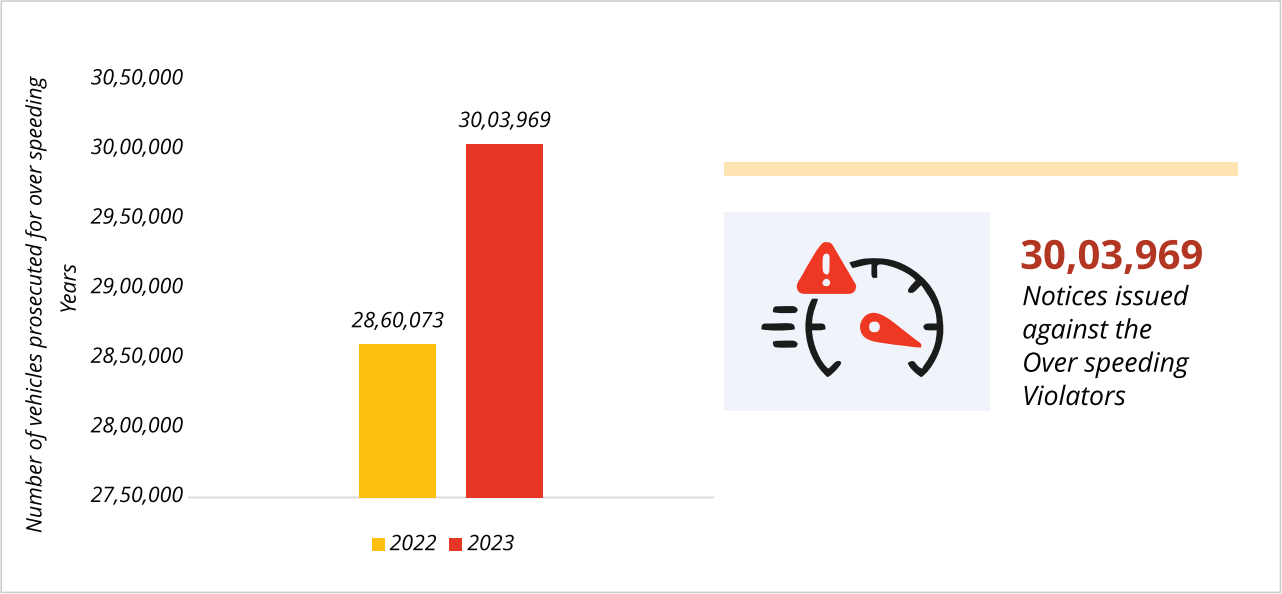


Figure 8.6 Notices sent to people for over-speeding (2022-2023)

Notices on the basis of violations recorded by OSVD cameras and tripod mounted cameras were issued to 30,03,969 vehicles for over speeding in the year 2023, as against 28,60,073 in the year 2022.

8.7 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 requires 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.

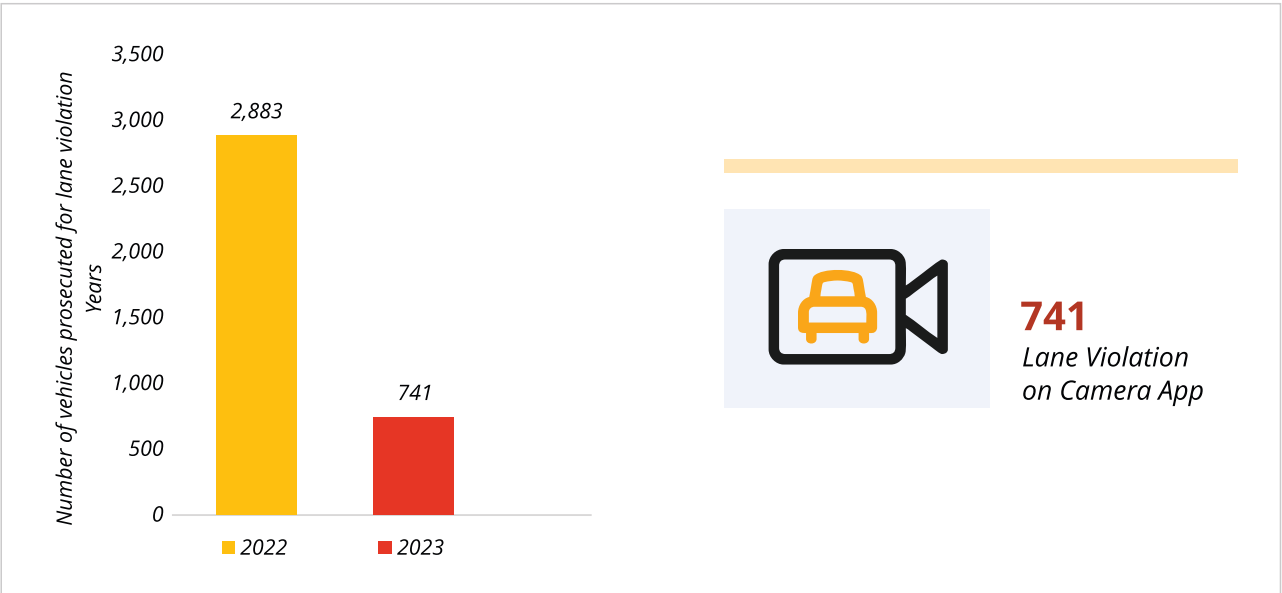


Figure 8.7 Lane violation through violation on camera app (2022-2023)

In 2023, 2108 vehicles were prosecuted for the 'Violation of the Hon'ble Supreme Court's Guidelines' as against 2298 in 2022. In the year 2023, 741 vehicles were prosecuted for lane violation through violation on camera app (VOCA).

Table 8.1: Prosecution against violation of rules (2023)

S. No	Vehicles	Not Using Seat Belt	Rider W/O Helmet	Pillion Rider W/O Helmet	Drink Driving	Dangerous Driving
1.	HTV	1,015	0	0	50	2013
2.	LGV / MMV	7,871	0	0	740	10,865
3.	D. Van	485	0	0	287	994
4.	School Cab	62	0	0	1	14
5.	Chartpvt	509	0	0	29	430
6.	DTC	835	0	0	3	211
7.	Trailer	19	0	0	1	14
8.	School Bus	255	0	0	1	59
9.	Roadways	77	0	0	0	60
10.	RTV	89	0	0	3	58
11.	Call Centre	43	0	0	5	5
12.	Taxi	2,195	0	0	261	1,558
13.	Car/Jeep	28,363	0	0	3,696	13,878
14.	Tractor	0	0	0	11	25
15.	TSR	0	0	0	558	1,395
16.	SC/Mcycle	0	1,98,164	49,711	9,997	19,640
17.	G. Sewa	71	0	0	32	57
18.	Cluster Bus	1,512	0	0	10	436
19.	Interstate Bus	190	0	0	4	106
20.	E Rickshaw	0	0	0	278	1,297
21.	Others	84	0	0	5	25
Total Challan		**43,675**	**1,98,164**	**49,711**	**15,972**	**53,140**
Compound Challan		**1,052**	**436**	**40**	**0**	**0**
Court Challan		**42,623**	**1,97,728**	**49,671**	**15,972**	**53,140**

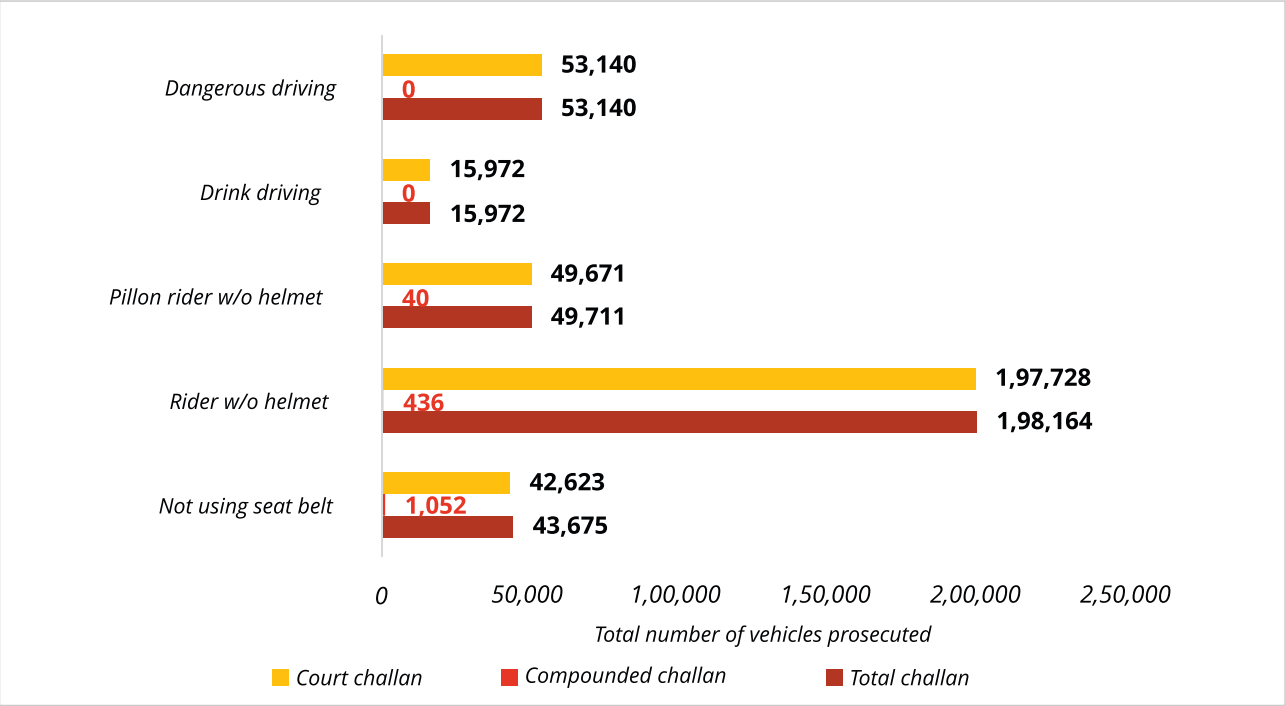


Figure 8.8 Prosecution against violation of rules

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*	*Returned*	*Challan*
2023	*1,66,301*	*779*	*528*	*4,74,997*	*23,089*	*10,012*	*15,875*

- **528** diesel/ petrol driven vehicles which were 10/15 years old were impounded in 2023.
- **4,74,997** vehicles were prosecuted for parking of motor vehicles on metaled roads in 2023.
- **23,089** vehicles were checked at Delhi borders and 10,012 vehicles were returned for being non-destined goods vehicles in 2023.
- **15,875** vehicles were prosecuted for using pressure horns installing and modified silencers in motor vehicles in 2023

