ROAD ACCIDENTS IN DELHI 2019

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FOREWORD

Road traffic accidents have emerged as a major public health hazard which needs to be tackled by a multidisciplinary approach. In 2019, the NCT of Delhi recorded 1,463 fatalities and 5,152 persons were injured in 5,610 road accidents. Road accident leads to morbidity, short and long-term disability and mortality as well. Apart from physical and financial trauma, road accidents have also become a cause of mental and emotional trauma among victims and their families. Road crashes impact the overall economy too, with an annual 3% of GDP loss, and with the maximum lives lost in the productive age group.

To improve road safety situation in Delhi, a multi-pronged concerted strategy needs to be implemented with special focus on preventing deaths of vulnerable road users like pedestrian, two-wheelers and NMT users. A holistic approach by addressing all 4E's i.e. Engineering, Education, Enforcement and Emergency care of Road Safety, as recognized by World Health Organization, are required to be implemented by strengthening current system and institutions and creating a new system that will target specific risk factor as well as creating protective strategies for vulnerable road users with scientific analysis of data identifying the causative factors.

Road traffic accidents are amenable to remedial action. Many developed countries have witnessed drop in road accidents and casualties by adopting multi-pronged approach to road safety that encompasses traffic management, road design, safer vehicles, law enforcement, provision of accident care, etc. We too, have made substantial progress by putting in place the necessary resources, programs and legislation for improving road safety scenario in recent years.

The current issue includes various dimensions and magnitude of road accidents in India and brings into focus the challenges relating to the prevention of road accidents. The data and analysis on road accidents contained in this volume would help in creating awareness and will assist in decision making in the area of road safety. I hope, the document would be useful for policy makers, academia, citizens, and civil society organizations working in areas who have a concern over road safety.

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PREFACE

Globally, deaths and injuries resulting from road traffic crashes are a major and growing public health problem and development crisis, and are predicted to increase, if road safety is not addressed adequately. These accidents cause much suffering and grief as well as economic hardship for families and loved ones.

In Delhi, 5610 road accidents were reported during the calendar year 2019, in which 1463 persons died and another 5152 persons were injured. In the year 2019, the number of road accidents were down by 14% and the number of deaths also declined by 13.43% as compared to 2018. The number of injures also declined as compared to the previous year by 15.34%.The data shows that 46% of persons killed in road accidents victims were pedestrians. Two wheelers riders were second most vulnerable victims constituting 34% fatalities.

Road traffic accidents may be a continual occurrence but they are preventable by adopting Road Safety Measures like strong policies, smart road designs, concerted and sustained efforts. These efforts can save several lives. Sustainable road safety must be planned and it requires long-term investment and appropriate management capacity for effective delivery. The capacity to respond to pedestrian safety is an important component to prevent road traffic injuries. If we are able to segregate pedestrians movements from the vehicular traffic on Delhi roads, we would be able to reduce the accidents considerably. The pedestrian facilities like foot-over bridges, subways, pelican signals etc. have been provided at a number of places but the facilities seem to have fallen short of the actual demand.

Road accidents are the result of various factors like driving recklessly/dangerously, non-observance of traffic rules, over speeding, jumping red lights, driving without training, disqualified drivers, driving under the influence of liquor, driving while talking on mobile phone, driving without helmet, poor maintenance of vehicles and bad road infrastructure.

The Delhi Traffic Police has adopted a number of accident reduction strategies for existing roads and intersections through continuous identification of black spots/accident prone areas on city roads with time bound improvement projects accompanied with targeted prosecution. Use of technology and road safety education is being imparted continuously for this purpose.

I hope that this booklet on “Road Accident in Delhi 2019” compiled by the Accident Research Cell of Delhi Police Traffic Unit presents the magnitude of road accidents in Delhi in all its dimensions and brings into focus challenges relating to the prevention of road crashes, on the roads. This document would be useful for policy makers, planners, researchers, academicians and other civil organizations working in the area of road safety.

This report is also available in PDF format on our website at **www.delhitrafficpolice.nic.in**

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CONTENTS

CHAPTER 1 AN OVERVIEW

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

The number of road traffic deaths on the world's roads remains unacceptably high with 1.35 million people dying each yearand causing up to 50 million injuries.

That's nearly 3 700 people dying on the world's roads every day.

The numbers are staggering. Road traffic crashes now represent the eighth leading cause of death globally. And, the fact is, every one of those deaths and injuries is preventable.

However, the rates of death relative to the size of the world's population has stabilized in recent years as a result of progress in important areas such as legislation, vehicle standards and improved access to post-crash care. This progress has not, however, occurred at a pace fast enough to compensate for the rising population and rapid motorization of transport taking place in many parts of the world. At this rate, the Sustainable Development Goals (SDG) target of 3.6 to halve road traffic deaths by 2020 will not be met. **(Source: Global Status report on Road Safety: 2018)**

Tens of millions of people are injured or disabled every year. Lot of people suffer life-altering injuries with long lasting effects. These losses take a huge toll on families and communities. The cost of emergency response, health care and human grief is immense.(Source: Global Status report on Road Safety: 2018)

Road traffic injuries cause considerable economic loss to individuals, their families, and to nations as a whole. **These losses arise from the cost of treatment as well as lossof productivity for those killed or disabled by their injuries, and for family members who need to take time off work or school** to care for the injured.

- **The rate of road traffic deathsis highest in Africa and South East Asia.**
- **There has been no reduction in the number of road traffic deaths in any low-income country since 2013.**
- **Road traffic injuries are the 8th leading cause of death across all age groups.**
- **Road traffic injuries are now the leading cause of death for children and young adults aged 5-29 years.**
- **More than half of all road traffic deaths are among vulnerable road users i.e. pedestrians, cyclists and motorcyclists.**

NATIONAL TRENDS

India, however ranks 1st in the number of road accident deaths across the 199 countries reported in the World Road Statistics, 2018 followed by China and US. As per WHO Global Report on Road Safety 2018, India accounts for almost 11% of the accident related deaths in the World.

During **the year 2018, 4,67,044 road accidents were reported causing injuries to 4,69,418 persons and claiming 1,51,417 lives in the country. This would translate, on an average, into**

1280 accidents and 415 deaths every day or 53 accidents and 17 deaths every hour in the country.

- Road accident in 2018 compared to the previous year i.e. 2017, increased by 0.46 percent, the number of persons killed increased by 2.37 percent and the number of persons injured decreased by 0.33 percent in the country.

TABLE 1.1
ROAD ACCIDENTS PARAMETERS

S.No.	Parameter	2017	2018	% Change over previous year
1	Total accidents in the Country	4,64,990	4,67,044	0.46
2	Total number of persons killed in the Country	1,47,913	1,51,417	2.37
3	Total number of persons injured in the Country	4,70,975	4,69,418	-0.33
4	Accident Severity (No. of persons killed every 100 accidents)	31.8	32.4	0.6

Source: Road accidents in India: Ministry of Road Transport and Highways.

Road accidents in million plus cities:

- **Urban Agglomerations due to dense population and road traffic congestion tend to have more road accidents.**
- **In 2018, the fifty Million-Plus Cities accounted for 18.3 percent of the total number of accidents and 11.7 percent of deaths in the country. Accident severity, i.e., accident deaths per 100 road accidents, has gone up by 0.2 percentage compared to previous year in these fifty million-plus cities.**
- **In 2018, a total of 85,318 road accidents were recorded in the 50 million-plus cities. These accidents resulted in a loss of 17,709 lives and caused injuries to 76,747 persons.**
- **In the year 2018, in 50 Indian Urban agglomeration (i.e. million plus cities), the number of accidents, persons killed and persons injured increased by 3.68%,4.35% and 3.79 % respectively, as compared to year 2017.**
- There is marginal increase in accident severity in 2018 over 2017 in fifty million cities.
- **Chennai had the highest number of road accidents (7580) while Delhi had the highest number of deaths (1690) due to road accidents followed by Chennai and Kanpur.**
- Details indicating the total number of accidents, persons killed and injured with accident severity in the 50 Million plus cities is illustrated at Table 1.2.

TABLE 1.2
TOTAL NUMBER OF ROAD ACCIDENTS, NUMBER OF PERSONS KILLED & INJURED IN MILLION PLUS CITIES IN 2017 AND 2018

S.NO.	CITIES	TOTAL ROAD ACCIDENTS		NUMBER OF PERSONS KILLED		NUMBER OF PERSONS INJURED	
		2017	2018	2017	2018	2017	2018
1.	AGRA	1032	1273	555	623	896	999
2.	AHMEDABAD	1563	1585	336	316	1443	1494
3.	ALLAHABAD	1163	1380	472	614	734	850
4.	AMRITSAR	119	123	67	77	100	82
5.	ASANSOL-DURGAPUR	425	447	271	286	406	349
6.	AURANGABAD	592	567	157	161	486	493
7.	BENGALURU	2297	4611	653	686	2083	4129
8.	BHOPAL	3393	3508	252	327	2720	3001
9.	CHANDIGARH	342	316	107	98	302	300
10.	CHENNAI	7257	7580	1299	1260	6975	7438
11.	COIMBATORE	1299	1136	277	162	1191	1140
12.	DELHI	6673	6515	1584	1690	6604	6086
13.	DHANBAD	366	365	196	252	199	123
14.	FARIDABAD	712	702	276	254	610	649
15.	GHAZIABAD	930	1054	402	421	709	774
16.	GWALIOR	2156	2104	317	294	1800	1660
17.	HYDERABAD	2834	2846	310	310	2370	2629
18.	INDORE	4513	3434	391	322	3676	2954
19.	JABALPUR	3303	3419	409	374	3113	3166
20.	JAIPUR	2983	2781	813	692	2550	2265
21.	JAMSHEDPUR	304	311	223	157	205	219
22.	JODHPUR	282	549	104	245	262	434
23.	KANNUR	578	621	68	68	700	735
24.	KANPUR	1568	1588	682	698	1199	1211
25.	KHOZIKODE	1467	1423	184	154	1544	1552
26.	KOCHI	2503	2411	137	141	2600	2478
27.	KOLKATA	3131	2663	329	294	2559	2162
28.	KOLLAM	1780	1940	213	241	1763	1997
29.	KOTA	481	466	93	89	471	478
30.	LUCKNOW	1515	1638	655	580	917	1005
31.	LUDHIANA	493	477	281	328	316	240
32.	MADURAI	920	962	189	153	891	945
33.	MALLAPURAM	2339	2423	385	367	2683	2601
34.	MEERUT	1040	1019	411	443	794	717
35.	MUMBAI	3160	3162	490	475	3287	3292
36.	NAGPUR	1242	1117	231	237	1256	1187
37.	NASHIK	631	581	171	217	510	557
38.	PATNA	422	966	147	597	218	524
39.	PUNE	1508	1194	373	352	1154	891
40.	RAIPUR	2159	2075	420	427	1288	1374
41.	RAJKOT	617	568	161	202	494	481
42.	SRINAGAR	363	375	60	46	345	383
43.	SURAT	902	1073	251	324	819	851
44.	THIRUVANTHAPURAM	2113	2306	172	202	2497	2747
45.	THRISSUR	1384	2222	106	218	1548	2593
46.	TIRUCHIRAPALLI	638	602	134	122	768	651
47.	VADODRA	867	777	186	182	755	641
48.	VARANASI	612	568	279	261	316	316
49.	VIJAYWADA CITY	1648	1657	349	359	1525	1482
50.	VIZAQ	1667	1838	343	311	1294	1422
TOTAL		**82286**	**85318**	**16971**	**17709**	**73945**	**76747**

Source: ROAD ACCIDENTS IN INDIA 2018: MINISTRY OF ROAD TRANSPORT AND HIGHWAYS

TRENDS IN DELHI

Delhi, over the years has witnessed spectacular growth of population due to constant influx of people from neighbouring states in search of employment and business.

- **The National Capital Territory of Delhi covers an area of1483 sq. km. and has a population of around 195 lacs** (Projected population of Delhi for the year 2019). Delhi has a total road length of 33,198 kms.
- Every aspect of development has increased the population of the city and has created pressure on the supporting systems like housing, infrastructure and transportation. Growth in population has led to increased demand for transportation and thus, subsequently, to a **phenomenal increase in the number of motor vehicles.**
- There are over **118.4 Lakh registered vehicles of all categories in Delhi for the year 2019.6.41 lakhs vehicles were added** during the year 2019. The yearly **compounding growth of vehicular population for the year 2019 is 5.72%.**
- Private transport viz. **private cars and two wheelers constitute 93.72%** of all registered vehicles in Delhi. On the contrary, all categories of buses, which are the major source of **public transportation, form less than 0.5%** of the total vehicular population.
- With the growth of population, traffic scenario has also become more challenging particularly with regard to the number of accidents.
- The **heterogeneity and magnitude of vehicle population, unpredictability of human behavior, economic constraints, insufficient road markings and signages, defective road designing, deficiencies in vehicle design,** are some of the factors leading to road accidents in Delhi. Drunken driving, over speeding, overloading, violation of traffic rules are the common causes of traffic accidents.
- This increase of traffic volume has manifested itself in numerous transportation problems. The traffic volume on main corridors has increased to the extent to cross the threshold carrying capacity of the roads.
- However, **with the increased presence and tactical deployment of traffic staff, traffic engineering and other steps taken after in-depth analysis of causes of accidents, the current traffic management strategies/ techniques have proved to be effective** in reducing the number of road accidents.
- **During the year 2019,5610 road accidents occurred in Delhi in which 5152 people were injured and 1463 people lost their lives.**
- There was a decrease of 13.5% in the number of fatal accidents in Delhi as compared to the previous year i.e. 2018.
- **The fatality rate has decreased by 13.43%.**
- **There is a decrease of 13.89% in total accidents.**
- Pedestrians were the most vulnerable victims. In 2019, **46.34% of the total persons killed in road accidents were pedestrians. Scooter/ Motorcycle riders were the second most vulnerable accident-prone victims** constituting **33.9%** of the total persons killed.
- **In the year 2019, car/taxis caused 213 fatal accidents accounting for 14.86% of total fatal accidents which was the maximum number for a vehicle type. HTV's came next with 174fatal accidents (12.1%).**

- **Accident classifications during day and night shows that in 2019, 656 fatal accidents occurred during the day whereas 777 occurred during the night.**
- **More fatal accidents occurred after 7P.M till 2 A.M on all days of week** as during these high congestion hours, commercial vehicles also start moving in Delhi, due to lifting of restrictions of no entry for them.
- **The spatial distribution is uneven. The concentration of accidents is high in densely populated areas. Fatal accidents are more in areas where there is a dangerous mix of vulnerable road users and heavy and high-speed vehicles.**
- **National highways and major roads of the city are more accident prone due** to heavy movement of commercial as well as other vehicles. As a result, traffic problems such as congestion,delays, overcrowding of buses, pollution and increased road accidents need to be tackled by the traffic managers.
- **In 2019, 119 cluster points were identified as Accident Prone Zones,** as per the criteria of 3 or more fatal accidents within a diameter of 500meters or 10 or more total accidents in the same region. The alphabetical list is at Table no 10.2.
- **The Outer Ring Road (20), Ring Road (19), GTK Road (11), Rohtak Road (7) and Wazirabad Road (7)** have the maximum number of dangerous stretches on them.
- **Behaviour pattern of road users/ motorists have a direct link with the occurrence of accidents. Road safety laws improve road userbehaviour, a critical factor in roadsafety, to reduce road traffic crashes,injuries and deaths.**
- In the year 2019, **a total of 54,72,426 challans (45,02,659 compounded and 9,69,767 in court) were issued from which a total amount of Rs. 78,20,32,400/- was realised as compounding amount** (challan amount).
- **Prioritizing the needs of vulnerable road users and recognizing the importance of the built-up environment when making policy** decisions with **appropriate modifications to the physical road environment and setting up a supportive policy framework can bring down accidents.**
- **Modifying the environment while protecting road users from unacceptable levels of risk,** as well as **building bicycle and pedestrian lanes, tunnels and car-free playing areas, other environmental solutions can be implemented to separate and protect these road users.** Where road users cannot be separated, the strategy should acknowledge the need to give **pedestrian safety priority over vehicular traffic – particularly by reducing speed.**

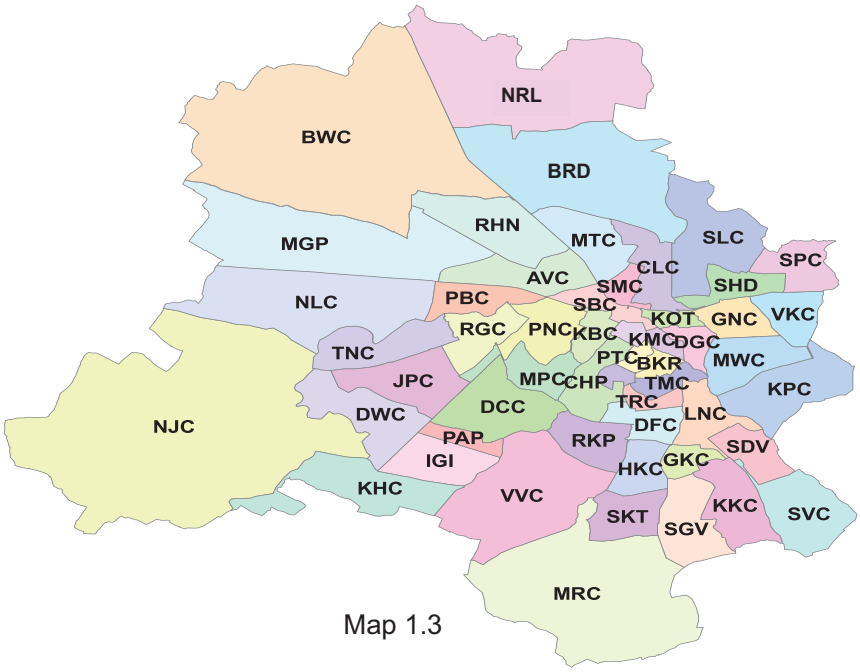
TRAFFIC RANGES (6)

Map 1.1

TRAFFIC DISTRICTS (12)

Map 1.2

TRAFFIC CIRCLES



Map 1.3

ROAD ACCIDENTS IN DELHI -2019

Map 1.4

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CHAPTER 2 VEHICLE REGISTRATION AND ACCIDENT STATISTICS

There has been a tremendous growth in private motor vehicles in India at the expense of public and shared modes of transportation.

Delhi, the National Capital, has been experiencing rapid demographic changes during the past few decades. The growth is reflected in terms of population size, economic activities and physical extent.

- **The human population, which was 43 lakhs in 1971 increased to 62.20 lakhs in 1981, 94.20 lakhs in 1991 to 119 lakhs (approx.) in 2011, showing four-fold(approximately) increase in the last three decades.**
- **At present (2019) there are approx. 118.4 lakhs motor vehicles registered in Delhi.**
- In addition to the motor vehicles registered in Delhi, it has been estimated that over one lakh vehicles from the neighboring states, also ply on Delhi roads, further deteriorating the already overburdened traffic scenario of the city.
- **Although, the number of motor vehicles on Delhi roads has increased by approx. twenty-one (21) times between 1981 to 2019, the road length has increased from 15,487 KMs in 1981 to 33,198 KMs up to 2019, which indicates increase of only two times (approx.). This has resulted in an increase in vehicle density per Sq. Km.**
- Growing vehicle fleet, unregulated urban expansions, increase in freight movement by road, inadequate and inefficient public transport system and lack of efficient control measures etc. are some of the key variables, which make traffic regulations and control an extremely challenging task.
- **Furthermore, the absence of any satisfactory alternative public transportation system has forced the commuters to use personalized modes of transport.**
- Despite measures by way of increasing the length of the road network and road surface space through widening, construction of a number of flyovers/ grade separators, and launching of the Metro, traffic congestion has continued to increase unabated.
- Delhi Metro has a network of 343kms. It carries about 25 lakh passengers per day. Buses in Delhi carry about 52 lakh passengers per day. In spite of this, Delhi faces huge congestion issues. This has its inevitable consequences in terms of accidents, pollution, commuting time and wasteful energy/ fuel consumption. (Data Source: DMRC).
- **According to an estimate, altogether 48 different types of vehicles ply on Delhi roads.**
- **Delhi has lost the air quality** gains of its first-generation action that included 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. **This is largely because of the explosive increase in vehicle numbers due to increased dependence on personal vehicles** in the absence of adequate, comfortable and efficient public transport services and walking and cycling facilities. Air pollution levels have worsened in recent times.

- Apart from the problems and requirements of transportation at the macro level, there are special problems in specific areas, particularly the old city, which deserve special attention.

Figure 2.1: The ownership and share of different modes of passenger mobility in Delhi

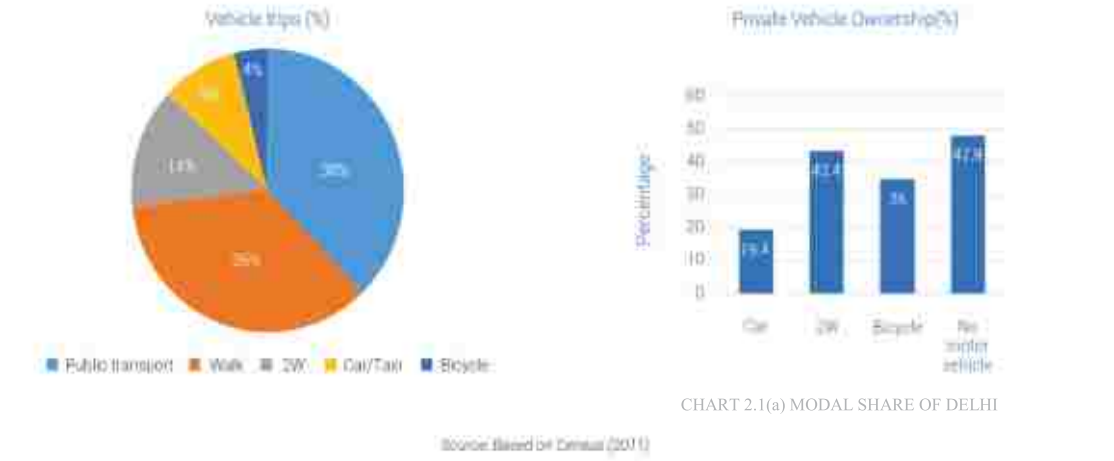


CHART 2.1(a) MODAL SHARE OF DELHI

Source: Based on Census (2011)

Source: NITI Aayog: Action plan for safe transportation

TABLE – 2.1

MOTOR VEHICLES REGISTERED IN DELHI

Cumulative

Year	Private Cars	M/Cycles Scooters	Taxis	TSRs	Goods Vehicles Delivery Vans and Others	Buses (Mini, Pvt. and others)	Total Motor Vehicles
1990	383,610	1,191,186	10,026	62,007	99,078	18,651	1,764,558
1991	427,743	1,294,066	10,426	65,829	106,052	19,671	1,923,787
1992	468,809	1,381,582	11,212	69,974	110,465	22,640	2,064,682
1993	510,242	1,467,182	11,679	71,568	114,294	23,940	2,198,908
1994	557,543	1,580,817	12,225	74,408	122,444	25,553	2,372,990
1995	617,585	1,707,528	13,384	77,884	131,877	27,473	2,575,731
1996	685,850	1,844,471	14,593	80,208	139,300	29,183	2,793,605
1997	765,470	1,991,710	16,654	80,210	146,668	32,333	3,033,045
1998	804,814	2,076,548	16,927	85,518	148,670	34,567	3,167,044
1999	857,353	2,169,162	17,482	87,785	154,695	36,933	3,323,410
2000	920,723	2,230,534	18,362	86,985	158,492	41,483	3,456,579
2001	984,093	2,291,906	19,242	86,185	162,289	46,033	3,589,748
2002	1,147,762	2,461,261	16,770	123,495	138,351	38,132	3,925,771
2003	1,325,753	2,645,356	18,281	125,653	154,153	40,207	4,309,403
2004	1,415,729	2,811,951	22,239	129,862	160,852	41,866	4,582,499
2005	1,442,174	3,015,267	22,472	74,159	156,131	25,351	4,937,354
2006	1,568,990	3,277,905	25,956	74,189	148,326	43,345	5,138,711
2007	1,696,484	3,528,407	28,575	70,356	164,762	44,440	5,533,024
2008	1,828,522	3,735,076	29,833	77,741	188,199	44,644	5,904,015
2009	1,859,370	3,797,943	40,072	83,948	175,250	55,148	6,011,731
2010	2,013,680	4,055,229	45,240	86,482	193,205	58,047	6,451,883
2011	2,173,323	4,342,403	57,958	88,181	209,370	61,471	6,932,706
2012	2,343,113	4,644,146	69,780	88,197	228,886	64,033	7,438,155
2013	2,474,087	4,962,507	70,335	86,838	140,942	39,694	7,774,403
2014	2,629,343	5,297,697	78,686	91,840	154,654	40,947	8,293,167
2015	2,790,566	5,681,265	79,606	81,633	161,821	32,540	8,827,431
2016	2,986,579	6,104,070	91,073	1,98,137	281,159	43,723	9,704,741
2017	3,152,710	6,707,891	1,48,434	1,74,000	2,31,767	38,265	10,482,757
2018	3,334,298	7,185,033	1,56,793	1,88,173	2,71,017	39,273	11,204,277
2019	3,486,976	7,614,730	1,64,448	1,94,203	3,15,036	40,253	11,845,336

Note: - Source Statistical Handbook of Delhi& Transport Department GNCTD.

The total number of registered motor vehicles figured at 11,845,336 for the year 2019 i.e. about twice the number ten years back (Table 2.1).

Two wheelers constitute bulk of the vehicular traffic on Delhi roads and account for 64.28 % of the total vehicular population

- The private cars/jeeps constitute 29.43% share of total registered motorized vehicles. In other words, **private vehicles constitute around 94%** of total registered vehicles in Delhi. In contrast, buses and TSRs constitute only 0.34% and 1.63 % of the total vehicles respectively (Chart- 2.1).
- **Increase in the numbers of private cars and two wheelers has been much higher than other types of vehicles. 6,41,059 vehicles were added during the year 2019.The actual growthof total newly added vehicles is mainly due to cars and two wheelers** (Table 2.2).
- Aggregators like Ola and Uber operators have boosted the growth of taxis and TSRs in the city.

Chart – 2.1

VEHICULAR POPULATION COMPOSITION

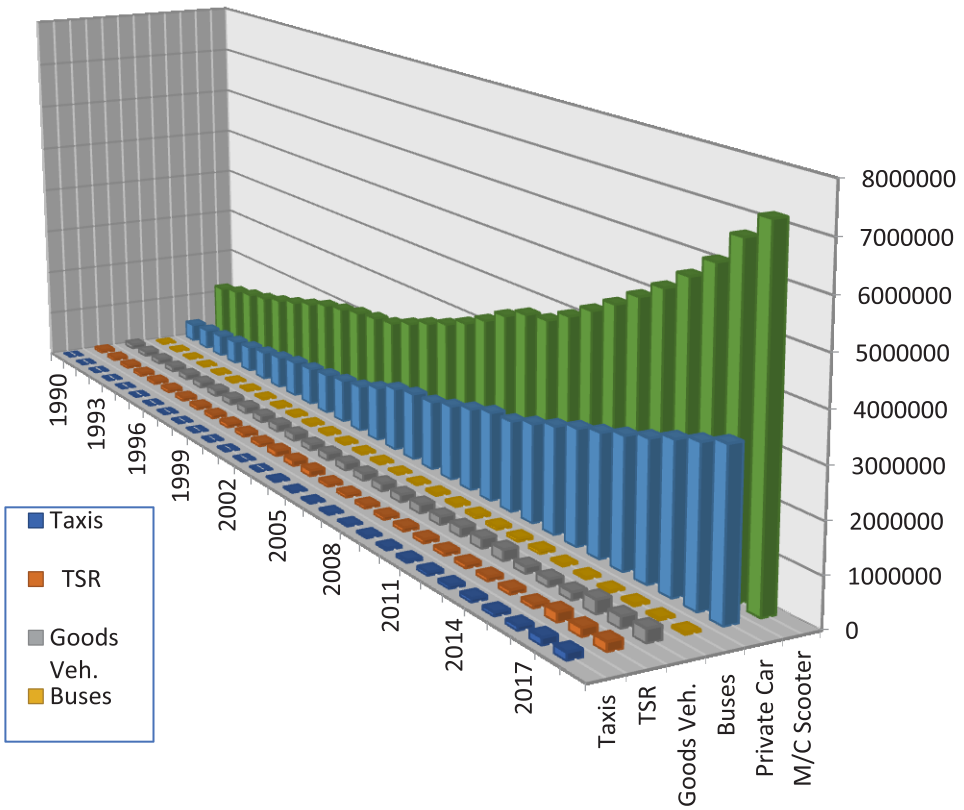


TABLE – 2.2

GROWTH / DECLINE IN MOTOR VEHICLE REGISTRATION OVER THE YEARS

Year	Private Cars	M/Cycles Scooters	Taxis	TSRs	Goods Vehicles	Buses	Total Regd. Vehicles	Yearly Growth (%)
1990	50,849	108,384	604	4246	9510	1170	174,763	11.00
1991	44,133	102,880	400	3822	6974	1020	159,229	9.02
1992	41,066	87,516	786	4145	4413	2969	140,895	7.32
1993	41,433	85,600	467	1594	3829	1300	134,226	6.50
1994	47,301	113,635	546	2840	8150	1613	174,082	7.91
1995	60,042	126,711	1159	3476	9433	1920	202,741	8.54
1996	68,265	136,943	1209	2324	7423	1710	217,874	8.46
1997	79,620	147,239	2061	2	7368	3150	239,440	8.57
1998	39,344	84,838	273	5308	2002	2234	133,999	4.42
1999	52,539	92,614	555	2267	6025	2366	156,366	4.70
2000	63,370	61,372	880	(-) 800	3797	4550	133,169	4.01
2001	63,370	61,372	880	(-) 800	3797	4550	133,169	3.85
2002	163,669	169,355	(-) 2472	37310	(-) 23938	(-) 7901	370,334	10.31
2003	177,991	184,095	1511	2158	15802	2075	383,632	9.77
2004	89,976	166,595	3958	4209	6699	1659	273,096	6.34
2005	26,445	203,316	233	(-) 55703	(-) 4721	(-) 16515	354,855	7.74
2006	126,816	262,638	3484	30	(-) 7805	17994	201,357	4.08
2007	127,494	250,502	2619	(-) 3833	16436	1095	394,313	7.67
2008	132,038	206,669	1258	7385	23437	204	370,991	6.71
2009	30,848	62,867	10239	6207	(-)12949	10504	107,716	1.82
2010	154,310	257,286	5168	2534	17955	2899	440,152	7.32
2011	159,643	287,174	12718	1699	16165	3424	480,823	7.45
2012	169,790	301,743	11822	16	19516	2562	505,449	7.29
2013	130,974	318,361	555	(-)1359	(-)87944	(-)24339	336,248	4.52
2014	155,256	335,190	8351	5002	13712	1253	518,764	6.67
2015	161,223	383,568	920	(-)10207	7167	(-)8407	534,264	6.44
2016	196,013	422,805	11467	116504	119338	11183	877,310	9.93
2017	166,131	603,821	57361	(-) 24137	(-) 49392	(-) 5458	778,016	8.01
2018	181,588	477,142	8359	14173	39250	1008	721,520	6.88
2019	152,678	429,697	7655	6030	44019	980	641,059	5.72

TABLE – 2.3

SLOW MOVING VEHICLES IN DELHI

Cumulative

Year	Cycle Rickshaws	Tongas	Rehras	Hand Carts	Bullock Carts	Cycle Rickshaw Trolleys	Total Slow-Moving Vehicles
1984	2115	1495	418	5702	929	5432	16,091
1985	1373	1354	346	6517	775	6305	16,670
1986	3628	1259	347	5103	771	6924	18,032
1987	5660	1173	350	4956	713	6429	19,281
1988	4179	1098	353	4993	714	5676	17,013
1989	11641	1008	276	4942	620	9382	27,869
1990	15649	974	276	4942	620	11476	33,937
1991	13030	956	266	4989	522	18198	37,961
1992	13539	927	203	5075	473	24637	44,854
1993	15429	867	190	5998	442	35576	58,502
1994	45778	867	190	4998	442	55576	87,851
1995	45778	796	205	5518	423	38925	91,645
1996	46231	679	120	5117	431	40251	92,829
1997	47000	585	144	5448	430	62745	116,352
1998	65244	545	70	5012	316	62000	133,187
1999	73038	597	40	4932	280	83541	162,328
2000	54791	451	43	4813	248	94896	155,242
2001	36544	305	46	4694	216	106251	148,056
2002	34748	276	45	4583	211	107047	146,910
2003	54300	290	39	4325	195	105489	134,638
2004	49838	400	58	5073	391	134023	189,793
2005	66195	422	62	5239	379	135872	208,169
2006	44537	321	41	1500	65	141219	187,683
2007	12170	355	57	13084	331	110887	136,884
2008	89429	242	42	3116	137	104303	197,269
2009	89429	242	42	3116	137	110887	203,474
2010	89429	242	42	3116	137	100665	193,252
2011	89429	242	42	3116	137	115000	207,587
2012	89429	242	42	3116	137	115000	207,587

Source: Official figures as provided by M.C.D. Figure for later years is not available.

With a mix of slow and fast-moving traffic on the roads, travel by non-motorized means like bicycles and rickshaws is unsafe.

- Inadequate cycling facilities are slowly pushing the population to depend on the use of motorized private vehicles, thereby causing loss to environment, health and life in far greater numbers than was the case two decades earlier. Data indicates that although approx. 35% of population of Delhi owns cycles, but only 4.5% (approx.) use them for commuting due to lack of safe cycling facilities or cycle-parking facilities.
- The road fatalities of cyclists are on the rise every year and lack of dedicated cycling infrastructure pushes them to switch to motorized transport. With inadequate cycling facilities, people tend to spend comparatively more money to reach the bus/metro station than on the bus/metro fare.

Further, due to fast development of National Capital Region and particularly the satellite towns around Delhi like NOIDA, Gurgaon, Rohtak, Manesar, Sonepat etc., the capital city is facing additional brunt of influx of higher volume of traffic thereby congesting important interstate roads and highways connecting the city.

- All National Highways i.e. NH1, NH 2, NH 8, NH 10 & NH 24 are carrying 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 is increasing steadily.
- **Vehicles registered in Haryana were responsible for the highest number of fatal accidents in Delhi among other state vehicles. Out of total 1433 fatal accidents, 131 were caused by vehicles registered in Haryana in the year 2019.**
- Vehicles registered in Delhi were involved in 484 fatal accidents (Table 4.5).

- **Public transportation options should be accessible within 500 metres within 1,000 metres for a household in urban areas and for semi-urban areas.**
- **Public and shared modes of transportation need to be scaled up to ensure long-term behavioural change in favour of public transportation.**
- **Density of urban settlements is an important parameter for planning frequency of buses on specific routes.**
- **For improved reliability of intra-city buses, passengers should be able to track the timings and arrivals in real-time. Collection of real-time data also enables monitoring of bus fleet for efficient operation.**
- **Parking management is an important tool to limit number of vehicles on the road. It can be done dynamically in order to decongest roads in areas worst affected from air pollution.**
- **As per the Households and Metro-users Survey by Department of Transport GNCTD, 45% of car users are likely to shift to public transport if the parking fees is hiked by 50%(MoUD 2016). Land is a scarce resource and is under pressure from various economic activities in the city.**
- **Electric vehicles present significant opportunity for improvement of air–quality by shifting the emissions**

from multiple moving sources in the city to point sources where they can be easily managed.

- A long-term vision for intra-city electric buses is required. Retrofitting CNG engines with electric drive trains and pantographs for opportunity charging enroute can be a way forward for electric mobility in Delhi. (Source: NITI Aayog Action plan for clean transportation)

(Source : NITI Aayog : Action plan for safe transportation)

Population and Road Accident trends: -

- The estimated total population of Delhi is 1,95,80,105 at the end of the year 2019. Hence, the population density in Delhi is more than 13,663 persons per sq. Km. Likewise, the per capita registered vehicles in Delhi comes very close to having **1 vehicle for every 2 persons in the city (1: 1.8) (Chart 2.2).**

Chart 2.2

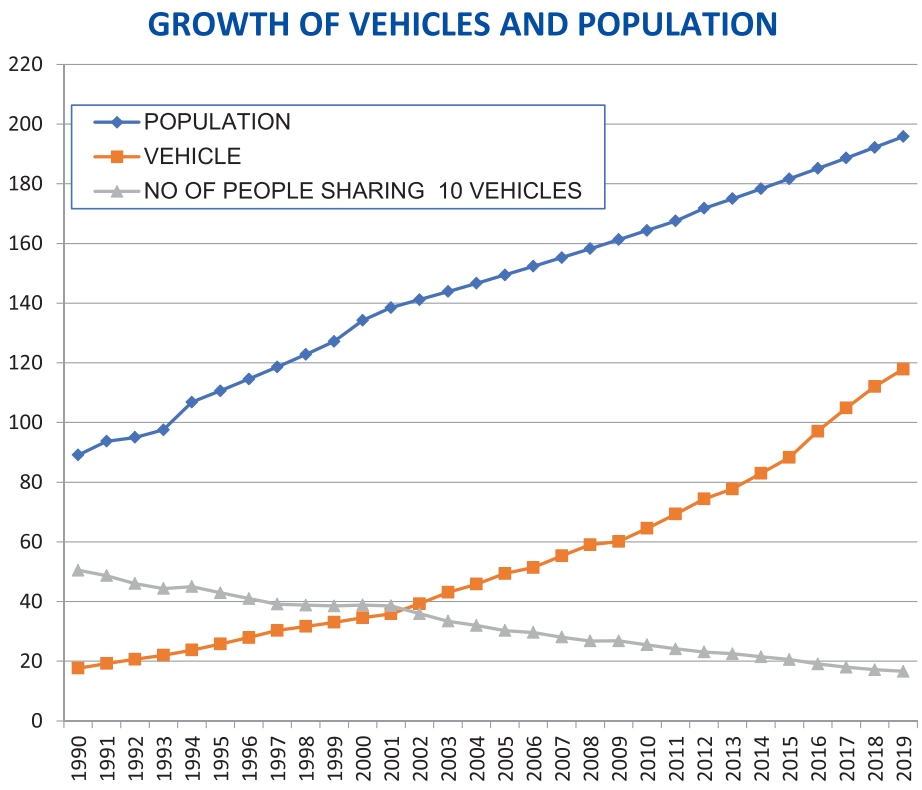


TABLE - 2.4

ROAD ACCIDENT TRENDS

Year	Population (Cumulative)	Motor Vehicles (Cumulative)	Fatal Accidents	Total Accidents (All Types)	Road Deaths (Per Year)	Fatality Rate		Accident Severity*
						Per one lakh population	Per 10000 vehicles	
1990	8,910,000	1,764,558	1559	7689	1670	18.74	9.11	21.71
1991	9,370,000	1,923,787	1651	8065	1778	18.97	8.92	22.04
1992	9,500,000	2,064,682	1628	8519	1727	18.17	8.36	20.27
1993	9,750,000	2,198,908	1686	8503	1783	18.28	8.10	20.96
1994	10,680,900	2,372,990	1790	9050	1884	17.64	7.94	20.81
1995	11,061,700	2,575,731	1981	10138	2070	18.71	8.04	20.41
1996	11,454,800	2,793,605	2223	11315	2361	19.96	8.18	20.86
1997	11,860,900	3,033,045	2224	10957	2342	19.19	7.50	21.37
1998	12,281,400	3,167,044	2102	10211	2182	17.88	6.90	21.36
1999	12,716,800	3,302,044	1974	9909	2045	16.08	6.19	20.63
2000	13,418,756	3,456,579	1943	10245	2014	15.01	5.82	19.65
2001	13,850,507	3,589,748	1768	9344	1842	13.29	5.13	19.71
2002	14,116,436	3,925,771	1625	8699	1696	12.01	4.35	19.49
2003	14,387,472	4,309,403	1731	8864	1801	12.51	4.18	20.31
2004	14,663,711	4,582,499	1929	9092	1832	12.49	4.00	20.14
2005	14,945,255	4,937,354	1966	9374	2049	13.71	4.14	21.85
2006	15,232,203	5,138,711	2135	9294	2169	14.24	4.22	23.33
2007	15,524,662	5,533,024	2081	8620	2140	13.78	3.86	24.82
2008	15,822,735	5,904,015	2015	8435	2093	13.23	3.55	24.81
2009	16,126,532	6,011,731	2272	7516	2325	14.42	3.87	30.93
2010	16,436,161	6,451,883	2104	7260	2153	13.10	3.34	29.65
2011	16,753,235	6,932,706	2047	7280	2110	12.59	3.05	28.98
2012	17,174,897	7,438,155	1822	6937	1866	10.86	2.51	26.89
2013	17,499,502	7,774,403	1778	7566	1820	10.40	2.34	24.05
2014	17,830,242	8,293,167	1629	8623	1671	9.37	2.01	19.37
2015	18,167,233	8,827,431	1582	8085	1622	8.93	1.84	20.06
2016	18,510,594	9,704,741	1548	7375	1591	8.59	1.63	21.57
2017	18,860,444	10,482,757	1565	6673	1584	8.39	1.51	23.73
2018	1,92,16,906	11,204,277	1657	6515	1690	8.79	1.50	25.94
2019	1,95,80,105	11,845,336	1433	5610	1463	7.47	1.23	26.07

Note: - * Accident Severity: Road Accident deaths per 100 accidents.

TABLE – 2.5

% GROWTH IN POPULATION, MOTOR VEHICLES AND ACCIDENTS

(All figures are in Percentages)

Year	Population	Motor Vehicles	Road Deaths	Total Accidents
1990	4.12	10.99	5.63	6.91
1991	3.79	8.28	6.47	4.89
1992	3.57	7.32	-2.87	5.63
1993	3.56	6.50	3.24	-0.19
1994	3.56	7.92	5.66	6.43
1995	3.56	8.54	9.87	12.02
1996	3.55	7.80	14.06	11.61
1997	3.54	8.57	-0.80	-3.16
1998	3.54	4.42	-6.83	-6.75
1999	3.54	4.08	-6.51	-3.01
2000	5.52	4.67	- 1.51	3.39
2001	3.12	3.85	- 8.54	-8.79
2002	1.88	9.36	- 7.93	-6.90
2003	1.87	9.77	6.19	1.90
2004	1.88	6.34	1.72	2.67
2005	1.89	7.74	11.84	3.11
2006	1.86	4.08	5.86	- 0.90
2007	1.90	7.67	- 1.34	- 7.32
2008	1.89	6.71	- 2.20	- 2.12
2009	1.87	1.82	11.08	-10.90
2010	1.88	7.32	-7.40	-3.41
2011	1.89	7.45	-2.04	0.28
2012	2.45	7.29	-13.08	- 4.95
2013	1.89	4.52	- 2.46	9.07
2014	1.90	6.67	- 8.18	13.97
2015	1.88	6.44	- 2.93	- 6.23
2016	**1.89**	**9.93**	**-1.91**	**-8.78**
2017	**1.88**	**8.01**	**-0.43**	**-9.5**
2018	**1.89**	**6.88**	**6.69**	**-2.36**
2019	**1.89**	**5.19**	**-13.43**	**-13.89**

CHART 2.3

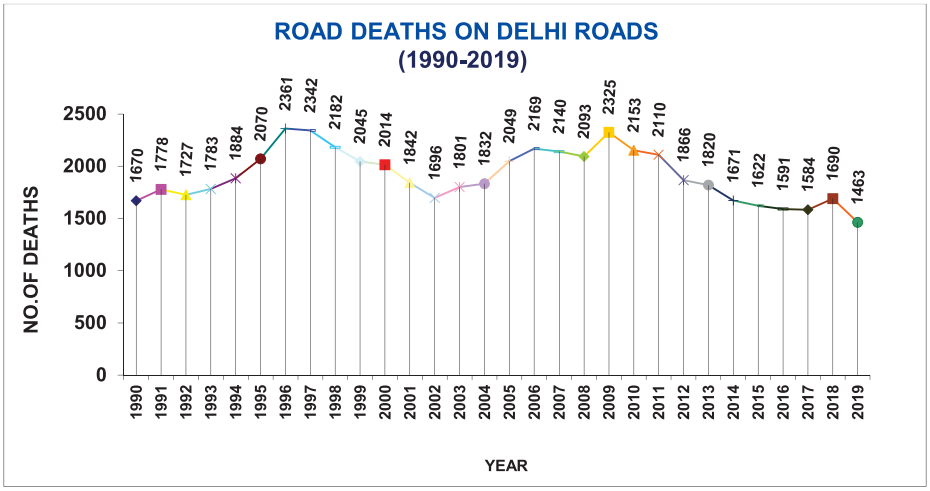
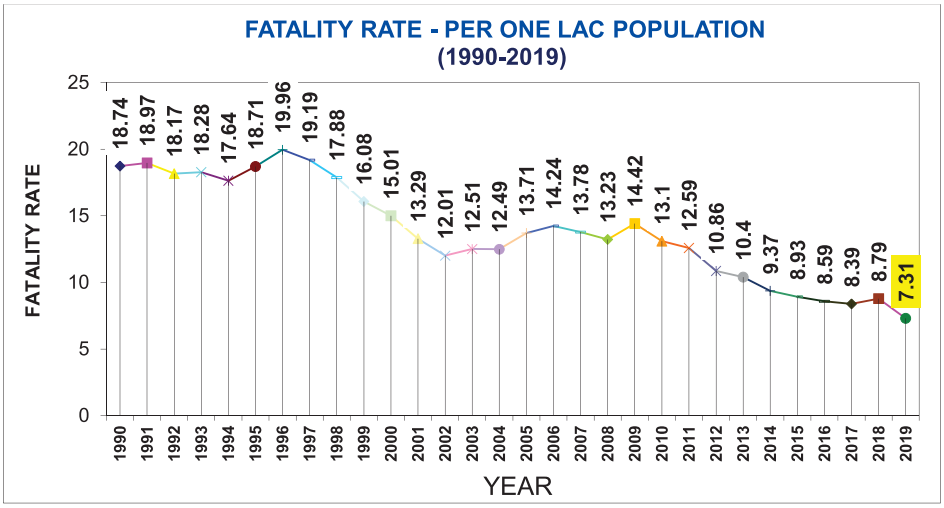


CHART 2.4



Fatality rate per one lac population has shown a declining trend since 2009.

(14.42 in 2009 to 7.31 in 2019)

- **The fatalities have been showing a downward trend from the year 2009 but in the year 2018trend was reversed, fatality rate has increased. In the year 2019 fatality rate has decreased compared to previous year (8.79 in 2018 and 7.47 in the year 2019).**
- The average annual human **population growth remained below 2% during the last 11 years but the average annual vehicular population growth remained between 4-10 % (barring year 2009) (Table No. 2.4 and 2.5). The road length has more or less remained the same.** This huge gap between two vital components has affected road traffic adversely. Increasing human as well as vehicular population is creating multi-prongedproblems for the city – from huge pressure on civic infrastructure to space crunch everywhere, particularly on roads.

*****

CHAPTER 3

VICTIMS OF ROAD ACCIDENTS

Vulnerable road users account for more than half of all road traffic deaths globally:

Pedestrians, cyclists, and riders of motorized Two Wheelers and Three wheelers and their passengers are collectively known as "vulnerable road users" and account for half of all road traffic deaths around the world. A higher proportion of vulnerable road users die in low-income countries than in high-income countries *(WHO: 10 facts on global road safety)*

The prominence of vulnerable road users in many parts of the world, many of whom cannot afford or do not have access to the safest vehicles, they are still largely ignored in the planning, design and operation of roads. In many countries, roads still lack separate lanes for cyclists or adequate crossings for pedestrians and allow motor vehicle speeds that are too high. (Source: WHO: Global Status Report on Road Safety 2018)

Vulnerable road users are at additional risk where their needs have not been taken into consideration during the planning of land use or road engineering. In most countries, roads are planned and built to allow motor vehicles to travel faster while insufficient thought is given to the needs of pedestrians and cyclists, thus forcing them to face increasing risk in use of roads and road crossings. (Source: WHO: Global Status Report on Road Safety 2013)

- **22.12 % of the total road accident victims lost their lives(21.73 %** in the year 2018). **The fatality rate amongst all road accident victims which has been decreasing steadily for the last few years, except in the 2018, fatality rate had increased.** (Table 3.1)
- **Pedestrians are the most vulnerable victims in fatal road mishaps.**
- **Pedestrians continued to suffer the highest casualties as victims of road accidents.** During the year 2019, a total of **678 pedestrians lost their lives and 1887 were injured as compared to** 775pedestrianswho lost their lives and 2160 pedestrians who wereinjured during the year 2018. This represents **46.34% of all victims killed** in the year 2019 as compared to 45.85 % in 2018. Proportions for the injured pedestrians were higher at 36.63% in 2019 against 35.49% in 2018 (Table 3.2).
- 2160 (35.49%) pedestrians were injured and 775(45.85%) were killed in 2018. The trend in the deaths of pedestrians shows that the share of pedestrian deaths range between 40% and 47% of the total victims in fatal accidents. (Table 3.2).
- The share of cyclists as victims of road accidents has remained around 2% to 4% during last 6 years. In the case of cyclists injured, this percentage has been reducing gradually over last 15 years and has come down from 6.37% in 2005 to 2.09% in 2019 (Table 3.2).
- **Electric rickshaws** were involved in 14 fatal accidents and 65 simple accidents during the year 2019. 14 persons were killed and 101 persons were injured in these accidents.

REASONS: -

- **Lack of proper and sufficient numbers of pedestrian crossings, Foot Over Bridges(FOB), subwaysand non-continuous, intentionally encroached, un-friendly and poorly maintained footpaths etc., ignorance of road safety rules, disregard to other road users rights by vehicle drivers are the major reasons of such accidents.**
- **The condition of road crossing facility is generally poor and notpedestrian friendly. Faulty designing of FOBs, lack of accessible escalators for disabled, lack of accessible footpaths for persons with disabilities, dark and dingy subways, lack of thought regarding requirement of FOBs/ Subways including long distancesand connectivity with arterial roads, lack of signages useful for pedestrian safety- all lead to unsafe pedestrian crossing**.

TABLE – 3.1

VICTIMS (KILLED & INJURED)

YEAR	PEDESTRIANS		CYCLISTS		CAR OCCUPANTS		SCOOTER / M. CYCLE RIDERS		BUS PASSENGERS		*SLOW MOVING VEHICLES' PULLER AND PASSENGERS		DRIVERS OF ANIMAL DRIVEN VEHICLE		OTHER DRIVERS		TOTAL	
	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ
2004	979	3096	181	506	42	684	467	2244	49	209	44	295	1	14	214	949	1977	7997
2005	935	3406	179	528	57	525	568	2293	60	303	46	255	1	12	203	960	2049	8282
2006	1030	3194	154	451	57	611	614	2485	66	269	41	276	0	7	207	987	2169	8280
2007	1071	2831	128	390	64	580	594	2536	44	148	29	198	5	29	205	998	2140	7710
2008	1043	3015	107	353	41	549	641	2355	31	136	19	166	7	24	204	744	2093	7342
2009	1170	2677	121	261	58	444	691	2350	37	121	29	170	6	20	213	893	2325	6936
2010	960	2465	137	309	48	493	705	2438	27	97	37	171	2	14	237	1121	2153	7108
2011	961	2387	107	295	66	423	676	2396	25	96	32	198	1	15	242	1165	2110	6975
2012	828	2261	114	249	64	482	577	2236	16	91	26	121	1	12	240	1181	1866	6633
2013	749	2568	92	305	77	522	613	2573	20	111	32	188	2	28	235	803	1820	7098
2014	749	2949	64	313	51	524	569	3136	7	66	24	296	3	20	204	979	1671	8283
2015	684	2862	71	297	80	632	567	3270	11	53	23	255	2	28	184	861	1622	8258
2016	682	2551	53	218	66	431	572	2911	4	51	34	244	5	37	175	711	1591	7154
2017	702	2283	67	154	53	404	557	2680	7	71	24	198	3	18	171	796	1584	6604
2018	775	2160	53	155	66	307	570	2542	9	39	17	158	4	26	196	699	1690	6086
2019	678	1887	36	108	39	281	496	2110	5	30	26	151	1	10	182	575	1463	5152

* Hand Cart, Electric rickshaw and Cycle Rickshaw.

TABLE – 3.2

VICTIM PROFILE (% OF TOTAL IN THE YEAR)

YEAR	PEDESTRIANS		CYCLISTS		CAR OCCUPANTS		SCOOTER / M. CYCLE RIDERS		BUS PASSENGERS		*SLOW MOVING VEHICLES' PULLER AND PASSENGERS		DRIVERS OF ANIMAL DRIVEN VEHICLE		OTHER DRIVERS	
	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ	KLD	INJ
2004	49.51	38.71	9.15	6.32	2.12	8.55	23.62	28.06	2.47	2.61	2.22	3.68	0.05	0.17	10.82	11.86
2005	45.63	41.13	8.74	6.37	2.78	6.34	27.72	27.68	2.93	3.66	2.24	3.08	0.05	0.14	9.91	11.60
2006	47.48	38.57	7.2	5.44	2.62	7.37	28.30	30.01	3.04	3.24	1.89	3.33	0.00	0.08	9.72	11.92
2007	50.06	36.71	5.98	5.05	2.99	7.52	27.75	32.89	2.05	1.91	1.35	2.56	0.23	0.37	9.57	12.94
2008	49.88	41.07	5.11	4.85	1.95	7.54	30.63	32.37	1.48	1.86	0.90	2.28	0.33	0.32	9.74	10.22
2009	50.32	38.59	5.20	3.76	2.49	6.40	29.72	33.88	1.59	1.74	1.24	2.45	0.25	0.29	9.16	12.87
2010	44.58	34.67	6.36	4.34	2.23	6.93	32.74	34.29	1.25	1.36	1.72	2.40	0.09	0.19	11.01	15.77
2011	45.55	33.59	5.07	4.15	3.07	6.20	32.06	34.67	1.30	1.29	1.48	2.80	0.04	0.22	11.40	17.10
2012	44.37	34.08	6.10	3.75	3.43	7.27	30.92	33.71	0.86	1.37	1.39	1.82	0.05	0.18	12.9	17.8
2013	41.15	36.17	5.05	4.29	4.23	7.35	33.68	36.24	1.09	1.56	1.75	2.64	0.10	0.39	12.91	11.31
2014	44.82	35.60	3.83	3.77	3.05	6.32	34.05	37.86	0.41	0.79	1.43	3.57	0.17	0.24	12.20	11.81
2015	42.17	34.65	4.37	3.59	4.93	7.65	34.95	39.59	0.67	0.64	1.41	3.08	0.12	0.33	11.34	10.42
2016	42.86	35.65	3.33	3.04	4.14	6.02	35.95	40.69	0.25	0.71	2.13	3.41	0.31	0.51	10.99	9.93
2017	44.31	34.56	4.22	2.33	3.34	6.11	35.16	40.58	0.44	1.07	1.51	2.99	0.18	0.27	10.79	12.05
2018	45.85	35.49	3.13	2.54	3.90	5.04	33.72	41.76	0.53	0.64	1.00	2.59	0.23	0.42	11.59	11.48
2019	46.34	36.63	2.46	2.09	2.67	5.45	33.9	40.95	0.34	0.58	1.78	2.93	0.06	0.19	12.44	11.16

* Hand Cart, Electric rickshaw and Cycle Rickshaw.

FIGURE -3.1 VICTIMS KILLED IN 2019 (1463)

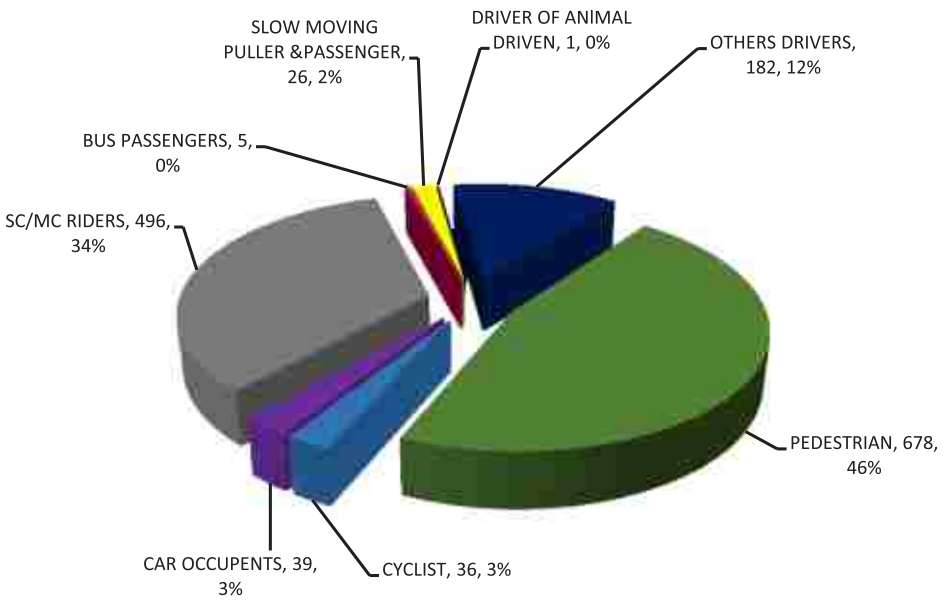
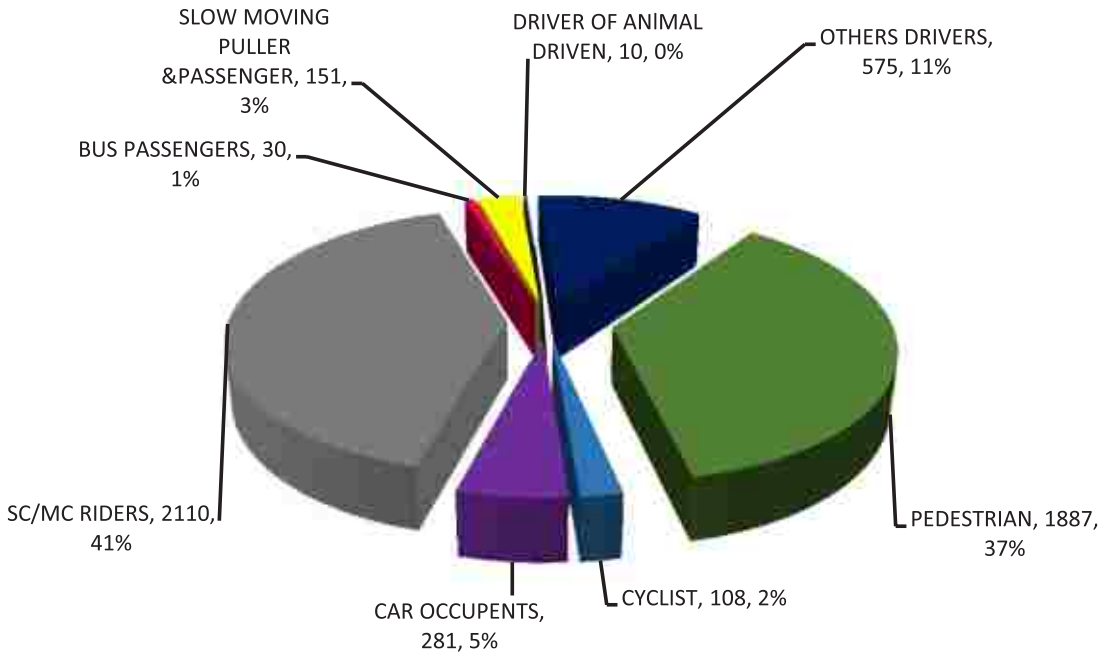


FIGURE -3.2 VICTIMS INJURED IN 2019 (5152)



Trend in the case of two wheelers (scooter and motor cycle) riders.

- **This is the next most vulnerable category of victims and accounted for 496 (33.9%) of all fatalities in accidents in Delhi and 2110 (40.95%) of all injured victims in 2019.** The figure of two wheelers victims' deaths in road accidents shows decrease trend from 2018. The number of two-wheeler rider victims injured in road accidents decreased from 2542 (in the year 2018) to 2110 (in the year 2019).
- Accident data thus suggests that **two-wheeler riders were victims in 1 of every 3 deaths or injuries.** One important fact that can be noted from Table 3.2 is that the share of two-wheelers as victims (fatalities and injuries) is gradually increasing.

Over the years, the share of deaths of car occupants out of total fatalities has remained between 2% and4%.

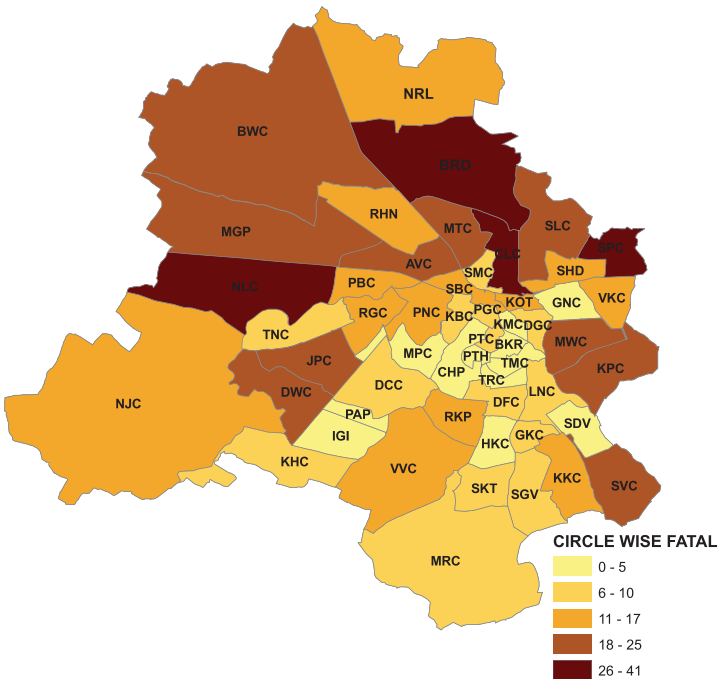
- The share decreased from 3.90% (2018) to 2.67% (2019). In case of non-fatal injuries, it has remained between 5% and8% over the years.
- The **bus travellers (passengers) are the safest among the road users** (Table 3.1).

Map 3.1(a) to Map 3.3(b) shows the traffic circle wise concentration of pedestrians, cyclists and two-wheeler victims.

- **More pedestrian fatalities were reported in Northwest, West, Outer and Northeast regions of Delhi (Map 3.1a).**

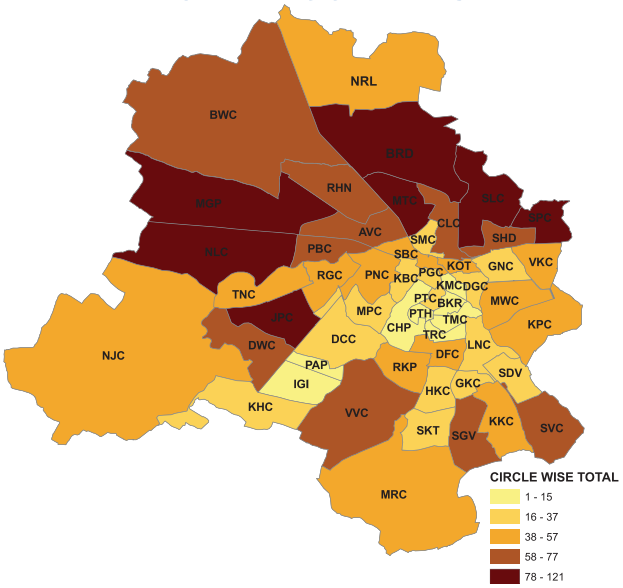
TOP CIRCLES IN PEDESTRIANS ACCIDENTS

FATAL ACCIDENTS



Map 3.1(a) (for area refer to Map 1.3)

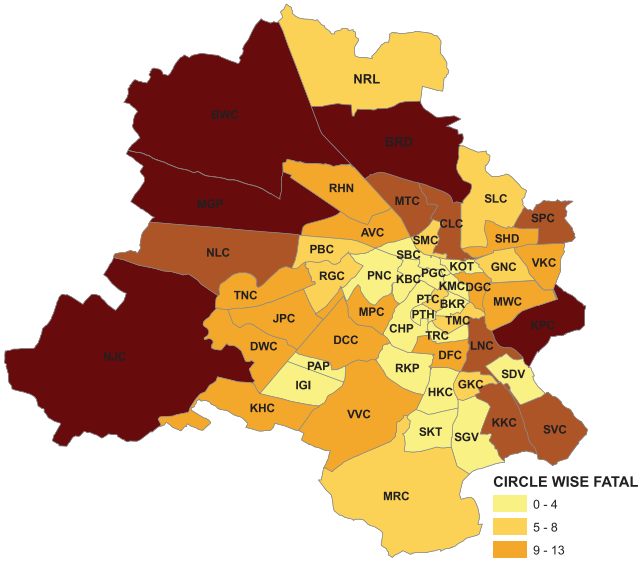
TOTAL ACCIDENTS



Map 3.1(b) (for area refer to Map 1.3)

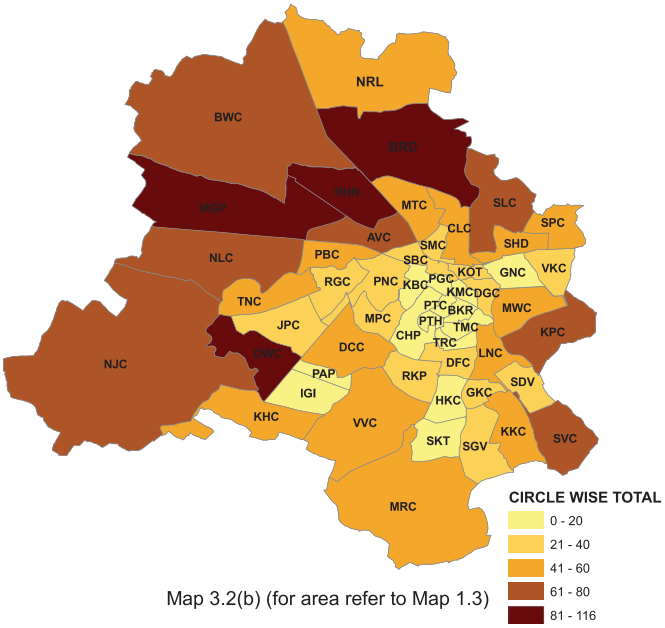
- **Vulnerability of two-wheelervictims ismore inBurari, Bawana, Mangolpuri, Najafgarh and Kalyanpuri areas. (Map 3.2a).**
- **Thetotal number of accidents of two wheelers are higher in Burari, Rohini, Mangolpuri, and Dwarka regions (Map 3.2(b))**

TOP CIRCLES IN TWO-WHEELERS ACCIDENTS FATAL ACCIDENTS



Map 3.2(a) (for area refer to Map 1.3)

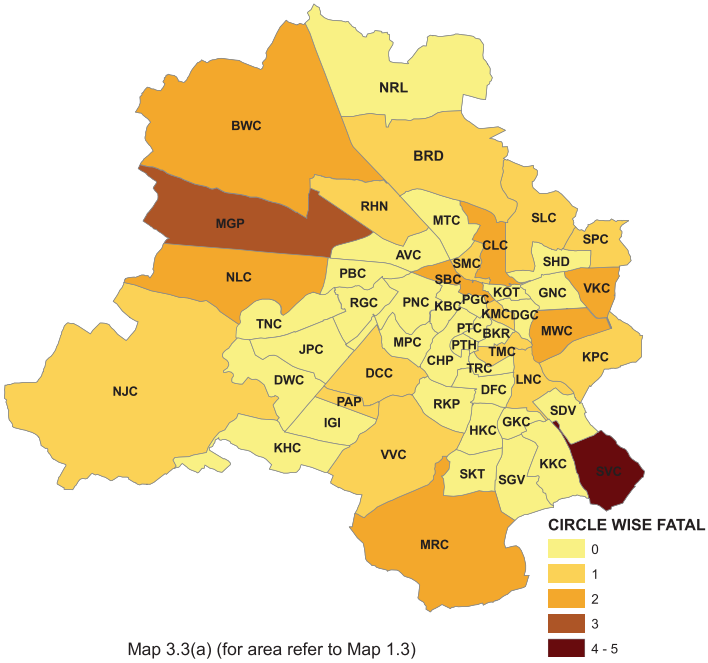
TOTAL ACCIDENTS



Map 3.2(b) (for area refer to Map 1.3)

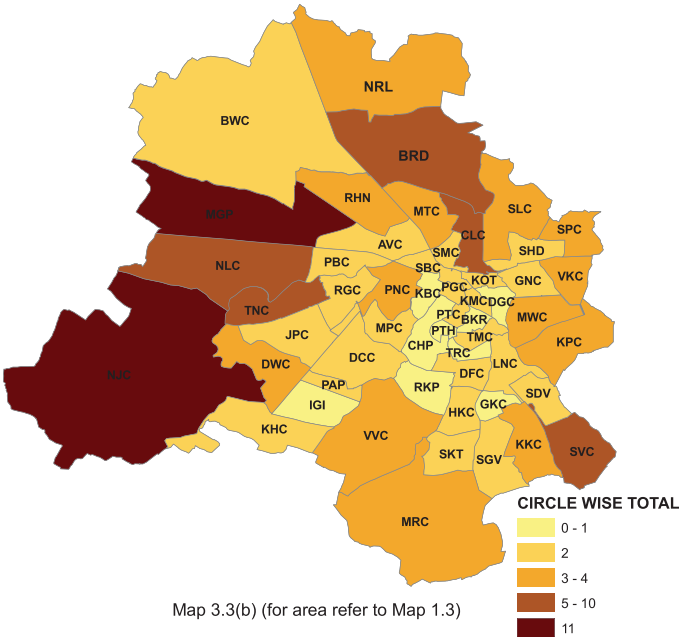
- **Cyclists are more vulnerable in Sarita Vihar, Mangolpuri and Najafgarh region (Map 3.3a).**

TOP CIRCLES IN CYCLIST ACCIDENTS
FATAL ACCIDENTS



Map 3.3(a) (for area refer to Map 1.3)

TOTAL ACCIDENTS



Map 3.3(b) (for area refer to Map 1.3)

Demographic classification of all victims:

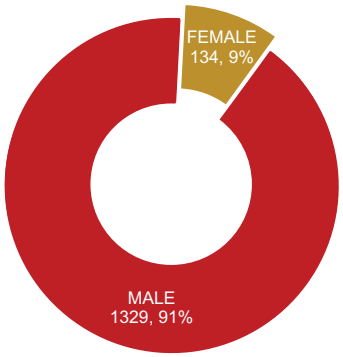
TABLE – 3.3

CHILDREN AND ADULTS (SEX-WISE) KILLED / INJURED IN ACCIDENTS

YEAR	CHILDREN				ADULTS			
	KILLED		INJURED		KILLED		INJURED	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
2004	65	24	205	112	1797	91	7224	460
2005	51	22	195	92	1854	122	7523	472
2006	39	21	206	114	2004	105	7385	575
2007	120	22	458	117	1891	107	6678	457
2008	136	45	508	122	1790	122	6140	572
2009	131	43	464	144	1993	158	5563	765
2010	111	38	482	138	1835	169	5738	750
2011	107	50	534	160	1772	181	5344	937
2012	119	39	515	148	1553	155	5056	914
2013	83	27	518	140	1548	162	5431	1009
2014	106	32	573	153	1388	145	6522	1035
2015	111	33	570	174	1347	131	6455	1059
2016	98	27	553	142	1336	130	5577	882
2017	91	38	514	141	1318	137	5104	845
2018	88	29	418	142	1439	134	4862	664
2019	67	22	307	89	1262	112	4200	556

Note: - Children means persons up to the age of 18 years

SEX RATIO OF PERSONS KILLED



SEX RATIO OF PERSONS INJURED

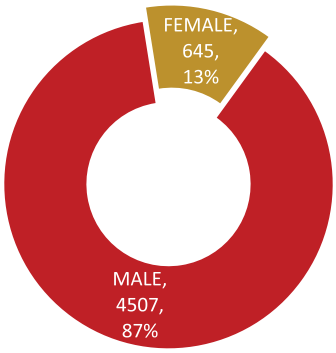


TABLE – 3.3 (A)

AGE GROUP (SEX-WISE) KILLED / INJURED IN ROAD ACCIDENTS- 2019

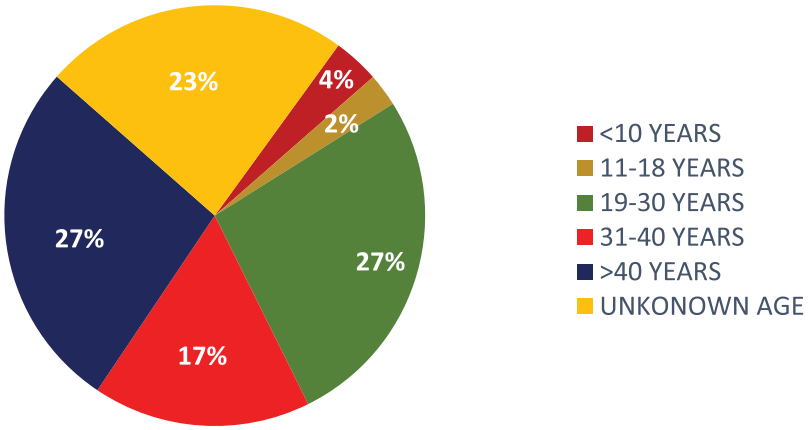
AGE GROUP	PERSONS KILLED			PERSONS INJURED		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
<10 YEARS	34	18	52	104	46	150
11-18 YEARS	33	4	37	203	43	246
19-30 YEARS	366	23	389	1210	141	1351
31-40 YEARS	234	11	245	664	99	763
>40 YEARS	337	59	396	1050	165	1215
UNKNOWN AGE	325	19	344	1276	151	1427
TOTAL	1329	134	1463	4507	645	5152

TABLE – 3.3 (B)

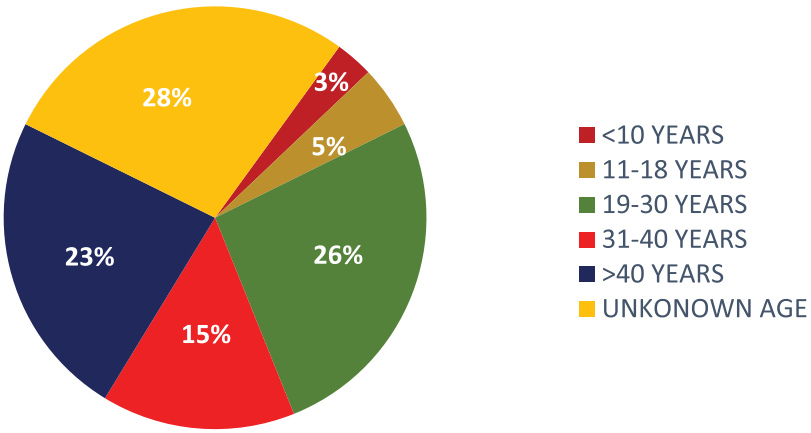
AGE GROUP (SEX-WISE) KILLED / INJURED IN ROAD ACCIDENTS- 2018

AGE GROUP	PERSONS KILLED			PERSONS INJURED		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
<10 YEARS	28	20	48	122	71	193
11-18 YEARS	61	9	70	296	71	367
19-30 YEARS	421	28	449	1474	178	1652
31-40 YEARS	252	30	282	813	124	937
>40 YEARS	394	55	449	1116	197	1313
UNKNOWN AGE	371	21	392	1459	165	1624
TOTAL	1527	163	1690	5280	806	6086

AGE PROFILE OF PERSONS KILLED



AGE PROFILE OF PERSONS INJURED



Demographic classification of all victims:

- Males outnumber females as victims of road accidents. In all, 1262 male adults and 112 female adults were killed while 4200 male adults and 556female adults were injured. (Table 3.3)
- Out of the total child **victims of fatal crashes,67 were boys and 22were girls, whereas 307 boys and 89 girls were injured.** (Table 3.3).
- **In 2019,91% of victims of various** ages killed were male while in the year 2018,the figure stood at90%.

*****

CHAPTER 4

INVOLVEMENT OF VEHICLE AT FAULT

Vehicles sold in 80% of all countries worldwide fail to meet basic safety standards.

The safety of vehicles 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)

The extent of damage and severity of accidents increases with the increase in size and speed of the impacting vehicles. With improvement in technology, the individual/private vehicles are increasingly safer for the passengers occupying the vehicles. But for the heterogeneous and mixed variety of road users, on Indian roads, **there is a need to minimize danger to the pedestrians and other small vehicles including non-motorized vehicles.**

Vehicles can be improved by making them safe for passengers, with seat belts, air bags, Anti-lock Breaking System (ABS), strong outer body, non-collapsing body, protective internal design and having safe exit passage in case of any mishappening. The vehicles, however, need to be improved also for the safety of the victim (non-passengers).

The vehicle wise analysis of accidents provides a broad overview of the involvement of vehicles at fault in accidents (Table 4.1).

- **In the year 2019, cars/taxis caused 213 fatal accidents accounting for 14.86% of total fatal accidents which was the maximum number by a vehicle type. HTVs came next with 174 fatal accidents (12.14%).** As compared to this, in the year 2018, Cars/Taxis accounted for the maximum number of fatal accidents at 253 (15.26%) and the HTVs at 184 (11.10%).
- **Two wheelers accounted for 10.04% of fatal accidents this year which has decreased from 10.31% recorded in the year 2018 (Tables 4.1 and 4.2).**
- In case of non-fatal accidents, **cars/taxis caused 34.5% of all simple accidents in the year 2019** which is higher than 33.47% in the year 2018.
- Two-wheeler riders (scooters/ motorcycles) were next with 15.72% of simple accidents this year, which is higher than the share in the year 2018, viz.15.68% (Tables 4.1 and 4.2).
- Hit and run fatal accident cases have shown a decrease trend in the year 2019 as compared to last year i.e. 2018 **(765 in the year 2018 to 674 in 2019).** 47.03% of all the fatal cases come under this category. The same trend is seen in case of simple accidents i.e. the figure has also decreased from 1296 to 1091 which is 26.12% of all the simple accidents. Lack of proper identification of vehicle viz. faulty/smeared number plate is mainly responsible for these fleeing offenders. Passers-by witnessing the accident also refrain from reporting the matter to police. Lack of surveillance cameras at the accident spot is another reason.
- Light Goods Vehicles (LGVs) have been showing a decrease in fatal accidents (Table 4.2).
- **City buses have caused a higher number of fatal accidents this year over 2018. The percentage share of**

buses has increased in fatal accidents. But simple accidents have shown decrease trend. (Table 4.2).

- **In 2019, 678 pedestrians have died in 674 accidents caused by all types of vehicles as compared to 775 pedestrian deaths in 2018.** The pedestrian casualties due to car/jeep/taxis were 88 this year in comparison to 102 in 2018. Two-wheelers caused 53 pedestrian deaths in 2018 against 63 in 2018. 395 pedestrians were killed by unknown vehicles in 2019 against 436 in 2018.

Figure -4.1

FATAL ACCIDENTS ACCORDING TO MAJOR GROUP OF IMPACTING VEHICLES 2019 (1433)

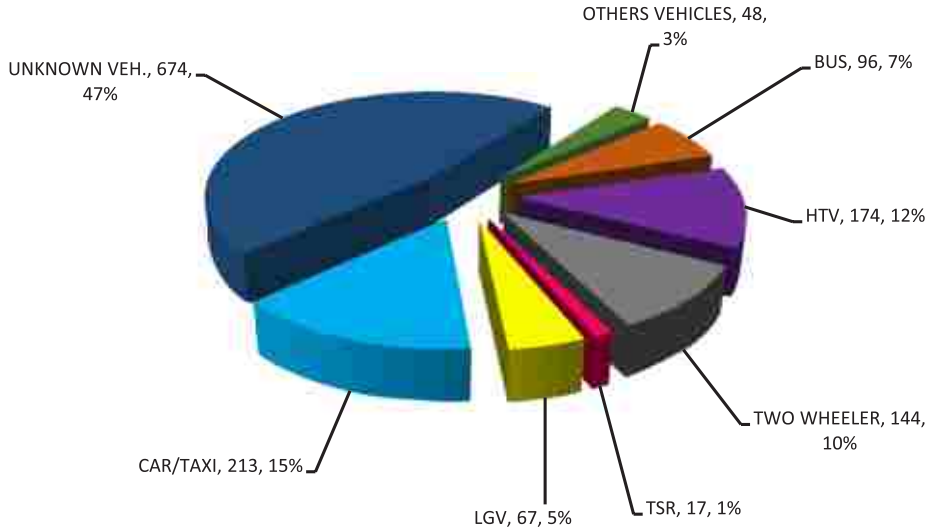


Figure -4.2

IMPACTING VEHICLES (TOTAL ACCIDENTS)- 2019 (5610)

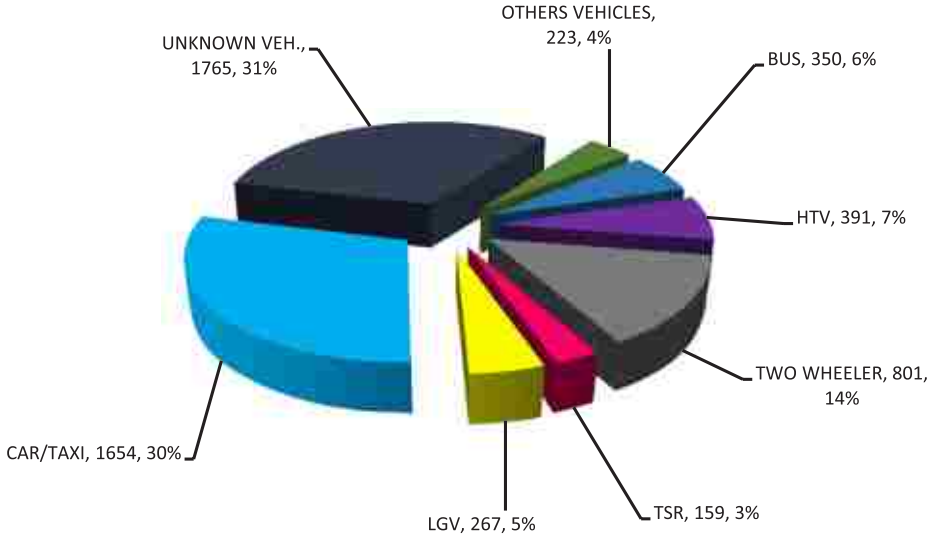


Table – 4.1

PROFILE OF VEHICLES AT FAULT

TYPES OF VEHICLE	FATAL ACCIDENTS					SIMPLE ACCIDENTS					TOTAL ACCIDENTS				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
AMBULANCE	0	1	0	3	2	3	5	5	2	4	3	6	5	5	6
BULLOCK CART	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
BYCYCLE	0	0	0	0	0	0	1	0	1	0	0	1	0	1	0
CALL CENTER CAB	0	0	1	0	0	7	2	7	3	2	7	2	8	3	2
CLUSTER BUS	24	11	14	15	23	35	41	53	58	40	59	52	67	73	63
CRANE	8	6	7	8	7	24	10	21	17	17	32	16	28	25	24
CYCLE RICKSHAW	1	0	0	0	0	0	3	2	3	0	1	3	2	3	0
DELIVERY VAN	19	22	20	20	10	98	92	79	82	58	117	114	99	102	68
DTC BUS	32	31	28	13	20	114	99	111	87	77	146	130	139	100	97
E_RICKSHAW	0	2	5	5	4	9	26	38	41	42	9	28	43	46	46
GOODS CARRIER *	232	171	165	172	165	401	339	295	239	205	633	510	460	411	370
GRAMIN SEWA	9	11	7	6	7	67	48	50	38	24	76	59	57	44	31
MILITARY VEH.	1	5	3	0	0	2	0	1	1	1	3	5	4	1	1
MINI BUS	14	16	20	14	14	62	67	43	33	40	76	83	63	47	54
OTHER STATE BUS	7	3	9	9	11	17	8	19	18	8	24	11	28	27	19
POLICE VEHICLE	0	0	2	1	0	1	2	0	1	1	1	2	2	2	1
PRIVATE BUS	35	45	38	30	26	112	105	75	82	79	147	150	113	112	105
PRIVATE CAR	277	261	280	233	202	2377	2089	1722	1512	1340	2654	2350	2002	1745	1542
ROAD ROLLER	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0
SCHOOL BUS	5	3	1	10	2	3	3	4	6	10	8	6	5	16	12
SCOOTER / M. CYCLE	147	155	140	171	144	1078	970	875	762	657	1225	1125	1015	933	801
TANKER	17	10	4	12	9	50	24	24	28	12	67	34	28	40	21
TAXI	15	19	7	20	11	101	139	119	114	101	116	158	126	134	112
TEMPO	82	76	71	100	67	279	234	223	233	200	361	310	294	333	267
TONGA/REHRA	0	0	0	0	0	2	0	1	1	0	2	0	1	1	0
TRACTOR	13	26	20	18	18	32	34	25	34	26	45	60	45	52	44
TSR	20	26	23	32	17	211	196	209	165	142	231	222	232	197	159
UNKNOWN VEHICLE	623	647	700	765	674	1418	1289	1107	1296	1091	2041	1936	1807	2061	1765

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

Table - 4.2

PERCENT SHARE OF IMPACTING VEHICLE (FATAL ACCIDENTS)

TYPES OF VEHICLE	FATAL ACCIDENTS					SIMPLE ACCIDENTS					TOTAL ACCIDENTS				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
BUSES	7.39	7.04	7.02	5.49	6.69	5.27	5.54	5.97	5.84	6.08	5.68	5.85	6.21	5.75	6.24
HTV	15.73	11.69	10.79	11.10	12.14	6.93	6.22	6.24	5.49	5.19	8.65	7.37	7.31	6.92	6.97
LGV	6.38	6.33	5.81	6.03	4.67	5.79	5.59	5.91	4.79	4.78	5.91	5.74	5.88	5.11	4.76
CAR / TAXI	18.45	18.08	18.33	15.26	14.86	38.10	38.23	36.04	33.47	34.49	34.26	34.00	31.88	28.84	29.48
TSR	1.26	1.67	1.46	1.93	1.18	3.24	3.36	4.09	3.39	3.39	2.85	3.01	3.47	3.02	2.83
SCOOTER/ M. CYCLE	9.29	10.01	8.94	10.31	10.04	16.57	16.64	17.12	15.68	15.72	15.15	15.25	15.21	14.32	14.28
UN-KNOWN	39.38	41.79	44.72	46.16	47.03	21.80	22.12	21.67	26.67	26.11	25.24	26.25	27.07	31.63	31.46
OTHER VEHICLE	2.08	3.39	2.87	3.68	3.34	2.26	2.30	2.93	4.63	4.18	2.22	2.53	2.92	4.38	3.98

Table 4.3 provides details of victims versus impacting vehicles for fatal accidents.