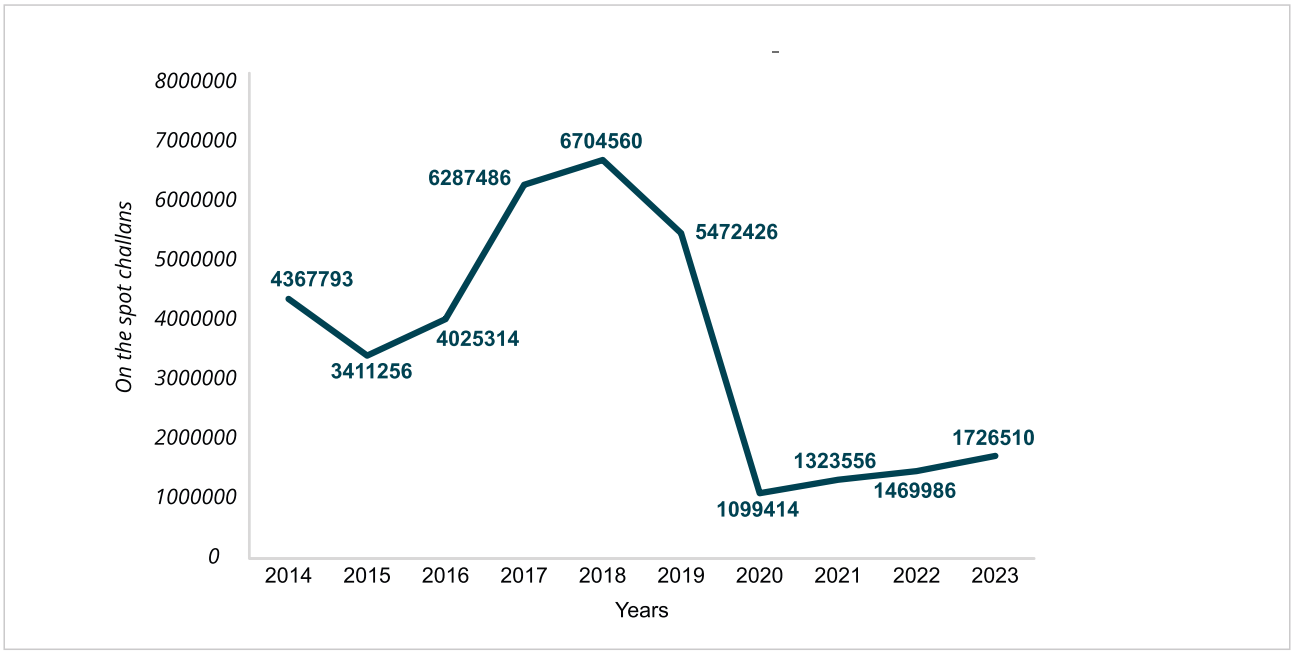


Figure- 8.9 On the spot challan trend (2014-2023)

Table 8.3: Change in pattern of challan (2022-2023)

Year	Total Challan	Court Challan	Compounding Challan	Compounding Amount (In Rs.)
On The Spot Challan				
2022	*14,69,986*	*14,23,390*	*46,596*	*2,67,92,500*
2023	*17,26,510*	*17,04,372*	*22,138*	*1,26,04,000*
Notices Issued U/S 133 M.V. Act 1988				
2022	*59,68,141*	*44,68,446*	*2,63,251*	*32,95,59,700*
2023	*55,79,415*	*39,50,506*	*1,41,447*	*15,77,11,100*

The above table depicts that in 2023 a total of 17,26,510 on the spot challans (22,138 compounded and 17,04,372 to court) and 55,79,415 notices (1,41,447 compounded and 39,50,506 to court) were issued.

The number of the spot challans increased from 14,69,986 to 17,26,510 in 2023, the number of notices decreased from 59,68,141 to 55,79,415 in 2023.

After 2019, this primarily happened due to installation of 209 RLVD cameras system at 43 prominent junctions and 125 OSVD camera system at 66 locations. This electronic enforcement is a milestone in the field of contactless prosecution.

Table 8.4: Total challans and compounding amount by traffic circle 2014-2023

Year	Total Challan	Total Compounding Amount
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/-*
2023	*17,26,510*	*Rs. 1,26,04,000/-*

The above table depicts that the total compounding amount on the spot challans has been the lowest in 2023 when compared with years from 2014 till year 2022, as most of the challans were sent to court.

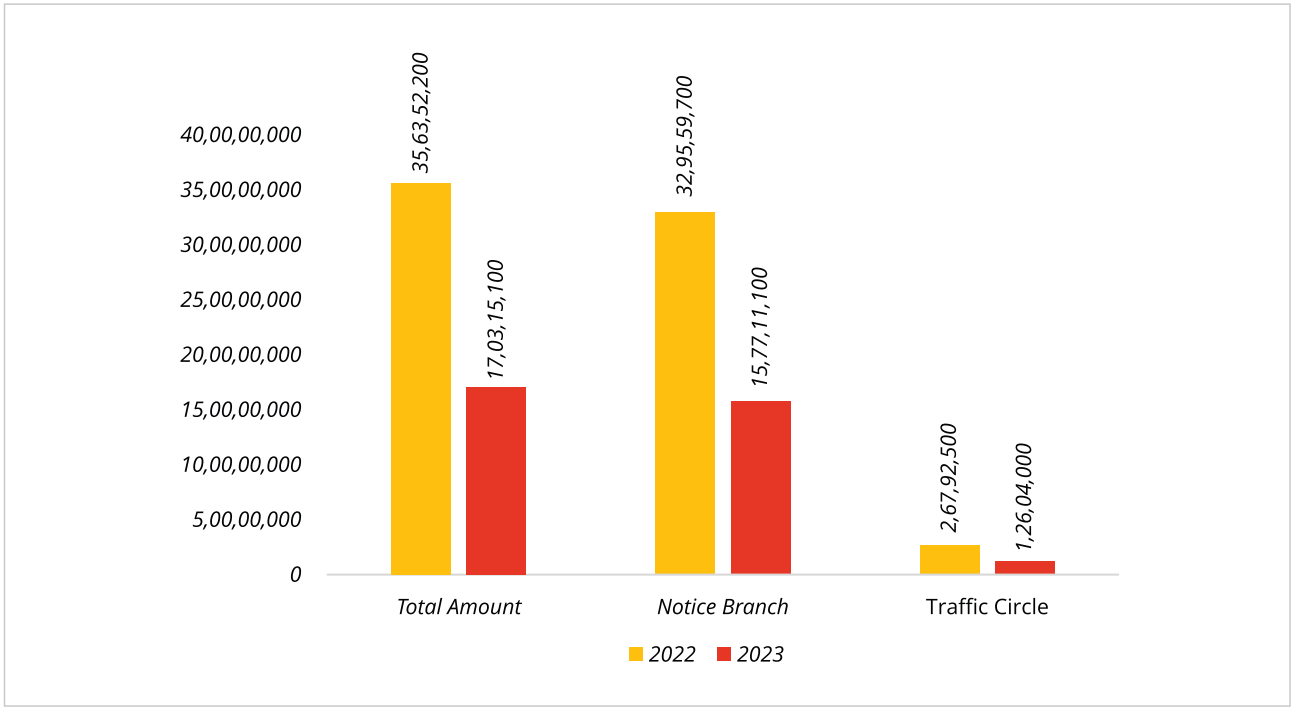


Figure-8.10 Total compounding amount

From the above figure it can be known that compounding amounts of Rs. 1,26,04,000/- and Rs. 15,77,11,100 /- were realised for traffic circle and notice branch respectively for the year 2023. There has been a significant decrease in compounding amount realised by the notice branch and Circles as well in 2023 when compared to 2022.

Table 8.5: Offence-wise prosecution (on the spot challan)

S. No	Offences	2019	2020	2021	2022	2023
1.	Traffic Signal	2,30,502	48,639	40,208	55,936	52,645
2.	W/O Driving License	76,845	25,167	28,992	60,453	71,366
3.	Minor Driving	1,038	77	32	110	111
4.	Over Speeding	1,04,450	8,043	18	0	0
5.	Violation of Restrictions	71,752	26,401	54,608	83,120	1,23,967
6.	Triple Riding	1,62,182	8,128	7,572	19,029	26,202
7.	W/O Helmet	10,36,151	94,555	91,036	2,12,440	1,98,164
8.	W/O Helmet Pillion Rider	45,49,12	22,329	16,724	44,475	49,711
9.	Improper Parking	9,34,699	2,79,830	4,63,732	3,62,844	4,74,997
10.	Dangerous Driving	2,25,553	52,072	48,759	66,259	53,140
11.	Permit Violation	65,018	20,407	23,584	25,557	25,303
12.	Drink Driving	3,60,55	3,986	2,831	2,255	15,972
13.	Playing Music	2,665	1,142	389	132	116
14.	Pressure Horn	24,760	8,367	4,051	9,220	8,168
15.	Tinted Glass	48,070	5,536	5,926	7,602	21,002
16.	High/Long Load	14,968	2,896	1,877	1,496	4,843
17.	Footboard Travel	175	2	3	4	5
18.	Stop Line Crossing	3,38,031	87,779	24,352	26,038	60,722
19.	W/O PullutionCerti.	81,246	69,199	1,04,369	1,31,799	1,66,301
20.	W/O Registration	53,489	25,637	21,367	22,086	21,907
21.	Defective Number Plate	74,580	6,979	18,412	12,052	11,425
22.	Allowing U/A to Drive	40,810	16,263	18,497	34,966	45,489
23.	Using Veh Unsafe Condn.	332	126	154	183	554
24.	Using Top Light	34	37	9	2	38
25.	Yellow Line Violation	52,776	836	6,005	6,426	6,732
26.	W/O Light/Head/Ind./Tail	2,31,067	22,812	15,989	9,322	10,375
27.	Not Driving in Proper Lane	4,431	465	1,937	1,829	1,733
28.	W/O Speed Governer	776	15	25	2	0
29.	Stop Without Bus Stop	952	89	221	146	150
30.	Park/Wait in Bus Lane	56,422	2,620	8,888	2,756	1,333

(Contd.)

S. No	Offences	2019	2020	2021	2022	2023
31.	Wrong Overtaking	6,347	662	411	321	225
32.	W/O Uniform Dvr/Condtr	15,333	614	83	112	3,273
33.	Over Charge/Misbehave	847	37	19	20	105
34.	Over Crowd In Pass Veh	16,100	4,982	6,979	7,648	7,100
35.	Refusal By Taxi/TSR	1,377	36	15	6	231
36.	W/O Fare Chart/Def.Mtr	34	0	0	18	132
37.	One Way Violation	2,93,698	1,12,170	1,23,796	91,196	83,449
38.	Carry Goods in Pass Veh	3,464	1734	1899	924	1,025
39.	Carry Pass in Goods Veh	3,687	1,100	1,527	827	1,031
40.	Carry Anmlin Goods Veh	282	8	22	10	11
41.	Honking Horn	23,522	1,235	380	249	36
42.	Unauthorized CNG/LPG	576	295	603	256	262
43.	Not Using Seat Belt	5,08,707	45,907	62,190	54,441	43,675
44.	Use M.Phone While Drive	18,451	10,915	26,176	25,820	18,385
45.	Using Pvt.Vehas Taxi	22,379	11,811	1,2605	9,940	9,202
46.	Smoking While Driving	1,540	1653	2,759	1,674	1,081
47.	Others	1,02,776	57,388	62,753	59,004	80,195
48.	W/O Insurance	25,438	8,241	10,563	18,888	23,991
49.	W/O PSV Badge	1,884	45	12	18	289
50.	Rupd/Lupd(124 CMVR)	1,191	129	150	72	96
51.	Using U/A Color Light	52	20	47	3	245
52.	**On The Spot Challan**	**54,72,426**	**10,99,414**	**13,23,556**	**14,69,986**	**17,26,510**
53.	**Driver Arrest**	**7,180**	**1030**	**141**	**0**	**0**
54.	**Vehicle Impounded**	**51,570**	**9,506**	**10,667**	**8142**	**6,408**

From the above table, it can be concluded that the maximum challans i.e. 4,74,997 have been issued for 'improper parking' in year 2023 followed by riders without helmets i.e. 1,98,164 and driving without pollution certificate which has been 1,66,301 respectively.