Table - 4.3

VICTIM V/S IMPACTING VEHICLE (FATAL ACCIDENTS)

VICTIMS	IMPACTING VEHICLE AT FAULT																					
	HTV		LGV		* OTHER HEAVY VEHICLES		BUS		M.BUS		ROADWAYS		CAR/JEEP / TAXI		TSR		SC / MC		UN-KNOWN		OTHERS		TOTAL	
	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
CAR	12	8	5	3	1	3	2	0	1	1	0	0	8	13	3	0	0	0	24	6	3	0	59	34
BUS	1	1	1	0	0	1	1	1	0	0	0	0	1	0	1	1	0	1	0	0	0	0	5	5
CYCLE	8	5	1	2	2	1	3	2	1	1	0	1	14	10	1	2	4	3	19	8	0	0	53	35
C.RIKSHAW	1	2	0	1	0	0	0	1	0	0	0	0	1	0	0	0	5	2	3	3	0	0	10	9
HTV	4	5	2	0	0	1	0	0	0	0	0	0	0	3	1	0	0	0	1	0	0	0	8	9
TSR	5	2	2	3	2	0	1	2	0	0	0	0	8	5	0	0	26	0	10	6	10	0	28	18
PASSENGER	0	0	0	0	0	0	7	2	1	0	1	3	0	0	0	0	0	0	0	0	0	0	9	5
PEDESTRIAN	46	45	44	25	22	16	26	28	4	5	3	2	102	88	10	5	63	53	436	395	14	13	770	675
SELF	0	3	5	4	3	3	0	0	1	0	0	0	22	19	10	7	72	68	0	0	6	4	119	108
LGV	3	6	5	0	2	1	0	1	0	0	0	0	1	2	0	0	0	0	7	1	2	0	18	11
SC/MC	78	77	34	26	20	17	28	31	6	6	5	5	87	59	6	2	0	16	262	242	0	6	562	487
OTHER	0	2	1	3	0	0	0	3	0	1	0	0	9	14	0	0	1	1	3	13	0	0	16	37
TOTAL	158	156	100	67	52	43	68	71	14	14	9	11	253	213	32	17	171	144	765	674	35	23	1657	1433

** Other Heavy Vehicles include Trailer/ Container, Tanker, Crane, Steam Roller and Tractor*

Table - 4.3 (a)

VICTIM V/S IMPACTING VEHICLE (TOTAL ACCIDENTS)

VICTIMS	IMPACTING VEHICLE AT FAULT																					
	HTV		LGV		* OTHER HEAVY VEHICLES		BUS		M.BUS		ROADWAYS		CAR/JEEP/ TAXI		TSR		SC / MC		UN-KNOWN		OTHERS		TOTAL	
	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
CAR	53	27	25	12	9	5	18	20	4	3	1	1	130	131	9	9	7	10	63	22	14	5	333	245
BUS	5	4	1	0	0	1	2	5	0	1	0	0	4	3	1	3	1	1	1	0	0	1	15	19
CYCLE	14	10	3	9	5	4	15	8	3	3	2	1	64	38	3	5	44	32	39	20	5	2	197	132
C.RIKSHAW	1	5	7	1	0	0	2	3	1	1	0	0	22	16	1	1	11	7	8	11	1	0	54	45
HTV	12	9	4	0	2	3	1	0	0	0	0	0	3	11	4	0	0	0	3	1	0	0	29	24
TSR	13	9	8	12	2	3	16	7	2	0	4	0	78	71	3	7	6	1	26	25	6	4	164	139
E_RICKSHAW	3	2	4	3	1	0	6	7	1	2	0	0	33	44	3	3	9	6	7	10	3	2	76	79
PASSENGER	0	0	0	0	0	0	38	27	5	2	4	3	0	0	0	0	0	0	0	0	0	0	47	32
PEDESTRIAN	90	87	111	88	43	36	85	110	15	15	7	8	571	518	63	64	511	459	1156	943	67	77	2719	2405
SELF	6	9	10	9	4	4	3	0	1	0	0	0	46	36	36	19	121	122	1	0	17	13	245	212
LGV	7	10	8	5	2	3	2	1	0	0	0	0	12	5	0	0	1	2	15	3	1	1	48	30
SC/MC	172	167	142	118	73	47	105	86	14	25	8	6	884	738	71	46	218	157	736	717	85	50	2508	2157
OTHER	9	13	10	10	3	1	8	3	1	2	1	0	32	43	3	2	4	4	6	13	3	0	80	91
TOTAL	**385**	**352**	**333**	**267**	**144**	**107**	**301**	**277**	**47**	**54**	**27**	**19**	**1879**	**1654**	**197**	**159**	**933**	**801**	**2061**	**1765**	**208**	**155**	**6515**	**5610**

** Other Heavy Vehicles include Trailer/ Container, Tanker, Crane, Steam Roller and Tractor*

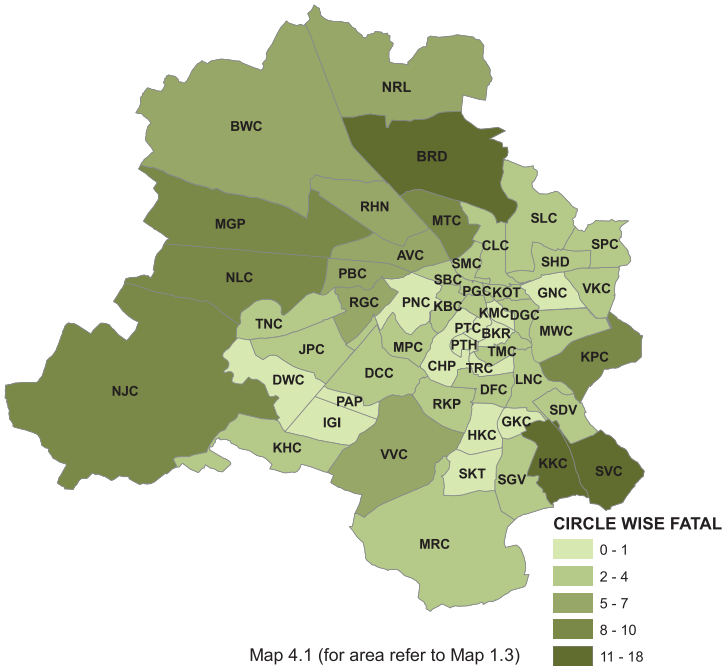
- **Two-wheeler riders have emerged as second most accident-prone victims at 487 in the year 2019 in comparison to 562 in 2018.** These riders were worst hit by HTVs (77) followed by Car/Jeep/Taxis (59) in 2018. A total of 242 riders had been killed by unknown vehicles this year lesser than the number (262) recorded in 2018.
- **Fatal accidents by own vehicles accounted for 108 in 2019 as against 119 in 2018.** Further two-wheeler riders top this category, 68 in 2019 as against 72 in 2018. Cars/jeeps/taxis occupants are the next higher number of victims of fatal accidents due to own vehicle.
- There has been a decrease in **'Cyclist'** fatal accident during the year 2019 (35) over 2018 (53). These accidents have been caused by Cars/taxis followed by HTVs,Buses and Unknown Vehicles (Table 4.3).

Map 4.1 (HTVs), Map 4.2 (Buses), Map 4.3 (Cars) shows the traffic circle wise regions with respect to concentration of offending vehicle wise fatal accidents.

- There are more fatal a**ccidents by trucks in Burari, Sarita Vihar, Kalkaji, Kalyanpuri, Mangolpuri, Model town, Najafgarh and Nangloi Circles.** (Map 4.1).
- More fatality occurred due to **Buses in Vivek vihar, Seemapuri, Kalyanpuri and Civil lines Circles** (Map 4.2).

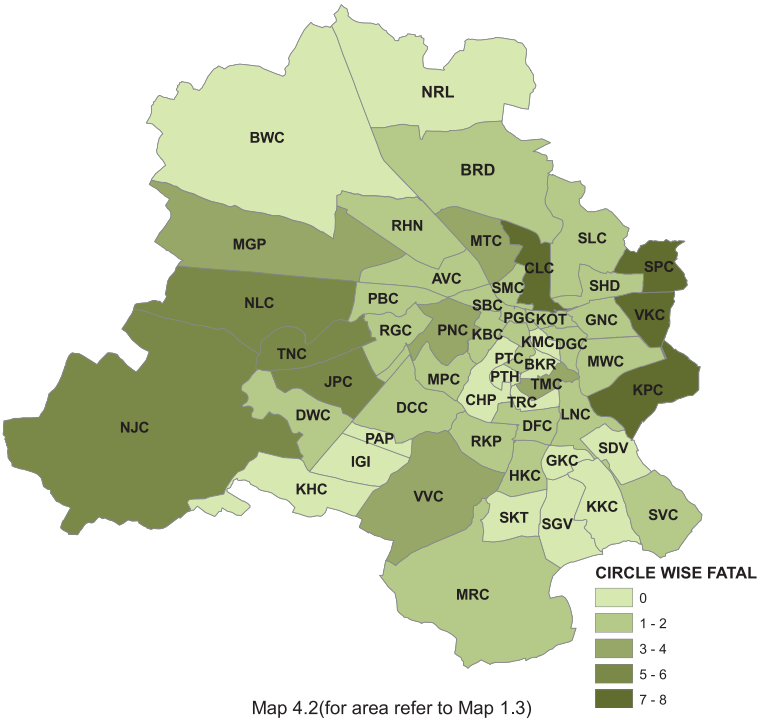
TOP CIRCLES IN FATAL ACCIDENTS

HTVs FATAL ACCIDENTS



Map 4.1 (for area refer to Map 1.3)

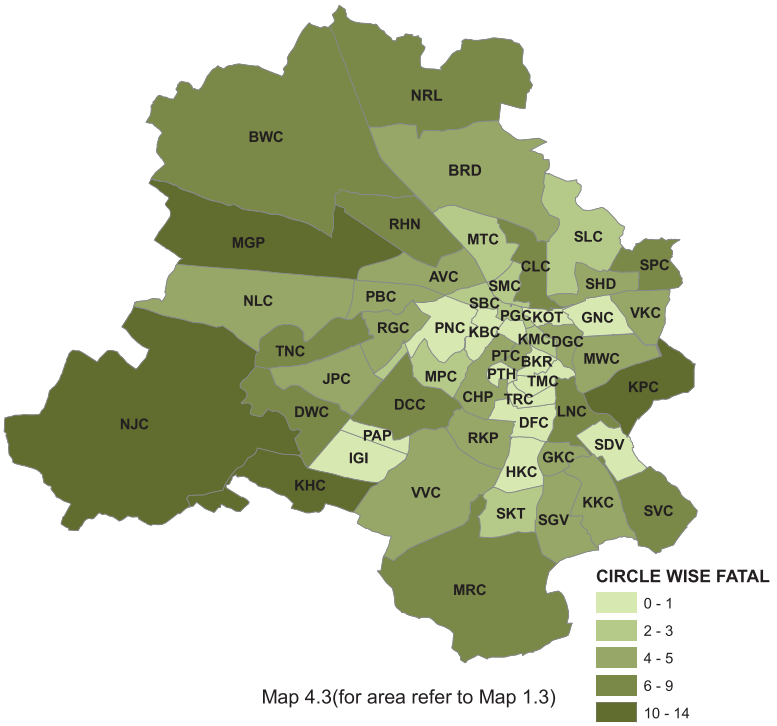
BUSES FATAL ACCIDENTS



Map 4.2(for area refer to Map 1.3)

- In **Kalyanpuri, Mangolpuri, Najafgarh, Kapashera and Mehrauli circles, cars** were the major offending vehicles (Map 4.3).
- More vehicles registered in **Delhi were involved in fatal accidents (67.13% of the vehicles with full registration details) followed by Haryana registered vehicles (20.5% of the vehicles with full registration details)** (Table 4.4). This scenario is similar to that of year 2018.
- In case of **simple accidents, vehicles registered in Delhi constituted 76.10%** of all known state vehicles while Haryana number plate vehicles constituted 14.95%. Uttar Pradesh number vehicles caused around 7.19% fatal and 5.9% simple accidents of known state vehicles. The numbers of accidents caused by other state vehicles is insignificant from analysis point of view.

CARS FATAL ACCIDENTS



Map 4.3(for area refer to Map 1.3)

- Among the vehicles registered in other state involved in accidents in **Delhi, cars were involved in maximum number of fatal accidents followed by two wheelers, Buses, and LGVs** (Table 4.5). The cars/jeeps registered in Delhi accounted for 142 (66.66%) of all fatal accidents in the city.
- **Among HTVs, Haryana registered vehicles were involved in 76 (43.67%) fatal accidents of all known state vehicles.**
- **In the bus category, 65 (67.7% of the vehicles with full registration details) Delhi registered buses were involved in causing fatal accidents in 2019** (Table 4.5).

Table – 4.4

ACCIDENTS CAUSED BY STATE-WISE REGISTERED VEHICLES - 2019

STATE	NON-INJURY ACCIDENTS	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
BIHAR	0	3	0	3	3	0
CHANDIGARH	0	4	2	6	6	2
CHHATTISGARH	0	0	1	1	1	3
DELHI	33	1949	429	2411	2491	442
GUJARAT	0	2	1	3	2	1
HARYANA	12	383	131	526	508	134
HIMACHAL PRADESH	0	2	0	2	4	0
JAMMU AND KASHMIR	0	1	1	2	1	1
KARNATAKA	0	2	0	2	2	0
KERALA	0	1	0	1	1	0
MADHYA PRADESH	0	2	1	3	2	1
MAHARASHTRA	0	2	0	2	4	0
NAGALAND	0	5	2	7	8	2
ODISHA	0	0	1	1	2	2
PUNJAB	0	18	4	22	21	4
RAJASTHAN	1	25	16	42	33	16
TAMIL NADU	0	1	0	1	1	0
TELANGANA	0	1	0	1	2	0
UTTAR PRADESH	4	152	46	202	193	47
UTTARAKHAND	0	8	4	12	9	4
UNKNOWN STATE	2	1564	794	2360	1858	804
TOTAL	**52**	**4125**	**1433**	**5610**	**5152**	**1463**

Table – 4.5

STATE WISE VEHICLE AT FAULT (FATAL ACCIDENTS) – 2019

STATE	VEHICLE AT FAULT								
	TWO WHEELERS	TSR	CAR/TAXI	BUSES	LGVs	HTVs	UNKNOWN VEHICLE	OTHER VEHICLE	TOTAL
CHANDIGARH	0	0	2	0	0	0	0	0	2
CHHATTISGARH	0	0	0	0	0	1	0	0	1
DELHI	105	12	142	65	51	35	0	19	429
GUJARAT	0	0	0	0	0	1	0	0	1
HARYANA	5	0	30	6	7	76	0	7	131
JAMMU AND KASHMIR	0	0	0	0	0	1	0	0	1
MADHYA PRADESH	0	0	0	0	1	0	0	0	1
NAGALAND	0	0	0	0	0	1	0	1	2
ODISHA	0	0	0	0	0	1	0	0	1
PUNJAB	0	0	1	0	0	3	0	0	4
RAJASTHAN	1	0	1	1	0	12	0	1	16
UTTAR PRADESH	8	1	7	10	3	11	0	6	46
UTTARAKHAND	0	0	1	1	0	2	0	0	4
UNKNOWN STATE	25	4	29	13	5	30	674	14	794
TOTAL	**144**	**17**	**213**	**96**	**67**	**174**	**674**	**48**	**1433**

On analyzing the fatal accident category of the offending vehicles belonging to Delhi state, it is found that private cars were responsible for most of the fatal accidents (142 i.e. 33.10%) followed by scooters/motor cycles (105 i.e. 24.47%) and Buses (65 i.e.15.15%). (Table 4.5)

Table – 4.6

STATE V/S VEHICLE AT FAULT (ALL ACCIDENTS) – 2019

STATE	VEHICLE AT FAULT								
	TWO WHEELERS	TSR	CAR/TAXI	BUSES	LGVs	HTVs	UNKNOWN VEHICLES	OTHER VEHICLES	TOTAL
BIHAR	0	0	3	0	0	0	0	0	3
CHANDIGARH	0	0	5	1	0	0	0	0	6
CHHATTISGARH	0	0	0	0	0	1	0	0	1
DELHI	571	109	1055	258	228	79	1	110	2411
GUJARAT	0	0	1	0	0	2	0	0	3
HARYANA	25	6	254	19	16	183	0	23	526
HIMACHAL PRADESH	0	0	1	0	0	1	0	0	2
JAMMU AND KASHMIR	0	0	1	0	0	1	0	0	2
KARNATAKA	0	0	1	0	0	1	0	0	2
KERALA	1	0	0	0	0	0	0	0	1
MADHYA PRADESH	0	0	1	0	1	1	0	0	3
MAHARASHTRA	2	0	0	0	0	0	0	0	2
NAGALAND	0	0	0	0	0	6	0	1	7
ODISHA	0	0	0	0	0	1	0	0	1
PUNJAB	3	0	9	1	0	8	0	1	22
RAJASTHAN	2	0	8	4	1	22	0	5	42
TAMIL NADU	1	0	0	0	0	0	0	0	1
TELANGANA	0	0	0	0	0	1	0	0	1
UTTAR PRADESH	31	8	87	25	7	28	0	16	202
UTTARAKHAND	1	0	5	3	0	3	0	0	12
UNKNOWN STATE	164	36	223	39	14	53	1764	67	2360
TOTAL	**801**	**159**	**1654**	**350**	**267**	**391**	**1765**	**223**	**5610**

- Among the category of total accident caused by Delhi registered vehicles, maximum accidents were committed by private cars (1055 viz. 43.75%) followed by scooters/ motor cycles (571 viz. 28.68%). **(Table 4.6) A total of 148 'Self' accidents were caused by Delhi registered vehicles.**

442 pedestrians were killed by unknown state vehicles which accounted for 65.57% of all pedestrians killed in the year 2019 (Table 4.7).

- About 25.37% pedestrians were killed by vehicles with Delhi registration number followed by 5.34% by Haryana numbered vehicles (Table 4.7).

- In the category of two-wheeler victims, 59.54% two-wheeler rider victims were killed by unknown state vehicles, 21.97% killed by Delhi registered vehicles and 11.49% were killed by Haryana registered vehicles.
- Similar trends as described above were observed in case of total accidents caused by vehicles of different states in Delhi (Table 4.8).
- **In case of accident by vehicles registered in Haryana, 42.74% victims of fatal accidents were two-wheeler riders and 27.48% were pedestrians. (Table 4.7)**

Haryana number vehicles were responsible for killing and injuring two wheelers more than pedestrians. This is opposite for other state vehicles.

- Most victims of the accidents caused by the vehicles registered with Delhi state were pedestrians (171 i.e. 39.86%) followed by scooter/motor cyclists (107 i.e. 24.94%). Delhi registered Vehicles were involved in 83 'Self' fatal accidents. (Table 4.7)

Table – 4.7

STATE V/S VICTIM (FATAL ACCIDENTS) – 2019

STATE	VICTIMS											
	CYCLIST	CYCLE RICKSHAW	E-RICKSHAW	SCOOTERIST/MC	TSR	CAR/TAXI	BUSES	PEDESTRIANS	SELF	BUS PASSENGERS	OTHERS	TOTAL
CHANDIGARH	0	0	0	1	0	0	0	0	1	0	0	2
CHHATTISGARH	0	0	0	0	0	1	0	0	0	0	0	1
DELHI	16	3	9	107	5	16	3	171	83	2	14	429
GUJARAT	0	0	0	1	0	0	0	0	0	0	0	1
HARYANA	7	1	1	56	3	7	1	36	9	0	10	131
JAMMU AND KASHMIR	0	0	0	0	0	0	0	0	1	0	0	1
MADHYA PRADESH	0	0	0	1	0	0	0	0	0	0	0	1
NAGALAND	0	0	0	0	0	0	0	1	0	0	1	2
ODISHA	0	0	0	0	1	0	0	0	0	0	0	1
PUNJAB	0	0	0	1	0	0	0	3	0	0	0	4
RAJASTHAN	0	0	0	7	0	2	0	6	1	0	0	16
UTTAR PRADESH	2	0	0	21	1	1	0	14	1	1	5	46
UTTARAKHAND	0	0	0	2	1	0	0	1	0	0	0	4
UNKNOWN STATE	10	5	4	290	7	8	1	442	13	2	12	794
TOTAL	**35**	**9**	**14**	**487**	**18**	**35**	**5**	**674**	**109**	**5**	**42**	**1433**

Table – 4.8

STATE V/S VICTIM (TOTAL ACCIDENTS) – 2018

STATE	VICTIMS											
	CYCLIST	CYCLE RICKSHAW	E-RICKSHAW	SCOOTERIST/MC	TSR	CAR/TAXI	BUSES	PEDETSTRIANS	SELF	BUS PASSENGERS	OTHERS	TOTAL
BIHAR	0	0	0	2	0	0	0	1	0	0	0	3
CHANDIGARH	0	0	0	4	0	1	0	0	1	0	0	6
CHHATTISGARH	0	0	0	0	0	1	0	0	0	0	0	1
DELHI	78	21	51	844	65	160	12	953	148	21	58	2411
GUJARAT	0	0	0	2	0	0	0	1	0	0	0	3
HARYANA	15	4	6	249	14	52	3	130	25	0	28	526
HIMACHAL PRADESH	0	0	0	2	0	0	0	0	0	0	0	2
JAMMU AND KASHMIR	0	0	0	1	0	0	0	0	1	0	0	2
KARNATAKA	0	0	0	1	0	1	0	0	0	0	0	2
KERALA	0	0	0	1	0	0	0	0	0	0	0	1
MADHYA PRADESH	0	0	0	2	0	0	0	1	0	0	0	3
MAHARASHTRA	0	0	0	0	0	0	0	1	1	0	0	2
NAGALAND	0	0	0	1	1	0	1	3	0	0	1	7
ODISHA	0	0	0	0	1	0	0	0	0	0	0	1
PUNJAB	1	0	1	8	2	1	0	6	1	0	2	22
RAJASTHAN	1	0	0	20	0	5	0	13	1	0	2	42
TAMIL NADU	0	0	0	1	0	0	0	0	0	0	0	1
TELANGANA	0	0	0	1	0	0	0	0	0	0	0	1
UTTAR PRADESH	6	2	4	77	15	9	1	72	7	1	8	202
UTTARAKHAND	1	0	0	6	1	1	1	2	0	0	0	12
UNKNOWN STATE	30	18	17	935	41	37	1	1212	36	10	23	2360
TOTAL	**132**	**45**	**79**	**2157**	**140**	**268**	**19**	**2395**	**221**	**32**	**122**	**5610**

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CHAPTER 5 TEMPORAL TRENDS

Human movement is influenced by the time, day and month of the year. It affects the vehicular movement and the number of accidents occurring at different times of the day, days of the week and months of the year.

A comparative analysis of the temporal trends of different types of accidents, hour wise, day wise and month wise reveals the following important /significant conclusions:

- Table 5.1 depicts the comparative figures of severity of accidents by the days of the week. In case of fatal accidents, it has been observed that total fatal accidents in 2019 have decreased in comparison to year 2018.
- **Accidents on each weekday decreased in 2019 in the comparison to year 2018.**
- **The number of fatal accidents were minimum on Wednesday (182) in 2019 as well as 2018 (204).**

Time wise analysis of fatal accidents, in figure 5.1(a) reveals accidents increasing gradually from 1800 hrs. (52) onwards to peak by 0000 hrs. (116), the highest figure of fatal accidents.

Table - 5.1

ACCIDENT TREND ON WEEKDAYS

TYPE OF ACCIDENT	SUNDAY		MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDAY		SATURDAY		TOTAL	
	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
FATAL	254	219	248	199	259	212	204	182	229	211	214	200	249	210	1657	1433
NON-FATAL	655	604	746	610	699	580	677	598	666	593	703	609	712	583	4858	4177
TOTAL	**909**	**823**	**994**	**809**	**958**	**792**	**881**	**780**	**895**	**804**	**917**	**809**	**961**	**793**	**6515**	**5610**

- Thereafter, accidents start decreasing gradually till 0800 hrs. (48). The trend continues to remain low till 1700 hrs. (46). From 1100 hrs. to 1700 hrs., it remains low with some variations and again starts rising after 1700 hrs. The same trend persisted in the year 2018 also with marginal variations. (Table 5.4)
- The reason for maximum number of fatal accidents between 2000 hrs to 0200 hrs is that, during this period, the no-entry time restrictions on commercial vehicles are lifted.
- It also overlaps with the evening peak hours of traffic. There is a sudden surge in different categories of vehicles on the roads which creates the conditions for collisions, knock downs etc.
- Poor light conditions on various roads and streets also contribute in causing more accidents.

- Drunken driving is obviously another big factor in causing more accidents.
- After 0100 hrs, fall in volume of pedestrians, slow moving vehicles and non-commercial traffic on road and lesser movements of commercial traffic leads to minimum number of accidents after 0200 hrs.

Figure 5.1

TIME-WISE FATAL ACCIDENTS - 2019

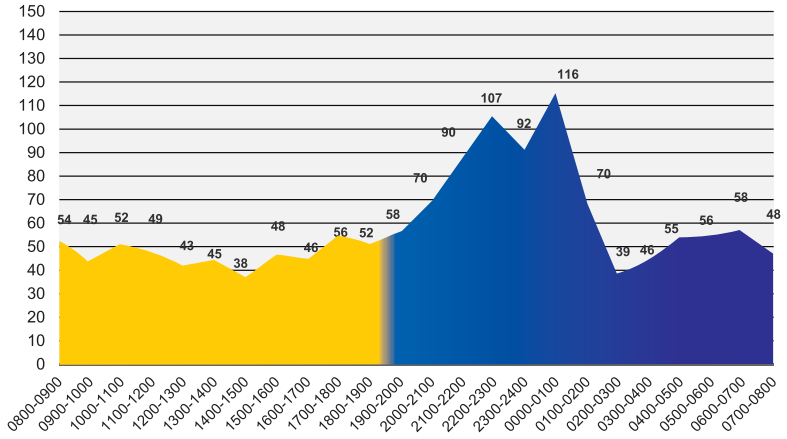
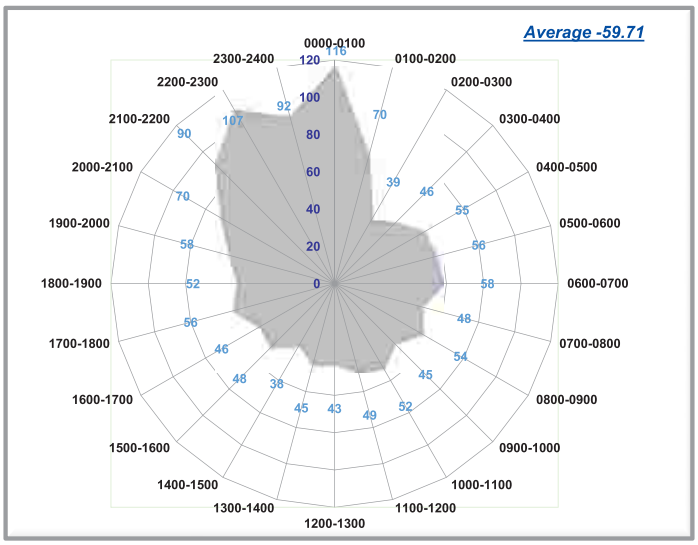


Figure – 5.2

TIME-WISE FATAL ACCIDENTS IN 2019 (1433)



In 2019, maximum fatal accidents occurred in January (171), March (137) and February (128) while least occurred in August (91), December (91) and September (92).

Table- 5.2

MONTH WISE TRENDS FATAL OF ACCIDENTS IN- 2018 & 2019

MONTH	FATAL		INJURY		NON-INJURY		TOTAL	
	2018	2019	2018	2019	2018	2019	2018	2019
JANUARY	125	171	381	347	7	4	513	522
FEBRUARY	134	128	378	332	4	5	516	465
MARCH	168	137	407	375	7	4	582	516
APRIL	157	123	430	319	5	4	592	446
MAY	123	126	384	351	8	4	515	481
JUNE	128	126	380	359	6	4	514	489
JULY	124	118	418	347	6	5	548	470
AUGUST	141	91	416	326	7	3	564	420
SEPTEMBER	142	92	370	329	6	5	518	426
OCTOBER	163	120	435	331	8	4	606	455
NOVEMBER	131	110	374	356	6	4	511	470
DECEMBER	121	91	410	353	5	6	536	450
TOTAL	**1657**	**1433**	**4783**	**4125**	**75**	**52**	**6515**	**5610**

Table – 5.3

ACCIDENTS CLASSIFIED ACCORDING TO DAY AND NIGHT

YEAR	FATAL ACCIDENTS		INJURY ACCIDENTS		NON-INJURY ACCIDENTS		TOTAL ACCIDENTS	
	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
1999	967	740	3652	2862	289	223	4908	3825
2000	894	705	4076	2759	355	256	5325	3720
2001	876	601	3761	2516	290	216	4927	3333
2002	853	563	3996	1891	265	165	5114	2619
2003	924	605	3937	1958	251	173	5112	2736
2004	1026	657	4042	1831	299	219	5367	2707
2005	1042	646	4342	1891	280	166	5664	2703
2006	1100	818	4151	2105	195	139	5446	3062
2007	1045	858	3604	2175	260	263	4909	3296
2008	882	825	3559	1945	151	201	4592	2971
2009	1143	1042	3207	1713	75	51	4425	2806
2010	1044	1041	3098	1811	31	31	4173	2883
2011	1040	1005	3271	1865	33	34	4344	2904
2012	886	906	2973	1814	54	60	3913	2780
2013	841	937	3600	2015	76	97	4517	3049
2014	804	825	4266	2519	102	107	5172	3451
2015	784	798	3895	2448	66	94	4745	3340
2016	718	830	3512	2186	61	68	4291	3084
2017	720	845	3056	1961	46	45	3822	2851
2018	743	914	2823	1960	35	40	3601	2914
2019	**656**	**777**	**2474**	**1651**	**23**	**29**	**3153**	**2457**

DAY HOURS: 8AM TO 9PM.

Accident classifications according to day and night shows that in 2019, 656 fatal accidents occurred during day time whereas 777 occurred during night time (Table 5.3).

- During 2018, there were 743 fatal accidents during day time and 914 during night time. Fatal accidents in day time were uniformly higher than those in night time in all the years from 1999 to 2011. Since 2012, the number of fatal accidents recorded during day were less than during night. This shows direct co-relation between visible and effective police presence during the day. In case of simple accidents, however, the day time figures are higher than night time figures.

Analysis of Time vis-a-vis Victim of fatal accidents indicates, most pedestrians were involved in fatal accidents from 1800 – 0100 hrs.

- Time between 2100-0100 is the most vulnerable for occurrence of accidents involving scooterists / motor cyclists. Most 'Self' induced accidents occur during the time slot of 2200-0400 hrs. In case of cyclists, the most vulnerable time is 0500-0900 and 2100- 2300 hrs. (Table 5.5).

Table 5.6 shows the distribution of impacting vehicles at fault (VAF) with the time slots.

- From the view point of v**ehicles at fault, 674 (47.03%) vehicles were unknown** which implies they were hit and run cases, as against 765 (46.16%) in 2018. The accidents by 'unknown vehicles' have been recorded at all hours though the number is higher from 2000 – 0100 hrs. The high rate of hit and run accident indicates non-reporting of accused vehicle and the apathy of general public/eye witnesses to report the accidents.

Table 5.4

ACCIDENTS CLASSIFIED ACCORDING TO THE TIME OF OCCURRENCE

S.NO.	TIME SLOT	SIMPLE ACCIDENTS					FATAL ACCIDENTS				
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1	0000-0100	292	235	222	214	188	111	92	92	121	116
2	0100-0200	174	177	132	141	134	73	73	71	88	70
3	0200-0300	127	118	100	123	94	42	77	55	50	39
4	0300-0400	88	77	91	78	70	43	34	57	35	46
5	0400-0500	95	82	110	88	69	50	52	45	54	55
6	0500-0600	141	116	115	105	92	55	62	53	59	56
7	0600-0700	156	159	129	143	126	69	62	60	77	58
8	0700-0800	241	200	172	170	159	60	53	60	69	48
9	0800-0900	241	238	195	179	162	68	61	55	54	54
10	0900-1000	300	235	224	200	178	51	50	68	71	45
11	1000-1100	273	246	208	196	180	62	44	42	64	52
12	1100-1200	279	236	234	195	153	44	39	45	68	49
13	1200-1300	274	261	230	212	181	58	58	48	50	43
14	1300-1400	269	272	192	225	192	52	45	55	43	45
15	1400-1500	293	287	258	217	217	70	58	43	40	38
16	1500-1600	328	283	222	208	178	51	47	51	62	48
17	1600-1700	322	280	227	218	194	40	56	57	42	46
18	1700-1800	293	266	242	212	184	62	50	56	50	56
19	1800-1900	330	299	277	257	204	64	50	49	53	52
20	1900-2000	349	298	255	238	246	81	66	78	64	58
21	2000-2100	410	372	338	301	228	81	94	73	82	70
22	2100-2200	442	412	323	319	274	95	99	117	103	90
23	2200-2300	419	359	347	327	246	120	114	119	138	107
24	2300-2400	367	319	265	292	228	80	112	116	120	92
TOTAL		**6503**	**5827**	**5108**	**4858**	**4177**	**1582**	**1548**	**1565**	**1657**	**1433**

Table-5.5

TIME Vs VICTIM (FATAL ACCIDENTS) – 2019

TIMESLOT	VICTIMS											
	CYCLIST	CYCLE RICKSHAW	E-RICKSHAW	SCOOTERISTS/MC	TSR	CAR/TAXI	BUSES	PEDESTRIANS	SELF	BUS PASSENGERS	OTHERS	TOTAL
0000-0100	3	0	0	35	4	5	0	58	8	0	3	116
0100-0200	0	0	0	29	4	4	0	24	5	0	4	70
0200-0300	0	0	1	18	0	0	0	14	4	0	2	39
0300-0400	1	0	0	12	0	3	1	15	10	0	4	46
0400-0500	2	1	0	19	3	4	0	15	8	0	3	55
0500-0600	4	0	0	9	1	1	0	27	8	0	6	56
0600-0700	2	1	0	16	0	2	0	31	3	0	3	58
0700-0800	3	2	1	12	1	0	0	26	2	0	1	48
0800-0900	2	0	1	16	1	0	0	31	2	0	1	54
0900-1000	1	1	1	12	0	0	0	24	3	2	1	45
1000-1100	0	0	0	11	0	1	0	35	3	0	2	52
1100-1200	1	0	0	23	0	1	1	23	0	0	0	49
1200-1300	3	0	2	18	1	0	0	16	3	0	0	43
1300-1400	0	0	1	15	0	0	0	26	2	1	0	45
1400-1500	0	0	1	14	0	0	0	18	5	0	0	38
1500-1600	3	0	0	18	2	2	0	16	6	1	0	48
1600-1700	0	0	1	19	0	0	1	22	1	0	2	46
1700-1800	1	0	2	25	0	0	0	25	3	0	0	56
1800-1900	1	0	0	10	1	1	1	30	5	0	3	52
1900-2000	1	0	2	17	0	2	0	31	5	0	0	58
2000-2100	1	1	0	18	0	1	0	44	2	1	2	70
2100-2200	2	1	0	39	0	1	0	42	4	0	1	90
2200-2300	3	0	0	44	0	2	0	43	12	0	3	107
2300-2400	1	2	1	38	0	5	1	38	5	0	1	92
TOTAL	**35**	**9**	**14**	**487**	**18**	**35**	**5**	**674**	**109**	**5**	**42**	**1433**

Table-5.6

TIME Vs VEHICLE AT FAULT (FATAL ACCIENTS) – 2019

TIME SLOT	VEHICLE AT FAULT								
	TWO WHEELERS	TSR	CAR/TAXI	BUSES	LGVs	HTVs	UNKNOWN VEHICLES	OTHER VEHICLES	TOTAL
0000-0100	6	0	16	0	3	17	69	5	116
0100-0200	7	1	13	0	4	8	37	0	70
0200-0300	3	0	2	2	2	7	22	1	39
0300-0400	7	1	7	0	4	7	19	1	46
0400-0500	3	2	8	0	3	11	27	1	55
0500-0600	6	1	9	2	2	9	26	1	56
0600-0700	5	2	10	6	3	7	25	0	58
0700-0800	3	1	8	6	6	10	13	1	48
0800-0900	6	0	12	7	1	4	20	4	54
0900-1000	7	0	7	5	3	4	18	1	45
1000-1100	4	0	6	11	3	5	21	2	52
1100-1200	1	0	6	9	3	6	23	1	49
1200-1300	4	1	6	6	1	9	13	3	43
1300-1400	6	0	8	5	3	4	18	1	45
1400-1500	5	0	8	2	1	6	14	2	38
1500-1600	4	0	15	7	5	2	11	4	48
1600-1700	1	1	5	0	2	7	29	1	46
1700-1800	7	2	10	7	4	7	18	1	56
1800-1900	9	0	8	6	1	1	24	3	52
1900-2000	10	0	7	5	2	2	28	4	58
2000-2100	7	1	6	4	1	6	44	1	70
2100-2200	12	1	11	3	3	3	52	5	90
2200-2300	12	3	15	3	3	13	57	1	107
2300-2400	9	0	10	0	4	19	46	4	92
TOTAL	**144**	**17**	**213**	**96**	**67**	**174**	**674**	**48**	**1433**

- **HTVs committed fatal accidents** at all hours. However, number of accidents was highest between 2200 and 0100 hrs.
- **Cars were involved in fatal accidents at all hours of the day and night with higher numbers during night hours.** Cars caused most accidents in the time period between 2100- 0200 hrs.
- Buses caused most fatal accidents from 0600 – 1400 and 1700 – 2300hrs. **Two-wheeler riders caused most accidents from 1900- 2400 hrs.** (Table 5.6).

*****

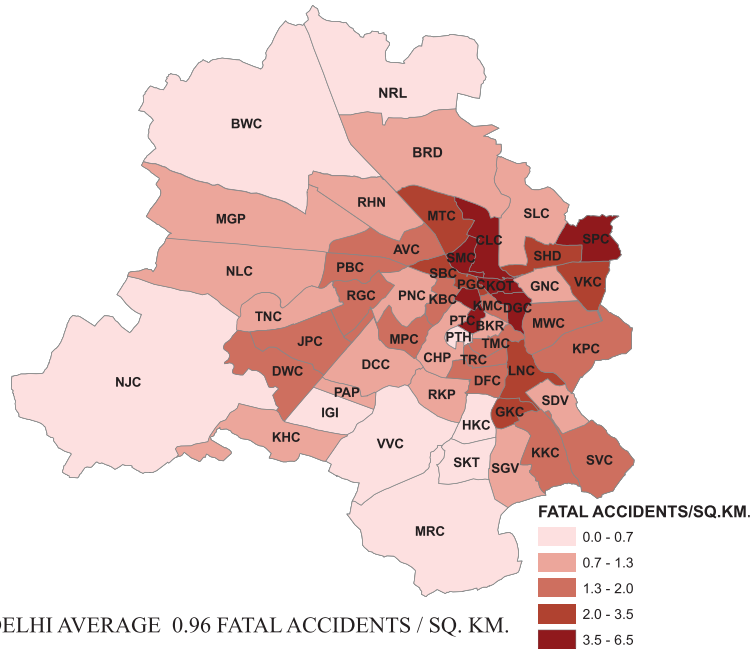
CHAPTER 6 SPATIAL TRENDS

The spatial distribution is uneven. The concentration of accidents is high in densely populated areas. Fatal accidents are more likely in areas where there is a dangerous mix of vulnerable road users and heavy and high-speed vehicles.

- The frequency of accidents is closely related to the concentration of human population. **High density regions with more population, more vehicles, more dense network of roads have more probability of collisions/ accidents. Thus, density of accidents was high in Central and Eastern parts of Delhi.** Density of Fatal accidents is maximum in Seemapuri, Civil lines, Kotwali, Sabzimandi and Daryaganj Circles, while total accidents were more in Shahdara, Kotwali and Paharganj followed by Sabzi mandi, Civil lines, Punjabi bagh, Seemapuri Circles, Ashok vihar, Defence colony and Greater Kailash Circles.
- In terms of total road accidents in 2019, **West Distt. (742) was the highest Accident Prone District** of all Delhi districts followed by **North-West Distt. (741),** South East Distt. (635) and Outer District (603). In 2018, **West Distt. (880)** remained the highest accident prone district and was followed by **North-West (803)**, South East (718) and Outer Districts (659) (Table 6.1).
- **Burari (282), Mangol Puri (247), Nangloi (220), Rohini (190), Dwarka (177) and Ashok Vihar (176)** circles had recorded the highest number of total accidents in Delhi in the year 2019.
- **On the other hand, New Delhi District (179) and Central District (188) registered the lowest incidents of total road accidents** in Delhi during 2019 (Table 6.1).
- **In fatal accidents,** the most Accident-Prone districts were **North-West (211), West (176), South-East (155), Outer (146),** and East Districts (132) in the year 2019, as compared to **North-West (265), West (248), Outer (166), South-East (146)** and East Districts (132) in the year 2018 (Table 6.1).
- **Burari (93), Nangloi (59), Mangolpuri (58) Kalyanpuri (57), Bawana (56), and Civil Lines (54),** circles recorded the highest number of fatal accidents in 2019 (Table 6.2).
- **Maps 6.1 and 6.2** show the traffic circle wise density of fatal and total accidents respectively.

Map 6.1

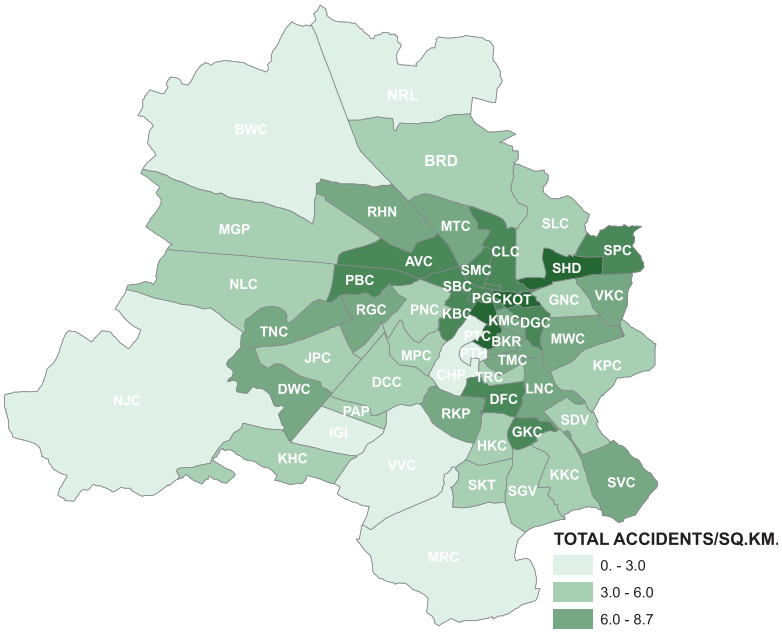
FATAL ACCIDENTS IN DENSITY WISE



DELHI AVERAGE 0.96 FATAL ACCIDENTS / SQ. KM.

Map 6.2

TOTAL ACCIDENTS IN DENSITY WISE



DELHI AVERAGE 3.78 TOTAL ACCIDENTS / SQ. KM.

TABLE - 6.1

ACCIDENT STATISTICS FOR TRAFFIC DISTRICTS

S. NO.	TRAFFIC DISTRICTS	FATAL ACCIDENTS					INJURY ACCIDENTS					NON-INJURY ACCIDENTS					TOTAL ACCIDENTS				
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1.	CENTRAL	64	55	55	58	50	264	207	184	157	136	6	7	06	4	2	334	269	245	219	188
2.	DWARKA	0	0	0	112	69	0	0	0	254	240	0	0	0	6	6	0	0	0	372	315
3.	NEW DELHI	60	57	65	69	43	206	191	176	149	128	21	17	13	6	8	287	265	254	224	179
4.	EAST	130	96	131	132	132	643	581	462	407	293	26	17	14	8	8	799	694	607	547	433
5.	NORTH EAST	115	100	91	126	113	548	511	468	442	372	2	1	01	3	2	665	612	560	571	487
6.	NORTH WEST	252	282	284	265	211	819	684	567	535	528	16	15	08	03	2	1087	981	859	803	741
7.	NORTH	98	105	79	108	123	346	327	329	295	266	3	1	04	01	1	447	433	412	404	390
8.	OUTER	178	155	169	166	146	522	528	492	491	453	1	0	0	02	4	701	683	661	659	603
9.	SOUTH	117	131	103	119	109	631	499	431	510	393	12	15	12	05	9	760	645	546	634	511
10.	SOUTH-EAST	212	200	199	146	155	1035	898	784	542	476	56	40	24	30	4	1303	1138	1007	718	635
11.	SOUTH WEST	157	163	171	108	106	586	574	518	372	280	9	12	04	04	0	752	749	693	484	386
12.	WEST	199	204	218	248	176	743	698	606	629	560	8	4	05	03	6	950	906	829	880	742
TOTAL		**1582**	**1548**	**1565**	**1657**	**1433**	**6343**	**5698**	**5017**	**4783**	**4125**	**160**	**129**	**91**	**75**	**52**	**8085**	**7375**	**6673**	**6515**	**5610**

TABLE - 6.2
ACCIDENTS CLASSIFIED ACCORDING TO TRAFFIC CIRCLES

S.NO	TRAFFIC CIRCLE	FATAL ACCIDENTS					INJURY ACCIDENTS					NON-INJURY ACCIDENTS					TOTAL				
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1.	ASHOK VIHAR	39	49	42	48	40	203	122	92	132	136	1	4	2	2	0	243	175	236	182	176
2.	BARAKHAMBA ROAD	5	1	4	4	3	29	26	29	20	23	4	2	3	3	4	38	29	36	27	30
3.	BURARI	81	106	133	104	93	241	244	199	191	188	3	0	2	0	1	325	350	334	295	282
4.	BAWANA	78	54	66	78	56	131	115	131	111	110	0	0	0	1	0	209	169	197	190	166
5.	CHANAKYA PURI	22	14	15	19	11	30	24	27	29	29	3	1	0	0	0	55	39	42	48	40
6.	CIVIL LINES	39	54	36	55	54	111	132	120	118	99	1	0	2	0	0	151	186	158	173	153
7.	DELHI CANTT.	41	45	28	38	25	120	87	66	74	68	0	3	1	4	3	161	135	95	116	96
8.	DARYA GANJ	24	28	30	28	22	92	76	65	56	43	3	0	2	1	1	119	104	97	85	66
9.	DEFENCE COLONY	19	22	21	21	20	102	85	97	101	83	3	1	3	3	3	124	108	121	125	106
10.	DWARKA	42	25	51	54	36	191	200	162	154	138	8	7	1	2	3	241	232	214	210	177
11.	GANDHI NAGAR	13	17	13	17	13	119	86	91	61	37	2	0	3	1	3	134	103	107	79	53
12.	GREATER KAILASH	17	10	11	7	16	77	70	55	51	51	6	2	0	0	0	100	82	66	58	67
13.	HAUZ KHAS	13	6	14	13	8	88	47	58	61	32	1	3	0	0	1	102	56	72	74	41
14.	I G I AIRPORT	7	12	8	8	1	35	37	21	9	23	1	0	0	0	0	43	49	29	17	24
15.	JANAK PURI	33	40	36	33	31	185	145	131	120	94	5	0	2	0	0	223	185	169	153	125
16.	KAROL BAGH	17	9	10	13	11	91	79	60	45	51	2	3	3	0	0	110	91	73	58	62
17.	KALKAJI	37	34	39	30	38	207	155	124	132	79	11	9	3	5	0	255	198	166	167	117
18.	KOTWALI	25	19	16	18	26	65	51	58	47	61	2	0	1	0	1	92	70	75	65	88
19.	KAMLA MARKET	8	10	7	10	6	30	26	22	27	16	0	0	0	0	1	38	36	29	37	23
20.	KALYAN PURI	59	35	63	56	57	246	212	164	161	99	16	6	5	5	2	321	253	232	222	158
21.	KAPAS HERA	23	29	25	21	29	77	93	72	69	66	0	2	2	0	0	100	124	99	90	95
22.	LAJPAT NAGAR	38	37	35	29	33	122	114	87	80	73	10	8	7	10	1	170	159	129	119	107
23.	MEHRAULI	27	31	18	26	21	130	130	84	93	77	1	1	0	0	0	158	162	102	119	98
24.	MODEL TOWN	51	44	44	52	41	208	179	162	128	109	11	11	4	1	1	270	234	210	181	151
25.	MAYA PURI	18	24	31	31	19	104	83	83	71	55	0	0	1	1	3	122	107	115	103	77
26.	MANDAWALI	24	11	23	27	31	146	131	108	96	81	1	1	3	1	3	171	143	134	124	115
27.	MANGOL PURI	55	57	59	56	58	215	237	229	235	188	1	0	0	0	1	271	294	288	291	247
28.	NAJAF GARH	55	68	52	48	50	159	138	125	145	106	1	1	0	3	0	215	207	177	196	156
29.	NANGLOI	59	42	63	88	59	168	192	171	167	160	0	3	1	1	1	227	237	235	256	220
30.	NARELA	81	83	65	61	37	167	139	114	84	95	1	0	0	0	0	249	222	179	145	132
31.	PALAM AIRPORT	5	8	10	12	7	23	21	16	17	11	3	1	1	0	0	31	30	27	29	18
32.	PUNJABI BAGH	39	44	42	33	24	94	114	118	133	119	1	0	0	1	2	134	158	160	167	145
33.	PAHAR GANJ	15	8	8	7	11	51	26	37	29	26	1	4	1	3	0	67	38	46	39	37
34.	PT. STREET	20	20	15	20	13	71	53	50	43	40	7	4	3	0	3	98	77	68	63	56
35.	PT. HOUSE	1	2	2	3	0	7	6	4	5	1	1	0	0	1	0	9	8	6	9	1
36.	PATEL NAGAR	21	26	22	32	19	98	87	56	59	66	1	0	1	0	0	120	113	79	91	85
37.	R.K. PURAM	18	20	14	19	18	168	117	111	81	74	4	2	3	0	4	190	139	128	100	96
38.	RAJOURI GARDEN	29	28	24	31	24	94	77	47	79	66	1	1	0	0	0	124	106	71	110	90
39.	ROHINI	45	44	44	32	32	176	176	132	145	155	0	0	0	1	3	221	220	176	178	190
40.	SADAR BAZAR	21	17	16	27	23	91	84	76	72	66	0	1	1	1	0	112	102	93	100	89
41.	SHAHDARA	43	34	33	49	31	152	165	129	159	121	2	0	0	2	0	197	199	162	210	152
42.	SUBZI MANDI	13	15	11	8	20	79	60	75	58	40	0	0	0	0	0	92	75	86	66	60
43.	SARITA VIHAR	37	35	32	49	40	120	164	141	133	122	9	11	1	5	2	166	210	177	187	164
44.	SAKET	10	10	11	11	10	94	65	62	60	36	0	1	0	0	0	104	76	73	71	46
45.	SANGAM VIHAR	18	19	22	21	19	137	91	119	99	92	7	2	7	6	1	162	112	148	126	112
46.	SEEMA PURI	37	36	29	47	52	224	182	168	152	119	0	0	0	0	2	261	218	197	199	173
47.	KHAJOORI	35	30	29	30	30	172	164	171	131	132	0	1	1	1	0	207	195	201	162	162
48.	SUKHDEV VIHAR	15	18	17	10	9	60	62	54	47	59	11	3	3	4	0	86	83	74	61	68
49.	TILAK NAGAR	37	41	43	39	27	159	143	159	158	108	0	2	1	1	0	196	186	203	198	135
50.	TILAK MARG	7	15	18	12	10	41	40	36	30	25	2	7	6	1	0	50	62	60	43	35
51.	TUGHLAK ROAD	5	5	11	11	6	28	42	30	22	10	4	3	1	1	1	37	50	42	34	17
52.	VIVEK VIHAR	34	33	32	32	31	132	152	99	89	76	7	10	3	1	0	173	195	134	122	107
53.	VASANT VIHAR	27	24	22	29	32	183	152	120	114	91	1	8	4	2	1	211	184	146	145	124

TABLE- 6.3

ACCIDENTS CLASSIFIED TRAFFIC RANGE-WISE
(2018& 2019)

NAME OF TRAFFIC RANGE	NON INJURY		SIMPLE		FATAL		TOTAL		PERSONS INJURED		PERSONS KILLED	
	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
CENTRAL RANGE	5	3	452	402	166	173	623	578	590	562	169	179
NEW DELHI RANGE	12	14	403	368	181	112	596	494	518	496	184	114
EASTERN RANGE	11	10	849	665	258	245	1118	920	1089	800	261	251
OUTER RANGE	5	6	1026	981	431	357	1462	1344	1337	1232	446	365
SOUTHERN RANGE	35	13	1052	869	265	264	1352	1146	1327	1056	268	269
WESTERN RANGE	7	6	1001	840	356	282	1364	1128	1225	1006	362	285
TOTAL	**75**	**52**	**4783**	**4125**	**1657**	**1433**	**6515**	**5610**	**6086**	**5152**	**1690**	**1463**

- On perusal of Table 6.3, it is evident that the **Outer Traffic Range recorded the highest number of fatal Accidents (357) and total accidents (1344)** in the year 2018.

Top 10 Accident Prone Roads:

i. The top 10 accident prone roads (total accidents) were **Ring Road (382),Outer Ring Road (349), , Rohtak Road (186), GTK Road (151), Najafgarh Road (129),** Mathura Road (120), Wazirabad Road (114), Grand Trunk Road (93), Pusta Road and NH-8 (68).

ii. From the **fatal accident point of view,** the top 10 accident prone roads (fatal accidents) were **Outer Ring Road (125), Ring Road (107), GTK Road (56), Rohtak Road (51), Mathura Road (38), Wazirabad Road (35), Najafgarh Road (30),** Grand Trunk Road (27), NH-24 (26) and NH-8 (20).

- Table 6.5 presents figures of accidents on National Highways, Ring Road and Outer Ring Road. **It is observed that on Ring Road, the stretch between Azadpur to Dhaula Kuan and Dhaula Kuan to IP Depot had the highest number of accidents. Outer Ring Road (Northern Stretch) is the most accident prone.**
- Table 6.6 and 6.7 shows the top 25 roads in fatal accidents and total accidents respectively in 2019. Outer Ring Road and Ring Road occupy the top 2 slots in both the tables.
- Table 6.7 (A), (B) and (C) shows the **most Accident Prone Roads for pedestrians, cyclists and two-wheelers.** These roads lack the facilities for the most vulnerable section of our road users.
- Table 6.8 gives the traffic district wise most dangerous roads.

TABLE – 6.4

ACCIDENT CLASSIFIED ACCORDING TO PLACE OF OCCURRENCE (ROADS)

S.NO.	ROAD NAME	FATAL ACCIDENTS				INJURY ACCIDENTS				NON-INJURY ACCIDENTS				TOTAL ACCIDENTS			
		2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
1.	AFRICA AVENUE	0	3	1	0	12	12	9	5	0	0	0	0	12	15	10	5
2.	ALIPUR ROAD	-	1	0	0	-	2	0	1	-	0	0	0	-	3	0	1
3.	ANAND MAI MARG	10	11	12	10	37	35	44	19	0	0	0	0	47	46	56	29
4.	ARUNA ASAF ALI MARG	5	2	2	2	12	4	4	13	0	0	0	1	17	6	6	16
5.	ASAF ALI ROAD	3	0	3	1	2	6	6	2	0	0	0	0	5	6	9	3
6.	AUGUST KRANTI MARG	0	0	1	0	1	1	1	0	0	0	0	0	1	1	2	0
7.	AUROBINDO MARG	7	4	4	10	27	27	35	17	0	0	0	1	34	31	39	28
8.	BAHADUR SHAH ZR MARG	3	4	1	3	8	4	5	2	0	0	0	1	11	4	6	6
9.	BAWANA ROAD	10	13	17	12	16	20	13	22	0	0	0	0	26	33	30	34
10.	BHATTI MINE MARG	2	2	2	2	3	4	4	7	0	0	0	0	5	6	6	9
11.	BOULEVARD ROAD	6	5	7	10	14	20	15	14	0	0	0	0	20	25	22	24
12.	CAPTAIN GAUR MARG	0	0	0	0	1	0	1	4	0	0	0	0	1	0	1	4
13.	CHHATARPUR ROAD	0	1	2	1	4	0	3	4	0	0	0	0	4	1	5	5
14.	DHANSA ROAD	10	9	8	5	21	21	12	14	1	0	0	0	32	30	20	19
15.	DESH BANDU GUPTA RD	1	1	7	7	15	19	12	11	1	1	0	0	17	21	19	18
16.	DR. AMBEDKAR ROAD	2	0	1	2	0	1	5	4	0	0	0	0	2	1	6	6
17.	DSIDC NARELA ROAD	2	1	4	2	2	1	2	4	0	0	0	0	4	2	6	6
18.	DWARKA ROAD	-	0	0		-	0	0		-	0	0	0	-	0	0	0
19.	FAIZ ROAD	0	0	1	2	2	0	4	1	0	0	0	0	2	0	5	3
20.	GHUMAN HERA MARG	0	0	0	1	3	2	5	1	0	0	0	0	3	2	5	2
21.	GRAND TRUNK ROAD	27	29	29	27	81	77	93	65	0	0	2	1	108	106	124	93
22.	GTKROAD	84	86	66	56	133	111	115	94	4	2	0	1	221	199	181	151
23.	GURGAON ROAD	0	0	0	2	1	0	0	0	0	0	0	0	1	0	0	2
24.	ISBT ROAD	-	0	1	0	-	0	1	1	-	0	0	0	-	0	2	1
25.	JAWAHAR LAL NEHRU RD	6	5	3	5	12	8	13	11	0	0	0	0	18	13	16	16
26.	JHARODA ROAD	1	1	4	2	4	7	4	5	0	0	0	0	5	8	8	7
27.	KANJHAWALA ROAD	5	0	5	2	10	6	10	9	0	0	0	0	15	6	15	11
28.	LALA LAJPAT RAI PATH	6	7	6	8	20	13	21	20	2	1	3	0	28	21	30	28
29.	LONI ROAD	2	2	2	3	13	6	14	10	0	0	0	0	15	8	16	13
30.	MAHIPAL PUR ROAD	3	3	8	8	13	10	14	24	0	0	2	0	16	13	24	32
31.	MANDOLI ROAD	0	0	2	1	6	1	4	4	0	0	0	0	6	1	6	5
32.	MATHURA ROAD	28	34	27	38	104	89	75	79	9	4	7	3	141	127	109	120
33.	MAYAPURI MARG	2	3	1	1	12	4	5	2	0	0	0	0	14	7	6	3
34.	MEHRAULI BADARPUR RD	19	21	23	16	63	76	67	48	2	0	2	0	84	97	92	64
35.	MEHRAULI GURGAON RD	11	3	7	5	36	26	18	20	1	0	0	0	48	29	25	25
36.	NAJAFGARH ROAD	32	38	25	30	105	97	113	99	1	1	1	0	138	136	139	129
37.	NAJAFGARH NANGLOI RD	12	9	10	7	26	19	19	29	1	0	0	0	39	28	29	36
38.	NANGLOI SULTANPURI RD	-	0	1		-	0	1		-	0	0	0	-	0	2	0
39.	NARAINA ROAD	2	2	1		3	2	5		0	0	0	0	5	4	6	0
40.	NARELA ROAD	7	4	10	3	10	8	18	18	0	0	0	0	17	12	28	21
41.	NELSON MANDELA MARG	0	1	4	2	10	17	15	7	0	1	0	0	10	19	19	9
42.	NEW ROHTAK ROAD	3	5	8	5	36	15	15	17	0	1	0	0	39	21	23	22
43.	NH-24	10	30	14	26	52	42	43	29	1	1	1	0	63	73	58	55
44.	NH-8	39	28	30	20	96	66	49	48	3	2	2	0	138	96	81	68

45.	NOIDA DND ROAD	5	0	1	5	7	4	3	6	0	0	2	0	12	4	6	11
46.	OLD GURGAON ROAD	0	2	0	0	4	4	5	2	1	1	0	0	5	7	5	2
47.	OLD ROHTAK ROAD	0	2	5	2	8	3	4	11	0	0	0	0	8	5	9	13
48.	OLOF PALME MARG	0	1	0	1	5	0	0	0	1	0	0	0	6	1	0	1
49.	OUTER CIRCLE CP	1	0	2	1	7	2	3	5	1	0	0	1	9	2	5	7
50.	OUTER RING ROAD	100	117	101	125	273	228	246	224	8	6	3	0	381	351	350	349
51.	PALAM DABRI ROAD	2	0	1	1	3	3	3	2	0	0	0	0	5	3	4	3
52.	PALLA ROAD	1	2	2	0	2	1	5	3	0	0	0	0	3	3	7	3
53.	PANCHKUIAN ROAD	2	2	2	2	5	1	3	2	1	0	0	0	8	3	5	4
54.	PANKHA ROAD	14	16	6	10	30	20	27	20	0	0	0	0	44	36	33	30
55.	PATEL ROAD	12	9	7	3	28	23	9	22	0	0	0	0	40	32	16	25
56.	PATPAR GANJ ROAD	2	2	2	2	20	15	12	8	0	0	0	0	22	17	14	10
57.	PRESS ENCLAVE MARG	3	2	1	0	7	8	8	4	0	0	0	0	10	10	9	4
58.	PRITHVI RAJ ROAD	0	1	1	2	5	3	7	1	0	1	0	0	5	5	8	3
59.	QUTAB ROAD	-	2	2	1	-	4	0	1	-	0	0	0	-	6	2	2
60.	RAJA RAM MARG	1	0	2	4	1	2	1	4	0	0	0	0	2	2	3	8
61.	RAMA ROAD	1	4	4	4	12	14	7	6	0	1	0	0	13	19	11	10
62.	RANI JHANSI ROAD	2	3	4	3	9	8	13	7	3	0	0	0	14	11	17	10
63.	RAO TULA RAM MARG	1	0	4	2	9	8	3	4	1	0	1	0	11	8	8	6
64.	RAVI DAS MARG	4	8	9	2	24	27	15	12	0	2	0	0	28	37	24	14
65.	RING ROAD	123	119	138	107	294	284	282	269	5	9	4	6	422	412	424	382
66.	RITHALA ROAD	4	1	1	4	8	7	5	4	0	0	0	1	12	8	6	9
67.	ROAD NO 13	0	0	0	2	8	0	0	2	0	0	0	0	8	0	0	4
68.	ROAD NO 37	3	0	1	1	6	2	2	1	0	0	0	0	9	2	3	2
69.	ROAD NO 40	9	3	9	7	14	26	29	24	0	0	0	0	23	29	38	31
70.	ROAD NO 41	6	2	8	4	20	13	20	14	0	3	0	0	26	18	28	18
71.	ROAD NO 56	20	18	17	17	41	35	32	34	3	3	0	0	64	56	49	51
72.	ROAD NO 57	8	6	15	11	35	39	28	21	0	2	0	2	43	47	43	34
73.	ROAD NO 66	0	4	2	0	7	8	15	10	0	0	0	0	7	12	17	10
74.	ROHTAK ROAD	37	55	75	51	135	140	147	132	2	1	1	3	174	196	223	186
75.	ROSHANARA ROAD	3	0	1	2	7	9	6	1	0	0	0	0	10	9	7	3
76.	SHANTI PATH	0	2	0	2	3	3	0	1	0	0	0	0	3	5	0	3
77.	STATION ROAD	10	2	6	2	11	4	8	7	0	0	0	1	21	6	14	10
78.	TODAPUR ROAD(DPS MARG)	6	0	0	4	36	0	0	13	0	0	0	0	42	0	0	17
79.	VIKAS MARG	9	12	13	12	42	37	41	35	1	1	0	0	52	50	54	47
80.	VIVEKA NAND MARG	1	0	1	3	7	9	7	7	0	0	0	0	8	9	8	10
81.	WAZIRABAD ROAD	25	9	13	35	88	101	86	79	0	0	1	0	113	111	100	114
82.	YAMUNA PUSHTA ROAD	6	20	9	10	51	62	33	20	0	2	2	0	57	84	44	30
83.	ROAD NO 13A	-	3	0	3	-	18	0	15	-	2	0	0	-	23	0	18
84.	BABA KHARAK SINGH MARG	3	3	6	4	5	10	5	7	0	0	0	0	8	13	11	11
85.	BAWANA AUCHANDI ROAD	1	0	1	1	2	2	1	0	0	0	0	0	3	2	2	1
86.	BIJWASAN ROAD	7	9	6	5	25	26	10	10	0	0	0	0	32	35	16	15
87.	BURARI ROAD	7	10	8	9	10	7	15	16	0	0	0	0	17	17	23	25
88.	CHHAWLA ROAD	3	5	3	0	5	8	13	5	0	0	1	0	8	13	17	5
89.	DDU MARG	1	0	2	1	3	7	2	2	0	0	0	0	4	7	4	3
90.	JAI SINGH ROAD	-	0	0		-	0	0		-	0	0	0	-	0	0	0
91.	JAIL ROAD	7	3	5	4	8	11	8	8	0	0	0	0	15	14	13	12
92.	JAITPUR ROAD	2	0	0	0	14	8	6	2	0	0	0	0	16	8	6	2
93.	JANPATH	1	1	0	0	7	3	2	8	0	0	0	0	8	4	2	8
94.	KOTLA ROAD	2	2	5	2	13	7	7	1	0	1	0	0	15	10	12	3
95.	LODI ROAD	2	1	1	0	4	9	11	7	0	0	0	0	6	10	12	7
96.	MAHARAJA SURAJMAL ROAD	0	0	0		2	1	5		0	0	0	0	2	1	5	0
97.	PUSA ROAD	4	5	1	2	8	12	12	11	0	0	0	0	12	17	13	13
98.	PUSTA ROAD	6	10	15	13	52	50	49	57	0	0	0	0	58	60	64	70
99.	QUTAB GARH ROAD	3	0	1	1	5	4	4	1	0	0	0	0	8	4	5	2
100.	RAMDEV MARG	0	0	1	2	1	1	0	3	0	0	0	0	1	1	1	5
101.	RIDGE ROAD	3	3	5	1	5	5	3	7	0	0	0	0	8	8	8	8
102.	SARDAR PATEL MARG	3	2	0	1	3	4	4	9	0	0	0	1	6	6	4	11
103.	SPM MARG	6	3	1	6	9	5	5	4	0	0	0	0	15	8	6	10

TABLE - 6.5
STATISTICS FOR NATIONAL HIGHWAYS, RING ROAD AND OUTER RING ROAD

NATIONAL HIGHWAYS																					
S. NO.	ROAD	FATAL					SIMPLE					NON-INJURY					TOTAL				
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1	ROHTAK ROAD (NH-10)	53	37	55	75	51	122	135	140	147	132	1	2	01	1	3	176	174	196	223	186
2	MATHURA ROAD NH-2	28	28	34	27	38	88	104	89	75	79	14	9	04	7	3	130	141	127	109	120
3	NH-8	38	39	28	30	20	87	96	66	49	48	0	3	02	2	0	125	138	96	81	68
4	N.H- 24	25	10	30	14	26	62	52	42	43	29	5	1	01	1	0	92	63	73	58	55
5	G.T.KARNAL ROAD NH-1	72	84	86	66	56	143	133	111	115	94	4	4	02	0	1	219	221	199	181	151
6	G.T.ROAD NH-58	28	27	29	29	27	82	81	77	93	65	0	0	00	2	1	109	108	106	124	93

TABLE - 6.5 (CONTD..)

RING ROAD																					
S. NO.	ROAD	FATAL					SIMPLE					NON-INJURY					TOTAL				
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1	AZAD PUR TO DHAULA KUAN	35	47	45	**50**	**48**	29	81	71	**106**	**94**	1	1	1	**0**	**1**	135	129	117	**156**	**143**
2	DHAULA KUAN TO I. P. DEPOT	29	39	34	**35**	**29**	128	110	92	**89**	**84**	4	4	5	**4**	**4**	159	153	131	**128**	**117**
3	I.P. DEPOT TO I. P. COLLEGE	25	20	22	**29**	**17**	84	50	72	**43**	**46**	4	0	1	**0**	**1**	81	70	95	**72**	**64**
4	I. P. COLLEGE TO AZAD PUR	16	17	18	**24**	**13**	29	53	49	**44**	**45**	1	0	2	**0**	**0**	65	70	69	**68**	**58**

OUTER RING ROAD																					
S. NO.	ROAD	FATAL					SIMPLE					NON-INJURY					TOTAL				
		2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
1	OUTER RING ROAD (WEST)	14	19	19	15	**12**	122	35	27	44	**41**	0	0	0	1	**0**	43	54	46	60	**53**
2	OUTER RING ROAD (NORTH)	48	67	81	74	**97**	88	173	148	152	**145**	0	0	2	0	**0**	176	240	231	226	**242**
3	OUTER RING ROAD (SOUTH)	22	14	17	12	**16**	87	65	53	50	**38**	1	8	4	2	**0**	107	87	74	64	**54**

TABLE – 6.6

TOP 25 ACCIDENT PRONE ROADS IN FATAL ACCIDENTS – 2019

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	OUTER RING ROAD	125	349	126
2.	RING ROAD	107	382	109
3.	GTK ROAD	56	151	59
4.	ROHTAK ROAD	51	186	51
5.	MATHURA ROAD	38	120	40
6.	WAZIRABAD ROAD	35	114	36
7.	NAJAF GARH ROAD	30	129	30
8.	GRANT TRUNK ROAD	27	93	28
9.	NH-24	26	55	29
10.	NH-8	20	68	20
11.	ROAD NO 56	17	51	17
12.	MEHRAULI BADARPUR ROAD	16	64	16
13.	PUSTA ROAD	13	70	13
14.	VIKAS MARG	12	47	12
15.	BAWANA ROAD	12	34	12
16.	ROAD NO 57	11	34	11
17.	PANKHA ROAD	10	30	10
18.	YAMUNA PUSTA ROAD	10	30	11
19.	ANAND MAI MARG	10	29	12
20.	AUROBINDO MARG	10	28	10
21.	BULOVARD ROAD	10	24	10
22.	BURARI ROAD	9	25	10
23.	MAHIPAL PUR ROAD	8	32	8
24.	LALA LAJPAT RAI PATH	8	28	8
25.	201 NO.ROAD	7	37	7

TABLE – 6.6

TOP 25 ACCIDENT PRONE ROADS IN FATAL ACCIDENTS – 2019

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	OUTER RING ROAD	125	349	126
2.	RING ROAD	107	382	109
3.	GTK ROAD	56	151	59
4.	ROHTAK ROAD	51	186	51
5.	MATHURA ROAD	38	120	40
6.	WAZIRABAD ROAD	35	114	36
7.	NAJAF GARH ROAD	30	129	30
8.	GRANT TRUNK ROAD	27	93	28
9.	NH-24	26	55	29
10.	NH-8	20	68	20
11.	ROAD NO 56	17	51	17
12.	MEHRAULI BADARPUR ROAD	16	64	16
13.	PUSTA ROAD	13	70	13
14.	VIKAS MARG	12	47	12
15.	BAWANA ROAD	12	34	12
16.	ROAD NO 57	11	34	11
17.	PANKHA ROAD	10	30	10
18.	YAMUNA PUSTA ROAD	10	30	11
19.	ANAND MAI MARG	10	29	12
20.	AUROBINDO MARG	10	28	10
21.	BULOVARD ROAD	10	24	10
22.	BURARI ROAD	9	25	10
23.	MAHIPAL PUR ROAD	8	32	8
24.	LALA LAJPAT RAI PATH	8	28	8
25.	201 NO.ROAD	7	37	7

TABLE – 6.7

TOP 25 ACCIDENT PRONE ROADS IN TOTAL ACCIDENTS – 2019

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	RING ROAD	107	382	109
2.	OUTER RING ROAD	125	349	126
3.	ROHTAK ROAD	51	186	51
4.	GTK ROAD	56	151	59
5.	NAJAF GARH ROAD	30	129	30
6.	MATHURA ROAD	38	120	40
7.	WAZIRABAD ROAD	35	114	36
8.	GRANT TRUNK ROAD	27	93	28
9.	PUSTA ROAD	13	70	13
10.	NH-8	20	68	20
11.	MEHRAULI BADARPUR ROAD	16	64	16
12.	NH-24	26	55	29
13.	ROAD NO 56	17	51	17
14.	VIKAS MARG	12	47	12
15.	201 NO. ROAD	7	37	7
16.	NAJAFGARH NANGLOI ROAD	7	36	7
17.	BAWANA ROAD	12	34	12
18.	ROAD NO 57	11	34	11
19.	MAHIPAL PUR ROAD	8	32	8
20.	ROAD NO 40	7	31	7
21.	LAL BHADUR SHASTRI MARG	7	30	7
22.	PANKHA ROAD	10	30	10
23.	YAMUNA PUSTA ROAD	10	30	11
24.	ANAND MAI MARG	10	29	12
25.	AUROBINDO MARG	10	28	10

TABLE – 6.7(A)

TOP 25 ACCIDENT PRONE ROADS OF PEDESTRIAN (DAY-NIGHT) ACCIDENTS – 2019

S.NO.	ROAD NAME	SIMPLE		FATAL		TOTAL	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
1.	RING ROAD	57	35	20	43	77	78
2.	ROHTAK ROAD	46	29	24	24	70	53
3.	OUTER RING ROAD	44	32	14	23	58	55
4.	GTK ROAD	30	16	19	17	49	33
5.	NAJAF GARH ROAD	27	18	8	8	35	26
6.	GRANT TRUNK ROAD	22	13	5	9	27	22
7.	MATHURA ROAD	24	10	6	7	30	17
8.	NH-8	8	4	4	6	12	10
9.	RAVIDASS MARG	4	5	5	4	9	9
10.	MEHRAULI BADARPUR ROAD	15	9	5	3	20	12
11.	BAWANA ROAD	3	1	5	3	8	4
12.	ROAD NO 40	11	4	3	4	14	8
13.	NH-24	7	0	3	4	10	4
14.	WAZIRABAD ROAD	27	9	5	1	32	10
15.	PUSTA ROAD	15	7	4	2	19	9
16.	ANAND MAI MARG	11	7	2	4	13	11
17.	ROAD NO 57	6	6	3	3	9	9
18.	NARELA ROAD	5	2	5	1	10	3
19.	YAMUNA PUSTA ROAD	6	5	2	3	8	8
20.	NEW ROHTAK ROAD	2	5	0	5	2	10
21.	BURARI ROAD	7	0	2	3	9	3
22.	MAHIPAL PUR ROAD	0	5	2	3	2	8
23.	DANSHA ROAD	4	0	3	2	7	2
24.	VIKAS MARG	10	8	3	1	13	9
25.	PANKHA ROAD	5	5	2	2	7	7

TABLE – 6.7(B)

TOP 25 ACCIDENT PRONE ROADS OF TWO-WHEELERS (DAY-NIGHT) ACCIDENTS – 2019

S.NO.	ROAD NAME	SIMPLE		FATAL		TOTAL	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
1.	RING ROAD	72	50	21	29	93	79
2.	OUTER RING ROAD	60	45	21	22	81	67
3.	ROHTAK ROAD	30	19	7	13	37	32
4.	GTK ROAD	28	17	6	10	34	27
5.	NH-8	8	12	6	8	14	20
6.	GRANT TRUNK ROAD	24	20	6	5	30	25
7.	MEHRAULI BADARPUR ROAD	17	15	1	10	18	25
8.	ROAD NO 56	6	8	4	6	10	14
9.	MATHURA ROAD	20	11	3	6	23	17
10.	NAJAFGARH NANGLOI RD	3	3	3	6	6	9
11.	PUSTA ROAD	8	13	2	5	10	18
12.	NAJAF GARH ROAD	29	24	3	3	32	27
13.	NH-24	12	7	3	3	15	10
14.	VIKAS MARG	12	3	1	5	13	8
15.	AGRA CANAL ROAD	8	4	4	2	12	6
16.	ROAD NO 57	6	5	2	4	8	9
17.	201 NO. ROAD	7	9	4	1	11	10
18.	WAZIRABAD ROAD	21	11	2	2	23	13
19.	ROAD NO 41	7	5	1	3	8	8
20.	BAWANA ROAD	5	3	2	2	7	5
21.	MEHRAULI GURGAON ROAD	5	2	2	2	7	4
22.	DEV PARKASH SHASTRI ROAD	3	1	1	3	4	4
23.	ANAND MAI MARG	9	9	0	3	9	12
24.	CHHAWLA ROAD	7	0	1	2	8	2
25.	NEW ROHTAK ROAD	3	3	2	1	5	4

TABLE – 6.7(C)

TOP 17 ACCIDENT PRONE ROADS OF CYCLIST (DAY-NIGHT) ACCIDENTS – 2019

S.NO.	ROAD NAME	SIMPLE		FATAL		TOTAL	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
1.	RING ROAD	8	3	2	4	10	7
2.	MEHRAULI BADARPUR ROAD	1	0	1	1	2	1
3.	ANAND MAI MARG	0	0	1	1	1	1
4.	ROHTAK ROAD	3	2	0	1	3	3
5.	OUTER RING ROAD	3	1	1	0	4	1
6.	DEV PARKASH SHASTRI ROAD	2	1	0	1	2	2
7.	VIKAS MARG	2	1	0	1	2	2
8.	BIJWASAN ROAD	0	1	1	0	1	1
9.	LALA LAJPAT RAI PATH	1	0	0	1	1	1
10.	NAJAF GARH ROAD	3	1	0	0	3	1
11.	GTK ROAD	2	1	0	0	2	1
12.	WAZIRABAD ROAD	2	1	0	0	2	1
13.	YAMUNA PUSTA ROAD	2	1	0	0	2	1
14.	JAITPUR ROAD	1	1	0	0	1	1
15.	NELSON MANDELA MARG	1	1	0	0	1	1
16.	PUSTA ROAD	1	1	0	0	1	1
17.	ROAD NO 56	1	1	0	0	1	1

TABLE- 6.8

TOP 10 ACCIDENT PRONE ROADS (DISTRICT-WISE)

CENTRAL DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	DESH BANDU GUPTA ROAD	7	17	7
2.	RING ROAD	6	24	8
3.	JAWAR LAL NEHRU ROAD	5	16	5
4.	NEW ROHTAK ROAD	4	16	4
5.	BAHADUR SHAH ZAFFER MARG	3	6	4
6.	NETAJI SUBHASH MARG	3	9	3
7.	FAIZ ROAD	2	3	4
8.	PUSA ROAD	2	11	2
9.	RANI JHANSI ROAD	2	3	2
10.	VIKAS MARG	2	6	2

DWARKA DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	MINOR ROADS	35	172	36
2.	NH-8	10	42	10
3.	201 NO. ROAD	11	51	11
4.	GURGOAN ROAD	2	2	2
5.	KARIYAPPA MARG	2	3	2
6.	STATION ROAD	2	10	2
7.	CHURCH ROAD	1	2	1
8.	PALAM DABRI ROAD	1	2	1
9.	RING ROAD	1	9	1
10.	THIMAYYA MARG	1	3	1

NEW DELHI DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	BABA KHARAK SINGH MARG	4	11	4
2.	KAUTILYA MARG	4	4	4
3.	KASTURBA GANDHI MARG	2	7	2
4.	MATHURA ROAD	2	9	2
5.	PRITHIVI RAJ ROAD	2	3	2
6.	SARDAR PATEL MARG	1	9	1
7.	RIDGE ROAD	1	6	1
8.	RIDGE ROAD	1	6	1
9.	OUTER CIRCLE CP	1	7	1
10.	RAISINHA ROAD	1	3	1

EAST DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	NH-24	23	51	26
2.	ROAD NO 56	17	51	17
3.	ROAD NO 57	11	34	11
4.	VIKAS MARG	10	41	10
5.	YAMUNA PUSTA ROAD	9	26	10
6.	71 NO ROAD	5	19	5
7.	NOIDA ROAD	3	8	3
8.	KOTLA ROAD	2	3	2
9.	NARWANA ROAD	2	3	2
10.	PATPAR GANJ ROAD	2	10	2

NORTH EAST DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	WAZIRABAD ROAD	26	94	27
2.	GRANT TRUNK ROAD	25	90	26
3.	PUSTA ROAD	12	66	12
4.	ROAD NO.68	4	9	4
5.	KARAWAL NAGAR ROAD	3	9	3
6.	LONI ROAD	3	13	3
7.	100 FOOTA ROAD	1	5	1
8.	BABAR PUR ROAD	1	4	1
9.	MANDOLI ROAD	1	5	1
10.	YAMUNA PUSTA ROAD	1	4	1

NORTH DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	OUTER RING ROAD	22	39	22
2.	RING ROAD	19	78	19
3.	BULOVARD ROAD	10	24	10
4.	WAZIRABAD ROAD	9	20	9
5.	ROAD NO 40	7	31	7
6.	SPM MARG	6	10	6
7.	RAJA RAM MARG	4	8	4
8.	NETAJI SUBHASH MARG	2	11	2
9.	OLD ROHTAK ROAD	2	12	2
10.	SHYAM NATH MARG	2	6	2

NORTH WEST DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	GTK ROAD	56	150	59
2.	OUTER RING ROAD	44	111	44
3.	RING ROAD	25	70	25
4.	BURARI ROAD	9	25	10
5.	ROAD NO 43	4	15	4
6.	NARELA ROAD	2	16	2
7.	RAM DEV MARG	2	5	2
8.	BHAMA SHAH MARG	1	3	1
9.	LAWRANCE ROAD	1	5	1
10.	PARWANA ROAD	1	4	1

OUTER DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	OUTER RING ROAD	31	95	31
2.	BAWANA ROAD	11	32	11
3.	RITHALA ROAD	4	9	4
4.	ROAD NO 41	4	17	4
5.	BADLI ROAD	2	5	2
6.	DSIDC NARELA ROAD	2	5	2
7.	KANJHAWALA ROAD	2	11	2
8.	RAM MURTI PASSI ROAD	2	3	2
9.	NARELA ROAD	1	5	1
10.	BHAGWAN MAHAVIR MARG	1	2	1

SOUTH DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	RING ROAD	11	58	11
2.	AUROBINDO MARG	10	28	10
3.	MAHIPAL PUR ROAD	8	31	8
4.	OUTER RING ROAD	8	32	8
5.	LALA LAJPAT RAI PATH	7	21	7
6.	MEHRAULI GURGAON ROAD	5	25	5
7.	MEHRAULI BADARPUR ROAD	3	14	3
8.	VIVEKA NAND MARG	3	10	3
9.	NELSON MANDELA MARG	2	9	2
10.	ARUNA ASFALI MARG	2	16	2

SOUTH EAST DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	MATHURA ROAD	36	111	38
2.	RING ROAD	18	59	18
3.	MEHRAULI BADARPUR ROAD	13	50	13
4.	ANAND MAI MARG	10	29	12
5.	OUTER RING ROAD	8	20	9
6.	LAL BHADUR SHASTRI MARG	7	30	7
7.	NOIDA DND ROAD	5	11	5
8.	13A NO ROAD	3	18	3
9.	AGRA CANAL ROAD	3	25	3
10.	OKHLA ESTATE ROAD	3	9	3

SOUTH WEST DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	NAJAF GARH ROAD	25	96	25
2.	NH-8	10	25	10
3.	OUTER RING ROAD	7	24	7
4.	BIJWASAN ROAD	5	15	5
5.	DANSHA ROAD	5	19	5
6.	JHARODA ROAD	2	7	2
7.	NAJAFGARH NANGLOI ROAD	2	6	2
8.	201 NO. ROAD	1	1	1
9.	GHUMAN HERA MARG	1	2	1
10.	KAPASHERA ROAD	1	5	1

WEST DISTRICT

S.NO.	ROAD NAME	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS KILLED
1.	ROHTAK ROAD	50	184	50
2.	RING ROAD	26	82	26
3.	PANKHA ROAD	10	30	10
4.	NAJAF GARH ROAD	5	32	5
5.	NAJAFGARH NANGLOI ROAD	5	30	5
6.	OUTER RING ROAD	5	26	5
7.	DEV PARKASH SHASTRI ROAD	4	17	4
8.	JAIL ROAD	4	11	4
9.	RAMA ROAD	4	10	4
10.	PATEL ROAD	3	25	3

BLACK SPOTS:

Black spot is a place which is accident prone or where the frequency of accidents is high. A Black Spot is identified on the basis of concentration of accidents at a specific place where some form of remedial measures can be introduced to reduce the number of accidents or their severity.

Accident Black spot: Criteria

- The area of around 500 m diameter having "3 or more fatal accidents" or "10 or more total accidents" is called the Accident Prone Zone. Top twenty such Accident Prone Zones having maximum number of fatal accidents are the Accident Black Spots. (Time period taken is the calendar year i.e. 1st January to 31st December.)
- All accidents on any of the roads approaching such intersection or spot having direct influence on the traffic movement at the spot are included in such analysis.

Top 20 Black spots of the year 2019:

S.NO.	NAME OF BLACK SPOT	NO. OF FATAL ACCIDENTS	NAME OF THE ROAD
1.	MUKUNDPUR CHOWK	11	OUTER RING ROAD
2.	NIRANKARI COLONY/GOPAL PUR RED LIGHT	9	OUTER RING ROAD
3.	MUKARBA CHOWK	8	GTK ROAD
4.	AZADPUR SABZI MANDI	8	GTK ROAD
5.	SIGNATURE BRIDGE TIMARPUR	8	WAZIRABAD ROAD
6.	MAJNU KA TILA	7	OUTER RING ROAD
7.	WAZIRABAD	7	OUTER RING ROAD
8.	AZAD PUR CHOWK	7	GTK ROAD
9.	5TH PUSTA USMAN PUR	6	PUSTA ROAD
10.	WAZIR PUR DEPOT	6	RING ROAD
11.	MANGOLPURI FLYOVER	6	OUTER RING ROAD
12.	EAST VINOD NAGAR/MV II RED LIGHT	6	NH-24
13.	GANDHI VIHAR BUS STAND	5	OUTER RING ROAD
14.	BURARI CHOWK	5	OUTER RING ROAD
15.	RAJOUKARI FLYOVER	5	NH-8
16.	ISBT KASHMIRI GATE	5	RING ROAD
17.	SIGNATURE BRIDGE KHAJOORI	5	WAZIRABAD ROAD
18.	MADHUBAN CHOWK	5	OUTER RING ROAD
19.	POWER HOUSE PITAMPURA	5	OUTER RING ROAD
20.	ANAND VIHAR ISBT	5	ROAD NO.56

TABLE 6.9

BLACK SPOTS – 2019

S.NO.	BLACK SPOT	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
1.	MUKUND PUR CHOWK*	12	11	23	14	11
2.	NIRANKARI COLONY/GOPAL PUR RED LIGHT	3	9	12	5	9
3.	MUKHARBA CHOWK*	11	8	19	16	8
4.	AZADPUR SABZI MANDI	10	8	18	10	8
5.	SIGNATURE BRIDGE TIMARPUR	5	8	13	13	8
6.	MAJNU KA TILA	13	7	20	18	7
7.	WAZIRABAD	10	7	17	15	7
8.	AZAD PUR CHOWK	6	7	13	9	7
9.	5TH PUSTA USMANPUR*	10	6	16	11	6
10.	WAZIR PUR DEPOT	6	6	12	8	6
11.	MANGOLPURI FLYOVER	5	6	11	9	6
12.	EAST VINOD NAGAR/MV II RED LIGHT	3	6	9	16	8
13.	GANDHI VIHAR BUS STAND	19	5	24	28	5
14.	BURARI CHOWK	12	5	17	18	5
15.	RAJOUKARI FLYOVER	11	5	16	13	5
16.	ISBT KASHMIRI GATE*	10	5	15	13	5
17.	SIGNATURE BRIDGE KHAJOORI	9	5	14	9	5
18.	MADHUBAN CHOWK	8	5	13	12	5
19.	POWER HOUSE PITAMPURA	8	5	13	10	5
20.	ANAND VIHAR ISBT	8	5	13	8	5

*In the year 2018 Mukundpur Chowk, Mukharba Chowk, 5th Pusta Usmanpur, and ISBT Kashmiri Gate were at Serial No.4, 8, 7 and 1 respectively.