Table 8.6: Vehicle-wise prosecution – 2023

Vehicles	2019	2020	2021	2022	2023
HTV	*2,71,459*	*33,523*	*37,436*	*23,357*	*28,261*
LGV / MMV	*6,73,390*	*93,257*	*1,05,318*	*1,05,735*	*1,10,697*
Bus	*58,559*	*9,199*	*11,491*	*15,265*	*14,039*
Cluster Bus	*4,815*	*1,744*	*3,016*	*1,960*	*3,381*
D.T.C.	*4,318*	*897*	*1,995*	*1,142*	*1,843*
Taxi/Call Centre	*2,64,070*	*56,067*	*59,680*	*43,751*	*74,326*
T.S.R.	*2,88,292*	*84,733*	*1,03,177*	*76,815*	*1,02,396*
Scooter/ M/Cycle	*25,65,231*	*5,02,796*	*5,16,018*	*7,46,628*	*8,23,100*
Car / Jeep	*10,25,191*	*2,68,735*	*3,96,028*	*3,29,453*	*3,76,078*
E-Rickshaw	*1,60,564*	*24,645*	*61,712*	*97,777*	*1,56,577*
D-Van	*1,04,660*	*15,494*	*17,298*	*15,736*	*21,192*
G-Sewa	*28,808*	*4,312*	*4,827*	*5,063*	*5,022*
RTV	*8,008*	*1,397*	*1,919*	*1,497*	*946*
Other	*15,061*	*2,615*	*3,641*	*5,807*	*8,652*

In 2023, maximum challans viz. 8,23,100 were issued against two wheelers followed by Cars (3,76,078), LGVs/MMVs (1,10,697) and E rickshaw (1,56,577). The vehicle-wise prosecution trend from 2020-2023 shows an increasing trend towards challans issued against two wheelers. In 2023, challans against cars have increased slightly upto 46,625 from the year 2022.

Table 8.7(a): Offence-wise vehicle – 2023

Offence	HTV	LGV	Delivery Van	Sch\ Cab	Ch. Bus	DTC	Trailor	School Bus	Road-ways	RTV	Call Centre
Traffic signal	86	1,528	386	20	76	68	4	21	5	37	156
W/o driving license	305	1,523	522	7	66	6	3	1	1	11	3
Violation of restrictions	9,049	35,774	6,391	20	154	0	298	20	29	0	38
Improper parking	4,250	23,835	5,671	51	2,059	270	31	135	98	199	280
Dangerous driving	2,013	10,865	994	14	430	211	14	59	60	58	5
Permit violation	825	926	62	47	5,545	69	10	139	67	346	33
Drink driving	50	740	287	1	29	3	1	1	0	3	5
Playing music	1	39	6	6	0	0	0	0	0	0	0
Pressure horn	104	134	5	1	17	0	0	2	3	21	1
Tinted glass	22	764	101	8	83	0	0	1	0	16	6
High/long load	2,533	2,119	183	0	0	0	0	0	0	0	0
Footboard travel	0	0	0	0	1	0	0	0	0	2	0
Stop line crossing	191	2,064	855	45	147	184	2	41	4	29	419
W/o pullutioncerti.	445	2,057	464	14	75	12	10	10	6	12	23
W/o registration	350	1,041	276	519	136	2	1	27	4	16	8
Defective number plate	312	543	79	2	25	0	4	1	2	4	1
Owner allowing u/a major person to drive	298	1,253	311	11	38	4	0	2	5	7	10
Using veh unsafe condn.	22	37	10	1	4	0	0	0	0	0	0
Yellow line violation	1	118	34	0	13	3	0	2	0	0	0
W/o light/head/ind./tail	1,866	5,642	1,094	4	148	1	6	7		10	16
Not driving proper lane	73	408	17	1	60	54	0	2	2	2	0
W/o speed governer	0	0	0	0	0	0	0	0	0	0	0
Stop without bus stop	0	0	0	0	95	0	0	7	4	2	0
Park/wait in bus lane	1	2	0	0	6	2	0	1	0	0	2
Wrong overtaking	29	54	14	0	46	11	0	13	0	5	0
W/o uniform dvr/condtr	0	0	0	3	87	11	0	12	0	7	0
Over charge/misbehave	0	0	0	0	0	0	0	0	0	0	0
Over crowd in pass veh	0	0	0	18	60	28	0	0	0	3	0
One way violation	350	2,847	799	10	120	24	0	19	11	44	11
Carry goods in pass veh	0	0	0	0	2	0	0	0	0	0	0
Carry pass in goods veh	73	644	213	0	0	0	0	0	0	0	0
Carry anmlin goods veh	0	8	0	0	0	0	0	0	0	0	0
Honking horn	2	4	0	0	0	0	0	0	0	0	0
Unauthorized cng/lpg	2	11	1	0	0	0	0	0	0	0	0
Not using seat belt	1,015	7,871	485	62	509	835	19	255	77	89	43
Use m.phone while drive	52	855	185	3	36	18	1	4	3	7	12
Using pvt.vehas taxi	9	8	6	771	0	0	2	23	0	0	0
Smoking while driving	1	42	16	0	2	0	0	1	0	0	0
Others	3,653	5,755	1,497	21	202	26	84	17	5	13	60
W/o insurance	105	1,069	227	6	21	1	0	1	3	2	20
W/o psv badge	0	3	0	0	1	0	0	0	0	1	0
Rupd/lupd (124 cmvr)	72	19	0	0	0	0	0	0	0	0	0
Using unauthorized colouredlight	101	95	1	0	1	0	0	0	0	0	0
Total	**28,261**	**1,10,697**	**21,192**	**1,666**	**10,294**	**1,843**	**490**	**824**	**389**	**946**	**1,152**

Table 8.7(b): Offence-wise vehicle – 2023

Offence	Taxi	Car/Jeep	Tractor	TSR	SCMC	G-Sewa	Cluster	Pvt. Int. Bus	E Rickshaw	others
Traffic Signal	1,968	30,498	22	913	16,029	65	137	9	611	6
W/O Driving Licence	492	8,497	34	1,668	51,157	129	14	225	6,659	43
Owner Allowing Minor To Driving	0	6	0	2	92	0	0	0	10	1
Violation Of Restrictions	102	27,797	175	2	1,032	0	0	2	42,463	621
Triple Riding	0	0	0	0	26,202	0	0	0	0	0
W/O Helmet	0	0	0	0	1,98,164	0	0	0	0	0
W/O Helmet Pillion Rider	0	0	0	0	49,711	0	0	0	0	0
Improper Parking	33,281	92,242	372	68,006	1,52,094	2,624	502	925	87,167	905
Dangerous Driving	1,558	13,878	25	1,395	19,640	57	436	106	1,297	25
Permit Violation	7,477	0	11	8,004		834	120	680	28	80
Drink Driving	261	3,696	11	558	9,997	32	10	4	278	5
Playing Music	1	46	0	5	9	0	0	0	2	1
Pressure Horn	45	1,559		4	6,261	3	0	4	3	1
Tinted Glass	426	19,520	0	0	0	2		11		42
High/Long Load	0	0	0	0	0	0	0	0	0	8
Footboard Travel	0	0	0	0	0	0	0	0	0	2
Stop Line Crossing	5,707	21,865	79	3,852	23,643	116	382	31	1,052	14
W/O PullutionCerti.	593	42,127	12	1,286	1,18,998	108	2	10		37
W/O Registration	261	5,263	260	673	12,366	156	1	4	406	137
Defective Number Plate	70	2,627	6	95	7,327	26	1	7	290	3
Owner Allowing U/A Major Person to Drive	279	4,220	18	924	30,400	107	24	148	7,359	71
Using Veh Unsafe Condn.	10	14	0	6	54	0	0	0	394	2
Using Top Light	3	33	0	0	0	0	0	0	0	2
Yellow Line Violation	1,307	4,557	32	409	237	0	4	0	15	0
W/O Light/Head/Ind./Tail	725	499	0	141	73	18	7	12	103	3
Not Driving Proper Lane	8	1,005	0	1	0	0	41	29	0	30
W/O Speed Governer	0	0	0	0	0	0	0	0	0	0
Stop Without Bus Stop	0	0	0	0	0	1	0	38	0	3
Park/Wait In Bus Lane	36	39	0	652	58	8	0	1	525	0
Wrong Overtaking	1	0	1	9	7	0	17	2	16	0
W/O Uniform DVR/Condtr	1,951	0	0	1,082	0	53	29	1	0	37
Over Charge/Misbehave	13	0	0	60	0	0	0	0	22	10
Over Crowd in Pass Veh	88	0	0	3,248	0	144	5	7	2,486	1,013
Refusal By Taxi/TSR	10	0	0	216	0	2	0	0	3	0
W/O Fare Chart/Def.Mtr	15	0	0	100	2	6	0	0	9	0
One Way Violation	6,881	23,853	86	3,944	42,495	159	67	25	1,667	37
Carry Goods in Pass Veh	16	0	0	107	0	6	1	0	183	710
Carry Pass in Goods Veh	0	0	0	0	0	0	0	0	0	101
Carry Anmlin Goods Veh	0	0	0	0	0	0	0	0	0	3
Honking Horn	0	1	0	2	27	0	0	0	0	0
Unauthorized Cng/Lpg	18	229	0	0	0	0	1	0	0	0
Not Using Seat Belt	2,195	28,363	0	0	0	71	1,512	190	0	84
Use M.Phone While Drive	310	10,278	8	164	6,275	23	25	5	116	5

(Contd.)

Using Pvt.Vehas Taxi	*0*	*8,210*	*0*	*4*	*125*	*0*	*0*	*0*	*4*	*40*
Smoking While driving	*66*	*835*	*0*	*17*	*80*	*0*	*2*	*1*	*18*	*0*
Others	*7,604*	*20,102*	*31*	*3,673*	*35,023*	*207*	*27*	*47*	*2115*	*33*
W/O Insurance	*483*	*4,182*	*16*	*973*	*15,520*	*63*	*14*	*8*	*1,268*	*9*
W/O Psv Badge	*59*	*0*	*0*	*199*	*0*	*2*	*0*	*0*	*8*	*16*
Rupd/Lupd (124 Cmvr)	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*5*
Using U/A Coloured Light	*6*	*37*	*0*	*2*	*2*	*0*	*0*	*0*	*0*	*0*
Total	**74,326**	**3,76,078**	**1,199**	**1,02,396**	**8,23,100**	**5,022**	**3,381**	**2,532**	**1,56,577**	**4,145**

The above tables depict that out of 8,23,100 challans issued against two-wheelers, 1,98,164 challans were for riding without helmets, 1,52,094 challans issued were for improper parking and 1,18,998 challans issued were for riding without pollution certificate. Out of 3,76,078 challans issued against cars, 92,242 were issued for improper parking, 42,422 were for not using seat belts during driving and 28,363 challans were issued for not obeying traffic signals.