TABLE 6.9 (A)

COMPARATIVE STATUS OF BLACK SPOTS-2018

S.NO	BLACK SPOT	SIMPLE ACCIDENTS		FATAL ACCIDENTS		TOTAL ACCIDENTS		PERSONS INJURED		PERSONS KILLED	
		2018	**2019**	2018	**2019**	2018	**2019**	2018	**2019**	2018	**2019**
1	ISBT KASHMIRI GATE*	14	**10**	10	**5**	24	**15**	22	**13**	10	**5**
2	KASHMIRI GATE CHOWK BOULAVERD ROAD	12	**10**	9	**3**	21	**13**	15	**10**	9	**3**
3	BHALSWA CHOWK*	8	**8**	9	**4**	17	**12**	10	**14**	9	**4**
4	MUKUND PUR CHOWK*	16	**12**	8	**11**	24	**23**	26	**14**	9	**11**
5	LIBAS PUR BUS STAND	10	**4**	8	**3**	18	**7**	15	**6**	9	**3**
6	GHEWRA MORE	5	**3**	8	**3**	13	**6**	8	**4**	8	**3**
7	5TH PUSTA USMANPUR	11	**10**	7	**6**	18	**16**	12	**11**	7	**6**
8	MUKARBA CHOWK*	9	**11**	7	**8**	16	**19**	12	**16**	7	**8**
9	MAHIPALPUR FLYOVER	5	**10**	7	**1**	12	**11**	7	**12**	7	**1**
10	RAJDHANI PARK	4	**9**	7	**3**	11	**12**	10	**11**	7	**3**

MUKUND PUR CHOWK (BRD)

COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	16	8	24	26	9
2019	12	11	23	14	11

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	4	10
DAY	7	13

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
1000-1100	1	2
2000-2100	2	2

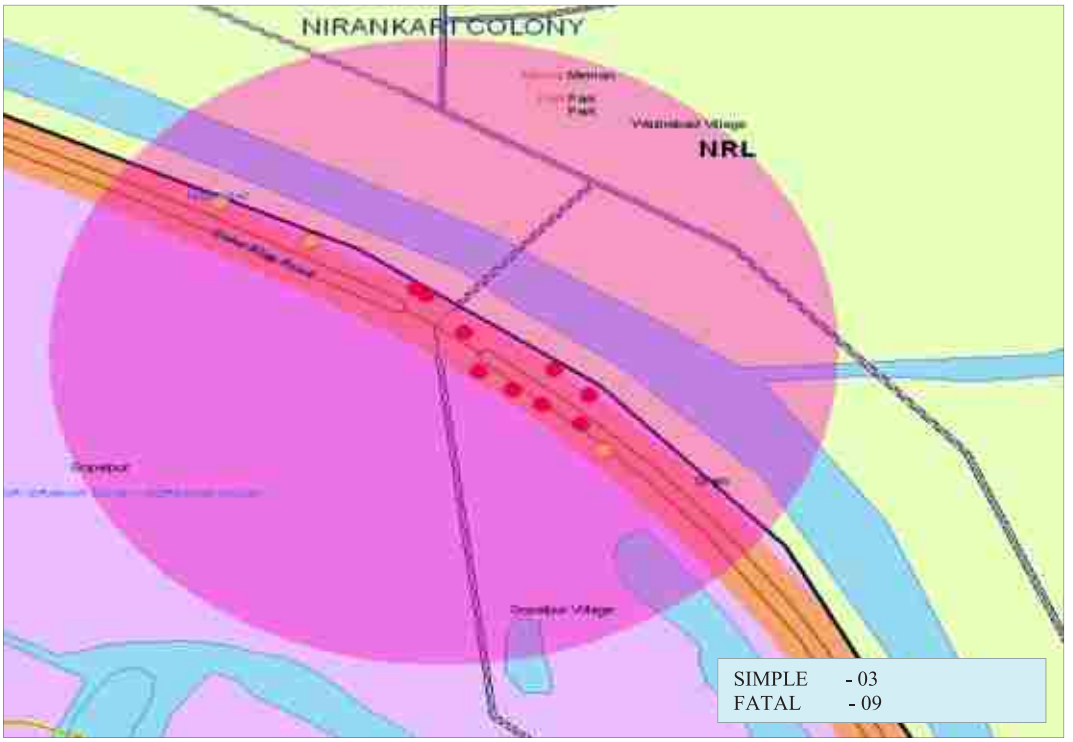
TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	6	9
TEMPO	3	6
HTV/GOODS	2	3

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	3	6
SCOOTER/M.CYCLE	7	13

MUKUND PUR CHOWK

This spot is the region around the junction point of Outer Ring road and Road no. 51. There is high speed vehicle movement on Outer ring road, which includes HTVs and other heavy motor vehicles. More fatal accidents are hit and run cases. Main offending vehicles are LGVs and HTVs. Main **victims here are Two Wheelers,** involved in 07 out of 11 fatal accidents and pedestrians involved 03 fatal accidents. More fatal accidents occurred in **day hours.**

NIRANKARI COLONY/GOPAL PUR RED LIGHT (BRD)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	11	6	17	21	6
2019	3	9	12	5	9

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	7	8
DAY	2	4

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0400-0500	2	2
2300-2400	2	2

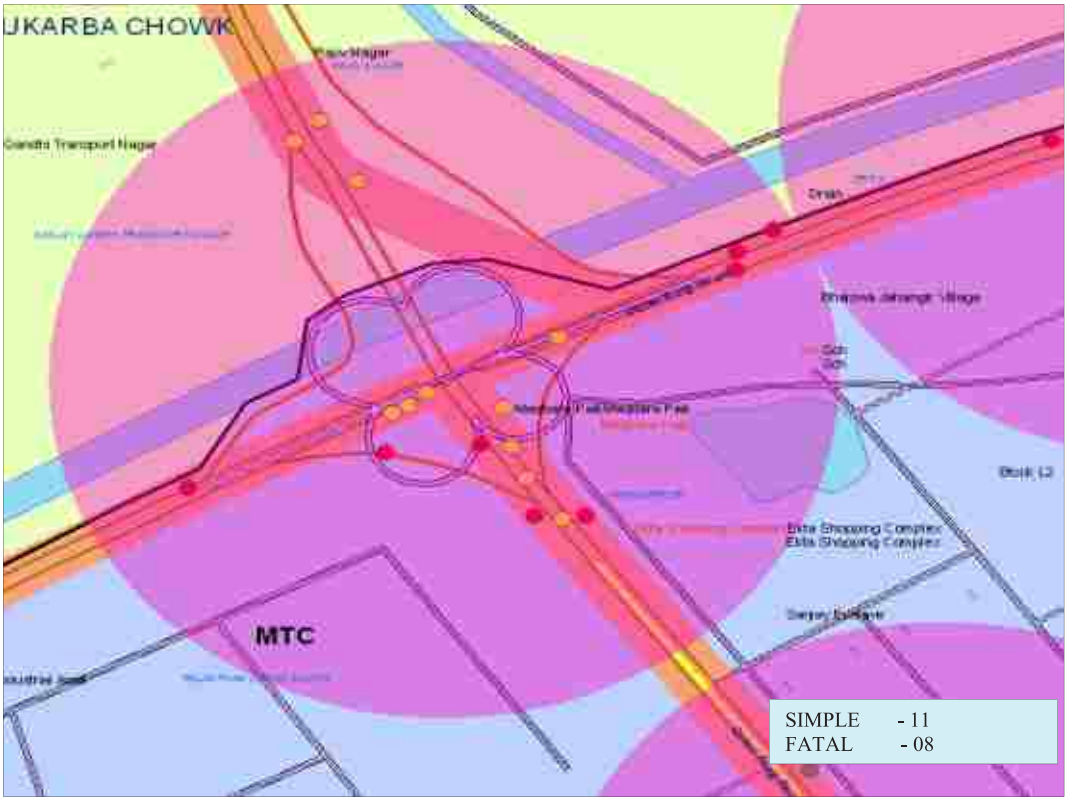
TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	5	5
HTVs	2	2

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	3	3
SCOOTER/M.CYCLE	4	6

NIRANKARI COLONY/GOPAL PUR RED LIGHT (BRD)

This spot is the region around the junction point of Outer Ring road and Nala road wazirabad village and Gopal pur. There is high speed vehicle movement on Outer ring road, which includes HTVs and other heavy motor vehicles. More fatal accidents are hit and run cases. Main offending vehicles are HTVs. Main **victims here are Two Wheelers,** involved in 04 out of 09 fatal accidents and pedestrians involved 03 fatal accidents. Most of fatal accidents occurred in **night hours.**

MUKHARBA CHOWK (BRD)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	9	7	16	12	7
2019	11	8	19	16	8

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	5	9
DAY	3	10

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0500-0600	2	3
1800-1900	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	5	9
HTVs	2	2

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	3	5
SCOOTER/M.CYCLE	2	10

MUKHARBA CHOWK (BRD)

This spot is the region around the junction point of Outer Ring road and GTK road. There is high speed vehicle movement on Outer ring road, which includes HTVs and other heavy motor vehicles. Most of fatal accidents are hit and run cases. Main offending vehicles are HTVs. Main **victims here are Two Wheelers,** involved in 10 out of 19 total accidents and pedestrians involved 05 total accidents. More of fatal accidents occurred in **night hours.**

AZADPUR SABZI MANDI (MTC)

COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	7	3	10	7	3
2019	10	8	18	10	8

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	5	10
DAY	3	8

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0000-0100	1	3
0700-0800	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	2	2
HTVs	4	10

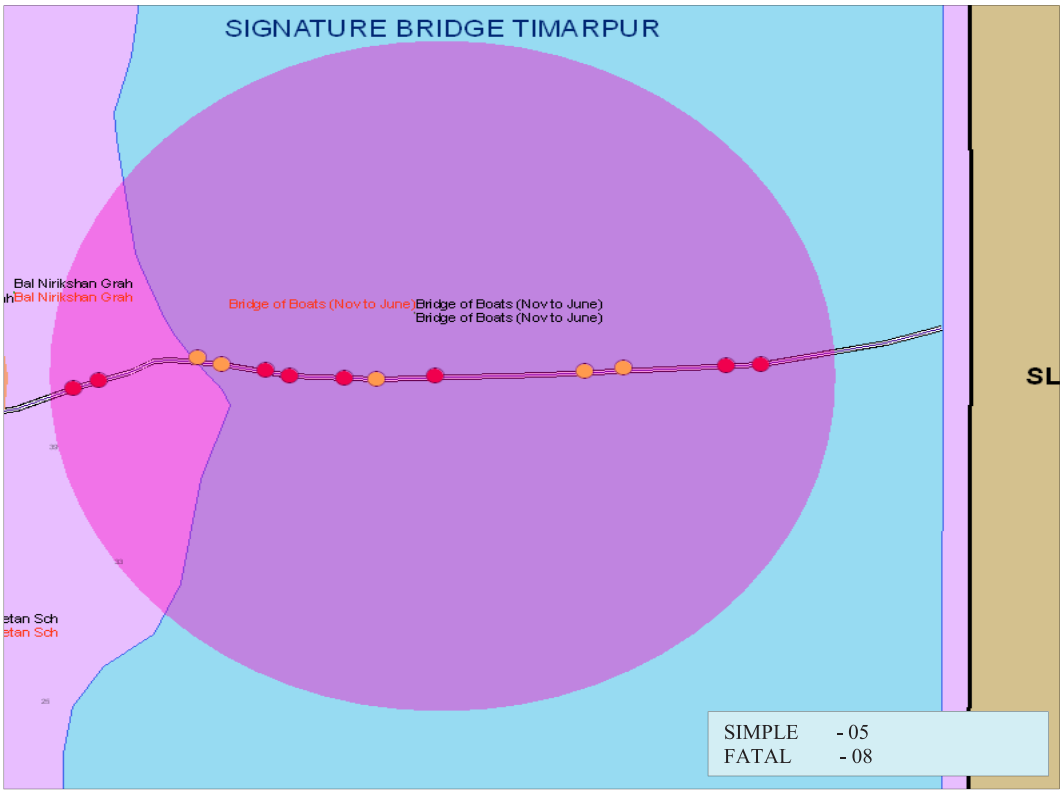
TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	5	12
SCOOTER/M.CYCLE	2	3

AZADPUR SABZI MANDI (MTC)

This spot is situated on Outer Ring road. There is high speed vehicle movement on GTK road and, which includes HTVs and movement of other heavy vehicles. Most of fatal accidents are hit and run cases.

Main offending vehicles are Two-wheelers. Main **victims here are Two Wheelers,** involved in 09 out of 13 total accidents. More of fatal accidents occurred in **day hours.**

SIGNATURE BRIDGE TIMARPUR (CLC)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2019	5	8	13	13	8

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	3	4
DAY	5	9

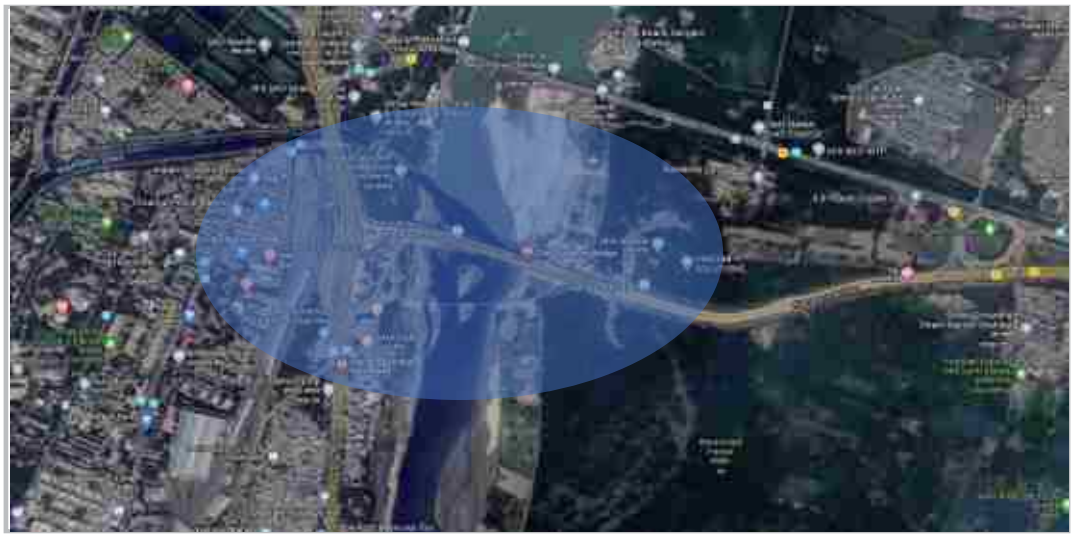
MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
2100-2200	2	3
2300-2400	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	6	10
TWO-WHEELERS	2	2

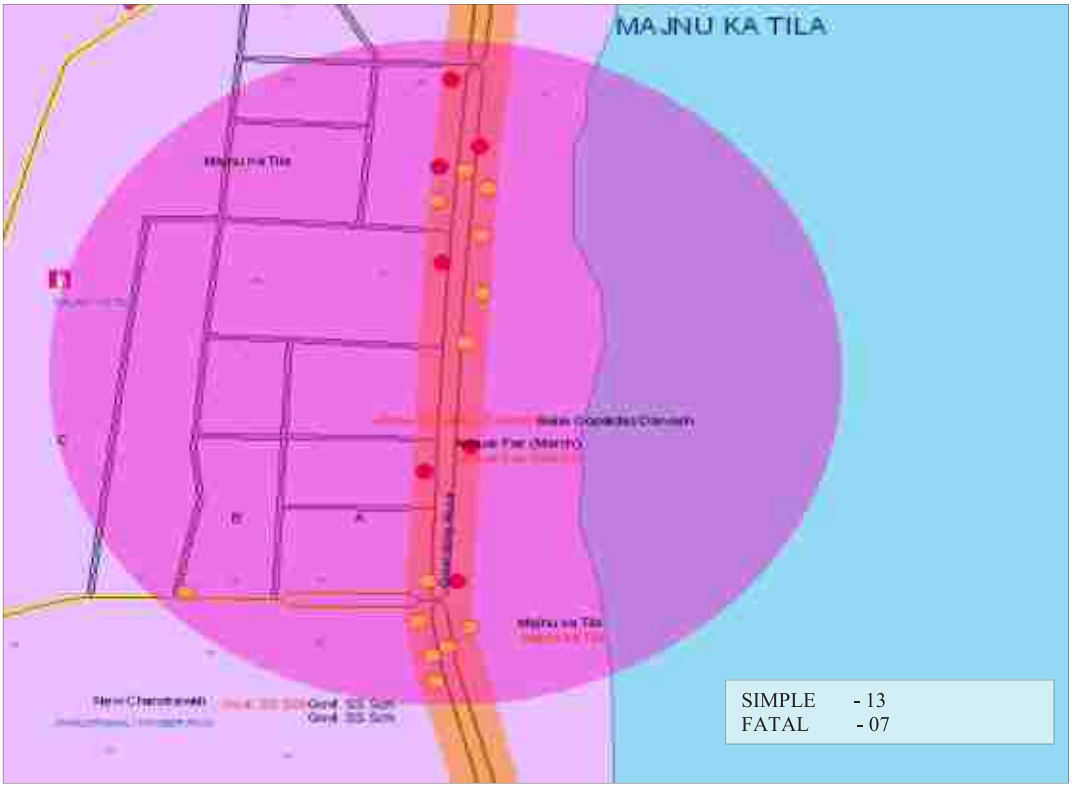
TOP VICTIMS		
	FATAL	TOTAL
SCOOTER/M.CYCLE	5	9
CARS	1	1

SIGNATURE BRIDGE TIMARPUR (CLC)

Signature Bridge is a cantilever spar cable-stayed bridge at Wazirabad road, connecting Wazirabad to East Delhi. This newly spot situated is on Wazirabad road in Timarpur side. There is high speed vehicle movement on wazirabad road, which includes HTVs and movement of other heavy vehicles and two-wheelers. Most of fatal accidents are hit and run cases. Main offending vehicles are Two-wheelers. Main **victims here are Two Wheelers,** involved in 05 out of 08 fatal accidents. More of fatal accidents occurred in **day hours.**



MAJNU KA TILA (CLC)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	4	2	6	4	2
2019	13	7	20	18	7

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	2	13
DAY	5	7

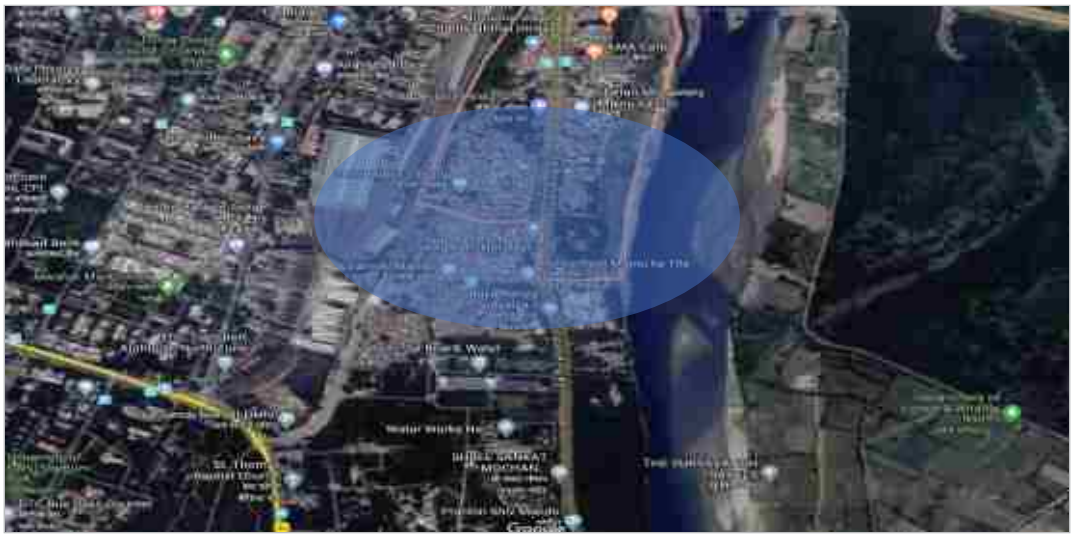
MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0200-0300	1	2
1900-2000	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	4	8
CARS	1	4

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	4	11
SCOOTER/M.CYCLE	2	7

MAJNU KA TILA (CLC)

This is situated on the Outer Ring Road near Tibetian colony. There is pedestrian movement and parking of the vehicles by the local residents. This is also an undeclared hub for Tourist Buses, Taxis and TSRs. Most of fatal accidents are hit and run cases. Main offending vehicles are cars. Main **victims here are Pedestrians,** involved in 11 out of 20 total accidents. Most of fatal accidents occurred in **day hours.**



WAZIRABAD (CLC)

COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	16	6	22	19	6
2019	10	7	17	15	7

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	5	11
DAY	2	6

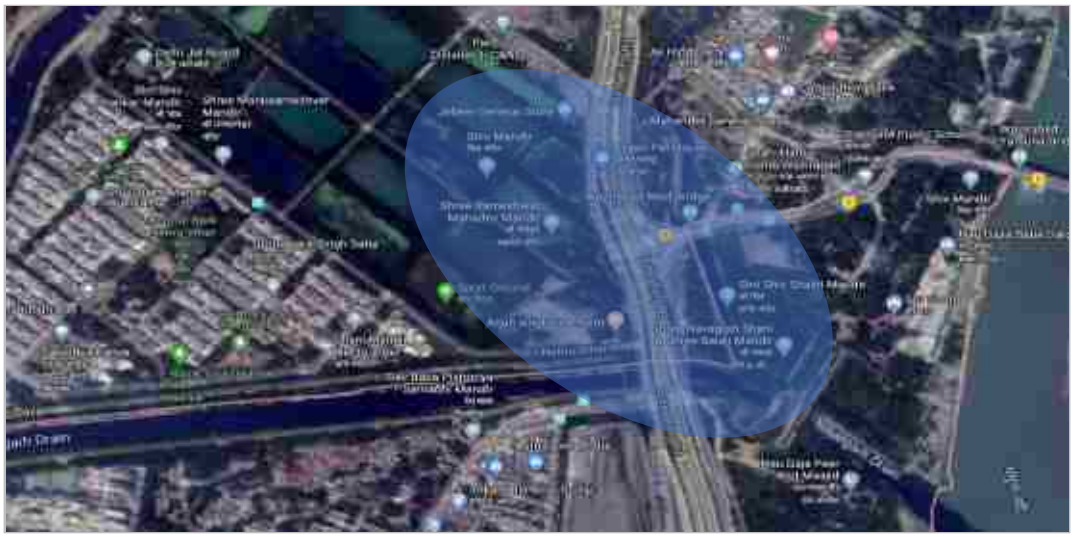
MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
1100-1200	1	2
1500-1600	2	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	4	7
CARS	1	4

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	2	3
SCOOTER/M.CYCLE	4	10

WAZIRABAD (CLC)

This is situated on the Outer Ring Road. There is merging traffic from Wazirabad road to Outer Ring road. There is movement of heavy vehicles and two-wheelers. More fatal accidents are hit and run cases. Main offending vehicles are cars. Main victims here **are Two-wheelers, involved in 10 out of 17 total accidents. Pedestrians** involved in 03 total accidents. More fatal accidents occurred in **night hours.**



AZAD PUR CHOWK (MTC)

COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	3	5	8	4	5
2019	6	7	13	9	7

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	4	8
DAY	3	5

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
1500-1600	2	3
1600-1700	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	4	6
HTVs	2	4

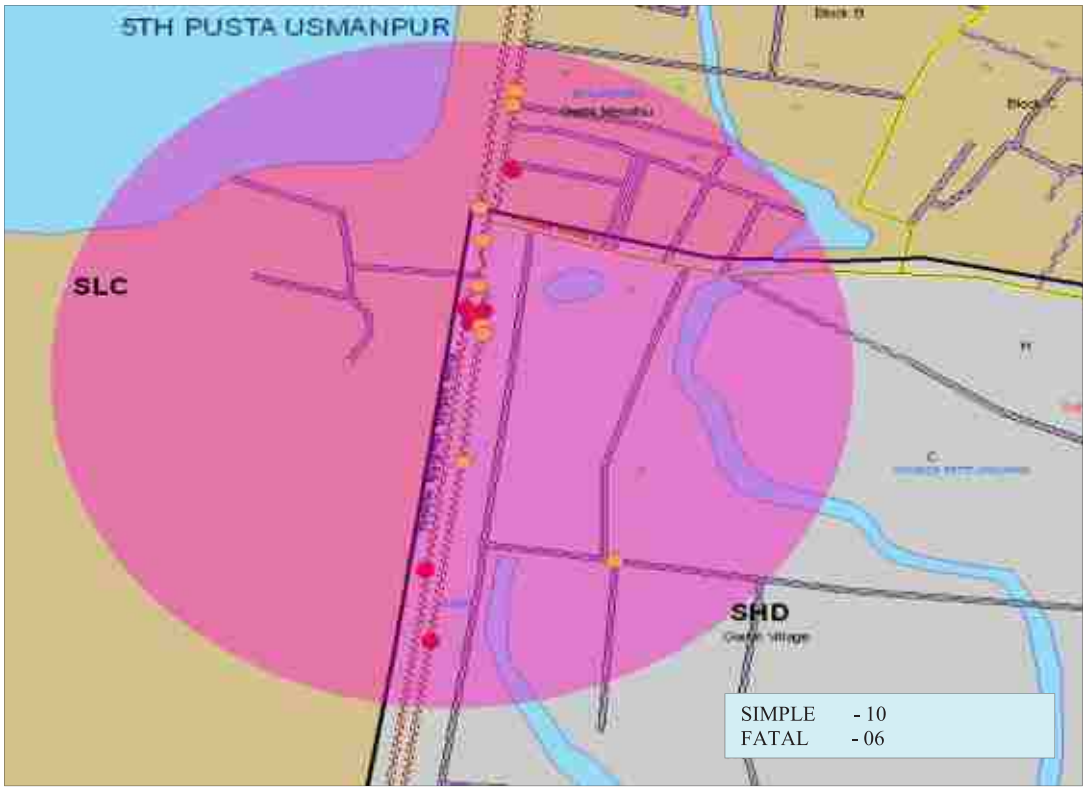
TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	4	7
SCOOTER/M.CYCLE	3	6

AZAD PUR CHOWK (MTC)

This spot is a junction point on GTK road and Ring road. There is a flyover leading to Road no. 51, an underpass on GTK road and a signal junction at ground level on Ring road. No safe pedestrian path is available for pedestrians to cross the road either on the highway or in the underpass.

There is a heavy movement of trucks, buses on ring road and GTK road. More fatal accidents are hit and run cases. Main offending vehicles are HTVs. Main **victims here are Pedestrians, involved in 07 out of 13 total accidents.** More fatal accidents occurred in **night hours.**

5TH PUSTA USMANPUR (KJC,SHD)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	11	7	18	12	7
2019	10	6	16	11	6

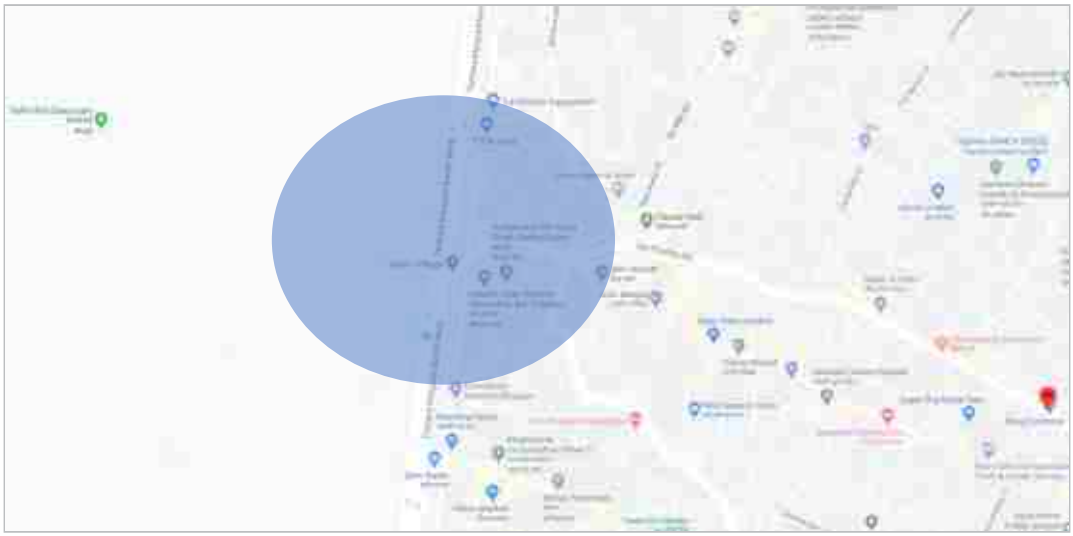
DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	4	9
DAY	2	7

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0500-0600	1	2
1100-1200	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	5	9
TWO WHEELERS	1	1

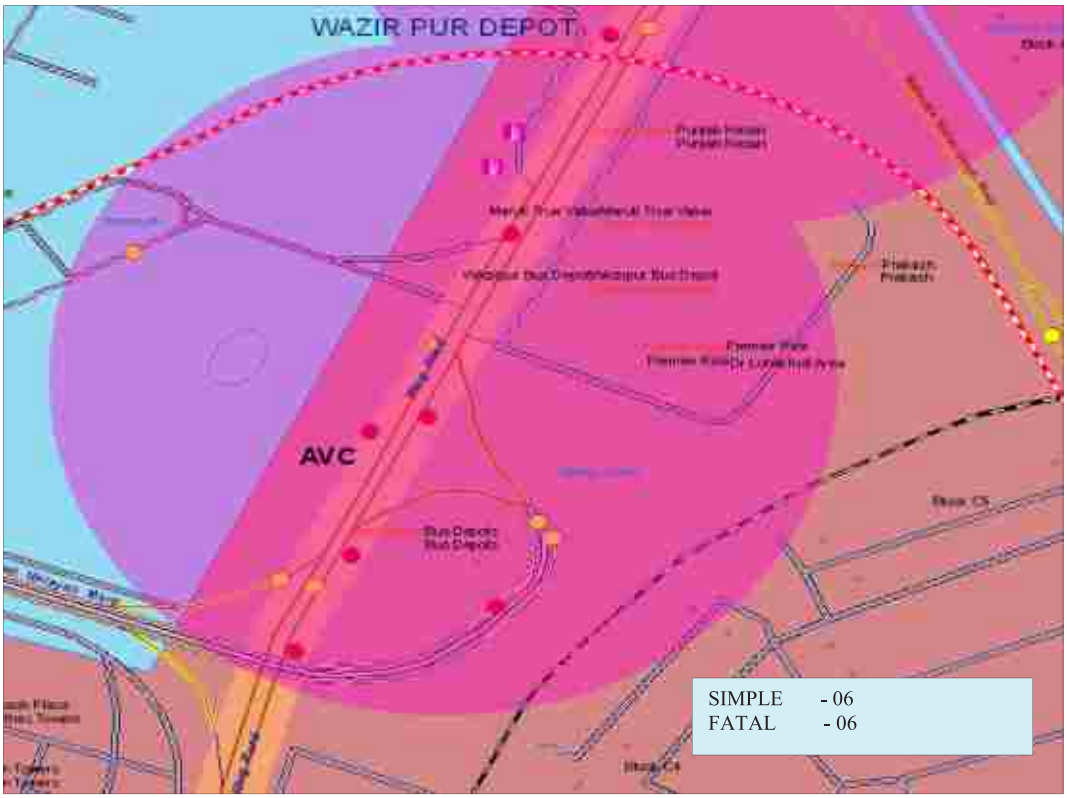
TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	4	9
SCOOTER/M.CYCLE	2	6

5TH PUSTA USMANPUR (KJC,SHD)



This point is situated on Pusta road that connects Kartar Nagar, Bhajanpura and Gamdi village which are highly populated areas. Here pedestrians, two-wheelers, TSRs and other slow-moving vehicles join the Shastri Park Red light and Khajoori chowk. More fatal accidents are hit and run cases. Main offending vehicles are HTVs. Main **victims here are Pedestrians, involved in 07 out of 13 total accidents.** More fatal accidents occurred in **night hours.**

WAZIR PUR DEPOT (AVC)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	4	4	8	4	4
2019	6	6	12	8	6

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	5	6
DAY	1	6

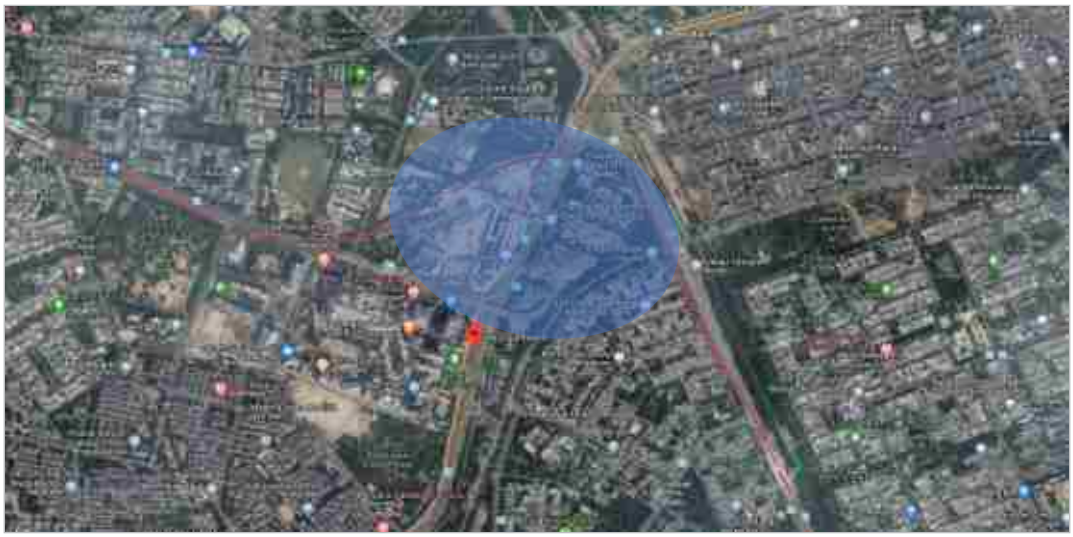
MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0300-0400	2	2
1900-2000	1	1

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	5	7
HTVs	1	1

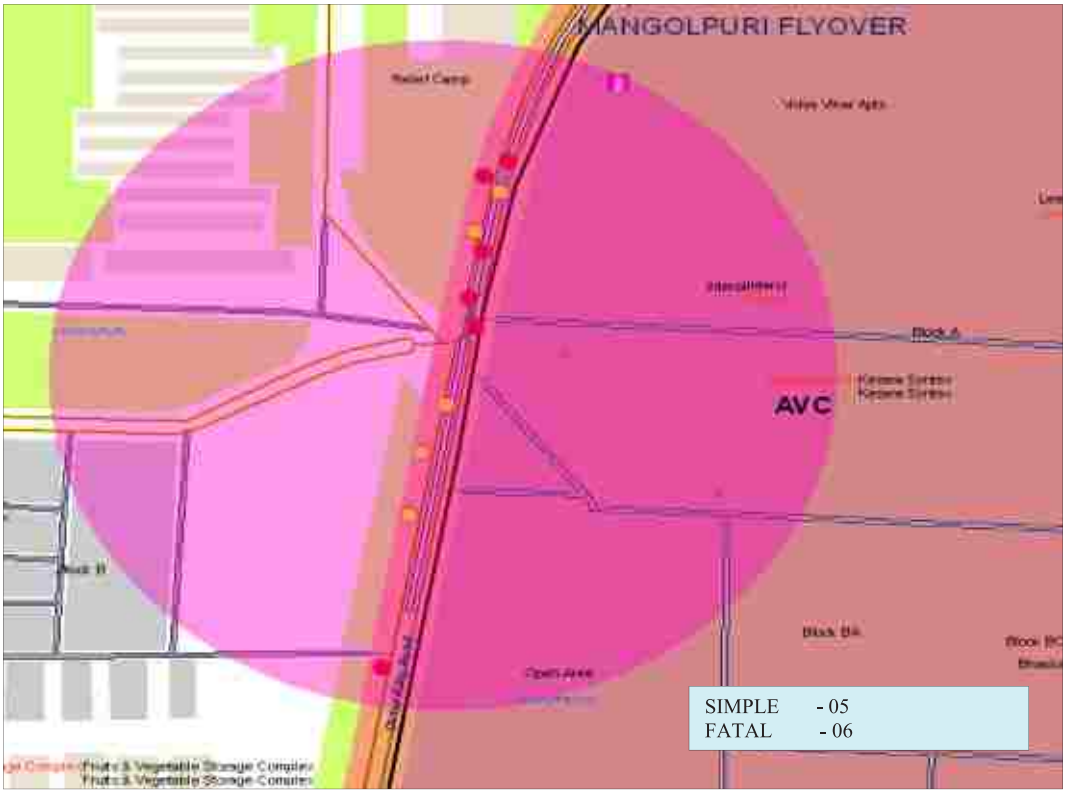
TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	1	3
SCOOTER/M.CYCLE	4	7

WAZIR PUR DEPOT (AVC)

This point is situated on Rind Road. There is movement of heavy vehicles HTVs, LGVs and all light motor vehicles. Most of fatal accidents are hit and run cases. Main offending vehicles are HTVs. Main **victims here are Two-wheelers, involved in 07 out of 12 total accidents, Pedestrians involved in 03 total accidents.** Most of fatal accidents occurred in **night hours.**



MANGOLPURI FLYOVER (MGP)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	5	2	7	12	2
2019	5	6	11	9	6

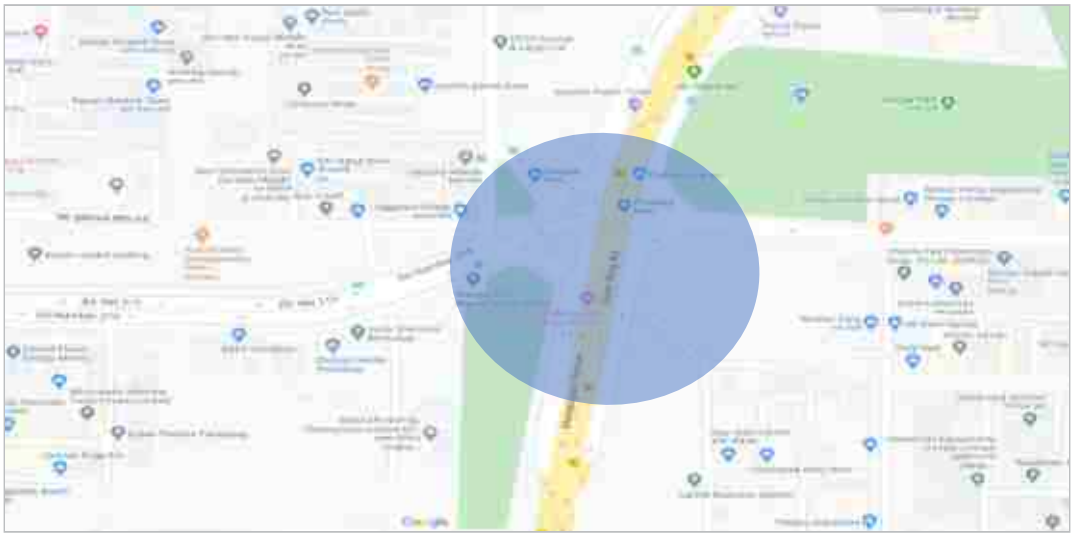
DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	5	9
DAY	1	2

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0000-0100	2	3
0100-0200	1	3

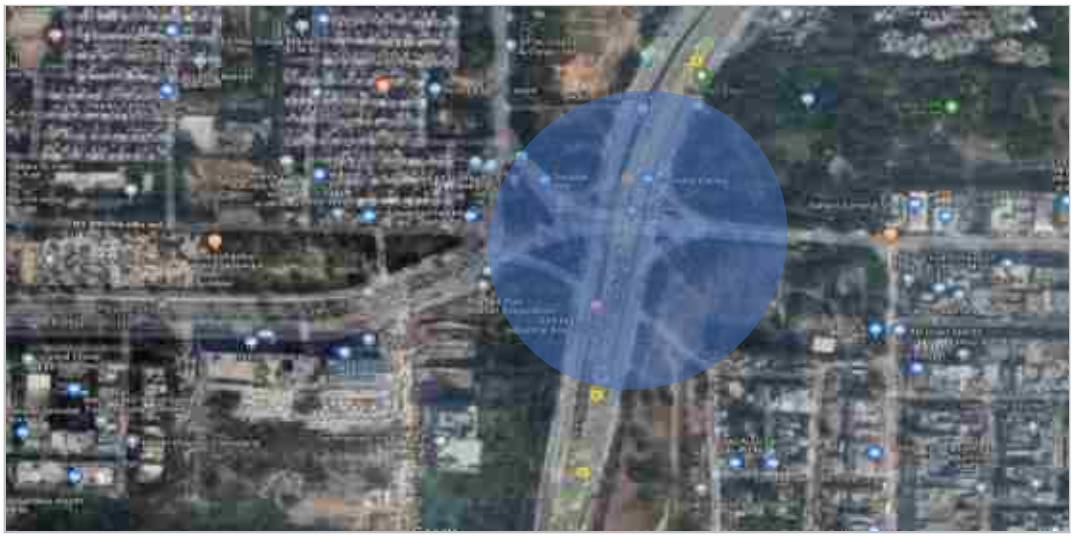
TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	4	5
CARS	1	2

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	1	1
SCOOTER/M.CYCLE	4	8

MANGOLPURI FLYOVER (MGP)



This point is situated on Outer Ring road which is elevated corridor. There is elevated flyover and ground level a junction point. High populated area Mangolpuri and West enclave. More fatal accidents are hit and run cases. Main offending vehicles are cars. Main **victims here are Two wheelers, involved in 08 out of 11 total accidents, Pedestrians involved in 01 fatal accidents.** Most of fatal accidents occurred in **night hours.**



EAST VINOD NAGAR/MV-II RED LIGHT (KPC)

COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	3	2	5	6	2
2019	3	6	9	16	8

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	5	7
DAY	1	2

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0100-0200	1	2
2300-2400	2	3

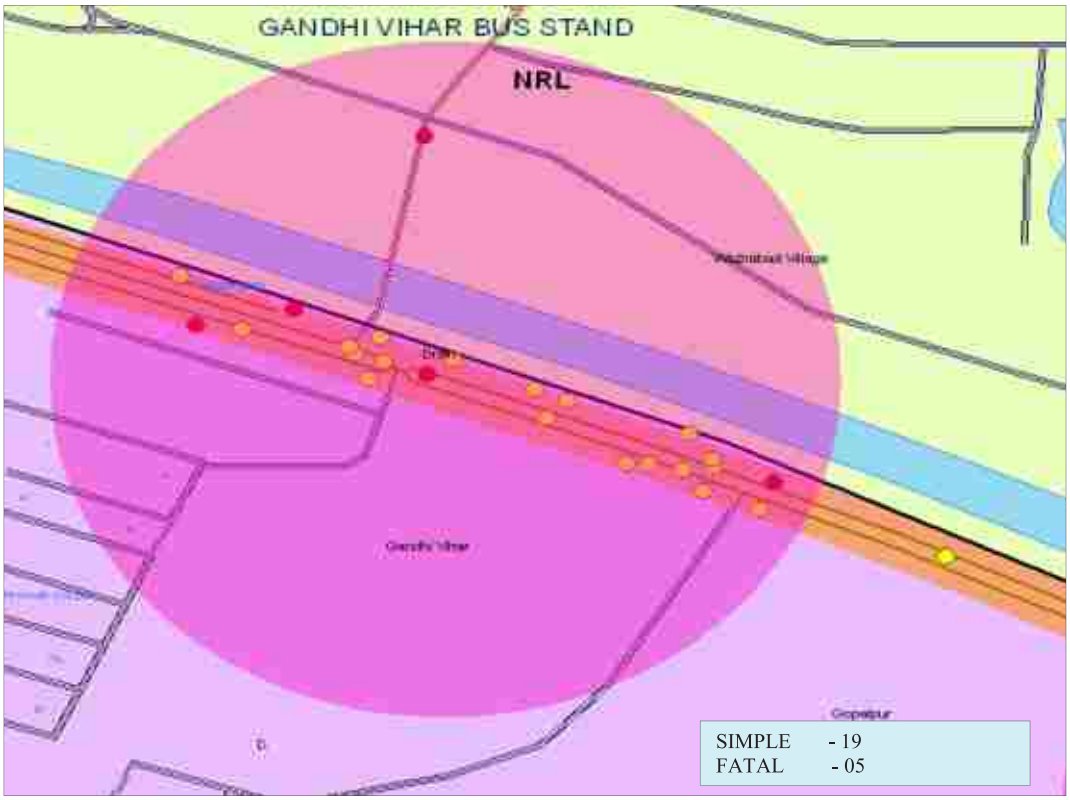
TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	3	3
HTVs	2	2

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	2	3
SCOOTER/M.CYCLE	2	4

EAST VINOD NAGAR/MV-II RED LIGHT (KPC)

This point is situated on NH-9 (old NH-24). This is a newly developed high-speed express way corridor connecting to Meerut Uttarpardesh. There is movement of high-speed vehicles and HTVs. More fatal accidents are hit and run cases. Main offending vehicles are HTVs. Main **victims here are Two wheelers, involved in 04 out of 09 total accidents, Pedestrians involved in 02 fatal accidents.** Most of fatal accidents occurred in **night hours.**

GANDHI VIHAR BUS STAND (BRD)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	10	2	12	10	2
2019	19	5	24	28	5

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	5	9
DAY	0	15

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0100-0200	1	2
2200-2300	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	2	4
CARS	1	7

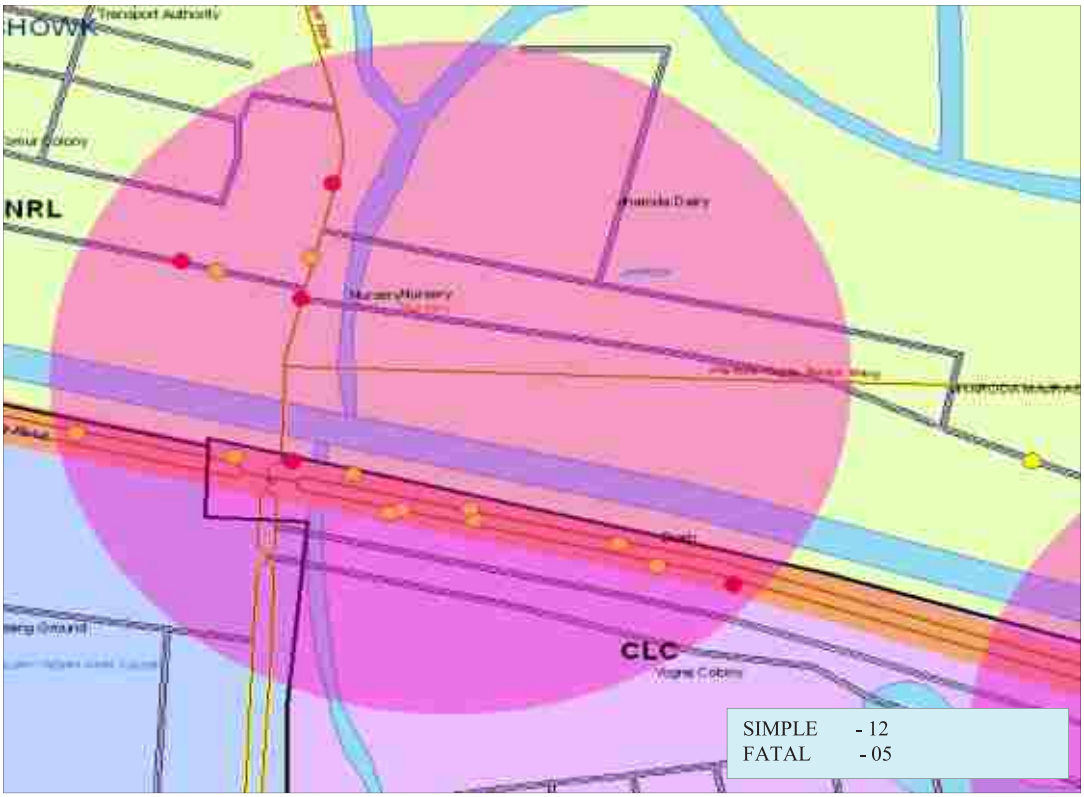
TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	3	6
SCOOTER/M.CYCLE	1	14

GANDHI VIHAR BUS STAND (BRD)

This point is situated on Outer Ring Road. This is high-speed corridor. There is movement of high-speed vehicles and HTVs. More fatal accidents are hit and run cases. Main offending vehicles are cars.