Total challans issued against LGVs were 1,10,697 out of which maximum challans i.e 35,774 were for violation of restrictions followed by 23,835 challans for improper parking and 10,865 challans were issued for dangerous driving.

E-rickshaws accounted for 1,56,577 challan out of which 87,167 challans were for improper parking followed by 42,463 challans for violation of restrictions.

Table 8.8: Circle-wise prosecution – 2023

Circle	Compound	Court	Total Challan	Amount
AMV	*5*	*14,612*	*14,617*	*2,500*
AVC	*756*	*22,630*	*23,386*	*4,00,500*
BDP	*159*	*31,938*	*32,097*	*99,000*
BGP	*0*	*3,864*	*3,864*	*0*
BKR	*335*	*10,355*	*10,690*	*1,79,500*
BNA	*224*	*9,300*	*9,524*	*1,20,000*
BPC	*82*	*16,494*	*16,576*	*46000*
CHP	*279*	*11,776*	*12,055*	*1,60,000*
CLC	*438*	*23,835*	*24,273*	*2,40,000*
CRP	*97*	*19,945*	*20,042*	*61,500*
CWL	*0*	*9,759*	*9,759*	*0*
DBC	*205*	*21,156*	*21,361*	*1,06,000*
DCC	*237*	*13,413*	*13,650*	*1,28,500*

(Contd.)

Circle	Compound	Court	Total Challan	Amount
DFC	435	23,170	23,605	2,34,000
DGC	655	32,668	33,323	3,65,000
DWC	528	57,887	58,415	2,775,00
GNC	428	19,618	20,046	2,21,000
HKC	569	36,195	36,764	3,04,500
IGI	530	32,022	32,552	3,28,500
JRP	410	5,454	5,864	2,27,000
KBC	1,081	32,929	34,010	5,70,000
KJC	137	41,445	41,582	71,500
KKC	496	36,977	37,473	2,68,500
KMC	374	29,100	29,474	2,18,000
KOT	427	38,336	38,763	2,42,500
KPA	158	19,283	19,441	9,7000
KPC	780	45,150	45,930	4,10,000
LNC	477	43,176	43,653	2,75,500
MDV	181	13,771	13,952	96,500
MGP	203	22,787	22,990	1,22,000
MPC	75	19,400	19,475	40,500
MRC	493	36,558	37,051	2,60,500
MTC	537	21,330	21,867	2,78,500
MYV	110	18,308	18,418	62,000
NFC	247	31,732	31,979	1,36,000
NJC	229	60,992	61,221	1,35,000
NLC	464	47,957	48,421	3,09,500
NNC	107	12,253	12,360	56,500
NRL	444	29,783	30,227	4,18,000
PBC	444	52,238	52,682	2,50,000
PGC	201	17,782	17,983	1,11,000
PNC	100	7,878	7,978	62,500
PRV	176	10,634	10,810	97,500

(Contd.)

Circle	Compound	Court	Total Challan	Amount
PSV	*306*	*28,117*	*28,423*	*1,58,500*
PTC	*915*	*61,697*	*62,612*	*4,87,000*
PTH	*26*	*5,511*	*5,537*	*15,000*
PVC	*336*	*11,001*	*11,337*	*1,79,500*
RGC	*313*	*56,156*	*56,469*	*1,65,500*
RHN	*229*	*23,538*	*23,767*	*1,23,500*
SBC	*256*	*32,546*	*32,802*	*1,39,000*
SBP	*86*	*4,373*	*4,459*	*51000*
SDE	*725*	*21,547*	*22,272*	*4,54,500*
SGV	*310*	*29,937*	*30,247*	*3,12,500*
SHD	*463*	*33,904*	*34,367*	*2,87,000*
SKT	*270*	*15,129*	*15,399*	*1,46,000*
SLP	*0*	*8,182*	*8,182*	*0*
SMB	*387*	*8,035*	*8,422*	*1,98,500*
SNC	*276*	*2,523*	*2,799*	*1,56,500*
SPB	*665*	*25,562*	*26,227*	*3,68,500*
SPC	*18*	*8,472*	*8,490*	*12,000*
SRC	*107*	*11,969*	*12,076*	*66,000*
SVR	*264*	*38,520*	*38,784*	*1,46,500*
TMC	*358*	*22,151*	*22,509*	*1,97,000*
TMP	*57*	*23,558*	*23,615*	*31,000*
TNC	*452*	*67,244*	*67,696*	*2,74,000*
TRC	*214*	*11,981*	*12,195*	*1,17,000*
VKC	*175*	*9,063*	*9,238*	*96,500*
VKJ	*137*	*11,078*	*11,215*	*75000*
VVC	*480*	*26,688*	*27,168*	*2,56,500*
TOTAL	**22,138**	**17,04,372**	**17,26,510**	**1,26,04,000**

The above table depicts that the highest challan of 67,696 has been issued at Tilak Nagar Circle (TNC), followed by 62,612 challans at Parliament Street Circle (PTC) and 61,221 challans at Najafgarh Circle (NJC). Swaroop Nagar Circle (SNC) has issued the lowest number of challan i.e 2,799 followed by 3,864 challans by Bhajanpura Circle (BGP) and 4,459 challans by Samaypur Badali (SBP) Circle.

8 .8 Vehicles Impounded

From the below table it can be observed that in the year 2023, a total of 6,408 vehicles were impounded. Prime offenders were drivers of cars, scooters and motorcycles. Primarily 2,532 scooters/motorcycles, 1,815 electric rickshaws, 868 TSRs and 576 cars were impounded. School cabs, school buses and call center cabs were among the lowest vehicle category to be impounded.

Table 8.9: Driver arrest and vehicle impounded – 2023

S.No.	Vehicle	Vehicles Impounded
1.	*SC/MC*	*2,491*
2.	*Electric Rickshaw*	*1,547*
3.	*TSR*	*659*
4.	*Car/Jeep*	*628*
5.	*Inter State Bus*	*264*
6.	*LGV / MMV*	*190*
7.	*Others*	*135*
8.	*Private Charter Bus*	*121*
9.	*HTV*	*91*
10.	*Gramin Sewa*	*81*
11.	*Taxi*	*71*
12.	*Tractor*	*58*
13.	*Delivery Van*	*52*
14.	*RTV*	*5*
15.	*School Cab*	*4*
16.	*Cluster Bus*	*4*
17.	*Call Centre*	*3*
18.	*Roadways*	*3*
19.	*DTC*	*1*
20.	*Trailor*	*0*
21.	*School Bus*	*0*
	Total	**6,408**

While two-wheeler riders accounted for 10% of fatal crashes in 2023, they ranked second on the list of road crash victims comprising 38.87% 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 crashes and fatalities.

8.9 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 2023, a total of 3,19,257 chase and challans were issued. Under this category, scooter/motorcycle riders topped the list of those prosecuted (27%) followed by car/jeep drivers (21%).

These two categories together make 48% of total prosecution by Traffic Police motorcycles. Month of December witnessed the highest number of chase and challan prosecutions followed by months of July and June respectively. Month of March witnessed the lowest number of chase and challan prosecutions.

Table 8.10: Month-wise total motor cycle prosecution – 2023 (Chase and Challan)

Month	HTV	LGV / MMV	Delivery Van	School Cab	Chart Pvt.	DTC	Trailor	School Bus	Roadways	RTV	Call Centre	Taxi	Car/ jeep	Tractor	TSR	SCMC	Gramin Sewa	Cluster Bus	E-Rickshaw	Other	Total
Jan	56	2,504	980	2	4	0	0	0	38	46	42	1,406	10,561	3	9,005	12,728	345	48	7,506	170	45,444
Feb	32	980	403	0	1	0	0	0	22	27	35	970	5,756	1	3,956	7,955	189	32	3,453	146	23,958
Mar	18	1,119	389	1	2	0	0	0	15	18	25	941	3,680	1	2,416	2,418	145	18	3,316	87	14,609
Apr	21	1,201	438	1	2	0	0	0	11	16	34	899	3,615	2	2,398	2,789	208	32	3,658	115	15,440
May	27	1,005	476	0	0	0	0	0	19	21	23	667	5,230	2	3,985	4,256	134	27	2,254	108	18,234
Jun	31	2,350	768	2	1	0	0	0	12	27	45	760	3,526	2	4,890	6,895	340	31	3,364	130	23,174
Jul	26	1,981	512	2	1	0	0	2	19	29	42	809	3,894	3	4,985	6,680	197	29	4,256	120	23,587
Aug	35	1,812	465	4	2	0	0	0	17	21	19	559	4,658	4	5,605	6,121	175	35	4,568	89	24,189
Sep	28	2,951	415	6	0	0	0	1	13	24	165	858	3,976	2	4,103	5,507	196	31	4,458	110	22,844
Oct	43	2,589	556	5	2	0	0	2	17	31	35	512	7,569	5	7,855	9,852	165	44	4,985	140	34,407
Nov	37	1,504	356	1	3	0	0	0	12	81	120	389	4,560	3	6,534	7,787	201	87	4,250	99	26,024
Dec	61	2,907	982	5	5	0	0	4	28	59	170	1581	11,211	7	8,608	13,408	780	125	7,208	198	47,347
Total	415	22,903	6,740	29	23	0	0	9	223	400	755	10,351	68,236	35	64,340	86,396	3,075	539	53,276	1512	3,19,257

8.10 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.

At present the number of vehicles registered in Delhi is over 79.45 lakhs, which is distributed over a human population of approximately 211.15 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.

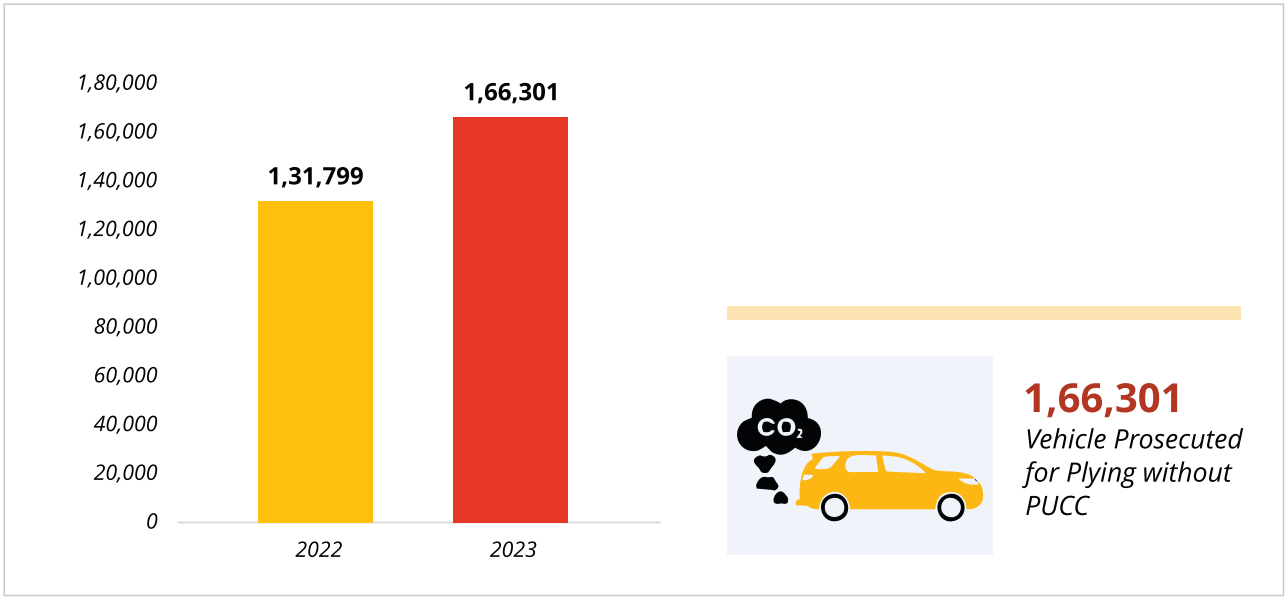


Figure 8.11 Prosecution against violation of rules

1,66,301 vehicles were prosecuted for plying without PUCC in 2023 and 779 vehicles were prosecuted for carrying construction and allied material without proper covers in goods vehicles in 2023.

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 11, 939 notices were issued by the Traffic Sentinel App in 2023.

Table 8.11: Traffic sentinel notices statements - 2023

S. No	Violation	No. Of Notices
1.	*Without Helmet*	*7,292*
2.	*Parking On Footpaths*	*2,292*
3.	Driving Against the Flow of Traffic	*1,415*
4.	*Tripple Riding*	*409*
5.	*Violation Of Stop Line*	*278*
6.	*Defective Number Plate*	*235*
7.	*Using Mobile Phone While Driving*	*5*
	Total	**11,939**

1,66,301 vehicles were prosecuted for plying without PUCC in 2023 and 779 vehicles were prosecuted for carrying construction and allied material without proper covers in goods vehicles in 2023.

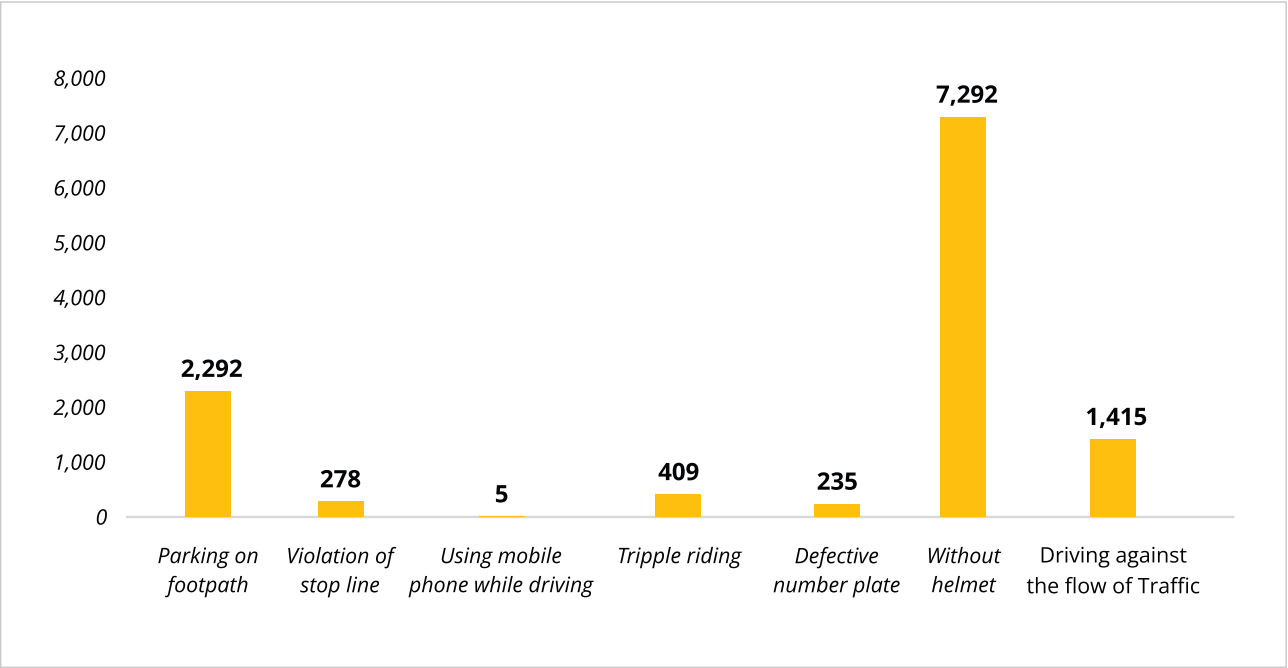


Figure 8.12 Traffic sentinel notices-2023

As depicted in above figure a total of 11,939 traffic sentinel notices statements were issued in 2023. Out of which 7,292 notices were for driving without a helmet followed by 991 notices for riding against traffic and 2,292 issues against parking on footpaths.


ROAD SAFETY AWARENESS PROGRAMME
TRAFFIC SIGNALS
STOP
GO

ROAD SAFETY INITIATIVES

IX. ROAD SAFETY INITIATIVES

9.1 Road Safety Cell:

Traffic hazards and fatalities on roads are the outcome of ignorance and arrogance on the part of road users. It is very important to instill good road user behavior in the minds of every citizen so as to reduce roads congestion and achieve zero casualties. Road Safety Cell, the educational wing of Delhi Traffic Police was **formed in the year 1972** with a view to organize **educational and awareness campaigns to sensitize different categories of road users about various aspects of road safety.**

Objective:

1. Sensitize 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 crash prone zones
4. Bring about behavioral and attitudinal change in the mindset of road users to: -
   i. Ensure better sense and orderliness on road.
   ii. Imbibe care, concern and mutual respect towards fellow road users.
   iii. Inculcate respect for others' Right of Way.
   iv. Create empathy towards road crash victims.
   v. Popularize the concept of Good Samaritan.

TARGET GROUPS: On the basis of vulnerability of different categories of road users, road users have been grouped into target groups to ensure effective sensitization.

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

METHODOLOGY: To make the awareness/educational programmes interesting and interactive, various methodologies have been adopted

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:

- Bal Bhawan, Baba Kharak Singh Marg, Punjabi Bagh and Roshanara Bagh
- Practical education to different categories of road users including school children.
- Parks simulate actual road conditions; have miniature road signs and vehicles to teach children as well as adults the proper methods to remain safe while on roads.

Two Road Safety Mobile Display Vans:

- Displayed at prominent locations to spread awareness about importance of road safety rules and to sensitize motorists as well as general public about road safety measures through audio-visual means.
- Equipped with latest audio-visual gadgets and aims at attracting maximum audience.

9.3 Road Safety Activities:

Road safety awareness sessions for school students are organised online/offline to educate them about the importance of obeying traffic rules and other aspects of safety to be followed.

Mode	Topics Covered
● *Lecture* ● *Interactive sessions* ● *Power point presentation* ● *Short Movies* ● *Road Safety Game* ● *Oath Taking* ● *Display of ME Van*	● Importance of obeying traffic rules ● Helmet Safety for two-wheeler ● Always use seat belt in four-wheeler

Awareness sessions conducted in schools during the year 2023

457 *Total no. of schools*

1,25,612 *No. of students*

4,705 *No. of teacher/parents*

Summer camp for college students:

Objective:

The camp offered interesting activities such as: -

- Road safety board games
- Competitions as well as training in traffic drill
- Self-defence, fire safety
- Disaster management
- First-aid & CPR administration
- Cyber awareness, etc.

These actions are essential part of modern educational system for the enhancement of the overall personality of students.

During Summer Camp-2023, competitions based on road safety related topics were also organised for school students such as: -

- Painting
- Slogan Writing
- Quiz competition
- Traffic drill etc.

Winners of various competitions were felicitated by the Special Commissioner of Police/TMD Zone-II, on the occasion of culmination function that was held on 10th June, 2023 at Adarsh Auditorium PHQ, New Delhi.

A total of 2,435 students and 346 teachers participated in summer camp

Display of Mobile Exhibition Van

Road safety exhibition vans were displayed at prominent locations and parks as part of community policing initiative "We Care" and also at schools, army, airforce, NCC headquarters during road safety awareness campaigns. During the year, vans were displayed at 114 locations in which a total of 2,55,374 persons were sensitized through film shows, audio video display and announcement through PA system about the importance of obeying traffic rules.

"No Honking" Awareness Drive

As per the directions of seniorofficers, special 'No Honking Drives' and awareness campaigns are being conducted every Tuesday to sensitize people that horns should be used with a valid reason and how unnecessary honking can be hazardous for other road users.

Cycle Conspicuity Campaign

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.
- Campaigns are organized in areas with high density of cyclists.
- They were also imparted tips about safe cycling habits that they should follow to ensure their safety on roads.

Reflective tapes were affixed on 40,455 cycles/E-rickshaw at various places (552 sessions).

Campaign to Promote Helmet Safety for Women Two-wheeler Riders

Delhi Traffic Police in association with NGO- Chetak Foundation - organised a campaign to promote helmet safety among women two-wheeler riders. Sh. Shashank Jaiswal, IPS, DCP/T-VIP & RSC, Sh. Ashok Kumar Maindola, ACP/Traffic and Sh. Sachin Haritash, Head & Director of Chetak Logistics and Sh. Arun Arora, Director, Chetak Foundation graced the occasion. Delhi Traffic Police has been working relentlessly towards sensitizing two-wheelers about the necessity of wearing a BIS-approved good quality helmet, in a proper manner, while riding or pillion riding on a two-wheeler.

As a first step towards this initiative, to sensitize women two-wheeler riders about the importance of wearing helmet, around **300 helmets** were distributed among female college students and women police personnel.