Main **victims here are Two wheelers, involved in 14 out of 24 total accidents, Pedestrians involved in 03 fatal accidents.** All fatal accidents occurred in **night hours.**

BURARI CHOWK (BRD)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	10	5	15	17	5
2019	12	5	17	18	5

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	3	4
DAY	2	13

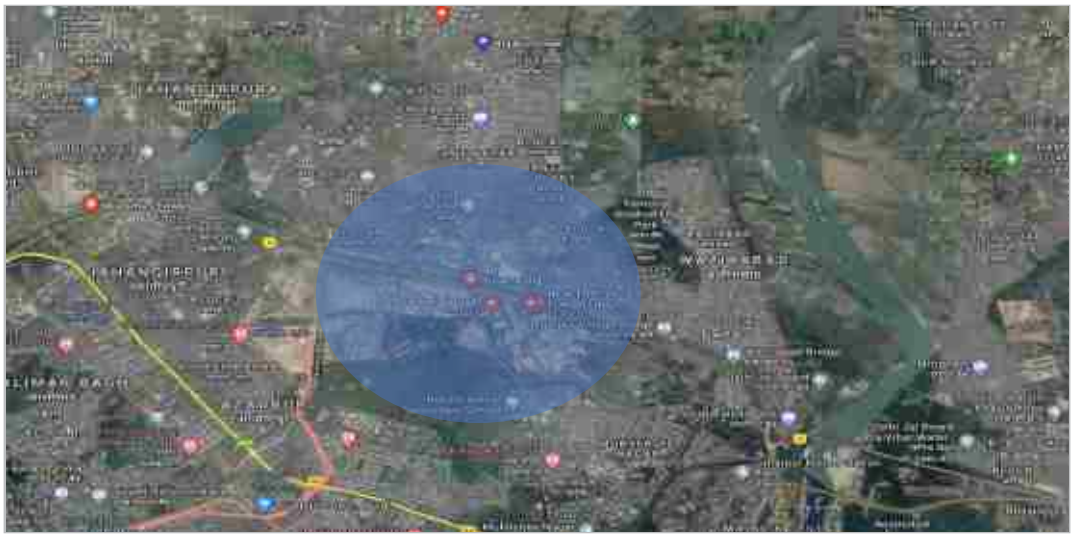
MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0000-0100	1	2
1900-2000	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	4	7
CARS	1	3

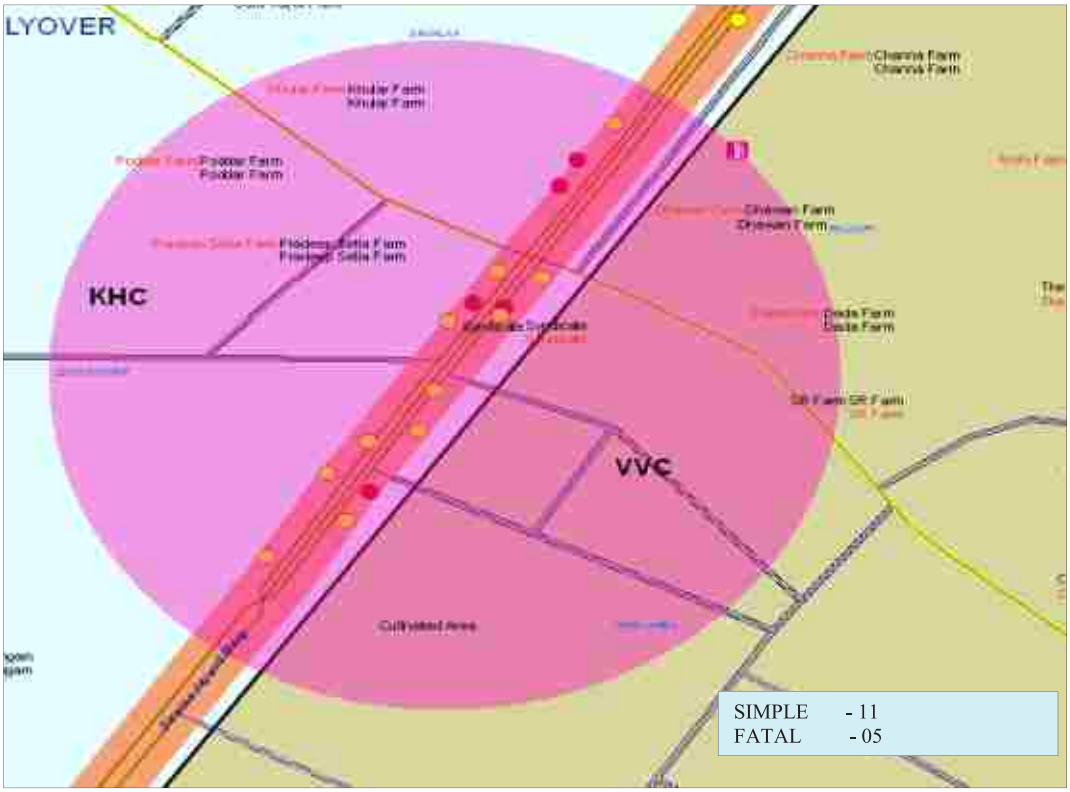
TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	1	5
SCOOTER/M.CYCLE	2	5

BURARI CHOWK (BRD)

This is an intersection on Outer Ring Road near Burari village. The minor road over the 'Nala' parallel to the Outer Ring road connect it to the main road. There is heavy movement of pedestrians, two-wheelers and other vehicles. There is heavy volume of traffic on Outer Ring road. More fatal accidents are hit and run cases. Main offending vehicles are cars. Main **victims here are Two wheelers, involved in 05 out of 17 total accidents, Pedestrians involved in 05 total accidents.** Most of total accidents occurred in **day hours.**



RAJOUKARI FLYOVER (KHC)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	6	3	9	7	3
2019	11	5	16	13	5

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	4	9
DAY	1	7

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0300-0400	1	2
0600-0700	2	2

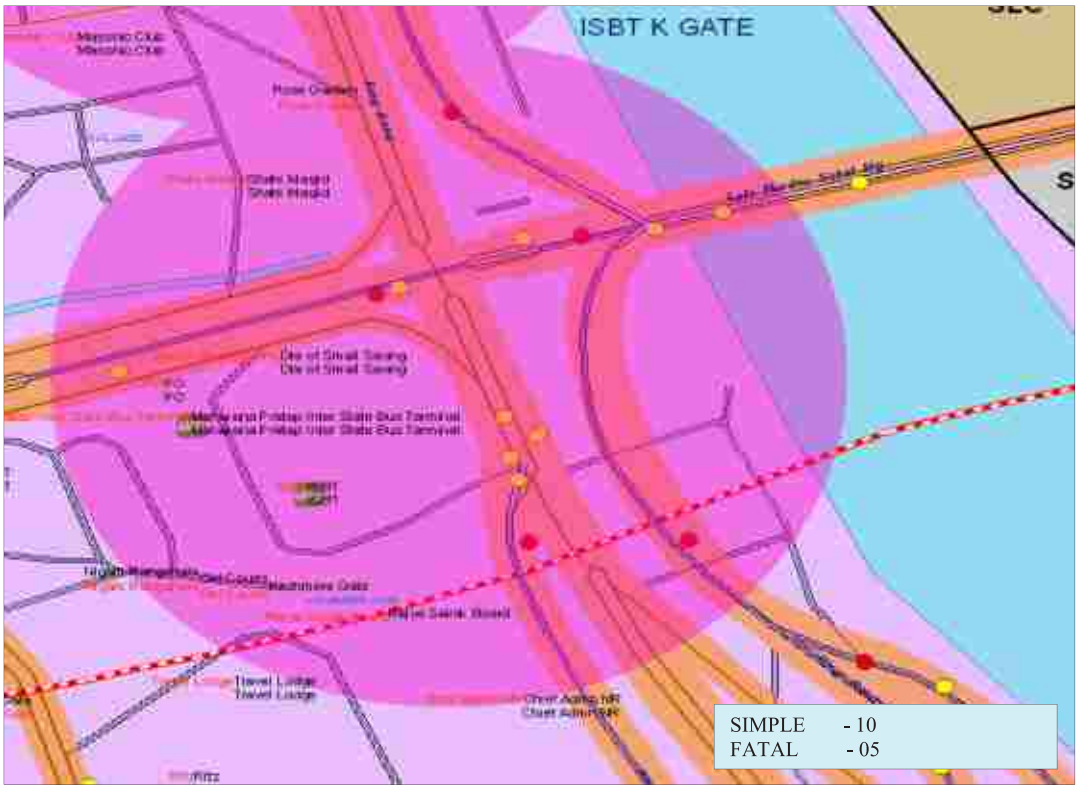
TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	3	7
CARS	2	4

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	2	5
SCOOTER/M.CYCLE	3	7

RAJOUKARI FLYOVER (KHC)

This point is situated on NH-8 at Rajokari. There is heavy vehicle and high-speed movement on the highway. More fatal accidents are hit and run cases. Main offending vehicles are cars. Main **victims here are Two wheelers, involved in 07 out of 16 total accidents, Pedestrians involved in 02 fatal accidents.** Most of fatal accidents occurred in **day hours.**

ISBT KASHMIRI GATE (CLC)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	14	10	24	22	10
2019	10	5	15	13	5

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	3	8
DAY	2	7

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0000-0100	1	2
1300-1400	1	2

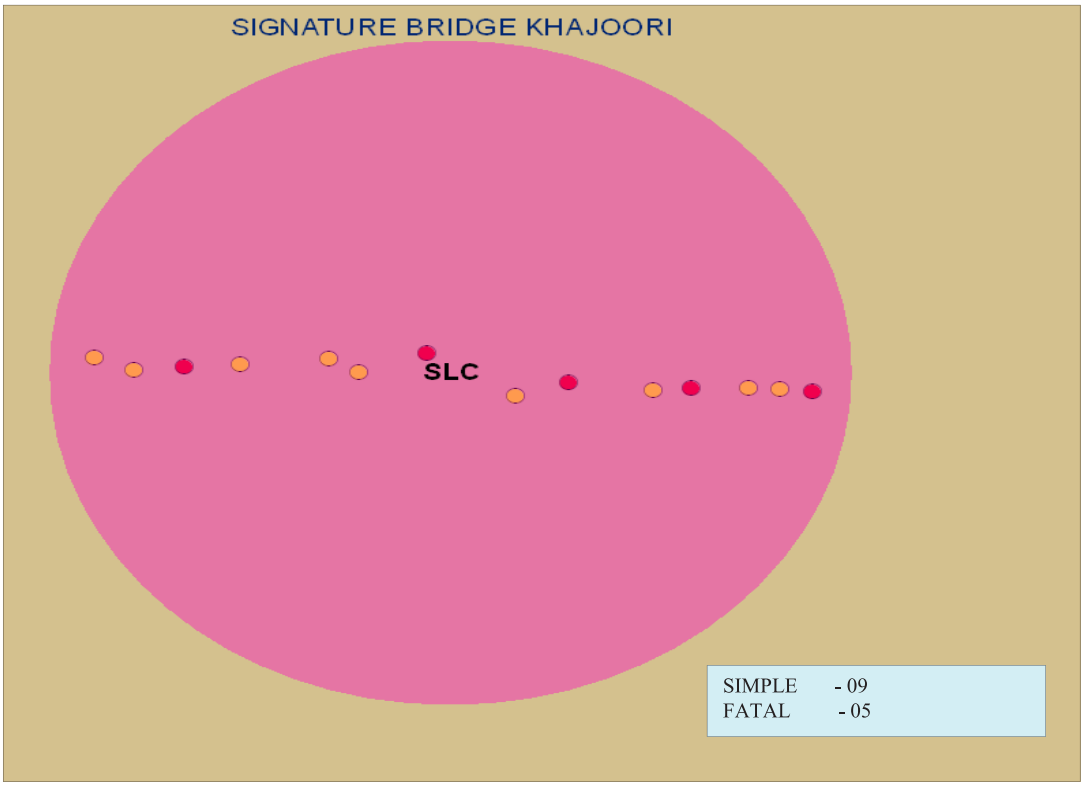
TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	1	5
BUSES	1	4

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	4	9
SCOOTER/M.CYCLE	1	3

ISBT KASHMIRI GATE (CLC)

This point is situated on Ring Road, at the junction point of Boulevard road on one side and ISBT road on other. It includes terminal area of ISBT, the ISBT flyover crossing Yamuna River and the connecting flyover loops. More total accidents are hit and run cases. Main offending vehicles are buses. Main **victims here are Pedestrians involved in 04 out of 05 fatal accidents.** More fatal accidents occurred in **night hours.**

SIGNATURE BRIDGE KHAZOORI (KJC)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2019	9	5	14	9	5

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	1	4
DAY	4	10

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
1300-1400	2	2
1400-1500	1	1

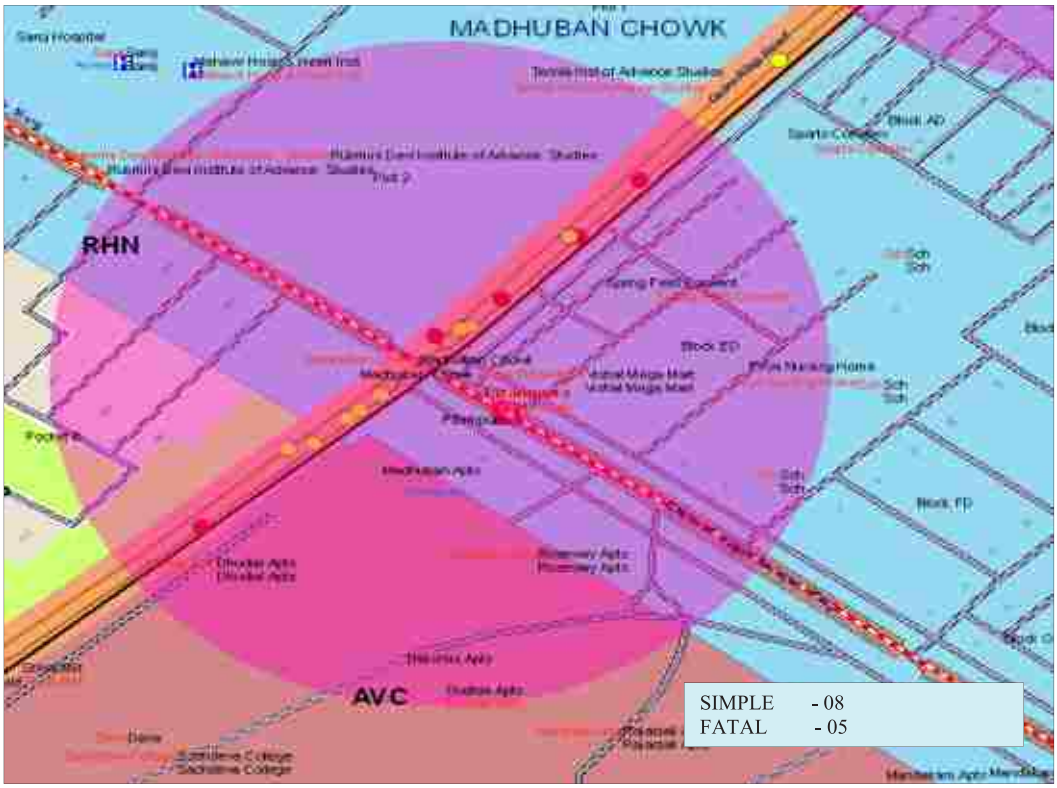
TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	4	9
DELIVERY VAN	1	1

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	4	5
SCOOTER/M.CYCLE	1	9

SIGNATURE BRIDGE KHAZOORI (KJC)

Signature Bridge is a cantilever spar cable-stayed bridge at Wazirabad road, connecting Wazirabad to East Delhi. This newly spot situated is on Wazirabad road in Khazoori side. Most of fatal accidents are hit and run cases. Main offending vehicles are Delivery van. Main **victims here are Two-wheelers involved in 09 out of 14 total accidents, Pedestrians involved in 04 fatal accidents**. Most of fatal accidents occurred in **day hours.**

MADHUBAN CHOWK (RHN)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	4	0	4	5	0
2019	8	5	13	12	5

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	3	8
DAY	2	5

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
1000-1100	1	1
2100-2200	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	3	4
BUSES	1	2

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	1	2
SCOOTER/M.CYCLE	4	7

MADHUBAN CHOWK (RHN)

This point is the intersection pint of Outer Ring road and Road No. 41. There is an underpass on Outer Ring road. It is major exchange point of passengers between Delhi metro and other public transport vehicles on Outer Ring road. Most of fatal accidents are Hit and run cases. Main offending vehicles are buses. Main **victims here are Two-wheelers involved in 04 out of 05 fatal accidents, Pedestrians involved in 01 fatal accidents.** More fatal accidents occurred in **night hours.**

POWER HOUSE PITAMPURA (RHN)

COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2019	8	5	13	10	5

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	3	6
DAY	2	7

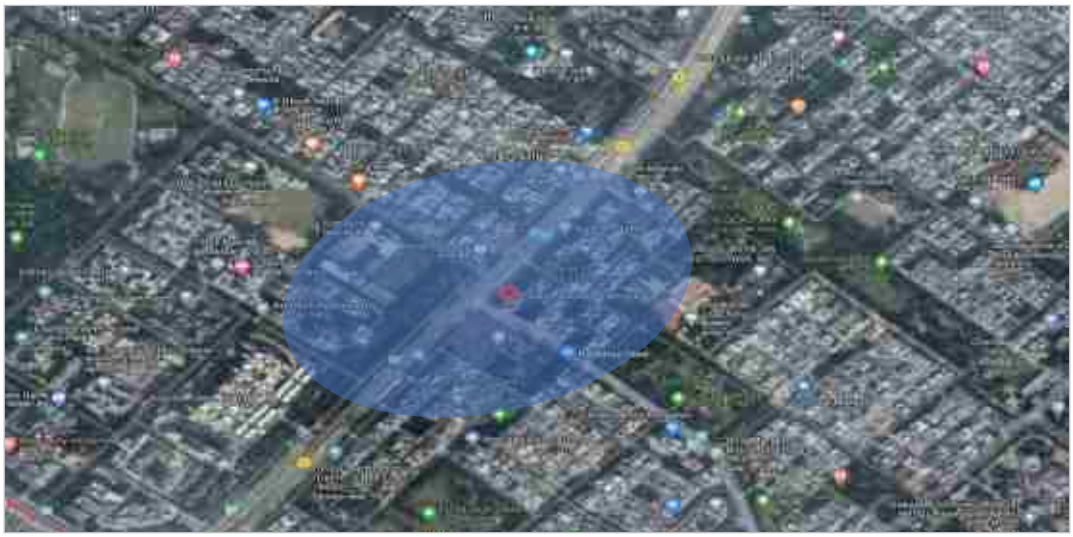
MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0000-0100	1	2
1200-1300	1	2

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
HTVs	2	3
CARS	1	6

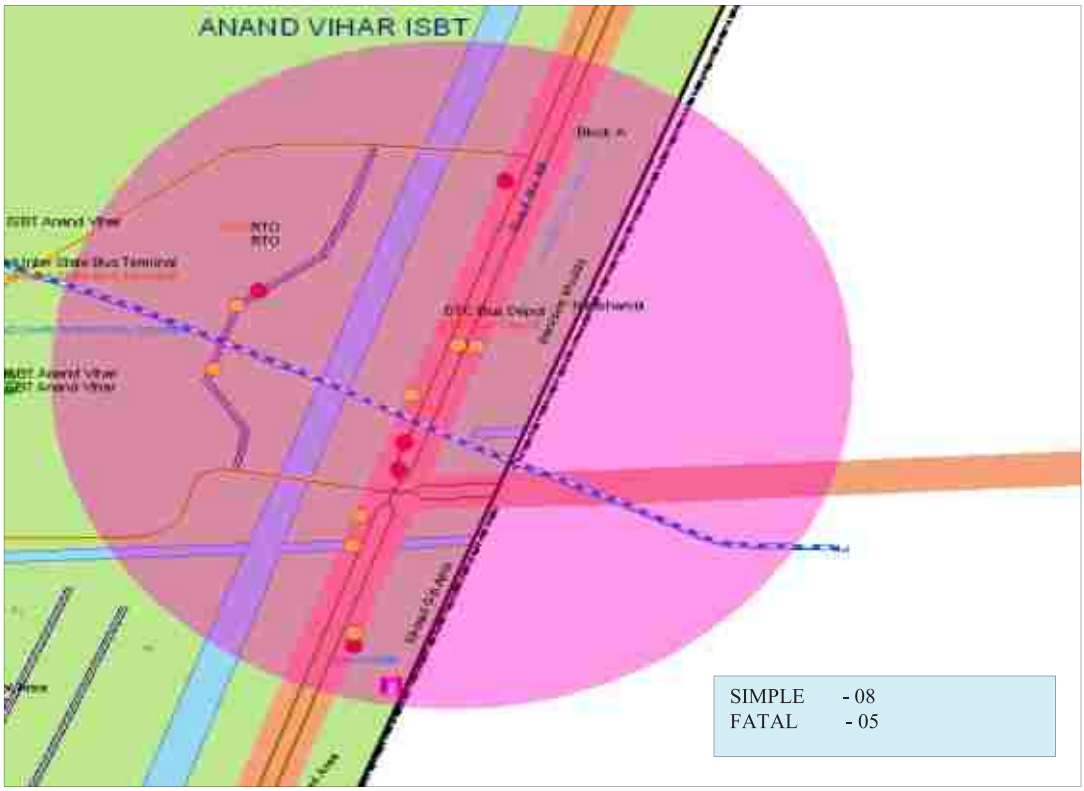
TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	2	4
SCOOTER/M.CYCLE	2	7

POWER HOUSE PITAMPURA (RHN)

This point is situated on Outer Ring road. There is movement of heavy vehicles on Outer Ring Road. Main offending vehicles are HTVs and cars. Main **victims here are Two-wheelers involved in 07 out of 13 total accidents, Pedestrians involved in 02 fatal accidents.** More fatal accidents occurred **in night hours.**



ANAND VIHAR ISBT (VKC)



COMPARATIVE ROAD ACCIDENTS					
YEAR	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	PERSONS INJURED	PERSONS KILLED
2018	9	6	15	11	6
2019	8	5	13	8	5

DAY NIGHT WISE ACCIDENTS		
	FATAL	TOTAL
NIGHT	0	1
DAY	5	12

MOST VULNERABLE TIME SLOTS		
	FATAL	TOTAL
0900-1000	1	2
2000-2100	2	3

TOP OFFENDING VEHICLES		
	FATAL	TOTAL
UN-KNOWN VEH	1	3
BUSES	4	9

TOP VICTIMS		
	FATAL	TOTAL
PEDESTRIAN	2	7
SCOOTER/M.CYCLE	1	3

ANAND VIHAR ISBT (VKC)

This point is situated on Road No. 56. It includes terminal area of ISBT. There is movement of buses and movement of pedestrians. Main offending vehicles are buses. Main **victims here are Pedestrians involved in 07 out of 13 total accidents.** All fatal accidents occurred in **day hours.**

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CHAPTER 7 CAUSES OF ROAD ACCIDENTS

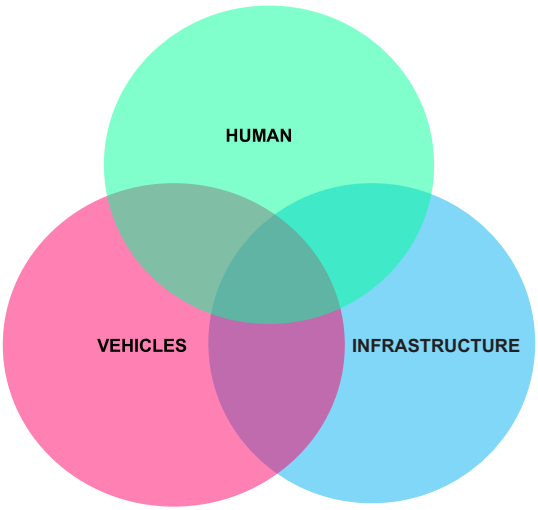
Road traffic accidents are primarily influenced by three main factors:

- **Human (drivers, riders, vehicle occupants, pedestrians and cyclists)**
- **Vehicle (vehicle design/structure, mass, equipment such as seatbelts or tyres, etc.)**
- **Infrastructure/Environment (hereinafter called "infrastructure" and comprising of roads, signages, weather, conditions affecting visibility, etc.)**

Accidents are caused by the mal-function/failure/error by one or more of these above factors.

An accident is a man-made tragedy and at some level, all accidents are preventable. There may be a lapse on the part of the driver or the victim, directly or indirectly who was unable to exercise control over self or vehicle.

However, other factors or causes also play their part in the occurrence of the tragedy. As such, there may be more than one cause responsible for an accident. There are other human interventions/ reasons besides driver(s) of the vehicle in the occurrence of an accident.

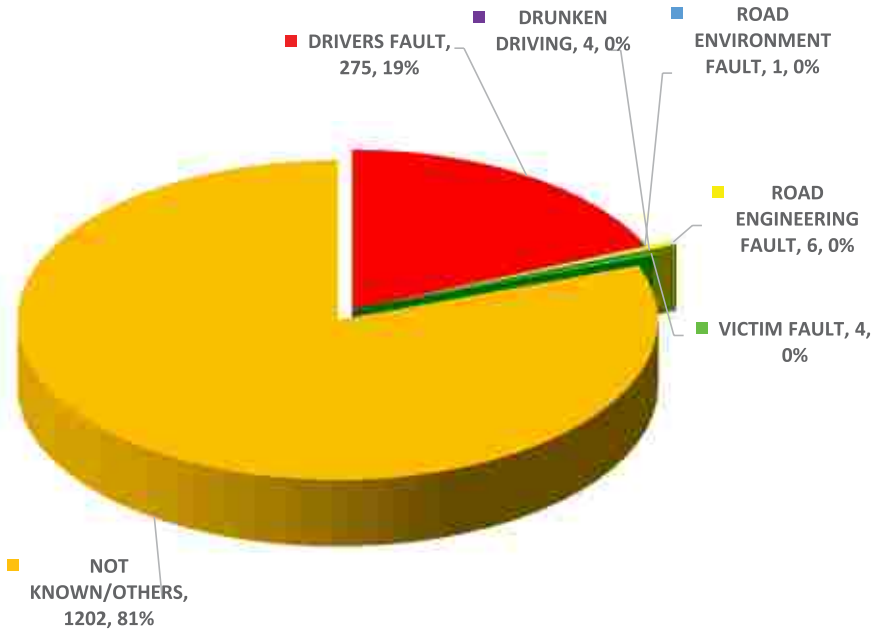


- A study was conducted to identify various causes of accidents. These factors can be broadly categorised into the following: -
  1. Driver's fault.
  2. Victim's fault.
  3. Vehicle mechanical fault.
  4. Road environment fault.
  5. Road condition / faulty road design / road engineering.
  6. Other reasons.

- There may be more than one of these factors responsible for an accident.
- An analysis done on the causes of fatal accidents that have occurred during the year 2019 **found that around 19 % of the total causes account for driver's fault.**
- **In 81% of the cases, the real cause was not known. This figure mostly comprises of hit and run cases.**
- Only 01% causes are related to road environment factors and 01% are related to faulty road engineering/ design.
- 02% accidents were solely due to victim's fault and only 04 fatal road accident cases were due to drunken driving. {Figure 7.1 (a)}.

Figure 7.1 (a):

CAUSES OF ACCIDENTS-2019



Driver's Fault:

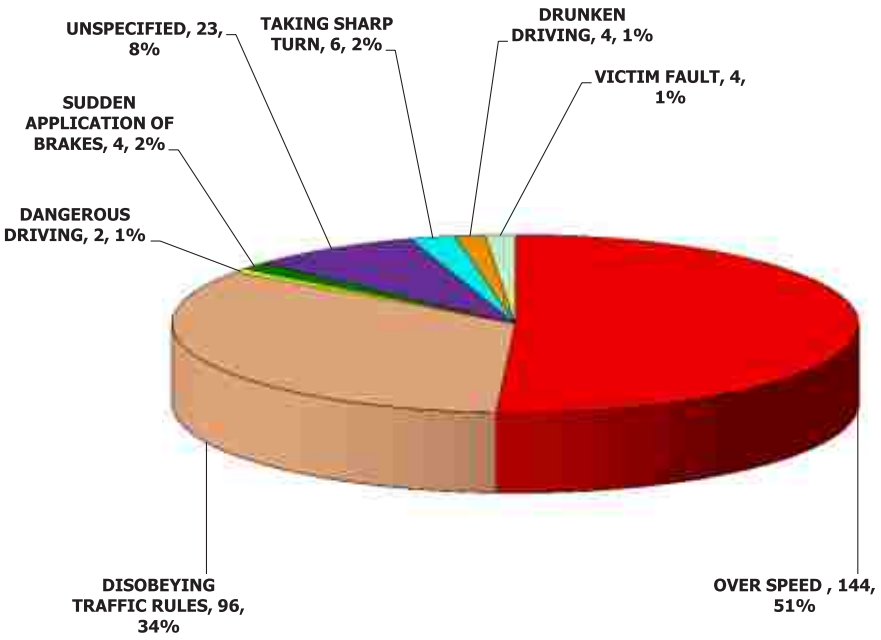
- This category refers to the accused driver's negligence that is found primarily responsible for committing an accident. This can further be broken down into:-

1. Over speed of vehicle.
2. Disobeying Traffic Signals.
3. Dangerous / rash driving.
4. Lane indiscipline.
5. Sudden application of brakes.
6. Drunken driving.
7. While reversing of vehicle.

- Of 279 total cases under driver's fault; **51% were caused due to over speeding, around 34% were caused due to disobeying traffic rules,** around 02% were due to dangerous driving, 02% were caused due to sharp turn and 2% due to sudden application of brakes. In around 8% of such causes, the fault was not specified. In 4 cases i.e. 1% of the causes of driver's fault were confirmed cases of drunken driving.

Figure7.1 (b)

DRIVERS' FAULT



Victim's Fault:

- Victim's fault relates to an act/omission/ lapse etc. on the part of either driver/ rider of the vehicle who has sustained damage/injury (or death). This factor can further be broken down as:-

1. Rash driving by victim.
2. Abruptly crossing the Road.
3. Lane indiscipline.
4. Boarding/de-boarding a moving vehicle.
5. Sudden application of brakes.
6. Victim vehicle without light.
7. Drunken driving.

- In the analysis of 4 cases (1% of total causes) of 'victim's fault', it was found that in **50% cases, the victims were responsible for rash driving and in 25% cases the victims were abruptly crossing the road.**

Road Environment Fault:

- 'Road Environment Fault, refers to ad-hoc or temporary factors/conditions that existed on road which are not congenial

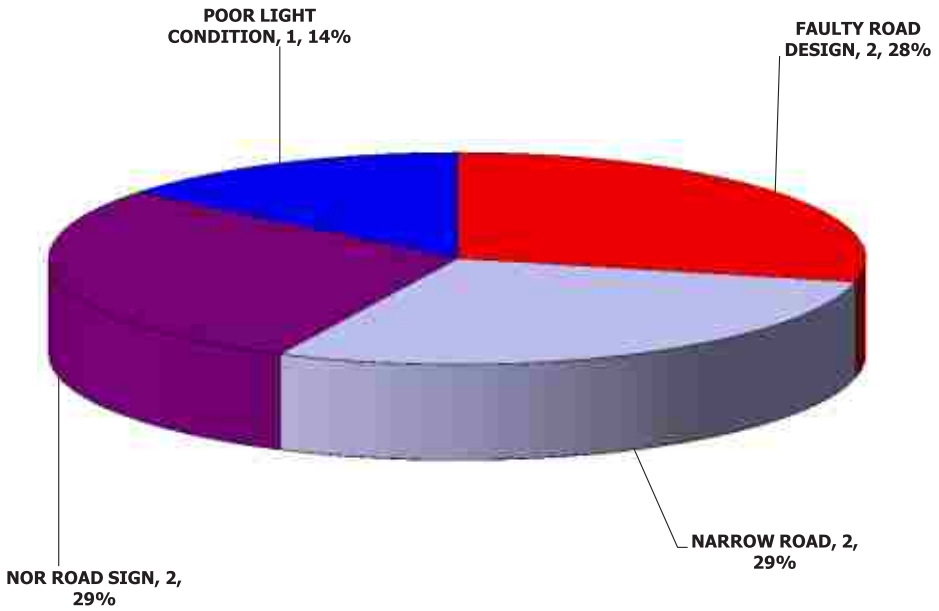
to smooth and safe road traffic and that may lead to an accident. This factor can further be broken down as:-

1. Poor Light Condition
2. Weather condition.
3. Unguarded civil work etc.
4. Slippery road.
5. Light reflection from front.
6. Encroachment on road.

- There is only one road accident case that occurred due to poor light condition.

Figure 7.1 (d)

FAULTY ROAD CONDITION/DEISGN AND ROAD ENVIRONMENT FAULT



Faulty Road Condition / Design:

- 'Faulty Road Condition / Design', refers to factors or conditions which are either **part of lay out or design or defects in the construction of road.** These factors/ 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 accident. This factor can further be broken down as: -

1. No central verge etc.
2. Hole or pit on road.
3. Faulty road design.
4. Narrow road.
5. Sharp curve.

- **Faulty road engineering/design are responsible for 6 i.e. 04% of total causes of fatal accidents in the year 2019.** Out of these causes, around 33% cases were due to no road sign on the road, 33% fatal accidents were caused due to narrow road and 33% fatal accidents were due to faulty road design.

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CHAPTER 8 BEHAVIOURAL, ENFORCEMENT AND ENVIRONMENTAL ISSUES

A number of countries have achieved sustained reductions in traffic-related injuries and fatalities through effective road safety programmes and legislative changes. The most positive changes to road user behaviour happen when road safety legislation is supported by strong and sustained enforcement, and where the public is made aware of the reasons behind the law and consequences of non-compliance.

Behaviour pattern of road users/motorists have a direct link with the occurrence of accidents. Road safety laws improve road user behaviour – a critical factor in road safety – to reduce road traffic crashes, injuries and deaths.

Use of motorcycle helmets:

Head injuries are the leading cause of death and major trauma for two-wheeled motor vehicle users.

The use of helmet is, as such, an important means of preventing road traffic deaths. Good helmet design and correct use of standard helmets when riding a motorcycle are highly important.

Fact: Wearing a good-quality helmet can reduce the risk of death from a road traffic crash. Wearing a good-quality helmet can reduce the risk of death by 40% and severe injury by approximately 70%. Only 44 countries, representing 17% of the world's population, have motorcycle helmet laws that meet *best practice: this means making sure the law applies to all drivers and passengers, all roads and engine types, requires the helmet to be fastened and makes reference to a particular helmet standard.* (Source-WHO: Road traffic injuries - Fact Sheet Reviewed January 2018)

- When motorcycle helmet laws are enforced effectively, wearing of helmets can increase to over 90%.
- The effectiveness of motorcycle helmets in reducing head injuries depends on the quality of helmets. Requiring helmets to meet a recognized safety standard is important to ensure that helmets can effectively reduce the impact of a collision to the head in the event of a crash. (Source: WHO: Global Status Report on Road Safety 2013)

U/s 129 of the Motor Vehicles Act 1988, every two-wheeler rider including pillion rider is required to wear helmet while driving.

- Use of helmet by two-wheeler riders has also been made compulsory in the traffic laws and strict enforcement is being done by Traffic Police besides creating awareness by its Road Safety Education cell. Yet, lot of people wear helmet only due to fear of prosecution and not for their safety. The tendency of people not to wear helmets or wear sub-standard helmets puts the rider at risk of injury.
- In the year 2019, **10,36,151 riders and 4,54,912 pillion riders were prosecuted by Delhi Traffic Police for not using helmet (Table 8.1).**

Seatbelt use:

Fact : Wearing a seat-belt reduces the risk of death among front-seat and rear-seat passengers. Wearing a seat-belt can reduce fatal and non-fatal injuries among front seat occupants by 45-50% and rear-seat car occupants by 25–75%. 105 countries, representing 67% of the world's population, have seat-belt laws that cover both front and rear seat occupants, in line with best practice. (Source-WHO: Road traffic injuries - Fact Sheet Reviewed January 2018)

- Mandatory seat-belt legislation is highly effective in promoting seat-belt wearing and is a cost effective means of reducing road traffic deaths and injuries.
- Increasing seat-belt use requires multisectoral action beyond the framing of appropriate legislation. This includes creating awareness and enforcement and the provision of in-vehicle seat-belt reminders, which have been highly effective in increasing use. (Source: WHO: Global status report on road safety-2018)

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

- Driving without using seatbelt is a punishable offence u/s 138(3) CMVR 1989. But still, many car users and HTV, LGV and bus drivers tend to violate this law. Traffic Police has been challaning these violators extensively.
- Road Safety Awareness campaigns are launched time to time and wide media publicity is given to make people aware of the use of seat belts as a safety precaution.
- **In the year 2019, 5,08,707 people were prosecuted by Delhi Traffic Police for driving without seat belt, as against 6,50,536 in 2018(Table 8.1).**

Drinking and Driving:

Fact: Drinking alcohol and driving increases the risk of a crash dramatically. Only 34 countries, representing 29% of the world's population, have national drink–driving laws that meet best practice. (Source-WHO: Road traffic injuries - Fact Sheet Reviewed January 2018)

- Drinking and driving increases both the risk of a crash and the likelihood that death or a serious injury will result.
- The risk in involvement in a crash increases significantly above a blood alcohol concentration (BAC) of 0.04 g/dl.
- Laws which establish lower BACs (between zero and 0.02 g/dl) for young/novice drivers can lead to reductions between 4% and 24% in the number of crashes involving young people.
- Enforcing sobriety checkpoints and random breath-testing can lead to reductions in alcohol-related crashes by upto 20%, and has shown to be very cost-effective. (Source: WHO: Global Status Report on Road Safety 2013)

Driving under the influence of liquor/drugs is a punishable offence u/s 185 M. V. Act 1988. Drunken driving has proved to be one of the major causes of traffic accidents.

- Moreover, around 47% fatal accident cases are 'hit and run' cases owing to which the drunken driving factors cannot be officially established in those cases. However, the prosecution statistics in this account is sufficient to draw the inference.
- Efforts were made to reduce the number of accidents caused due to drunken driving by increasing the prosecution of drunken drivers. In the year 2019, **a total of 36,065 persons were caught and prosecuted** on this account, but the real number of culprits driving under influence of liquor may be much higher than the prosecution figures show as all offenders are not caught.
- However, with continuous pressure and strategic prosecution by launching special drives by Traffic Police till late in night, there has been a positive impact on the reduction of road accidents.

Post-crash care:

Simple and affordable post-crash care interventions save lives. Effective care for the injured requires timely care at the scene, prompt transport to appropriate emergency and surgical care at hospital, and early access to rehabilitation services. (Source: WHO: Global Status report on Road safety-2018)

Fact: Access to timely and effective emergency care after road traffic crashes saves lives and reduces disability among the injured. **Key solutions for emergency care system development include establishing universal access numbers linked to integrated prehospital and facility-based emergency care services, training all frontline providers in basic emergency care, and promoting lay first responder training where formal systems are limited. (Source-WHO: Road traffic injuries - Fact Sheet Reviewed January 2018)**

Less than 25% of people have access to a staffed operating theatre within two hours of a road traffic crash.

- Delays in detecting and providing care for those involved in a road traffic crash increases the severity of injuries. Care of injuries after a crash has occurred is extremely time-sensitive: delay of minutes can make the difference between life and death.
- Of 1433 fatal accidents, 674 or 47% were hit and run cases in 2019, while last year 46.17% cases were in hit and run category. In terms of total accidents, 1765 (31.46%) were of hit and run cases in the year 2019.
- Most accidents occurred at night when there were no eye witnesses to such occurrences. The apathetic attitude of people generally leads to such category of accidents remaining unsolved. Often, passers-by try to ignore or avoid getting involved in helping the accident victims on the pretext of not having time or avoiding legal hassle. This is despite the issuance of good Samaritan guidelines by Ministry of Road Transport and Highways and highlights the need for more publishing, awareness campaign and effective implementation of good Samaritan guidelines on field.

Distracted driving

Distracted driving by mobile devices such as smartphones and/ or other in-vehicle devices is a growing risk factor linked to serious negative outcomes. The use of a mobile phone while driving is widespread amongst young and novice drivers and growing amongst motorcyclists, adding further to the already high risk of crash and death among these groups. (Source: WHO: Global Status Report on Road Safety-2018)

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. *Mobile phone use creates various types of distraction: visual, auditory, manual and cognitive. Texting involves cognitive distraction, as well as longer periods of both manual and visual distraction.*

- Evidence shows that the distraction caused by talking on mobile phones can impair driving performance in a number of ways, e.g. longer reaction times (notably braking reaction time), impaired ability to keep in the correct lane, and shorter following distances. Texting also results in considerably reduced driving performance, with young drivers at particular risk.
- There is a four-fold increase in crash risk when talking on a mobile phone while driving.
- Hands-free phones are not much safer than hand-held phone sets, and texting considerably increases the risk of a crash.
- The use of mobile phone while driving falls under dangerous driving and hence is a punishable offence U/s 184 M.V. Act 1988. It has now become a menace for safe driving on Delhi roads.
- In the year 2019, **18,451 people were prosecuted by Delhi Traffic Police for using mobile phone while driving** as against **13,736** in 2018. **(Table 8.1)**
- In the year 2019, **2,25,553 people were prosecuted by Delhi Traffic Police for dangerous driving** as against **2,43,735** in 2018. **(Table 8.1)**

Speed:

Fact: Controlling speed reduces road traffic injuries. As average speed increases, so too does the likelihood of having a road traffic crash and the severity of the consequences should a crash occur. An increase of 1 km/h in mean vehicle speed results in an increase of 3% in the incidence of crashes resulting in injury and an increase of 4–5% in the incidence of fatal crashes. (Source-WHO: Road traffic injuries - Fact Sheet Reviewed January 2018)

Only 47 countries, representing 13% of the world's population, have laws that meet best practice on urban speed. This means having a national urban maximum speed limit of not more than 50 km/h and allowing local authorities to modify this limit when necessary, to ensure safe speeds locally.

- An increase in average speed is directly related to the likelihood of a crash occurring and to the severity of the crash consequences.
- A 5% increase in average speed leads to an approximately 10% increase in crashes that cause injuries, and a 20% increase in fatal crashes.
- Pedestrians have a 90% chance of surviving a car crash at 30 km/h or below, but less than a 50% chance of surviving impacts of 45 km/h or above.
- Safe speed thresholds vary according to different types of road, different types of collision and different road users, with their inherent vulnerabilities. Effective speed management needs to take these and other variables into account.
- Zones of 30 km/h can reduce crash risk and injury severity and are recommended in areas where vulnerable road users are particularly at risk.

Under Section 183 of the Motor Vehicles Act 1988, every driver of the motor vehicle is required to follow the speed limit as notified for the road.

- In the year **2019, 1,04,450 drivers were prosecuted for driving at a speed exceeding the speed limit of the road** as against **1,41,052** in 2018.

Use of child restraints:

Fact: The use of appropriate child restraints considerably reduces the risk of serious injury to children. Placing children in child restraints reduces the risk of serious injury by up to 80% compared to children restrained only by seat-belts. Further, children in booster seats have a 77% reduced risk of being injured in a crash compared to unrestrained children. Only 53 countries, representing 17% of the world's population, have a child restraint law that meets best practice. Best practice laws apply restrictions on children sitting in the front seat and require that the restraints children use are appropriate for their age/height/weight. (Source-WHO: Road traffic injuries - Fact Sheet Reviewed January 2018)

- Children who are unrestrained in a car are at increased risk of injury and death in the event of a collision. Appropriate child restraint systems, which include child seats for infants and booster seats for older children, are designed with the child's developmental stage in mind. They work to secure the child in a way that reduces the chance of a severe injury occurring.
- If correctly installed and used, child restraints reduce deaths among infants by approximately 70% and deaths of small children between 54% and 80%.
- Mandatory child restraint laws and their enforcement lead to an increase in the use of child restraints. **(Source: WHO: Global Status Report on Road Safety 2013)**

Lane Driving

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

- **Vehicles change lanes without following the rules/** regulations. This tendency is more rampant in two-wheeler riders. **Traffic Police has been launching special drives against such offenders** regularly.
- 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 to repeat their violation.
- Besides, **Road Safety Education** is imparted to a cross section of the society along with media campaigns, social media outreach and FM radio broadcast.
- Traffic Police also launches regular special enforcement drives against these types of violations with strict prosecution. During the year **2019, a total of 12,506 vehicles were prosecuted** under the offences 'Violation of Hon'ble Supreme Court Guidelines' as against 13,825 in 2018.

TABLE-8.1

PROSECUTION AGAINST VIOLATION OF RULES – 2019

S.NO	VEHICLES	NOT USING SEAT BELT	RIDER W/O HELMET	PILLION RIDER W/O HELMET	DRUNKEN DRIVING	DANGEROUS DRIVING	USING MOBILE WHILE DRIVING
1.	**HTV**	50454	0	0	423	51172	365
2.	**LGV / MMV**	148589	0	0	1634	84411	1185
3.	**D. VAN**	2320	0	0	403	5147	253
4.	**SCHOOL CAB**	1890	0	0	30	127	29
5.	**CHARTPVT**	16874	0	0	71	6736	40
6.	**DTC**	973	0	0	1	742	4
7.	**TRAILOR**	6	0	0	4	178	0
8.	**SCHOOLBUS**	708	0	0	10	293	3
9.	**ROADWAYS**	240	0	0	3	912	0
10.	**RTV**	1728	0	0	23	417	11
11.	**CALLCENTRE**	2866	0	0	20	415	92
12.	**TAXI**	47669	0	0	898	5188	828
13.	**CARJEEP**	230865	0	0	10367	35372	9671
14.	**TRACT0R**	0	0	0	18	52	7
15.	**TSR**	0	0	0	1159	2150	159
16.	**SCMC**	0	1036151	454912	20174	29739	5719
17.	**GSEWA**	490	0	0	78	215	11
18.	**CLUSTERBUS**	1349	0	0	4	1173	8
19.	**INTERSTATEBUS**	1173	0	0	10	568	7
20.	**E RICKSHAW**	0	0	0	729	522	56
21.	**OTHERS**	513	0	0	6	24	3
TOTAL CHALLAN		**508707**	**1036151**	**454912**	**36065**	**225553**	**18451**
COMPOUND CHALLAN		**485554**	**934034**	**421602**	**0**	**145708**	**4527**
COURT CHALLAN		**23153**	**102117**	**33310**	**36065**	**79845**	**13924**

Safe Vehicles

Vehicle safety features such as electronic stability control and advanced braking make a substantial contribution to reducing road traffic deaths and injuries.

Despite the potential benefits, not all new and used vehicles are required to be equipped with these and other internationally recognized vehicle safety standards.

Vehicle safety is increasingly critical to the prevention of crashes and has been shown to contribute to substantial reductions in the number of deaths and serious injuries on the roads.