The comparative details of Road safety activities is as under: -

Table 9.1: Road safety activity

Activity	2022	2023
No. of students imparted road safety education	*1,98,147*	*1,35,012*
No. of teachers imparted road safety education	*7,806*	*5,015*
No. of school imparted road safety education	*839*	*491*
No. of college students imparted road safety education	*7,117*	*1,954*
No. of college faculty imparted road safety education	*424*	*35*
No. of college imparted road safety education	*37*	*14*
No. of places where mobile exhibition vans displayed	*598*	*120*
No. of public witnessed mobile exhibition vans	*6,07,342*	*26,2,139*
No. of DTC drivers/conductors educated	*28,632*	*28,163*
No. of cluster bus drivers educated	*32,342*	*35,231*
No. of taxi/TSR/e-rickshaw drivers educated	*13,245*	*14,834*
No. of truck drivers educated	*771*	*419*
No. of corporate house employees educated	*7,117*	*3,331*
No. of NCC cadets educated	*10,147*	*10,628*
No. of armed forces personnel educated	*1,251*	*1,718*

9.4 Community Engagement

"RAAHGIRI DAY"

Delhi Police, Delhi Traffic Police and New Delhi Municipal Corporation (NDMC), in association with Raahgiri Foundation, have been organizing Raahgiri Day on Sundays. On the day of Raahgiri, following activities are conducted:

Puppet show	*Road safety awareness activities*
Yoga camp	*Nukkad Natak*
Zumba sessions	*Pep-talk sessions are organised*
Flash mob, Dance	

Other major attractions include: -

- Display of mobile exhibition van
- Quiz and painting competition on road safety organized by Delhi Traffic Police and
- Distribution of prizes to the winning participants
- Dog show by the Crime Branch of Delhi Police
- Orchestra by Delhi Police Band
- Demonstration on self-defense techniques by Delhi Police, etc.

Citizens of all age groups get a chance to participate in interesting games and activities like chess, tug-of-war, cricket, badminton, etc.

WAY FORWARD

X. WAY FORWARD

Road traffic injuries pose a significant global threat, contributing to millions of deaths and injuries annually. Addressing this requires improving road safety standards, enhance infrastructure, enforce traffic regulations, and promote public awareness. Investing in research, technology, and sustainable urban planning can contribute to mitigating this challenge.

With a rapidly growing and increasingly urban population, the safe system calls for an efficient and sustainable mix of transport modalities – including mass public transport – while upholding the safety of pedestrians, cyclists and other vulnerable road users, who account for half of all deaths.

A more holistic approach to mobility will bring benefits in tackling many other crucial issues. By encouraging walking and cycling for example, we can reduce the burden of noncommunicable diseases, reduce pollution and combat climate change. By prioritising the safety of vulnerable road users, we can help reduce poverty and tackle inequalities, including access to jobs and education.

The increase in motor vehicles and motor vehicle-based transport systems poses serious questions around sustainability. As the urban population grows globally, the demand for mobility will outstrip the capacity of systems that rely heavily on private vehicles. this poses a greater challenge towards efforts to meet global climate targets.

Better coordination with leaders from related fields could help strengthen impact and help raise awareness of the road safety crisis among key decision-makers and leverage greater investment into mobility systems that are designed for people, with safety front and centre.

The Global Plan of Action for the United Nations Decade of Road Safety 2021–2030 calls for a holistic, safe system approach to halve road traffic deaths by 2030. It is possible if the right decisions are taken and measures are put in place.

(Source: WHO-Global Status report on Road safety-2023)

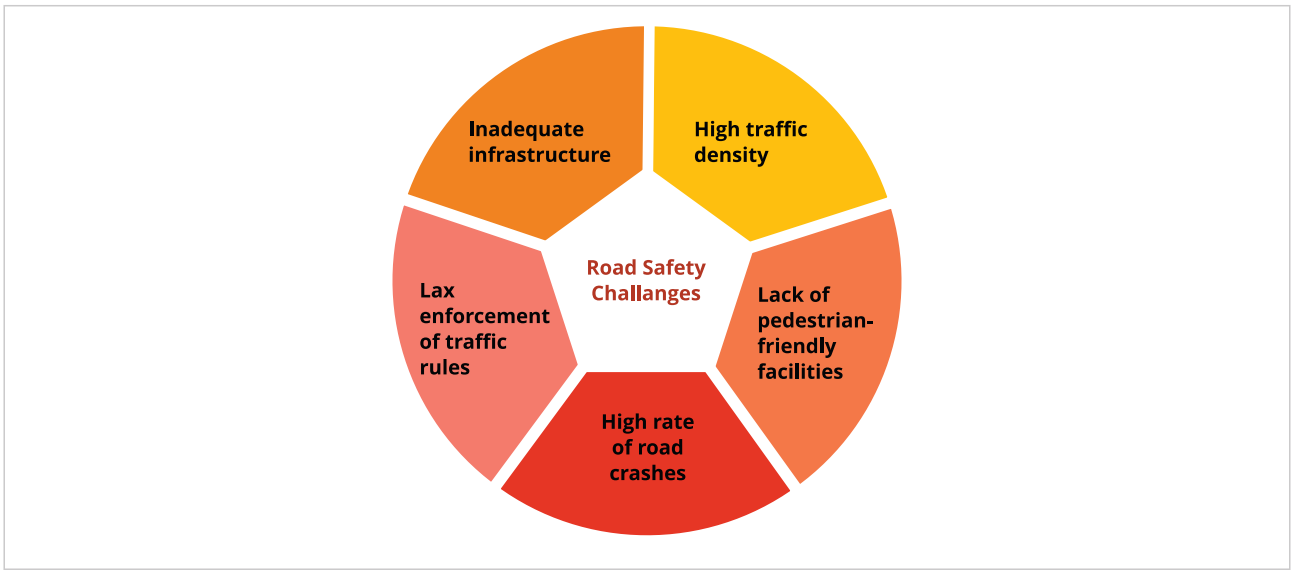
On average, every single day, 16 road crashes and four deaths occur in Delhi. The toll of road crashes cannot be overstated. Streets are central to any city's functioning and existence. The safety of everyone who uses the streets of Delhi must be our foremost priority.

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.

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:



Tackling these issues require comprehensive measures such as :

1. **Improved road design/ Infrastructure development:**

- Identifying crash-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. **Strict enforcement of traffic regulations:**

- 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.

3. **Enhanced public transport:**
- 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.

4. **Increased road safety education and awareness campaigns:**
- Develop engaging campaign to educate the public about responsible driving, pedestrian safety and importance of following traffic rules.
- Integrating road safety education into the school curriculum to instill safe road habits from an early age.

5. **Community engagement:**
- Involve communities in road safety initiatives, encouraging local participation and fostering a sense of shared responsibility for safe roads.

Additionally, addressing air pollution and congestion contributes to creating a safer environment for everyone on the roads in Delhi.

Pedestrian safety

What we presently have for the pedestrians:

- *A study was conducted on the pedestrian crashes. The data shows that, in* **70%** *of crash cases, pedestrians met with a crash when they were* **moving /standing along the road side**, *and in* **24%** *of crash cases, while they were* **crossing the road.**

- *This depicts the condition of the footpaths and waiting space and road crossing facilities provided for pedestrians on most of the roads of Delhi.*

- *The footpaths are missing on many of the main arterial roads of Delhi and where ever provided it's more or less nominal. They* **are non-continuous, encroached upon, un-friendly, and poorly maintained on most of the roads** *of Delhi. Some examples are shown in the following pictures.*

- The crashes caused while crossing the roads, accounts for 24% of pedestrian crashes, highlights the importance of need of attention to pedestrian crossing facilities.

- With **the increase in human population and vehicular volume**, there is struggle for space and mobility on the road. This brings the **human and vehicular conflict** on the roads. With the roads getting wider to accommodate more vehicles, the road crossing is becoming more and more vulnerable. Any miscalculation on part of any human (driver/pedestrian) results in impact that injures the pedestrian and its **severity depends on the speed and the mass of the vehicle.**

- **The normal option for preventing such crashes is by providing signaled crossing for the pedestrians.** This is done by stopping the vehicles for some time (few seconds or a minute). But with

high density of pedestrians and their regular need to cross the roads, this frequency of halting increases which lowers the average speed of vehicle and on some congested roads, this frequency becomes so high that average speed of vehicle comes down to 10-15 Km/hr. Thus, it is done at the cost of the mobility of vehicles. **Long halting of vehicles adds into the emission and pollution level.** It increases the frustration level of drivers and the chances of error. The other way out is the **segregation of traffic and pedestrian movement (for crossing). This can be done either by lifting the "fast moving and heavy vehicles" (flyovers and elevated corridors) or by providing FOB and subways. FOBs are cheaper and safer than subways, flyovers and underpasses.** So, FOB at heavy footfall area can be better option for crossing the road.

- The arrangement of making **FOB with guided paths can be preferred over pelican signal crossing or red light crossing** for pedestrians on NHs and high-speed corridors for the following reasons:

    - The **risk factor is still higher in signal crossing due to the possibility of human error** and high speed of the vehicle's corridors, especially during lean hours.
    - **Halting of traffic** even for few seconds or minutes **add to the congestion of traffic and pollution**, especially during peak hours.
    - This **halting** and slow movement of traffic on **mass level adds to the burden on GDP** due to extra fuel burning.
    - This also **increases the frustration** in the mind of drivers and the pedestrians which sometimes lead to road rage.

- Footpath should be properly developed and should be separated from road by grills to to ensure safety of pedestrians.

- 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 maximize their benefits to pedestrian safety, sidewalks should be part of every new and existing roadway where there is existing or potential future demand. (Source: WHO: Save LIVES – A road safety technical package)

- Unplanned ramp landing on opposite side of bus stand or place of footfall is of no use. No proper protection by railing or divider of bus stand creates more probability of road crashes.

- If the FOB is not practical, then there will be no use of high grills fixed on divider. Vehicle-pedestrian conflict will continue. Pedestrians will continue to obstruct traffic risking their lives.

- Pedestrian overpasses and underpasses are bridges and tunnels that allow for uninterrupted flow separate from vehicular traffic. This measure is used primarily in areas with high pedestrian volumes or where vehicle flows and speeds are high (e.g. expressways). To ensure the use of overpasses and underpasses, their accessibility and security needs to be addressed. (Source: WHO: Save LIVES – A road safety technical package)

- The NHs pass through villages and other heavily populated areas. These roads are wide having 6-8 lanes and have vehicles moving at high speed. The local people have to cross these roads for their daily needs and become victim of high speed and heavy vehicles. To reduce crashes due importance should be given to the needs of local people and right arrangement should be made to cross the road.
- On the roads which are not elevated corridors, more FOBs should be provided for crossing by the pedestrians. Many FOBs can be provided at small distances, if these are potential road crossing points. Life and safety of the locals is equally important and should not be ignored for speed.

- FOBs should be equipped with escalators to make it more people friendly.

- The location/point of providing FOB should be as per the requirement of the users (It has been found that shifting location even by 50 meters makes it ineffective). Similarly, the design of the FOB/Subway should be as per the requirement of the intersection or locations. It can also be extended to cover service road.

- The FOB or skyway should be designed from the point of view of user. To provide maximum facility to the user, having potential to attract people and features to increase comfort. It may include architectural design to provide facility at the right place eg having escalator ramps, double storey escalators.

At the **intersections like Peeraghari,** there is movement of thousands of people on the carpeted area of the intersection for interchanging public transport at different arms of the intersection. Their movements on the roads create conflict with the vehicles. This makes them unsafe and also obstructs the vehicular movement which adds to the congestion and pollution.

The pedestrian infrastructure, FOBs/Subways/Footpaths/halting-space should be designed and located so as to prevent the pedestrian movement on the carpeted area of the arterial roads, or reduce it to a minimum. This shall allow the free flow of vehicles on these roads reducing the conflicts of pedestrians with the vehicles and hence reducing the congestion as well as crashes.

All the **major intersections like Dhaula Kuan, Peeragarhi, Singhu Border, Mukarba Chowk, ISBT, etc.,** needs to be individually designed according to the composition of public transport (DTC, Cluster Buses, Roadways buses, Gramin Sewa, RTV, TSR, Rickshaw, E-Rickshaw, etc.) and pedestrian traffic.

A separate halting space for other public transport vehicles like TSRs/Gramin Sewa to be provided. A railing can be provided to separate them and make them stand in a single queue.

Providing more information of modes of transport to the users at the exchange junctions like ISBT, Dhaula Kuan, Mukarba Chowk, etc., so that people particularly new comers get information of his next mode of transport at the exchange hub without roaming unnecessarily on the roads.

We need to set the priorities and improve our planning. We need to give the utmost importance to pedestrian safety, to secure these pedestrians from their killer vehicles. We need to segregate them from other road users. The simple steps that can be taken to achieve this are:

- Number of crashes while pedestrian crossing the road remained very low or zero on roads which were completely covered by high grills on the median like NH-8. Similar, action can be taken on other NHs, Ring Road, Outer Ring Roads and major Arterial Roads and **high grills on the central verge should be fixed on all these roads**. All the pedestrian crossing on these roads should be closed (except at the major intersection), **but this should be done after making safe passage for pedestrians to cross the roads, providing proper FOB/Subway for pedestrian.**

- The NHs pass through villages and other heavily populated areas. These roads are wide 6-8 lanes and have vehicles moving at high speed. The local people have to cross these roads for their daily needs and become victim of high speed and heavy vehicles. **To reduce crashes due importance should be given to the needs of local people and right arrangement should be made to cross the road.**

- On the roads which are not elevated corridors, more FOBs should be provided for crossing by the pedestrians. **Many FOBs can be provided at small distances, if these are potential road crossing points. Life and safety of the locals is equally important and should not be ignored for speed.**

- **If constructing FOB is not possible, proper pelican signal should be provided to cross the roads.**

- **Providing of FOB/Subway is must for all the six-lane/eight-lane roads.** Crossing Highways, now a days, particularly in Delhi where the vehicle density is very high, is like crossing an unmanned railway track or rather tougher than it.

- These **FOB/Subway/underpasses should be modified to accommodate slow moving vehicles (cycles/Rickshaw/E-Rickshaw) at places where its number is high.**

- **Footpath should be properly developed and should be separated from road by grills** to prevent pedestrians coming on road.

- **FOBs should be equipped with escalators to make it more people friendly.**

- The **location/point of providing FOB should be as per the requirement of the users** (It has been found that shifting location even by 50 meters makes it ineffective).

- **Similarly, the design of the FOB/Subway should be as per the requirement of the intersection or**

locations. It can also be extended to cover service road or extended up to the shopping mall complex's platform or into the bus terminal if it is more convenient for people using it.

- **Thus, we need to develop guided paths/skyways instead of just the foot over bridge/subways for pedestrians at the major intersections** and crossings. These guided paths should lead them to their desired destination i.e., bus stand, metro station, shopping complex, etc.

- At the intersections like Peera Ghari, there is movement of thousands of people on the carpeted area of the intersection for inter-changing public transport at different arms of the intersection. Their movements on the roads create conflict with the vehicles. This makes them unsafe and also obstructs the vehicular movement which adds to the congestion and pollution.

- **The guided paths/FOBs/Skyways should be designed in a way that a pedestrian needs not move on the road. The approach and exit of such facilities should be segregated properly.**

- **The encroachment of foot path by vendors needs to be discouraged/removed**. Further, the rehri and hand cart vendor needs to be removed from all these roads. The high grill segregating the foot path and roads will help on this account.

- **Separate bus bay to be provided at all the bus stands extending the road side ways**. The bus bays should be long enough to accommodate 2-3 buses (as per the requirement of point) and should be provided with grills having gap only at the position of gates at the bus stands (as provided in case of metro stations having high rush).

- **All the major intersections like Peeragarhi, Singhu border, Mukarba chowk, ISBT, Dhaula Kuan, etc., needs to be individually designed according to the composition of public transport (DTC, Cluster Buses, Roadways buses, Gramin Sewa, RTV, TSR, Rickshaw, E-Rickshaw, etc.)** and pedestrian traffic.
- **A separate halting space for other public transport vehicle like TSRs/Gramin Sewa to be provided**. A railing can be provided to separate them and make them stand in a single queue.

- **Providing more information of modes of transport to the users at the exchange junctions like ISBT, Dhaula Kuan, Mukarba chowk, etc.,** so that people particularly new comers get information of his next mode of transport at the exchange hub without roaming unnecessarily on the roads. This information can be in the form of:

    - **Route maps of the DTC/Cluster buses like that of the metro route maps to be displayed on the bus stand,** at least at the major intersections and transport hubs.
    - **Sufficient number of direction boards for the passengers to provide information regarding availability of next connecting mode of transport** or to reach nearby important places safely through footpaths and foot over bridges.

- **The pedestrian infrastructure, FOBs/Subways/Footpaths/halting-space should be designed and located so as to prevent the pedestrian movement on the carpeted area of the arterial roads, or reduce it to a minimum. This shall allow the free flow of vehicles on these roads reducing the conflicts of pedestrians with the vehicles and hence reducing the congestion as well as crashes.**

Two-wheelers Safety:

- Key risk factors for motorcycle traffic injuries include the non-use of helmets, vehicle speed, alcohol use, mixed traffic conditions, lack of protection from the vehicle in a crash and lack of safe infrastructure for powered two wheelers such as poor road surfaces and roadside hazards.

- There are around 52.94 lakh registered Two-wheelers in Delhi. Their percentage share is around 66.63% of the total number of registered vehicles in Delhi. The percentage share is increasing every year except in 2023.

- Two-wheeler riders have been victims in around 38% of fatal road crashes in 2023. The percent share of two-wheeler as victim is given below:

Table 10.1: Percentage share of two-wheeler as victim

Year	Fatal Crashes	Total Fatal Crashes	Percentage
2019	*487*	*1,433*	*33.98*
2020	*432*	*1,163*	*37.14*
2021	*459*	*1,206*	*38.05*
2022	*539*	*1,428*	*37.74*
2023	*538*	*1,432*	*37.56*

- While the normal touching or brushing of vehicles results in damage to vehicles, in case of Two-wheeler rider, it ends up with injury or fatality. With the ever-increasing vehicular volume on road, there is a struggle for space on road.

Improving road condition:

- Road infrastructure is strongly linked to fatal and serious injury causation in road collisions, and research has shown that improvements to the road infrastructure are critical to improving overall road safety.

- Road design, road environment, road marking and road furniture are important for facilitation of road users and smooth and safe flow of traffic. While the road designs and environments assist the driver in moving the vehicle on road safely; the road sign, road marking and road furniture, if properly placed, helps in preventing the crashes and reducing the severity of crashes.

- Road designs that control speeds seem to be the most effective crash control measure.

- Road infrastructure design can influence both the likelihood and severity of a motorcycle crash. Studies have shown that motorcyclists are particularly vulnerable to collisions on curves, bends, slip roads (i.e. roads with a tight radius) and roundabouts.

- **The following things can be done to improve the safety on the roads:**
    - Providing nose protection to all the protruding noses on roads. Fixing reflectors at start of all the dividers.
    - The road markings (lanes and stop lines, etc.) should be repainted after regular intervals (say three months or six months) because just in few months when it gets dull the reflective blaze is lost and its benefit during night is lost (when it is needed more).
    - Marking lane with reflective paints on all the roads.
    - Similarly, vehicles from halting arms of the signaled intersection encroach into the common area of intersection without stop line, which becomes cause of congestion or crashes. These vehicles can't be prosecuted manually or using technology by taking photographs as it does not fulfill the legal requirement.
    - Reflectors/reflective paints on side railing, poles, and trees of road.
    - Illumination of roads should be given importance particularly in outer and rural areas. Many stretches of NHs, Outer Ring Road and other arterial roads remain dark and become the cause of crashes. Illumination is important in preventing pedestrian and cyclist crashes.
    - Cautionary sign to be fixed well before schools, speed calmers, cuts in divider merging/diverging.
    - Speed calmer/mastic strips to be placed on minor road just before it meets the major road, it stops the random entry of small vehicles into fast and heavy movement of vehicle on major road.
    - Planning of intersections needs to be done as per the composition of the vehicular movement. Experts can be involved for the segregated safe movement of these vehicles.
    - Slow moving vehicle drivers and two-wheeler riders prefer to take shorter wrong direction to cross the road, if 'U' turn or the proper road crossing passage is far away (more than a km.)
    - All the major intersection should be made a little elevated with roughened surface to slow down vehicles at intersection.
    - Unnecessary cuts on road medians should be identified and closed.

- The repair and construction work on road and road side should be well protected with sufficient sign boards, reflectors, illuminators and deployment of appropriate number of volunteers for managing traffic.

- There should be strict time limit for these repair work. The relaying of roads by the repairing authority should be made essential. It is found that many road owning agencies like Jal board, sewer repair units, leave the roads uncarpeted even after completion of work.

- Besides, these roads can be improved by fixing overhead boards on NHs and major (six/eight lane roads) showing speed limit and vehicle permitted in that lane.

- These boards should be fixed on the central verge in the interval of one km distance

- There should be coordination between different agencies which dig the road or road side for fixing pipes (water, sewer or gas), laying cables or repairing or upgrading footpath or divider, etc. All the repairing should be done within a minimum time. It has been found that hardly few months after the first agency has finished its work, the other agency digs the road. People using the road continue to suffer again and again.

- Repairing/re-fixing of worn-out speed calming measures like mastics strips, rumble strips, pseudo breakers and fixing of cats eye should be done at regular intervals (in around six months) as these gets worn out and becomes ineffective.

- Regular survey of road by road maintaining agencies for improvement and repair on the above-mentioned points to be done.

- Area incharge of road maintaining agency to be made responsible for keeping the road standards up to the mark.

Alcohol Detection Systems:

- Alcohol impaired driving due to alcohol consumption is an important factor influencing both the risk of a road traffic crash as well as the severity and outcome of injuries that may result from it.

- Internationally, drink driving is considered to be a crucial road safety issue. An alcohol ignition interlock device, a breath alcohol analyzer can be connected to the ignition of a vehicle, which cannot be started unless the driver passes the unit's breath alcohol tests. It can be a major deterrent to drinking and driving.