Pedestrian front protection: Softer bumpers and modified front ends of vehicles can reduce the severity of a pedestrian impact with a car.

Motorcycle anti-lock braking systems: Help the rider maintain control during an emergency braking situation and reduce the likelihood of a road traffic crash and subsequent injury.

Environmental challenges for Prosecution

The sharp increase in vehicle numbers due to increased dependence on personal vehicles in lieu of adequate, comfortable and efficient public transport services and walking and cycling facilities is worsening air pollution levels in recent times.

- Delhi has lost its air quality gains of the first-generation action which included large scale conversion of public transport buses and three wheelers to natural gas, relocation of polluting industries and improvement in emission standards for vehicles, among others.
- Both particulate levels (PM 10 and PM 2.5) as well as nitrogen oxides are increasing steadily. Ozone, which was not a problem earlier, is rising again. During winter, PM 2.5 levels are normally 3 to 4 times higher than the standard and during smog episodes, it can go as high as 7 to 8 times the standard. This has serious public health consequences.
- At present, Delhi's vehicular population is over **118 lakhs** which is distributed over a human population of approximately 195 lakhs, indicating a high number of vehicles per lakh human population.
- **Inferior and adulterated fuel quality, poor motor vehicle maintenance, inadequate traffic planning are some of the major contributors for increase in vehicular pollution** particularly in city areas.
- Regular measurement of air pollutant and monitoring of air quality, establishment of realistic air quality standards, source inventories, understanding on seasonal variations of air pollutant in the ambient 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 regulations measures are taken by Delhi Traffic Police: -**

  1. Action against polluting **vehicles plying without PUCC** and visible polluting vehicles.
  2. Action against vehicles **carrying construction and allied material without proper covers** in goods vehicles.
  3. Action **against 10 years old diesel and 15 years old petrol driven vehicles** along with challaning and impounding of 15 years or more de-registered diesel motor vehicles.

4. Action against **parking of motor vehicles on metalled roads** in Delhi.
5. Action against **pressure horns and modified silencer** in motor vehicles.
6. Returning of **non-destined goods vehicles** from Delhi borders.

Table 8.2

PROSECUTION AGAINST NON-DESTINED VEHICLE /15 YRS OLD VEHICLES/ WITHOUT PUCC/ BUILDING MATERIAL

YEAR	BORDER CHECKED/NON DESTINED VEHICLE		15 YRS OLD VEHCILE		WITHOUT PUCC VEHICLE	BUILDING MATERIAL
	CHECKED	RETURNED	CHECKED	IMPOUNDED	CHALLAN	CHALLAN
2019	175070	7543	139839	337	80126	108

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CHAPTER 9 CHALLANS AND PROSECUTION STATISTICS

Enforcement of traffic laws:

If traffic laws on drunk-driving, seat-belt wearing, speed limits, helmets, and child restraints are not enforced, they cannot bring about the expected reduction in road traffic fatalities and injuries related to specific behaviors. Thus, if traffic laws are not enforced or are perceived as not being enforced, it is likely they will not be complied with, and therefore, will have very little chance of influencing behavior.

Effective enforcement includes establishing, regularly updating, and enforcing laws at the national, municipal, and local levels that address the previously discussed (Chapter-8) risk factors. It also includes the definition of appropriate penalties.

Enforcement is vital to the success of road safety laws. Effective enforcement is the key deterrent factor in ensuring road discipline and also increasing public awareness. During the year 2018, the strategies for prosecution of errant road users were pro-actively made to create deterrence among violators thereby reducing the number of accidents.

- Emphasis was also given on selective quality prosecution to maximize the positive impact of enforcement on road discipline.
- In the year 2019, **a total of 54,72,426 challans (45,02,659 compound and 9,69,767 court) were issued from which a total amount of Rs. 78,20,32,400/- was realised as compounding amount** (challan amount).
- The prosecution includes **spot challans by traffic circle** (field) staff, notices issued on the **complaints received from facebook or through traffic helpline, Traffic Sentinel and interceptors** (Table 9.1). The amount mentioned in the table excludes the amount collected through fines imposed by the courts for all court challans.
- A vehicle violating traffic rule may not be intercepted at the spot, in some instances. **These violations are photographed/ video graphed by the police staff** as well as general public and later are sent to the centralized Notice Branch of Traffic Police. These violations are scanned, edited, processed and uploaded in the centralized computer of Computer Centre of Traffic Police.
- **Notice U/S 133 M.V. Act are generated and issued to the violators /owners of these vehicles** requiring them to pay the amount of challan for the violation reported.
- Comparatively in the year 2018, total number of challans was 67,04,560 while the total compounding amount was Rs. 1,09,82,07,500/- (Table 9.2). This table also provides the figures of total challans and amount collected during previous years.
- Table No. 9.3 provides the details of year-wise challans of various traffic offences committed by all vehicles. **Maximum challans i.e. 10,36,151 had been issued for 'Without helmet'** in the year 2019.
- Table No. 9.4 shows the year wise prosecution of various types of vehicles. In the year 2019, **maximum challans viz. 25,65,231 were issued against two wheelers followed by Cars (10,25,191),** LGVs/MMVs (6,73,390) and TSR (2,88,292).
- Table No. 9.5 gives the detailed figures of challans issued in 2019 against different types of vehicles under different offences.

- Table No. 9.6 provides the Traffic Circle –wise figures of cash and court challans, their total and amount collected by Traffic Police in the year 2019.

TABLE- 9.1

TOTAL COMPOUNDING AMOUNT (2018-2019)

YEAR	PARTICULARS	FROM TRAFFIC CIRCLE	FROM NOTICE BRANCH	TOTAL AMOUNT
2018	COMPOUNDING AMOUNT	1,09,82,07,500	1,09,44,100	1,10,91,51,600
2019	COMPOUNDING AMOUNT	78,20,32,400	15,87,71,500	94,08,03,900

TABLE - 9.2

TOTAL CHALLANS AND COMPOUNDING AMOUNT

YEAR	TOTAL CHALLAN	TOTAL COMPOUNDING AMOUNT
1991	1,418,858	Rs. 68,775,881/-
1992	1,416,646	Rs. 91,278,306/-
1993	1,447,854	Rs. 113,344,844/-
1994	1,403,533	Rs. 121,844,774/-
1995	1,328,300	Rs. 111,150,220/-
1996	1,464,807	Rs. 139,426,950/-
1997	1,319,818	Rs. 149,392,000/-
1998	1,438,818	Rs. 168,104,150/-
1999	1,680,565	Rs. 173,492,560/-
2000	2,198,295	Rs. 223,332,920/-
2001	2,904,349	Rs. 308,017,130/-
2002	3,541,229	Rs. 335,560,250/-
2003	3,392,309	Rs. 305,647,350/-
2004	3,965,845	Rs. 294,489,585/-
2005	4,106,169	Rs. 341,203,950/-
2006	4,325,803	Rs. 360,366,270/-
2007	4,048,886	Rs. 848,149,000/-
2008	3,566,415	Rs. 641,079,540/-
2009	4,310,910	Rs. 536,788,400/-
2010	2,971,717	Rs. 450,510,400/-
2011	3,051,505	Rs. 445,221,400/-
2012	3,298,827	Rs. 495,148,700/-
2013	4,005,633	Rs. 601,510,000/-
2014	4,367,793	Rs 710,497,500/-
2015	3,411,256	Rs 645,320,400/-
2016	4,025,314	Rs. 668,928,000/
2017	6,287,486	Rs. 985,671,300/-
2018	6,704,560	Rs. 1,098,207,500/-
2019	54,72,426	Rs. 782,032,400/-

TABLE 9.3
OFFENCEWISE PROSECUTION (ON THE SPOT CHALLAN)

SL NO	OFFENCES	2015	2016	2017	2018	2019
1.	TRAFFIC SIGNAL	401,033	92,037	167911	216916	230502
2.	W/O DRIVING LICENCE	17,370	31,030	46093	61981	76845
3.	MINOR DRIVING	1,916	746	1067	1228	1038
4.	OVER SPEED	240,954	86,771	139985	141052	104450
5.	VIOLATION OF RESTRICTIONS	62,216	62,987	74745	69622	71752
6.	TRIPPLE RIDING	59,232	102,356	156043	198903	162182
7.	W/O HELMET	469,528	888,941	1102354	1237745	1036151
8.	W/O HELMET PILLION RIDER	177,508	396,140	492192	581811	454912
9.	IMPROPER PARKING	564,269	676,301	1088734	1208608	934699
10.	DANGEROUS DRIVING	236,930	205,470	234422	243735	225553
11.	PERMIT VIOLATION	66,416	41,141	54580	56973	65018
12.	DRUNKEN DRIVING	25,958	28,006	33343	39240	36055
13.	PLAYING MUSIC	1,202	944	1296	1631	2665
14.	PRESSURE HORN	168	5334	6626	7584	24760
15.	TINTED GLASS	24,549	37,293	52975	65896	48070
16.	HIGH/LONG LOAD	40,774	73,675	199777	128127	14968
17.	FOOTBOARD TRAVEL	73	46	191	322	175
18.	STOP LINE CROSSING	143,727	242,250	388409	401243	338031
19.	W/O PULLUTION CERTI.	12,112	23,056	33861	46439	81246
20.	W/O REGISTRATION	23,169	18,894	21694	30681	53489
21.	DEFECTIVE NUMBER PLATE	34,031	35,097	80109	94764	74580
22.	ALLOWING U/A TO DRIVE	45,891	40,135	33199	31392	40810
23.	USING VEH UNSAFE CONDN.	205	443	370	347	332
24.	USING TOP LIGHT	6	11	82	20	34
25.	YELLOW LINE VIOLATION	77,657	29,633	67204	86992	52776
26.	W/O LIGHT/HEAD/IND./TAIL	54,560	104,973	328168	277610	231067
27.	NOT DRIVING PROPER LANE	3,485	2,811	5262	6034	4431
28.	W/O SPEED GOVERNER	100	75	543	442	776
29.	STOP WITHOUT BUS STOP	82	316	723	762	952
30.	PARK/WAIT IN BUS LANE	558	44,850	71255	89508	56422
31.	WRONG OVERTAKING	6,363	2621	7202	6587	6347
32.	W/O UNIFORM DVR/CONDTR	15,474	15,309	27976	28762	15333
33.	OVER CHARGE/MISBEHAVE	188	377	1033	1510	847
34.	OVER CROWD IN PASS VEH	1,062	1,155	12464	19713	16100
35.	REFUSAL BY TAXI/TSR	2,109	782	2462	2605	1377
36.	W/O FARE CHART/DEF.MTR	1	6	27	24	34
37.	ONE WAY VIOLATION	15,373	280,888	358200	377158	293698
38.	CARRY GOODS IN PASS VEH	1,743	1137	2672	4031	3464
39.	CARRY PASS IN GOODS VEH	94,389	2035	2904	3792	3687
40.	CARRY ANML IN GOODS VEH	79	124	275	404	282
41.	HONKING HORN	1,705	12,686	18536	24393	23522
42.	UNAUTHORIZED CNG/LPG	72	68	74	435	576
43.	NOT USING SEAT BELT	220,047	231,813	626942	650536	508707
44.	USE M.PHONE WHILE DRIVE	4,466	4930	15558	16154	18451
45.	USING PVT.VEH AS TAXI	1,770	2665	5497	14161	22379
46.	SMOKING WHILE DRIVING	460	1154	4030	3822	1540
47.	OTHERS	79,950	169,087	294148	202611	102776
48.	W/O INSURANCE	6,772	18,178	16522	13624	25438
49.	W/O PSV BADGE	6,053	3888	3933	4132	1884
50.	RUPD/LUPD(124 CMVR)	29,074	4624	3800	2486	1191
51.	USING U/A COLOR LIGHT	7	24	18	14	52
52.	ON THE SPOT CHALLAN	3,411,256	4,025,314	6287486	6704560	5472426
53.	DRIVER ARREST	7,945	7,363	6295	6731	7180
54.	VEHICLE IMPOUNDED	51,786	49,122	52125	53428	51570

TABLE- 9.4

VEHICLE-WISE PROSECUTION – 2019

VEHICLES	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
HTV	176262	164425	211670	155185	185523	226279	198169	210281	254841	275294	512424	418733	271459
LGV / MMV	631001	577513	614892	440190	512648	493957	462687	440239	531774	510211	1114677	1081822	673390
BUS	20270	19586	20564	14732	7654	12806	8464	5684	9480	36532	72152	78914	58559
CLUSTER BUS	11011	14729	15756	14987	23151	716	1540	2323	2235	4481	10256	7398	4815
D.T.C.	4401	3708	5805	2774	7017	8551	11524	4046	1991	4975	8106	5652	4318
TAXI	51278	46641	39432	28401	33035	48320	76304	105075	119987	206741	339801	324042	256440
T.S.R.	133517	184610	265693	200418	125058	147882	259527	249430	166477	187991	275937	307706	288292
SCOOTER/ M/CYCLE	540828	758637	1120855	900286	1114356	1042130	1553000	1779180	1215260	1875748	2442224	2848956	2565231
CAR / JEEP	577617	819092	1002323	746371	910094	1193410	1280654	1391167	948929	761603	1161628	1231757	1025191
PVT / STA (BLUE/ RED LINE BUS)	90668	102882	106591	57753	10278	1647	606	591	595	1380	-	-	
E-RICKSHAW	-	-	-	-	-	-	-	-	-	26472	120299	165952	160564

TABLE-9.5 (A)
OFFENCE VS VEHICLE – 2019

OFFENCE	HTV	LGV	DELIVERY VAN	SCH CAB	CH. BUS	DTC	TRAILOR	SCHOOL BUS	ROADWAYS	RTV	CALL CENTRE
TRAFFIC SIGNAL	1124	6624	2092	86	491	141	1	16	10	127	144
W/O DRIVING LICENCE	836	4089	1515	56	181	9	0	9	4	42	31
OVER SPEED	526	1727	25	7	225	9	3	22	8	10	148
VIOLATION OF RESTRICTIONS	21502	34721	3423	3	63	0	53	8	9	0	0
IMPROPER PARKING	34960	100686	30431	731	9687	836	15	331	1050	2923	671
DANGEROUS DRIVING	51172	84411	5147	127	6736	742	178	293	912	417	415
PERMIT VIOLATION	7034	7780	35	645	2870	22	13	607	63	478	1228
DRUNKEN DRIVING	423	1634	403	30	71	1	4	10	3	23	20
PLAYING MUSIC	333	578	47	4	39	0	0	0	2	13	1
PRESSURE HORN	5002	4892	153	3	222	1	7	6	15	82	2
TINTED GLASS	31	108	9	41	107	0	0	1	0	20	50
HIGH/LONG LOAD	4351	9902	710	0	0	0	0	0	0	0	0
FOOTBOARD TRAVEL	0	0	0	15	44	1	0	0	3	96	0
STOP LINE CROSSING	3318	22084	10644	225	2132	246	2	64	8	457	283
W/O PULLUTION CERTI.	894	3268	935	81	165	4	1	22	6	12	58
W/O REGISTRATION	1239	4581	851	2944	650	3	3	98	3	54	15
DEFECTIVE NUMBER PLATE	2418	6116	1697	6	54	0	2	6	0	9	24
OWNER ALLOW U/A MAJOR PERSON TO DRIVE	1073	4375	942	104	185	2	7	24	13	46	23
USING VEH UNSAFE CONDN.	5	38	16	2	1	0	0	0	0	1	2
YELLOW LINE VIOLATION	6767	14941	2209	15	1218	87	1	18	18	34	0
W/O LIGHT/HEAD/IND./TAIL	47914	134707	22326	17	1382	15	0	28	10	64	385
NOT DRIVING PROPER LANE	1512	1099	927	7	395	125	12	119	27	30	1
W/O SPEED GOVERNER	339	267	2	3	65	9	6	17	2	2	4
STOP WITHOUT BUS STOP	0	0	0	1	423	95	0	33	99	66	1
PARK/WAIT IN BUS LANE	4897	10901	4004	17	795	577	0	17	0	829	51
WRONG OVERTAKING	2438	1962	4	11	981	208	12	271	78	73	0
W/O UNIFORM DVR/CONDTR	0	0	0	28	612	79	0	17	1	89	138
OVER CHARGE/MISBEHAVE	0	0	0	0	1	0	0	1	0	0	0
OVER CROWD IN PASS VEH	0	0	0	21	49	15	0	2	0	0	0
ONE WAY VIOLATION	2883	7273	6807	52	267	41	2	9	0	93	831
CARRY GOODS IN PASS VEH	0	0	0	16	205	0	0	0	0	0	0
CARRY PASS IN GOODS VEH	1190	2021	455	0	0	0	0	0	0	0	0
CARRY ANML IN GOODS VEH	16	239	26	0	0	0	0	0	0	0	0
HONKING HORN	3910	7566	279	8	140	0	0	7	0	68	7
UNAUTHORIZED CNG/LPG	11	108	0	6	1	0	0	0	0	1	0
NOT USING SEAT BELT	50454	148589	2320	1890	16874	973	6	708	240	1728	2866
USE M.PHONE WHILE DRIVE	365	1185	253	29	40	4	0	3	0	11	92
USING PVT.VEH AS TAXI	183	143	1	1525	70	0	0	2	2	0	1
SMOKING WHILE DRIVING	164	350	45	3	6	8	0	0	0	4	5
OTHERS	11374	42754	5503	52	899	63	1	43	17	99	93
W/O INSURANCE	102	1163	422	24	30	2	0	5	1	6	2
W/O PSV BADGE	1	2	1	0	5	0	0	1	0	0	38
RUPD/LUPD (124 CMVR)	697	492	0	0	0	0	1	0	0	0	0
USING U/A COLOURED LIGHT	1	14	1	0	2	0	0	0	0	1	0
TOTAL	271459	673390	104660	8835	48383	4318	330	2818	2604	8008	7630

TABLE-9.5 (B)
OFFENCE VS VEHICLE – 2019

OFFENCE	TAXI	CARJEEP	TRACTOR	TSR	SCMC	OTHER	GSEWA	CLUSTER	PVT INT BUS	E RICKSHAW
TRAFFIC SIGNAL	16515	80164	32	8638	111839	46	792	159	7	1454
W/O DRIVING LICENCE	1163	14527	47	2611	49045	43	95	16	20	2506
OWNER ALLOWING MINOR TO DRIVING	5	228	1	14	772	4	0	0	0	14
OVER SPEED	4911	96469	0	39	179	46	5	3	88	0
VIOLATION OF RESTRICTIONS	0	2569	286	5	279	139	0	0	0	8692
TRIPLE RIDING	0	0	0	0	162182	0	0	0	0	0
W/O HELMET	0	0	0	0	1036151	0	0	0	0	0
W/O HELMET PILLION RIDER	0	0	0	0	454912	0	0	0	0	0
IMPROPER PARKING	80104	177742	659	175315	190426	607	19271	759	1595	105900
DANGEROUS DRIVING	5188	35372	52	2150	29739	24	215	1173	568	522
PERMIT VIOLATION	25107	23	6	16873	0	70	903	109	282	870
DRUNKEN DRIVING	898	10367	18	1159	20174	6	78	4	10	729
PLAYING MUSIC	106	1300	0	72	129	27	6		1	7
PRESSURE HORN	356	1483	0	227	12150	17	12	9	103	18
TINTED GLASS	1133	46562	0	0	0	7	1	0	0	0
HIGH/LONG LOAD	0	0	0	0	0	4	0	0	0	1
FOOTBOARD TRAVEL	0	0	0	0	0	16	0	0	0	0
STOP LINE CROSSING	26669	123238	393	17795	122018	73	1385	279	89	6629
W/O PULLUTION CERTI.	1420	16443	43	1086	56662	68	61	2	15	0
W/O REGISTRATION	1362	15792	299	1679	18642	714	203	7	94	4256
DEFECTIVE NUMBER PLATE	2485	24615	23	409	34743	13	109	0	17	1834
OWNER ALLOW U/A MAJOR PERSON TO DRIV	1788	4310	68	2974	22734	49	122	15	149	1807
USING VEH UNSAFE CONDN.	11	32	1	10	30	12	0	0	0	171
USING TOP LIGHT	2	31	0	0	0	1	0	0	0	0
YELLOW LINE VIOLATION	2201	13089	76	517	10684	11	69	83	62	676
W/O LIGHT/HEAD/IND./TAIL	3213	6059	11	2268	10609	37	237	12	73	1700
NOT DRIVING PROPER LANE	1	0	0	2	3	1	5	89	75	1
W/O SPEED GOVERNER	7	0	0	0	0	2	0	4	47	0
STOP WITHOUT BUS STOP	0	0	0	0	0	4	21	160	49	0
PARK/WAIT IN BUS LANE	2877	9553	10	5423	8941	12	1758	191	9	5560
WRONG OVERTAKING	2	19	0	6	1	14	2	245	20	0
W/O UNIFORM DVR/CONDTR	7507	0	0	6137	0	8	205	61	35	416
OVER CHARGE/MISBEHAVE	75	0	0	741	0	28	1	0	0	0
OVER CROWD IN PASS VEH	251	0	0	9042	0	238	114	3	1	6364
REFUSAL BY TAXI/TSR	70	0	0	1295	0	12	0	0	0	0
W/O FARE CHART/DEF.MTR	0	0	0	34	0	0	0	0	0	0
ONE WAY VIOLATION	14415	65211	183	14468	171657	54	1824	17	20	7591
CARRY GOODS IN PASS VEH	230	0	0	2005	0	268	134	0	0	606
CARRY PASS IN GOODS VEH	0	0	0	0	0	21	0	0	0	0
CARRY ANML IN GOODS VEH	0	0	0	0	0	1	0	0	0	0
HONKING HORN	529	3148	0	286	7365	0	27	6	31	145
UNAUTHORIZED CNG/LPG	28	416	0	2	0	1	0	0	2	0
NOT USING SEAT BELT	47669	230865	0	0	0	513	490	1349	1173	0
USE M.PHONE WHILE DRIVE	828	9671	7	159	5719	3	11	8	7	56
USING PVT.VEH AS TAXI	0	20220	0	0	0	232	0	0	0	0
SMOKING WHILE DRIVING	112	739	0	33	57	0	1	0	3	10
OTHERS	6344	10421	65	13032	9687	12	549	50	85	1624
W/O INSURANCE	438	4500	11	547	17681	16	73	2	19	394
W/O PSV BADGE	400	0	0	1235	0	174	25	0	2	0
RUPD/LUPD (124 CMVR)	0	0	0	0	0	1	0	0	0	0
USING U/A COLOURED LIGHT	4	13	0	2	11	0	0	0	3	0
TOTAL	256424	1025191	2291	288290	2565221	3649	28804	2592	4754	160553

TABLE- 9.6
CIRCLE-WISE PROSECUTION-2019

CIRCLE	COMPOUND	COURT	TOTAL CHALLAN	AMOUNT
AVC	121943	28944	150887	21475700
BKR	57360	6048	63408	7915100
BNA	87215	19026	106241	16174100
BRD	114593	21271	135864	24437500
CHP	35510	4429	39939	7100300
CLC	79166	24291	103457	16859300
DCC	73421	16105	89526	15217300
DFC	85054	17250	102304	16061300
DGC	69700	18024	87724	11319900
DWC	121389	20723	142112	17938700
GKC	73620	19747	93367	13954900
GNC	90200	18854	109054	16357800
HKC	67107	13604	80711	10088200
IGI	41980	9057	51037	6716900
JPC	99272	27205	126477	15058100
KBC	98054	20119	118173	15270800
KJC	70087	14097	84184	11357000
KKC	87362	19711	107073	16693600
KMC	61300	24050	85350	9259800
KOT	106079	26070	132149	16755200
KPA	111768	21404	133172	19866600
KPC	109514	25538	135052	20631500
LNC	82483	18790	101273	18253200
MGP	92946	16834	109780	15598700
MPC	79674	16134	95808	15179200
MRC	75835	14541	90376	17252200
MTC	145261	24363	169624	26288400
MWC	100353	21952	122305	15471800
NJC	95675	20995	116670	15025800
NLC	93131	17378	110509	21663000
NRL	114765	21465	136230	25081000
PAP	76607	10943	87550	11240800
PBC	108759	20520	129279	16903600
PGC	80347	23705	104052	11120100
PNC	93094	16145	109239	13568200
PTC	70485	11356	81841	10843500
PTH	9943	1331	11274	1356200
RGC	108752	22391	131143	16559200
RHN	120027	23102	143129	18642000
RKP	96690	21093	117783	16359300
SBC	81947	19238	101185	12243100
SDV	67649	16184	83833	11057800
SGV	71327	21562	92889	10625300
SHD	84033	20753	104786	15280200
SKT	71485	18520	90005	14047100
SMC	94224	20362	114586	17507900
SPC	83801	33731	117532	13939900
SVR	81596	15273	96869	17535300
TMC	50283	5629	55912	8819600
TNC	99368	18420	117788	13532200
TRC	34688	4923	39611	5908700
VKC	82330	18130	100460	12236700
VVC	93407	18437	111844	16382700
TOTAL	**4502659**	**969767**	**5472426**	**782032300**

Vehicles impounded and drivers arrested:

- A total of **7,180 drivers were arrested** in the year 2019 and **51,570 vehicles were impounded.** The **maximum number of drivers who were arrested were Cars drivers and scooters/motor cycle riders** for various traffic violations. In the vehicles impounded category, **maximum scooters/motor cycles, TSRs and Cars had been impounded.**

- **Majority of those arrested (4-wheeler and 2-wheeler drivers)** were under the head of 'drunken driving' which is one of the major cause of accidents. **Out of 36,065 challans for drunken driving in the year 2019, a whopping, 55.4 % were against car/jeep drivers and scooter/motor cycle riders** (Table No. 9.5). This data supports the argument that the menace of drunken driving has spread in the cross section of the society at alarming levels.

TABLE- 9.7

DRIVER ARREST AND VEHICLE IMPOUNDED-2019

S.NO.	VEHICLE	DRIVER ARRESTED	VEHICLES IMPOUNDED
1.	HTV	39	1332
2.	LGV / MMV	278	2638
3.	D. VAN	122	468
4.	SCHOOL CAB	1	385
5.	CHARTPVT	13	464
6.	DTC	1	12
7.	SCHOOLBUS	1	30
8.	ROADWAYS	2	46
9.	RTV	1	94
10.	CALLCENTRE	1	57
11.	TAXI	224	1823
12.	CARJEEP	3206	8505
13.	TRACT0R	14	290
14.	TSR	250	3507
15.	SC/MC	2846	25532
16.	OTHERS	25	378
17.	GSEWA	13	444
18.	CLUSTERBUS	2	41
19.	INTERSTATEBUS	5	170
20.	ELECTRIC RICKSHAW	136	5335
TOTAL		7180	51551

- In the year 2019, cars/taxis were involved in committing 213 fatal accidents (15%). Though **two wheeler riders were responsible for 10% fatal accidents but as victims they were high on the list (34%) after pedestrians (46%)** (Chapter 3 and 4).

'Chase and Challan' by Traffic Police motor cycle riders:

- Designated traffic motor cycles chase fleeing violators, intercept and challan them. The basic aim of this scheme is to bring about road discipline thereby reducing the number of accidents.
- During the year 2019, **4,74,495 challans were issued by these traffic motor cycles** (Table No. 9.8).
- Here also, **scooter/motor cycle riders topped the list of those prosecuted (60%) followed by car/jeep drivers (19.75%)**. These two categories together make 80% of total prosecution by Traffic Police motor cycles. These figures may also be compared with the figures of total prosecution given at Table No. 9.4.

TABLE – 9.8

MONTH WISE TOTAL MOTOR CYCLE PROSECUTION -2019 (CHASE AND CHALLAN)

MONTH	HTV	LGV / MMV	D. VAN	SCHOOLCAB	CHARTPVT	DTC	TRAILOR	SCHOOLBUS	ROADWAYS	RTV	CALLCENTRE	TAXI	CARJEEP	TRACT0R	TSR	SCMC	OTHERS	GSEWA	CLUSTERBUS	TOTAL
JANUARY	322	488	100	47	153	2		2		13	1	1241	6413	23	1056	26498	428	17	0	36804
FEBRUARY	274	641	279	117	147	1	3	10		5	15	1750	6707	55	913	27207	437	107	7	38675
MARCH	146	1272	272	3	170	2		2	0		45	1499	7370	0	782	30347	452	37	0	42399
APRIL	190	1602	377	325	214	5		3	18	29	38	1715	7853	17	1447	32501	249	79	0	46662
MAY	194	991	280	47	173	2		1			22	1955	7626	18	1933	27685	1269	32	0	42228
JUNE	379	1193	250	178	157	2		2		5	71	1816	7796	130	1623	26455	929	165	0	41151
JULY	2007	3606	293	6	144	15	7	3		32	61	2558	12226	210	3286	54892	1144	311	4	80805
AUGUST	1878	6298	271	207	149	34		2	7	46	41	2388	13065	617	3218	56091	1535	70	250	86167
SEPTEMBER	186	450	84	5	58	2		1	6	1		338	1982	4	208	4876	144	2	1	8348
OCTOBER	126	398	61	21	18	5		4	4	7	56	463	1923	1	155	10444	159	15	21	13881
NOVEMBER	71	547	113	275	84	0			16	2	32	732	3029	1	587	10499	108	9	0	16105
DECEMBER	84	130	7		30					1		114	1332	21	31	19506	9	5	0	21270
TOTAL	5857	17616	2387	1231	1497	70	10	30	51	141	382	16569	77322	1097	15239	327001	6863	849	283	474495

TABLE 9.9

TRAFFIC SENTINEL NOTICES STATEMENTS-2019

Sl.No.	VIOLATION	No. OF NOTICES
1.	PARKING ON FOOTPATH	6014
2.	VIOLATION OF STOP LINE	1914
3.	VIOLATION OF TRAFFIC SIGNAL	2
4.	YELLOW LINE VIOLATION	8
5.	USING MOBLE PHONE WHILE DRIVING	5
6.	TRIPPLE RIDING	1180
7.	DEFECTIVE NUMBER PLATE	8383
8.	NOT USING THE SEAT BELT	20
9.	PILLION RIDER WITHOUR HELMET	0
10.	WITHOUT HELMET	18046
11.	DRIVING AGAINST THE FLOW OF TRAFFIC	10731
12.	DANGEROUS DRIVING	8
13.	IMPROPER PARKING	170
14.	IMPROPER PARKING WITH LAW FULL DIRECTON	25
TOTAL		46506

Traffic Sentinel Scheme

- Delhi Police launched a new scheme named **Traffic Sentinel** Scheme in 2015 for general public. **This is a participative scheme and aims 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...One Touch Away" App on Android and "Delhi Traffic Police" App on iOS platforms.
- The scheme was revamped and re-launched with new features and capabilities in 2017.

Traffic police and Road Safety:

The huge figure of fatal as well as non-fatal accidents and prosecution underline the poor behaviour of road users. However, **Traffic Police is not only prosecuting the traffic rule violators but simultaneously promoting road safety education specially in schools, amongst commercial drivers and DTC drivers,** giving wide media publicity to educate the public of the consequences of rule violations, **forming Road Safety Clubs,**

launching public outreach through social media 'Facebook', 'Twitter' and 'WhatsApp' etc.

ROAD SAFETY CELL:

The educational wing of Delhi Traffic Police was formed in the year 1972 with a view to educate road users regarding the proper and safe use of road and transportation and to develop human resources responsive to public and are technically competent.

- Since the inception of Road Safety Cell, it has been working untiringly to increase the awareness of road users to cope with various problems related to road and transportation i.e., traffic congestion, accidents, increased travel time, etc. through various initiatives such as
  - (i) Road Safety March
  - (ii) Street plays
  - (iii) Painting/Quiz/Essay Competitions.
  - (iv) Health Check –up Camps for drivers including commercial drivers.
  - (v) Designing of Road Safety literature.
  - (vi) Workshops and seminars for **teachers** or representatives from school who in turn teach students.
  - (vii) Workshops on safe and defensive driving for **school bus drivers**.
- **Traffic Training Parks** have been established with a view to impart practical education to different categories of road users including school children. These parks simulate actual road conditions; have miniature road signs and vehicles to teach children proper methods to remain safe while on roads.

1. T.T.Park Punjabi Bagh
2. T.T.Park Roshanara Bagh
3. T.T.Park B.K.S Marg
4. T.T.Park Bal Bhawan

- In addition to school children, Road Safety Cell organizes regular road safety awareness programmes/workshops for other categories of road users such as commercial vehicle drivers, cyclists, two-wheeler drivers, drivers of private four-wheeled vehicles, drivers of govt. organizations, slum/rural dwellers who are more ignorant and easy victims of road related disasters.
- **Modes of Education:** Various methodologies have been adopted to impart road safety education to various categories of road users.
  - (i) Lectures/interactive sessions
  - (ii) Worskhops
  - (iii) Competitions based on road safety related topics for school children such as essay, debate, painting, quiz, slogan writing, nukkar natak, innovation with waste material, etc.
  - (iv) Film Shows
  - (v) Exhibitions
  - (vi) Distribution of Road Safety Literature
  - (vii) Road Safety march/rallies
  - (viii) Fixing of Reflective tapes on cycles.

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CHAPTER 10 ACCIDENT PRONE ZONES

The GPS mapping of Accident spots:

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

- The **accident spots of the year were analyzed spatially to identify the cluster points or accident-prone zones** on the Delhi Roads. Criteria adopted to filter such Accident Prone Zones is: -
  - i. **3 or more fatal accidents within the circle of diameter of 500meters** or
  - ii. **10 or more total accidents in the same region.**
- Accidents on all the major and minor roads joining the intersection having direct influence on the traffic movement at such place or junction were taken into consideration.
- The roads inspected on map to identify these accident-prone zones were:
  - (i) All major road corridors of Delhi.
  - (ii) Top 50 roads having maximum fatal accidents during the year 2019.
- 292 accident cluster points were analyzed out of which **119 cluster points were identified as Accident-Prone Zones of the year 2019,** as per the above-mentioned criteria. The fatal accidents list in descending order is at Table No. 10.2.

Table 10.1

Accident Prone Zones – 2019

ROAD ACCIDENTS IN ACCIDENT PRONE ZONES – 2019			
ROAD ACCIDENTS	SIMPLE	FATAL	TOTAL
2019 (WHOLE YEAR)	4177	1433	5610
APZ-2019	755	437	1192
% SHARE	18.08%	30.5%	21.25%

Map 10.1 (a)

Accident Prone Zones of the Year – 2019 (>4) – (28)

Map 10.1 (b)

Accident Prone Zones of the Year – 2019 (=4) – (22)

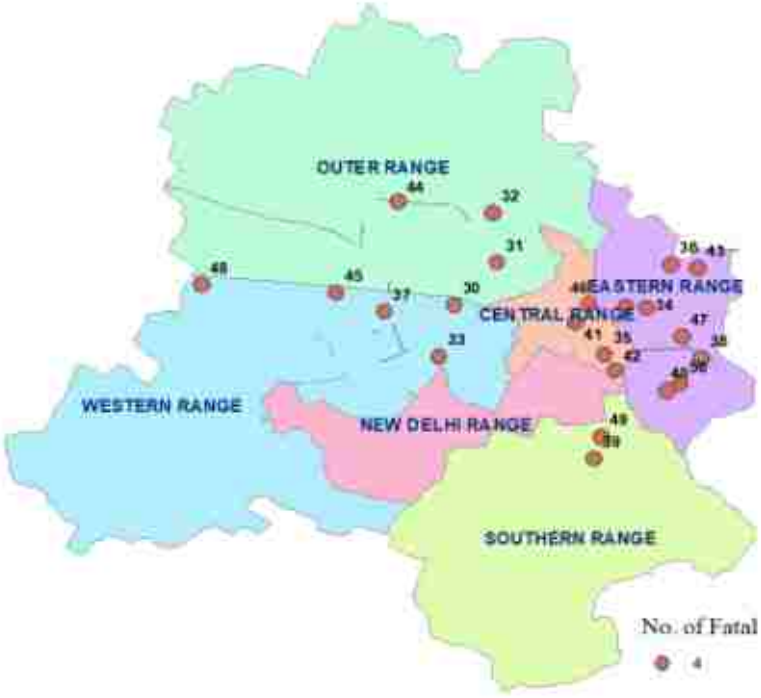

Table 10.2

ACCIDENTS PRONE ZONE 2019

S.NO.	ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS	ROAD NAME
1.	MUKUNDPUR CHOWK	12	11	23	OUTER RING ROAD
2.	NIRANKARI COLONY	3	9	12	OUTER RING ROAD
3.	MUKARBA CHOWK	11	8	19	GTK ROAD
4.	AZADPUR SABZI MANDI	10	8	18	GTK ROAD
5.	SIGNATURE BRIDGE TIMARPUR	5	8	13	WAZIRABAD ROAD
6.	MAJNU KA TILA	13	7	20	OUTER RING ROAD
7.	WAZIRABAD	10	7	17	OUTER RING ROAD
8.	AZAD PUR CHOWK	6	7	13	GTK ROAD
9.	5TH PUSTA USMAN PUR	10	6	16	PUSTA ROAD
10.	WAZIR PUR DEPOT	6	6	12	RING ROAD
11.	MANGOLPURI FLYOVER	5	6	11	OUTER RING ROAD
12.	EAST VINOD NAGAR/MV II RED LIGHT	3	6	9	NH-24
13.	GANDHI VIHAR BUS STAND	19	5	24	OUTER RING ROAD
14.	BURARI CHOWK	12	5	17	OUTER RING ROAD
15.	RAJOUKARI FLYOVER	11	5	16	NH-8
16.	ISBT KASHMIRI GATE	10	5	15	RING ROAD
17.	SIGNATURE BRIDGE KHAJOORI	9	5	14	WAZIRABAD ROAD
18.	MADHUBAN CHOWK	8	5	13	OUTER RING ROAD
19.	POWER HOUSE PITAMPURA	8	5	13	OUTER RING ROAD
20.	ANAND VIHAR ISBT	8	5	13	ROAD NO.56
21.	SARITA VIHAR METRO STATION	7	5	12	MATHURA ROAD
22.	NEHRU PALACE	6	5	11	OUTER RING ROAD
23.	ALI VILLAGE	6	5	11	MATHURA ROAD
24.	TEES HAZARI RED LIGHT	4	5	9	BOULEVARD ROAD
25.	DEEPALI CHOWK	3	5	8	OUTER RING ROAD
26.	KHEL GAON	2	5	7	NH-24
27.	MAYUR VIHAR EXTENSION	1	5	6	NOIDA LINK ROAD
28.	SGT NAGAR	0	5	5	GTK ROAD

29.	SHASTRI PARK/IT PARK	20	4	24	G.T.ROAD
30.	PUNJABI BAGH CHOWK	9	4	13	RING ROAD
31.	SHALIMAR BAGH	8	4	12	RING ROAD
32.	BHALSWA CHOWK	8	4	12	OUTER RING ROAD
33.	MAYA PURI CHOWK	8	4	12	RING ROAD
34.	SEELAMPUR T POINT	8	4	12	G.T.ROAD
35.	DELHI GATE	8	4	12	N. SUBHASH MARG
36.	GOKALPURI	7	4	11	WAZIRABAD ROAD
37.	ROUND ABOUT BHAIRAON ENCLAVE	6	4	10	OUTER RING ROAD
38.	MOOL CHAND	5	4	9	RING ROAD
39.	HASANPUR DEPOT ROAD NO. 57	5	4	9	ROAD NO 57
40.	AKSHARDHAM MANDIR	4	4	8	NH-24
41.	DTC BUS DEPOT NAND NAGRI	4	4	8	WAZIRABAD ROAD
42.	PUL MITHAI SPM MARG	4	4	8	SPM MARG
43.	ITO/I P FLYOVER	4	4	8	RING ROAD
44.	SHAHBAD DAIRY	3	4	7	BAWANA ROAD
45.	KIRARI MORE	3	4	7	ROHTAK ROAD
46.	METRO STATION JUNGPURA	2	4	6	LALA LAJPAT RAI MARG
47.	BUS STAND JAGAT PURI	2	4	6	ROAD NO 57
48.	TIKRI VILLAGE	2	4	6	ROHTAK ROAD
49.	MONESTRY RING ROAD	2	4	6	RING ROAD
50.	MANGLAM HOSPITAL BUS STAND NH-24	0	4	4	NH-24
51.	MOTI NAGAR FLYOVER	13	3	16	PATEL ROAD
52.	SHASTRI NAGAR METRO STATION	10	3	13	VIR BANDA BAIRAGI MR
53.	VIJAY GHAT	10	3	13	RING ROAD
54.	LONI ROAD CROSSING	10	3	13	WAZIRABAD ROAD
55.	KASHMIRI GATE CHOWK BOULEVARD ROAD	10	3	13	BOULEVARD ROAD
56.	RAJDHANI PARK	9	3	12	ROHTAK ROAD
57.	NARAINA	8	3	11	RING ROAD
58.	NIGAM BODH GHAT	8	3	11	RING ROAD
59.	KALINDI KUNJ	8	3	11	ROAD NO 13A
60.	KHAJOORI KHAS PUSTA ROAD	8	3	11	PUSTA ROAD
61.	CRPF CAMP SONIA VIHAR	8	3	11	PUSTA ROAD
62.	TUGLAQABAD METRO STATION	8	3	11	MATHURA ROAD
63.	UNDER PASS DWARKA	7	3	10	DWARKA LINK ROAD
64.	HANUMAN MANDIR YAMUNA BAZAR	6	3	9	RING ROAD

65.	KABOOTAR MARKET	6	3	9	N. SUBHASH MARG
66.	SIRASPUR	6	3	9	GTK ROAD
67.	RTR FLYOVER VASANT VIHAR	5	3	8	OUTER RING ROAD
68.	RAJOURI GARDEN	5	3	8	RING ROAD
69.	JAHANGIR PURI METRO STATION GTK ROAD	5	3	8	GTK ROAD
70.	INDIRA KALYAN VIHAR RED LIGHT	5	3	8	ANAND MAI MARG
71.	SARITA VIHAR FLYOVER	5	3	8	MATHURA ROAD
72.	METRO STATION SHIVAJI PARK	5	3	8	ROHTAK ROAD
73.	ICD TUGLAKABAD	4	3	7	MEHRAULI BADARPUR RD
74.	SUBHASH NAGAR METRO STATION	4	3	7	NAJAFGARH ROAD
75.	SAI BABA MANDIR NH-1	4	3	7	GTK ROAD
76.	SWAROOP NAGAR	4	3	7	GTK ROAD
77.	LIBASPUR BUS STAND	4	3	7	GTK ROAD
78.	M.S. PARK METRO STATION	4	3	7	G.T.ROAD
79.	KARKARI MORE	4	3	7	ROAD NO 57
80.	GAGAN CINEMA	4	3	7	WAZIRABAD ROAD
81.	AIIMS	4	3	7	RING ROAD
82.	GEETA COLONY CUT VIKAS MARG	3	3	6	VIKAS MARG
83.	PRESS ENCLAVE CROSSING	3	3	6	LAL BAHADUR SHASTRI
84.	DILSHAD GARDEN	3	3	6	G.T.ROAD
85.	ADARSH NAGAR	3	3	6	GTK ROAD
86.	JAHANGIR PURI BUS STAND OUTER RING ROAD	3	3	6	OUTER RING ROAD
87.	GHEWRA MORE	3	3	6	ROHTAK ROAD
88.	ESI HOSPITAL RING ROAD	3	3	6	RING ROAD
89.	JANAK PURI EAST	3	3	6	NAJAFGARH ROAD
90.	JASOLA VIHAR	3	3	6	ROAD NO 13A
91.	SHAHDARA FLYOVER	3	3	6	G.T.ROAD
92.	PREPAID BOOTH MUKARBA CHOWK	2	3	5	OUTER RING ROAD
93.	VASANT VALLEY SCHOOL	2	3	5	ABDUL GAFAR KHAN MG
94.	HOTEL CROWN PLAZA MAA ANAND MAI MARG	2	3	5	ANAND MAI MARG
95.	CVD DEPOT NANGAL VILLAGE	2	3	5	PANKHA ROAD
96.	ANAND VIHAR RAILWAY FLYOVER	2	3	5	ROAD NO.56
97.	BRAR SQUARE	2	3	5	RING ROAD

98.	SHYAMGIRI MANDIR SHASTRI PARK	1	3	4	G.T.ROAD
99.	BER SARAI FLYOVER	1	3	4	OUTER RING ROAD
100.	NIZAMUDIN YAMUNA BRIDGE	1	3	4	NH-24
101.	SHAKTI NAGAR CHOWK	1	3	4	GTK ROAD
102.	RAMDEV CHOWK NARELA	1	3	4	NARELA ROAD
103.	ITI DHEERPUR	1	3	4	OUTER RING ROAD
104.	KHAJOORI CHOWK	13	2	15	WAZIRABAD ROAD
105.	METRO STATION HAIDER PUR	12	2	14	OUTER RING ROAD
106.	HYAAT HOTEL	12	2	14	RING ROAD
107.	DHAULA KUAN	12	2	14	RING ROAD
108.	APOLO HOSPITAL	9	2	11	MATHURA ROAD
109.	KANHIYA NAGAR METRO STATION	9	2	11	VIR BANDA BAIRAGI MR
110.	SHAMSHAN GHAT PUNJABI BAGH	8	2	10	RING ROAD
111.	PEERAGARHI CHOWK	18	1	19	OUTER RING ROAD
112.	METRO STATION INDERLOK	12	1	13	VIR BANDA BAIRAGI MR
113.	TOLL PLAZA BADARPUR	11	1	12	MATHURA ROAD
114.	MAHIPALPUR FLYOVER	10	1	11	NH-8
115.	ZAKHIRA FLYOVER	10	1	11	ROHTAK ROAD
116.	BIRLA INSTITUTE OF MANAGEMENT TECHNOLOGY	10	1	11	LAL BAHADUR SHASTRI
117.	SEC 10 RED LIGHT DWARKA	9	1	10	ROAD NO 224
118.	CHIRAG DELHI FLYOVER	11	0	11	JOSEF BRIJ TITO MARG
119.	UDYOG NAGAR	10	0	10	ROHTAK ROAD

Map 10.1 (c)

Accident Prone Zones of the Year – 2019 (=3) – (53)

Map 10.1 (d)

Accident Prone Zones of the Year – 2019 (<3) – (16)

- **Traffic Outer range (27), Eastern range (26), Southern range (24) and Western range (21)** have maximum number of Accident-prone zones.
- Among the **Traffic Districts, North-West (21), West (17), South East (16), North (16), North East (15) and East (11)** have maximum number of Accident-prone zones.
- **The roads of Burari circle (12), Civil Lines Circle (8), Sarita Vihar Circle (8), Kalyan Puri Circle (5), Shahdara Circle (5), Nangloi Circle (5), Khazoori Circle (5), and Seema Puri Circle (5), have maximum number of accident-prone zones.**
- **18 circles have a total number of 89 Accident prone zones which accounted for 364 fatal accidents** in the year 2019.