New Law (Bharatiya Nyaya Sanhita, 2023) Regarding Road Safety

Offence	Sections under India penal code	Sections under Bhartiya nyay sanhita
Rash Driving Or Riding On A Public Way	**Section 279: -** Whoever drives any vehicle, or rides, on any public way in a manner so rash or negligent as to endanger human life, or to be likely to cause hurt or injury to any other person, shall be punished with imprisonment of either description for a term which may extend to six months, or with fine which may extend to one thousand rupees, or with both.	**Section 281 :** *Whoever drives any vehicle, or rides, on any public way in a manner so rash or negligent as to endanger human life, or to be likely to cause hurt or injury to any other person shall be punished with imprisonment of either description for a term which may extend to six months, or with fine which may extend to one thousand rupees, or with both.*
Causing Hurt By Act Endangering Life Or Personal Safety Of Others	**Section 337: -** Whoever causes hurt to any person by doing any act so rashly or negligently as to endanger human life, or the personal safety of others, shall be punished with imprisonment of either description for a term which may extend to six months, or with fine which may extend to five hundred rupees, or with both.	**Section 125:** Whoever does any act so rashly or negligently as to endanger human life or the personal safety of others, shall be punished with imprisonment of either description for a term which may extend to three months or with fine which may extend to two thousand five hundred rupees, or with both, but— (a) where hurt is caused, shall be punished with imprisonment of either description for a term which may extend to six months, or with fine which may extend to five thousand rupees, or with both; (b) where grievous hurt is caused, shall be punished with imprisonment of either description for a term which may extend to three years, or with fine which may extend to ten thousand rupees, or with both.
Causing Grievous Hurt By Act Endangering Life Or Personal Safety Of Others	**Section 338:-** Whoever causes grievous hurt to any person by doing any act so rashly or negligently as to endanger human life, or the personal safety of others, shall be punished with imprisonment of either description for a term which may extend to two years, or with fine which may extend to one thousand rupees, or with both	

Causing Death By Negligence	**Section 304A:-** Whoever causes the death of any person by doing any rash or negligent act not amounting to culpable homicide shall be punished with imprisonment of either description for a term which may extend to two years, or with fine, or with both.	**Section 106.** *(1) Whoever causes death of any person by doing any rash or negligent act not amounting to culpable homicide, shall be punished with imprisonment of either description for a term which may extend to five years, and shall also be liable to fine ; and if such act is done by a registered medical practitioner while performing medical procedure, he shall be punished with imprisonment of either description for a term which may extend two years, and shall also be liable to fine.* *Explanation : For the purpose of this sub-section, "registered medical practitioner" means a medical practitioner who possesses any medical qualification recognised under the National Medical Commission Act, 2019 and whose name has been entered in the National Medical Register or a State Medical Register under that act.* *(2) Whoever causes death of any person by rash and negligent driving of vehicle not amounting to culpable homicide, and escapes without reporting it to a police officer or a Magistrate soon after the incident, shall be punished with imprisonment of either description of a term which may extend to ten years, and shall also be liable to fine. (Section 106 (2) of BNS did not come into force on 1st July, 2024)*

- The section inserted in Bharatiya Nyaya Sanhita, 2023 have enhance sentence against offender/ culprit. This improvement would mitigate road crashes this create fear in mind of offenders.

Suggestions for Crash Prone Zones: -

- The number of road crashes occurring in a zone depends on its structural design, the type of vehicles moving through it, and the time-period of the day when more road crashes take place. Accordingly, corrective and preventive measures are required to be taken. There is no clear segregation of different types of traffic moving through a Crash-Prone Zone. However, the Crash-Prone Zones can be classified based on the type of victim/ offending vehicle involved in the road crashes. Accordingly, steps can be taken to prevent road crashes.

Following are some of the steps that can be taken by the agencies to prevent road crashes in the Crash-Prone Zones:

I. Pedestrian crash prone zones:-

1. These are places which lack safe pedestrian facilities for movement i.e. footpaths, road crossings (FOBs, skyways) and boarding places (safe platform for waiting and boarding a Bus/TSR, Gramin Sewa, etc.). Such facilities should be provided for safe crossing of pedestrians.

2. Speed is one of the main contributing factor in the occurrence of a crash resulting into fatality, particularly on the National Highways and other major arterial roads, thus speed needs to be slowed down with provision of speed calming measures.

3. Table top with speed calming surface can be constructed in the common area of the intersection to control and reduce speed.

4. Fixing of grills with adequate height on the central verges at places where a crash of pedestrian occurs while crossing the road. This can be undertaken after making safe passage for pedestrians to cross the roads.

5. The place where speed calming measures have been provided needs to be adequately equipped with proper sign boards and reflectors which should also be properly illuminated.

6. The road markings and signages should be visible round the clock.

7. Repairing/re-fixing of worn-out speed calming measures like rumble strips, pseudo speed breakers and fixing of cats eye should be undertaken periodically by the agencies.

8. Location of FOB and its entry/exit point should be such that it is easily accessible to pedestrians, so that they make optimum use of the same.

9. Those FOBs/subways which are not being used should be modified / improved/ relocated, so that it is optimally used. Escalators can be provided to make it more effective.

10. There should be proper and systematic placement of public transport exchange facility like auto rickshaws, city buses and interstate buses at the multi modal hubs like ISBT or Dhaula Kuan, Mukarba chowk, Peeragarhi chowk so that passengers interchange them easily (even with luggage or children) and safely cross through proper/safe platform, without risking their lives.

11. Planning of auto rickshaw stands and bus stands should be properly undertaken so as to avoid halting and boarding/de-boarding at the end/start of flyover. Such places become prone to crashes and add to traffic congestion.

12. Boarding/de-boarding in the interstate buses from road, outside the ISBT bus stand, needs to be stopped and enforced as the waiting place of such passengers on road is found to be cluster point of crashes.

II. Two-wheeler crash prone zones:

1. Effective prosecution/education is required at such locations.

2. The merging of minor roads, having movement of two-wheeler and slow-moving vehicles need to be studied and planned to avoid direct merging into highways and other major roads.

3. Speed calming measures should be provided.

4. Slow moving vehicles and two wheelers prefer to take a short cut by moving in the wrong direction to cross the road, if 'U' turn or proper road crossing passage is far away. Such wrong side movement on the main road can be prevented by making underpass or providing service roads.

5. Conflict points in traffic movement should be detected and should be made safe, for example, at such places like:

a. Merging points of traffic at the end of the flyover

b. Small road stretches between two flyovers that have common entry – exit into and out of the fly over.

c. Perpendicular movement of traffic/pedestrian at the end of flyover or flyover loop.

6. Pseudo two-wheeler tracks can be tested for safe and disciplined movement of two-wheelers on major roads at two-wheeler Crash Prone Zones.

A Road safety initiative for two-wheeler riders can be started at state level involving all the stakeholders. It would be like pulse polio immunization programme which shall include free distribution of ISI marked standard helmets to all persons (rider/pillion rider/male/female) prosecuted for without helmet.

Free-to-use helmets can also be provided at important junctions/places/metro stations, etc., with the use-and-return policy.

If this becomes successful its cost would be less than the loss borne due to two-wheeler crash injuries/deaths.

For a helmet to be effective it needs to be of standard quality (ISI mark) to provide maximum protectio to the head.

Motorcyclists wearing standard-approved helmets have a lower risk of head and traumatic brain injury than those not wearing helmets.

Proper fastening of the helmet is also important for a helmet to be fully effective.

III. Cyclist crash prone zones:

1. Cyclist become victim in road crashes on the following accounts:

a. Lack of NMV lanes on straight stretches of road.

b. Lack of safe road crossing facility on wide road near/at the intersection.

c. Darkness during night (where there is poor illumination) as cycles do not have light source of their own.

2. To prevent such road crashes illumination on roads should be given importance, particularly in the outer and rural areas and places where there is heavy movement of cycles. Many stretches of NHs, Outer Ring Road and other arterial roads remain dark and become the cause of crashes. Illumination is important in preventing pedestrian and cyclist crashes.

3. Distribution of reflective stickers/jackets should be undertaken in cyclist Crash Prone Zones. It can be distributed during evening peak hours in corridors having heavy cyclist movement, so that it goes to actual users.

4. Planning of intersections should be carried out as per the composition of the vehicular movement, for example, at Shastri park red light, importance may be given to the movement of the cycles, cycle-rickshaws and slow-moving vehicles. Traffic experts can be involved for suggesting measures in controlling crashes involving cyclists.

5. More number of FOBs/subways/small under passes should be provided on six and eight lane roads, NHs for safer crossing on such roads for pedestrians, two–wheelers and slow-moving vehicles of local residents.

6. Conflict points in traffic movement should be detected and corrected by the agencies to make them safe for all.

IV. Crash prone zones of hit and run cases:

1. CCTV camera should be installed at these points to identify the motor vehicles at fault.

2. CATS Ambulances and PCR Vans halting points can be stationed near such points to check hit and run cases and for immediate post-crash care.

V. HTVs crash prone zones:

1. Effective and stringent prosecution of the offenders along with the road safety education of the truck drivers and vulnerable road users residing in the area near the Crash-Prone Zone.2. Conflict points in traffic movement need to be identified and detected to make them safe.

3. Speed calmer/mastic strips to be placed on minor road just before it meets the major road. It stops the random entry of small vehicles into fast and heavy movement of vehicle on major road.

VI. Crash prone zones during night hours:

1. Proper illumination through provision of adequate street lighting needs to be undertaken at such locations.

2. Dark spots should be identified and taken up with concerned agencies for undertaking necessary development of infrastructure in order to make them safe.

Delhi Traffic Police will continue to work on improving the traffic situation by better enforcement and by adoption of advanced technology with cooperation of other stakeholders.

ACKNOWLEDGEMENTS

This book is based on the road crash data analysis and research conducted by the Road Crash Research Cell of Delhi Traffic Police based on the crash data received from traffic field officers. Delhi Traffic Police acknowledge the valuable contributions made to this report by the following:

- **Sh. Shive Keshari Singh, Dy. Commissioner of Police/Traffic,** for his valuable direction and supervision to compile this book.
- **Sh. Amrit Raj ACP/CRC, Sh. Deepak Sharma TI/C.R.Cell** for drafting and preparing the book.
- **Sh. Chandran PT.,** who coordinated with various agencies to compile the book.
- **Sh. Varun Kumar, Sh. Mukesh Kumar and Sh. Sandeep Kumar,** who developed all the maps, charts and graphs shown in the book. They also prepared the main frame work of the book and conducted all the statistical analysis
- **Sh. Mithra Dass,** who collected and compiled data from various agencies.
- **Sh. Jaipal Singh, Nirmal Singh and Ajay Kumar** who collected details of crash data from MACT districts and the field survey to black spots/crash-prone zones.
- **I/C Prosecution Branch/Traffic** for providing prosecution data and analysis and for uploading the book on Delhi Traffic Police website.
- **Traffic Circle Inspectors, MHCs and other field staff**, who collected the crash data of each road crash from Police Stations and crash spots, got the precise GPS location, compiled and sent crash report to the Accident Research Cell.

Special thanks to the following departments for the valuable inputs taken from their publications:

- **Ministry of Road Transport and Highways (MoRTH), Govt. of India:** "Road Accidents in India -2022".
- **NCRB, Govt. of India:** "Accidental deaths and Suicide in India - 2022".
- **WHO:** "Global status report on road safety".
- **Road Safety Cell/DTC:** Data of DTC buses.
- **Delhi Transport Department:** Vehicular and Road data -Statistical hand book of Delhi.

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