Table 10.3

Range wise Number of Accident Prone Zones – 2019

RANGE NAME	NUMBER OF ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
OUTER RANGE	**27**	157	126	283
EASTERN RANGE	**26**	146	99	245
SOUTHERN RANGE	**24**	140	69	209
WESTERN RANGE	**21**	147	62	209
CENTRAL RANGE	**18**	142	75	217
NEW DELHI RANGE	**3**	23	6	29
TOTAL	**119**	**755**	**437**	**1192**

Table 10.4

Range/District wise Number of Accident Prone Zones – 2019

RANGE NAME	DISTRICT NAME	NUMBER OF ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
CENTRAL RANGE **(18)**	CENTRAL	**2**	12	8	20
	NORTH	**16**	130	67	197
NEW DELHI RANGE **(3)**	DWARKA	**3**	23	6	29
EASTERN RANGE **(26)**	EAST	**11**	34	46	80
	NORTH EAST	**15**	112	53	165
OUTER RANGE **(27)**	NORTH WEST	**21**	118	99	217
	OUTER	**6**	39	27	66
SOUTHERN RANGE **(24)**	SOUTH	**8**	47	19	66
	SOUTH EAST	**16**	93	50	143
WESTERN RANGE **(21)**	SOUTH WEST	**4**	25	14	39
	WEST	**17**	122	48	170

Table 10.5
Circle wise Number of Accident Prone Zones – 2019

S.NO.	CIRCLE NAME	NUMBER OF ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
1.	BURARI CIRCLE	12	66	60	126
2.	CIVIL LINES CIRCLE	8	77	42	119
3.	SARITA VIHAR CIRCLE	8	57	25	82
4.	KALYAN PURI CIRCLE	5	10	24	34
5.	NANGLOI CIRCLE	5	27	14	41
6.	KHAZOORI CIRCLE	5	45	17	62
7.	SEEMA PURI CIRCLE	5	25	16	41
8.	SHAHDARA CIRCLE	5	42	20	62
9.	MODEL TOWN CIRCLE	4	24	21	45
10.	VASANT VIHAR CIRCLE	4	18	10	28
11.	KOTWALI CIRCLE	4	26	13	39
12.	PUNJABI BAGH CIRCLE	4	38	12	50
13.	VIVEK VIHAR CIRCLE	4	16	15	31
14.	KALKAJI CIRCLE	4	17	14	31
15.	ASHOK VIHAR CIRCLE	3	23	12	35
16.	MAYA PURI CIRCLE	3	18	10	28
17.	RAJOURI GARDEN CIRCLE	3	16	8	24
18.	ROHINI CIRCLE	3	28	12	40
19.	SABZI MANDI CIRCLE	2	5	8	13
20.	TILAK NAGAR CIRCLE	2	7	6	13
21.	SANGAM VIHAR CIRCLE	2	13	4	17
22.	DARYA GANJ CIRCLE	2	12	8	20
23.	DEFENCE COLONY CIRCLE	2	6	7	13
24.	DELHI CANTT CIRCLE	2	14	5	19
25.	MANGOL PURI CIRCLE	2	8	11	19
26.	SADAR BAZAR CIRCLE	2	22	4	26
27.	NARELA CIRCLE	2	5	6	11
28.	KAPASHERA CIRCLE	2	18	8	26
29.	LAJPAT NAGAR CIRCLE	2	6	7	13
30.	MANDAWALI CIRCLE	2	8	7	15
31.	PATEL NAGAR CIRCLE	2	23	4	27
32.	DWARKA CIRCLE	1	9	1	10
33.	R.K. PURAM CIRCLE	1	12	2	14
34.	BAWANA CIRCLE	1	3	4	7
35.	HAUS KHAS CIRCLE	1	11	0	11
	TOTAL	**119**	**755**	**437**	**1192**

Roads with number of Accident Prone Zones are given in **Table No. 10.6.** Top 19 roads have 106 Accident Prone Zones and 376 fatal accidents occurred at these places during the year 2019.

- **The Outer Ring Road (20), Ring Road (19) and GTK Road (11)** have the maximum number of dangerous stretches on them.

Table 10.6

Road wise Number of Accident Prone Zones – 2019

S.NO.	ROAD NAME	NUMBER OF ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
1.	OUTER RING ROAD	20	155	96	251
2.	RING ROAD	19	130	65	195
3.	GTK ROAD	11	54	49	103
4.	ROHTAK ROAD	7	42	18	60
5.	WAZIRABAD ROAD	7	52	29	81
6.	GRAND TRUNK ROAD	6	39	20	59
7.	MATHURA ROAD	6	46	19	65
8.	NH-24	5	10	22	32
9.	ROAD NO 57	3	11	11	22
10.	PUSTA ROAD	3	26	12	38
11.	VIR BANDA BAIRAGI MARG	3	31	6	37
12.	BOULEVARD ROAD	2	14	8	22
13.	ANAND MAI MARG	2	7	6	13
14.	NETAJI SUBHASH MARG	2	14	7	21
15.	NAJAFGARH ROAD	2	7	6	13
16.	LAL BAHADUR SHASTRI MARG	2	13	4	17
17.	ROAD NO 13A	2	11	6	17
18.	ROAD NO.56	2	10	8	18
19.	NH-8	2	21	6	27
	Total	**106**	**693**	**398**	**1091**
20.	VIKAS MARG	1	3	3	6
21.	BAWANA ROAD	1	3	4	7
22.	SPM MARG	1	4	4	8
23.	DWARKA LINK ROAD	1	7	3	10
24.	NARELA ROAD	1	1	3	4
25.	JOSEF BRIJ TITO MARG	1	11	0	11
26.	LALA LAJPAT RAI MARG	1	2	4	6
27.	PATEL ROAD	1	13	3	16
28.	MEHRAULI BADARPUR ROAD	1	4	3	7
29.	PANKHA ROAD	1	2	3	5
30.	NOIDA LINK ROAD	1	1	5	6
31.	ABDUL GAFAR KHAN MARG	1	2	3	5
32.	ROAD NO 224	1	9	1	10
	TOTAL	**119**	**755**	**437**	**1192**

Few important points revealed during study of these accident-prone zones are listed below:

- Accident prone zones have further been identified as **Pedestrian (29), Two wheelers (18), Cyclist (03) and HTVs (18) Accident prone zones** according to the category of the victim as well as the vehicle at fault.
- Prosecution and preventive actions according to the offending and victim vehicle of the place can reduce accidents.

Pedestrian Accident-Prone Zones:

- 29 out of the 119 accident prone zones are identified as **pedestrian accident-prone zones** based on the criteria of 3 or more fatal or 10 or more total pedestrian accidents within the range of 500 meter diameter. (Table 10.7)

Pedestrian facilities like FOBs, footpaths, safe boarding places, etc. needs to be improved at these places.

Map 10.2

Pedestrians Accident Prone Zones – 2019

Table 10.7

Pedestrian Accident Prone Zones – 2019

(FATAL ACCIDENT SENIORITY)

S.NO.	ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
1.	AZADPUR SABJZI MANDI	7	5	12
2.	MAJNU KA TILA	7	4	11
3.	ISBT K GATE	5	4	9
4.	5TH PUSTA USMANPUR	5	4	9
5.	AZAD PUR CHOWK	3	4	7
6.	MONESTRY RING ROAD	1	4	5
7.	SIGNATURE BRIDGE KHAJOORI	1	4	5
8.	TIKRI VILLAGE	0	4	4
9.	SHASTRI PARK/IT PARK	7	3	10
10.	MOTI NAGAR FLYOVER	5	3	8
11.	PUL MITHAI SPM MARG	4	3	7
12.	KHAJOORI KHAS PUSTA ROAD	3	3	6
13.	SIRASPUR	3	3	6
14.	GANDHI VIHAR BUS STAND	3	3	6
15.	HASANPUR DEPOT	3	3	6
16.	KABOOTAR MARKET	3	3	6
17.	MUKHAND PUR CHOWK	3	3	6
18.	NIGAM BODH GHAT	3	3	6
19.	MUKHARBA CHOWK	2	3	5
20.	M. S. PARK METRO STATION	2	3	5
21.	SAI BABA MANDIR	1	3	4
22.	SHAHBAD DAIRY	1	3	4
23.	SARITA VIHAR METRO STATION	1	3	4
24.	ITI DHEERPUR	1	3	4
25.	HANUMAN MANDIR	1	3	4
26.	JASOLA VIHAR	0	3	3
27.	DEEPALI CHOWK	0	3	3
28.	NIRANKARI COLONY/GOPAL PUR RED LIGHT	0	3	3
29.	PREPAID BOOTH MUKARBA CHOWK	0	3	3

Two-Wheelers Accident Prone Zones:

- **18** out of the 119 accident prone zones are identified as **Two-wheeler accident prone zones** based on the criteria of 3 or more fatal or 10 or more total two-wheeler accidents within the range of 500 meter diameter. (Table 10.8)

Map 10.3

Two Wheelers Accident Prone Zones – 2019

Table 10.8

Two-Wheeler Accident Prone Zones – 2019

(FATAL ACCIDENT SENIORITY)

S.NO.	ACCIDENT PRONE ZONES	SIMPL ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
1.	MUKUND PUR CHOWK	6	7	13
2.	SIGNATURE BRIDGE TIMARPUR	4	5	9
3.	WAZIRABAD	6	4	10
4.	MANGOLPURI FLYOVER	4	4	8
5.	WAZIR PUR DEPOT	3	4	7
6.	MADHUBAN CHOWK	3	4	7
7.	NIRANKARI COLONY/GOPAL PUR RED LIGHT	2	4	6
8.	SGT NAGAR	0	4	4
9.	RAJOUKARI FLYOVER	4	3	7
10.	SHALIMAR BAGH	3	3	6
11.	SARITA VIHAR FLYOVER	3	3	6
12.	AZAD PUR CHOWK	3	3	6
13.	TEES HAZARI RED LIGHT	2	3	5
14.	NEHRU PALACE	1	3	4
15.	MAYUR VIHAR EXTN	0	3	3
16.	MUKHARBA CHOWK	8	2	10
17.	GANDHI VIHAR BUS STAND	13	1	14
18.	PEERA GARHI CHOWK	11	0	11

These places either have high density two-wheeler movement or, these are on high speed corridors or may have too many openings of minor roads onto the major road or, lack nearby 'U' turn or, lack road crossing facility which prompts the rider to ride on the wrong side and indulge in random movement of two wheelers. Roads at such places have to be studied and redesigned for safe movement of two-wheelers. Pseudo two-wheeler tracks can be tested at some places.

Cyclist Accident Prone Zones:

- **03** accident prone zones are identified as **Cyclist accident prone zones** based on the criteria of 2 or more total cyclist accidents within the range of 500 meter diameter. (Table 10.9)

Map 10.4

Cyclists Accident Prone Zones – 2019

Table 10.9

Cyclist Accident Prone Zones – 2019

(FATAL ACCIDENT SENIORITY)

S.NO.	ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
1.	ALI VILLAGE	0	2	2
2.	NTPC COLONY	1	1	2
3.	UTTAM NAGAR	2	0	2

These are the places having high cyclist movement. Continuous **NMV tracks with safe road crossing facility for cycles,** by slowing down other vehicle movement are needed at these points. **Separate underpasses or FOBs where ever possible for slow moving** vehicles can also be proposed.

HTVs Accident Prone Zones:

- **18** accident prone zones are identified as **HTVs accident prone zones** by the criteria of 3 or more total accidents by HTVs within the range of 500 meter diameter. (Table 10.10)

Map 10.5

HTVs Accident Prone Zones – 2019

Table 10.10

HTVs Accident Prone Zones – 2019

(FATAL ACCIDENT SENIORITY)

S.NO.	ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
1.	AZADPUR SABJZI MANDI	6	4	10
2.	NEHRU PALACE	1	3	4
3.	ALI VILLAGE	0	3	3
4.	AZAD PUR CHOWK	2	2	4
5.	SARITA VIHAR METRO STATION	1	2	3
6.	POWER HOUSE PITAMPURA	1	2	3
7.	MUKHAND PUR CHOWK	1	2	3
8.	BHALSWA CHOWK	3	1	4
9.	MAJNU KA TILA	2	1	3
10.	PEERA GARHI CHOWK	2	1	3
11.	NANGLI POONA	2	1	3
12.	WAZIRABAD	2	1	3
13.	KIRARI MORE	2	1	3
14.	HOTEL BULBUL MUNDKA	2	1	3
15.	GANDHI VIHAR BUS STAND	2	1	3
16.	LONI ROAD CROSSING	4	0	4
17.	RAJDHANI PARK	3	0	3
18.	MADHUBAN CHOWK	3	0	3

These places have heavier vehicle movement and are mostly on NHs and Ring road/Outer Ring road.

Hit and run Accident Prone Zones:

- **35** accident prone zones are identified as **Hit and run accident prone zones** identified by the criteria of 3 or more fatal or 4 or more total Hit and run accident cases within the range of 500-meter diameter. (Table 10.11)
- Fixing **CCTV cameras** and placing **CATs ambulance** at these places can be effective in preventing fatalities.

Map 10.7 (a)

Hit and Run Accident Prone Zones – 2019

Table 10.11

Hit and Run Accident Prone Zones – 2019

(FATAL ACCIDENT SENIORITY)

S.NO.	ACCIDENT PRONE ZONES	SIMPL ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
1.	SIGNATURE BRIDGE TIMARPUR	4	6	10
2.	MUKHAND PUR CHOWK	3	6	9
3.	5TH PUSTA USMANPUR	4	5	9
4.	MUKHARBA CHOWK	4	5	9
5.	WAZIR PUR DEPOT	2	5	7
6.	NIRANKARI COLONY/GOPAL PUR RED LIGHT	0	5	5
7.	SIGNATURE BRIDGE KHAJOORI	5	4	9
8.	MAJNU KA TILA	4	4	8
9.	BURARI CHOWK	3	4	7
10.	WAZIRABAD	3	4	7
11.	AZAD PUR CHOWK	2	4	6
12.	MANGOLPURI FLYOVER	1	4	5
13.	SHAHBAD DAIRY	1	4	5
14.	HASANPUR DEPOT	0	4	4
15.	TIKRI VILLAGE	0	4	4
16.	NARAINA	4	3	7
17.	RAJOUKARI FLYOVER	4	3	7
18.	SIRASPUR	3	3	6
19.	DEEPALI CHOWK	2	3	5
20.	JAHANGIRPURI BUS STAND	2	3	5
21.	LIBAS PUR BUS STAND	2	3	5
22.	RAJOURI GARDEN	2	3	5
23.	MADHUBAN CHOWK	1	3	4
24.	SHASTRI NAGAR METRO STN	1	3	4
25.	SHALIMAR BAGH	1	3	4
26.	MAYUR VIHAR EXTN	1	3	4
27.	ANAND VIHAR RAILWAY FLYOVER	1	3	4
28.	ITI DHEERPUR	1	3	4
29.	EAST VINOD NAGAR/MV II RED LIGHT	0	3	3
30.	DELHI GATE	0	3	3
31.	SGT NAGAR	0	3	3
32.	CVD DEPOT NANGAL VILLAGE	0	3	3
33.	BUS STAND JAGAT PURI	0	3	3
34.	TEES HAZARI RED LIGHT	0	3	3
35.	BER SARAI FLYOVER	0	3	3

These are the places with high speed corridors and the places where there is heavy vehicle movement during the night.

Day-Time Accident Prone Zones:

- **27** accident prone zones were found to be more vulnerable zones during day time by the criteria of 3 or more fatal or 10 or more total accidents within the range of 500 meter diameter. (Table 10.12)

Map 10.8

Day-Time Accident Prone Zones – 2019

Table 10.12

Day-Time Accident Prone Zones – 2019

(FATAL ACCIDENT SENIORITY)

S.NO.	ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
1.	MUKHAND PUR CHOWK	6	7	13
2.	ANAND VIHAR ISBT	7	5	12
3.	WAZIRABAD	6	5	11
4.	SIGNATURE BRIDGE KHAJOORI	6	4	10
5.	5TH PUSTA USMANPUR	5	4	9
6.	AZAD PUR CHOWK	4	4	8
7.	BUS STAND JAGAT PURI	2	4	6
8.	MANGLAM HOSPITAL BUS STAND NH-24	0	4	4
9.	MUKHARBA CHOWK	7	3	10
10.	AZADPUR SABJZI MANDI	5	3	8
11.	KASHMIRI GATE CHOWK	5	3	8
12.	NARAINA	4	3	7
13.	RTR FLYOVER VASANT VIHAR	3	3	6
14.	SARITA VIHAR METRO STATION	3	3	6
15.	AKSHARDHAM MANDIR	2	3	5
16.	JAHANGIRPURI BUS STAND	2	3	5
17.	ITO/I P FLYOVER	1	3	4
18.	SIGNATURE BRIDGE TIMARPUR	1	3	4
19.	MAYUR VIHAR EXTN	0	3	3
20.	SGT NAGAR	0	3	3
21.	BURARI CHOWK	11	2	13
22.	MAJNU KA TILA	11	2	13
23.	DELHI GATE	8	2	10
24.	MOTI NAGAR FLYOVER	8	2	10
25.	SHASTRI PARK/IT PARK	11	1	12
26.	GANDHI VIHAR BUS STAND	15	0	15
27.	TOLL PLAZA BADARPUR	11	0	11

Night Time Accident Prone Zones:

- **40 accident prone zones were found to be vulnerable zones during night time** by the criteria of 3 or more fatal or 10 or more total accidents within the range of 500 meter diameter. (Table 10.13)
- **Proper illumination and reflective markings and signages alongwith cats eye** can reduce accidents at these places.

Map 10.9

Night-Time Accident Prone Zones – 2019

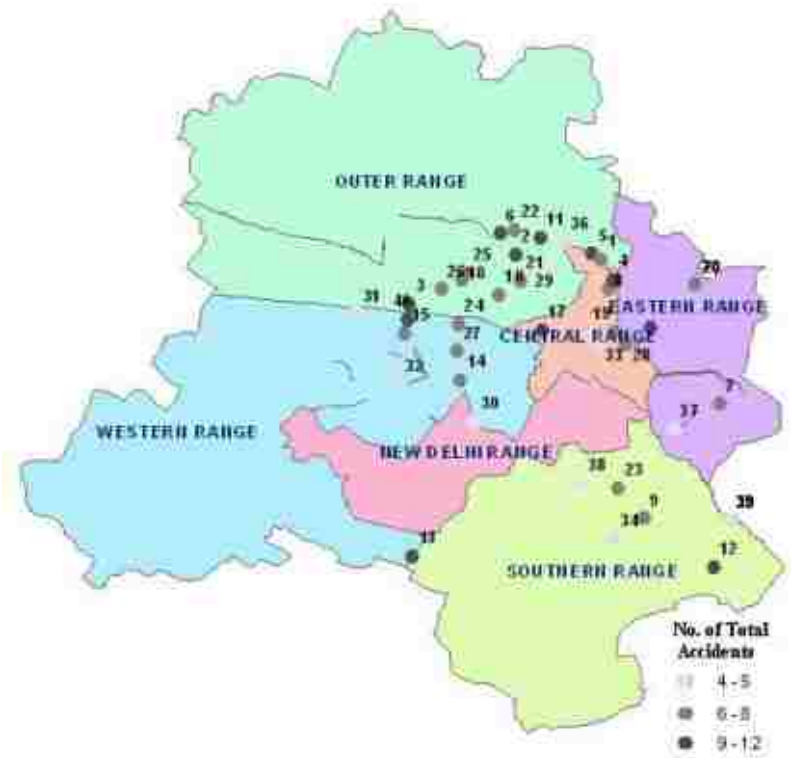

Table 10.13

Night-Time Accident Prone Zones – 2019

(FATAL ACCIDENT SENIORITY)

S.NO.	ACCIDENT PRONE ZONES	SIMPLE ACCIDENTS	FATAL ACCIDENTS	TOTAL ACCIDENTS
1.	NIRANKARI COLONY	1	7	8
2.	AZADPUR SABJZI MANDI	5	5	10
3.	MANGOLPURI FLYOVER	4	5	9
4.	SIGNATURE BRIDGE TIMARPUR	4	5	9
5.	GANDHI VIHAR BUS STAND	4	5	9
6.	MUKHARBA CHOWK	4	5	9
7.	EAST VINOD NAGAR/MV II RED LIGHT	2	5	7
8.	MAJNU KA TILA	2	5	7
9.	NEHRU PALACE	2	5	7
10.	WAZIR PUR DEPOT	1	5	6
11.	MUKHAND PUR CHOWK	6	4	10
12.	ALI VILLAGE	5	4	9
13.	RAJOUKARI FLYOVER	5	4	9
14.	MAYA PURI CHOWK	4	4	8
15.	ROUND ABOUT BHAIRAON ENCLAVE	3	4	7
16.	SHASTRI PARK/IT PARK	9	3	12
17.	SHASTRI NAGAR METRO STN	6	3	9
18.	MADHUBAN CHOWK	5	3	8
19.	ISBT K GATE	5	3	8
20.	GOKALPURI	4	3	7
21.	SHALIMAR BAGH	4	3	7
22.	BHALSWA CHOWK	3	3	6
23.	MOOL CHAND	3	3	6
24.	METRO STATION SHIVAJI PARK	3	3	6
25.	POWER HOUSE PITAMPURA	3	3	6
26.	DEEPALI CHOWK	3	3	6
27.	ESI HOSPITAL	3	3	6
28.	HANUMAN MANDIR	3	3	6
29.	AZAD PUR CHOWK	2	3	5
30.	BRAR SQUARE	2	3	5
31.	KIRARI MORE	2	3	5
32.	JANAKPURI EAST	2	3	5
33.	PUL MITHAI SPM MARG	2	3	5
34.	PRESS ENCLAVE CROSSING	2	3	5
35.	TEES HAZARI RED LIGHT	1	3	4
36.	BURARI CHOWK	1	3	4
37.	KHEL GAON	1	3	4
38.	AIIMS	1	3	4
39.	KALINDI KUNJ	1	3	4
40.	PEERA GARHI CHOWK	9	1	10

Illumination of the roads is the major influencing factor for night accident prone zones.

The Accident-Prone Zone can broadly be classified into the following zone types:

Table 10.14

Zone Type Accident Prone Zones – 2019

ZONE TYPES	NUMBER OF ACCIDENT-PRONE ZONES
MULTI-LEVEL INTERSECTION	28
ROAD STREACH	21
T-INTERSECTION	20
INTERSECTION	12
METRO STATION	11
BUS-STAND	7
MULTI-INTERSECTION	6
HIGHWAY VILLAGE	5
EXCHANGE HUB	3
HOSPITAL	2
FLYOVER	2
UNDERPASS	1
ROUND ABOUT	1
TOTAL	**119**

Note:-

1. **Multilevel intersections** are the intersections which are modified by making flyovers, underpasses, flyover loops at normal intersections eg. Punjabi Bagh chowk, Dhaula Kuan, Mukarba chowk etc.
2. **Multi intersection** are the junction points of more than 2 roads or a stretch of single major road having more than 2 minor roads joining within 500 meter stretch.
3. 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.**

- The above classification does not completely segregate one category from the other, there is some overlapping for e.g. some metro stations are also exchange hubs e.g. Peera garhi chowk. Some Exchange hubs are also multilevel intersections e.g. Mukarba chowk.
- The classification clearly shows that intersections of different types are more prone to accidents. Multilevel intersections are the most dangerous.
- Other accident-prone places are places of high foot fall eg. 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:
  - (i) These points lack safe, systematic transport exchange facility (metro buses, buses, TSR, E-rickshaw etc) for passengers.
  - (ii) The points do not have safe boarding facilities for passengers to board

buses/RTVs etc (People stand, wait and board from road).

(iii) There is also lack of proper and enough information 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.

Correction of Accident Prone Zones:

- Field officers' study and analyze these spots for the causative factors of accidents like:
  1. Slopes.
  2. Embankments.
  3. Road curvatures.
  4. Road surface.
  5. Line of sight visibility.
  6. Angle of intersections.
  7. Cuts in central verges.
  8. Need for FOBs/Subways.

The preventive measures are suggested to other civic agencies for maintenance.

- The field officers send proposals through Traffic Engineering Branch for improvement in road structure and road design. The proposals can be of short term, having immediate effects, like:
  (i) Speed calming measures
  (ii) Making fresh road markings
  (iii) Fixing cautionary and informative boards
  (iv) Proper illumination at the spot and fixing of reflective gadgets (CAT eyes, road blinkers, thermoplast road markings, reflective bollards etc.)
  (v) Nose protection
  (vi) Modification or some change of traffic movement
  (vii) Fixing of railing on road side or on divider
- The long-term measures for removing of traffic related problems, (regulation and accidents) from the spot are also identified, which are as follows:
  (i) Suggesting Underpass/FOB
  (ii) Developing footpath for pedestrians
  (iii) Proper waiting/ boarding place/ platform for pedestrians
  (iv) Developing service lanes
  (v) Change in route of buses or other transport vehicles
  (vi) Displacing bus stands.
  (vii) Closure of cuts on roads.
  (viii)Making oval round-about etc.
- Accordingly, corrective measures listed above were undertaken. This was accompanied by Enforcement and Road Safety Education.

The comparison of the list of Accident Prone Zones of the year 2018 and 2019 reveals that:

(i) Out of 110 Accident Prone Zones of 2018, 43 spots mentioned did not come under the above criteria and thus did not find place in the list of Accident Prone Zones of the year 2019.

(ii) 121 Accident Prone Zones show increase in fatal accidents in the year 2019 as compared to 2018. Signature Bridge Timarpur (+8), Ali Village (+5), Nehru Palace (+5) and Signature Bridge Khazoori (+5) have maximum increase in fatal accidents in the year.

(iii) 140 Accident Prone Zones show decrease in total accidents in the year 2019 as compared to 2018. Swaroop Nagar (-11), Libaspur Bus Stand (-11), Majlis Park Metro Station (-11), Shyamgiri Mandir Shastri Park (-10), and ISBT Kashmiri Gate (-9) have maximum decrease in total accidents in the year 2018.

- Around 30.5% of total fatal accidents (437 out of 1433) occurred in the road-stretch at APZ which is around 60 kms. in length.
- 168 (40%) out of these are hit and run cases. CCTV cameras can be proposed to be installed and CATS Ambulances can be positioned at these points to reduce the fatality and ensure quicker response to accidents.

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CHAPTER 11 THE WAY FORWARD

Road traffic injuries are a major but neglected global public health problem, requiring concerted efforts for effective and sustainable prevention. Of all the systems that people have to deal with on a daily basis, road transport is the most complex and the most dangerous.

- **When safety is taken into consideration during the planning, design and operation of roads, substantial contributions can be made to reducing traffic deaths and injuries.**
- **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.**
- **The aim is to create a safe road environment, rather than placing the main responsibility for safety on users who fail to deal with the intrinsic dangers of the roads.**
- **Head-on crashes, for example, occur on undivided roads while the lack of a footpath or a safe crossing presents a major risk for death and injury to pedestrians.**
- **For cyclists and motor cyclists, the lack of specific infrastructure features that ensure a safe journey like cycle lanes and motorcycle lanes leaves them vulnerable to impact and injury**
- **The provision of affordable and safe public transport as well as facilities for safe walking and cycling are highly important. (Source: WHO: Global Status Report on Road Safety 2018.)**

- **WHO: Pedestrian Safety: Many pedestrian safety problems cannot be solved simply by addressing one of the 'three Es' (engineering, education, enforcement) in isolation. Engineers, law enforcement, designers, planners, educators, and citizens should all play a role in identifying and implementing effective countermeasures for improving pedestrian safety.**
- **Although a situational assessment is typically conducted prior to initiating a programme, emphasis also needs to be given to occasional assessments of the pedestrian safety situation as the transport, socioeconomic and environmental situation changes in a given setting.**

While developing our cities, we gave due importance to the free flow/smooth flow of traffic by making flyovers and underpasses but we ignored development of facilities for pedestrians, who are the main victims in Road Accidents in our country, unlike developed country where cars/four wheelers are the major victims.

"The best way to get the desired result is to provide the conditions/ atmosphere to the users which make them themselves follow rules/paths willingly instead of forcing them to follow rules."

Land use and transport planning:

Prioritizing the needs of vulnerable road users includes recognizing the importance of the built environment when making political and planning decisions. Some of the solutions lie in **appropriate modifications to the physical road environment and setting up a supportive policy framework rather**

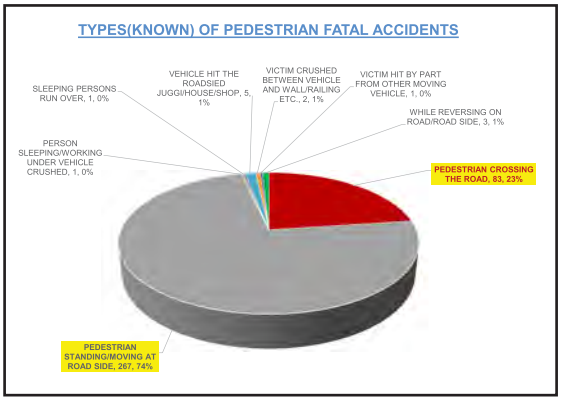
than focusing only on human behaviour as the primary cause of road traffic crashes.

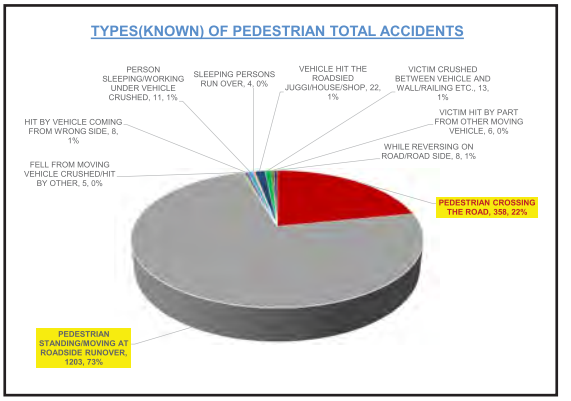
PEDESTRIAN SAFETY:

What we presently have for the pedestrians:

- A study was conducted on the type of accident pedestrian is involved in is given chart 11.1:

Chart – 11.1(a & b)





- It clearly shows that among the known types of pedestrian accidents 95% of all pedestrian accidents are caused either **while the pedestrian is moving (or standing) along the road side (73%) or the pedestrian is crossing the road (22%).**
- **The pedestrian is moving (or standing) along the road side (66.6%):** It depicts the condition of footpaths and waiting space for pedestrians (to get public transport) 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, un-friendly, and poorly maintained on most of the roads** of Delhi. Some examples are shown in the following pictures.

Pedestrian Difficulties (Some example)

Unusable Footpath

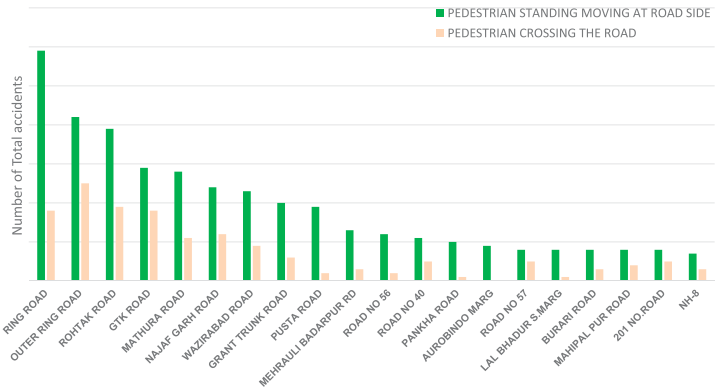
Open Sewage on Footpath

Lack of continuous Footpath

Bushes on Footpath

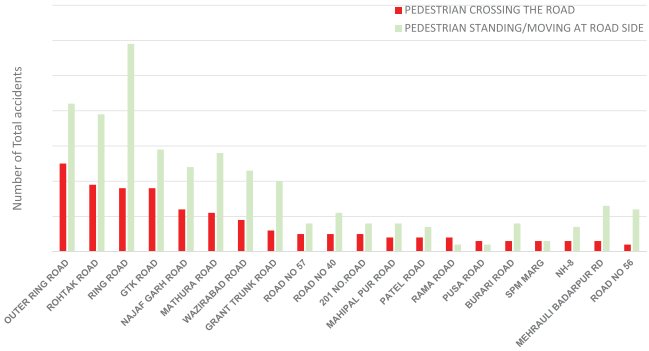
Electric Transformers on footpath

TOP-20 ROADS FOR ACCIDENTS WHILE PEDESTRIAN MOVING ALONG ROADSIDE...(TOTAL ACCIDENTS)



- **The accidents caused while crossing the roads, accounts for 22% of pedestrian accidents,** highlights the importance of need of attention to pedestrian crossing facility.
- With **the increase in population both human and vehicular** there is struggle for space and mobility on the road. This brings the **human and vehicular conflict on the roads. While the vehicle driver is in hurry and speeds up at the maximum possible speed, there is limitation to the speed at which a pedestrian can move** (that too depend on the age, sex and health condition of the pedestrian and the luggage he/she is carrying). With the roads getting wider and wider to accommodate more and more vehicles, the road crossing is becoming more and more challenging. Any mis-calculation 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 accidents is by providing signaled crossing for the pedestrians.** But this is done by stopping the vehicles for some time (few seconds or a minute). But with high density of pedestrians and their 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 (the average speed of a cycle) which takes off all the advantage of moving in vehicle that can move at far-far high speed. Thus, it is done at the cost of the mobility of vehicles. And in todays fast moving world all the advantage of time saving by **fast moving vehicles is lost. Long halting of vehicles adds the emission and pollution level.** It adds the frustration level and increases the chances of error.
- The other way out is the **segregation of traffic and pedestrian movement (for crossing). This can be done either 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, it could be better option.

TOP-20 ROADS FOR ACCIDENTS WHILE PEDESTRIAN CROSSING THE ROAD...(TOTAL ACCIDENTS)



- 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 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 minds of driver and the pedestrian which sometimes lead to road rage.
- But there are few things that are to be taken care of while constructing FOB to make sure that it is effectively used.

Some of the Pros and Cons of present Foot Over Bridges:

- If FOB is **situated away from the actual place of need,** so people prefer other means.
- If the **FOB is provided at the intersections where actual crossings at the ground level is possible, people prefer to cross road at ground level,** so there no use of high grills provided on divider. Vehicle-pedestrian conflict remains and pedestrians continue to obstruct traffic risking their lives. The purpose of making FOB gets lost.
- **People like comfort** and don't prefer climbing – getting down again climbing just to cross roads. When it is possible to provide a safe and more comfortable skyway directly and safely dropping them at the point of need/work.
- **When around 40% of passengers getting down have to go to the complex the mall** and the metro station can be connected by the skyways, with small exits at other points of attraction in between.
- **The extended dropping into the complex platform shall reduce the conflicts on the service road too.** These small one time efforts in construction can reduce numerous conflicts, and such small improvements can contribute in large scale reduction in congestion.
- **Unplanned ramp landing on opposite side of bus stand** or place of footfall becomes useless.
- **FOB on two lane roads with open intersection, without escalator**

having ramp that increases the effective from 20 m to 200 mts **never attracts people** and is wastage of public money.

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

Thus, 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 accidents while pedestrian crossing the road very low or zero which road was completely covered by high grills on the median like NH-8. It is completely covered by high grills on the median. Similar, action can be taken on other on 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, proper FOB/Subway to be provided 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. These local people have to cross these roads for their daily needs and become victim of high speed and heavy vehicles. **To reduce accidents due importance to be given to their needs of local people and right arrangement should be made to cross the road.**
- If these roads are not elevated corridor the no. of FOBs provided for crossing the road should me more. **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 making FOB is not possible, proper pelican signal should be provided for pedestrians to cross the roads.**
- **Providing of FOB/Subway should be must for all the six lane / eight lane or more roads.** Crossing Highways now a day, 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 of is high.**
- **Footpath should to be properly developed it should be separated from road by grills** to prevent pedestrians from 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 and more is the need of most pedestrians landing there.
- **Thus, we need to develop guided paths/skyways instead of just the foot over bridge/subways for pedestrians at the major intersections** and crossing. These guided paths should lead them to their desired destination ie bus stand/metro station/shopping complex etc.
- There is movement of thousands of people as pedestrians at the intersections like Peera Ghari for changing direction of travel of public transport. 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.
- **If elevated guided paths/FOB/ skyways can be designed for their safe movement, right from the alighting point from first vehicle to the boarding point of second vehicle,** people will have not to move on road making themselves safe and also reducing traffic congestion.
- **The encroachment of foot path by vendors needs to be discouraged/ removed.** Also 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 this.
- **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 bus (as per the requirement needs of points) and grills with gap only at the position of gates to be provided at the bus stands (as provided in case of metro stations having high rush).
- **All the major intersections like Peeragarhi, Singhu border, Mukharba 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 destination at that stand/intersection (like shopping complex/metrostation/college etc) thus again segregation the pedestrians from road and not allowing them to come on road.
- **A separate halting space for other public transport vehicle like TSRs/Gramin Sewa to be provided.** This again, separated by railing to make them stand in a single queue not allowing the pedestrians to come on road.
- Important junctions like singhu border, peeragarhi chowk, madhubhan chowk, ISBT, mahipalpur flyover etc are to be developed into proper hubs where

roadways passengers, DTC/CBUS passengers, Gramin Sewa, TSRs and E-Rickshaw etc are systematically available to the users safely interchanging from one mode to another and minimum or no movement of pedestrian on roads.

- **Public convenience/dustbins should be provided at the hubs and at small distances on NHs** to facilitate the users and to keep the roads clean.
- **Providing more information of modes of transport to the users at the exchange junctions like ISBT, Dhaula Kuan and Mukarba chowk** so that people particularly new comer easily get information of his next mode of transport at the exchange hub without roaming to much 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 direction boards for the passengers to get next connecting mode of transport** or to reach nearby important places safely through footpaths and foot over bridges.
- **Thus we need to make all the NHs, Ring Road, Outer Ring Road and other important arterial roads by reducing the movement of pedestrians on the carpeted area of the road to minimum and making it virtually pedestrian free zones.**

Two wheelers Safety:

There are around 72 lacs registered two-wheelers in Delhi. Their percentage share is around 64% of total vehicular population of Delhi. The percentage share is increasing every year.

Two-wheelers have been victims in around 34% of fatal road accidents during the year 2019. Two-wheeler riders were victims in 553 fatal and 3001 total accidents during the year 2019.

The percent share of two-wheeler as victims is given below:

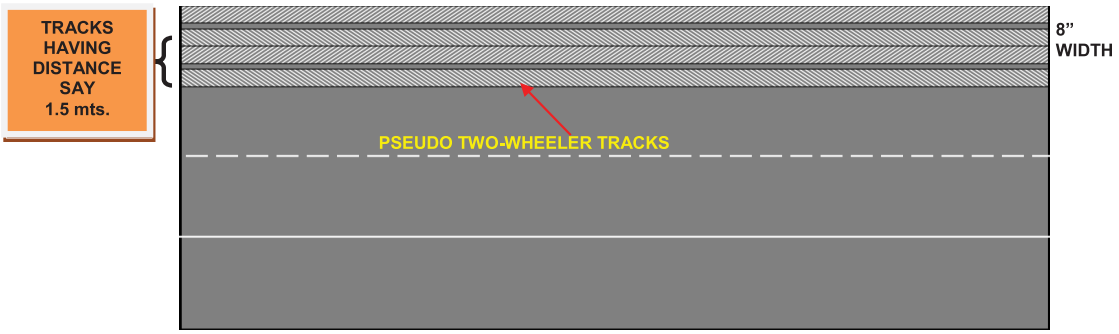
Year	Two-Wheelers Fatal Accidents	Total Fatal Accidents	Percentage
2016	555	1548	**35.85**
2017	551	1565	**35.20**
2018	562	1657	**33.91**
2019	487	1433	**33.98**

- There are very few safety gadgets available for the two-wheeler riders. Though, a lot of research work has been done for the safety of the passengers in the cars, no solid protection is available for safety of two-wheeler riders, except for the helmet.
- Let it be anyone's fault, when there is impact, collision or even touching, it is the two-wheeler rider who remains at the receiving end. It results either in fatality or comparatively more severe injury to the riders.
- While the normal touching or brushing of vehicles results in only damage to vehicles, in case of two-wheeler it ends in injury or fatality.
- With the ever-increasing population of vehicles on road, there is a struggle for space on road.
- Safety of two-wheeler riders has always been a cause of concern as, till now, no complete segregation for two-wheelers has been designed on the roads and no definite lane has been ear-marked for two-wheelers.
- On the left lane they are at the mercy of heavy commercial vehicles, while on the right they have to compete with high speed vehicles and in the middle lane they are exposed to the lane changing vehicles.

Pseudo Two-wheelers Track:

- To secure these two-wheelers they can be segregated from other vehicles by developing pseudo two-wheeler tracks.
- These tracks can be designed using pseudo breaker strips as in the design given below.

Psuedo-Two Wheeler Tracks Made Of Psuedo Breaker Strips



The dedicated two-wheeler track should only be wide enough to accommodate the safe movement of two motorcycles/scooters at a time (simultaneously), without brushing each other but should not accommodate the axle length of four-wheeled vehicles so that four wheelers do not dare venture into the two wheeler track.

- Where there is heavy two-wheeler movement or there are more two-wheeler accidents (eg. Two-wheeler Accident Prone Zones), such track can be placed on the extreme right lane of three or four lane road.
- This arrangement shall allow disciplined straight movement of two-wheelers in two designated lines.
- It shall hinder their zig zag movement and also shall deter other four wheeled vehicles to normally enter this section (as there will be bumpy ride for all other vehicles except for the two-wheelers).
- At same time all vehicles can move in this area also, when there is congestion or heavy traffic in this section of road.
- It can first be tested in small sections of two-wheeler accident prone zones like Madhuban Chowk underpass etc.

Improving Road Condition:

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 design and environment assist the driver in safely moving the vehicle on road; the road sign, road marking and road furniture, if properly placed, helps in preventing the accidents and reducing the severity of accidents.

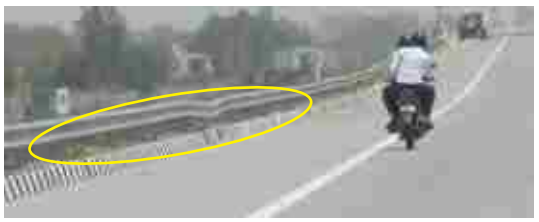
Thus, these are to be given due importance. Unfortunately, most of our roads (except in NDMC area) score poorly for these primary features of roads. All major arterial roads should be surveyed for following things can be done to improve the safety on the roads.

- **Providing nose protection** to all the protruding noses on roads.

- **Fixing reflectors** at start of all the dividers.

- **Marking lane with reflective paints** on all the roads.

- **Fixing of cats eye on these lane** marking as well as on the sides of the road.
- **The road markings (lanes and stop lines etc.) should be 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).
- 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 accidents. These vehicles can't be prosecuted manually or using technology taking photographs as it does not fulfill the legal requirement.
- **Reflectors/reflective paints on side railing, poles, and trees of road.**



- **Providing side protection/railing especially on bandh roads** or roads along with drains/canals etc.
- **Road markings are helpful in changing the lane in advance to avoid the conflict** near the bifurcation point. Eg. For loops near Dhaula kuan or AIIMS.

- **Illumination of roads should to 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 accident. This nowhere gets pointed out. Illumination is important in preventing pedestrian and cyclist accidents.
- **Cautionary sign** to be fixed well before schools, speed calmers, cuts in divider merging/diverging.

- **Appropriate speed calming measures** to be made as per the requirement of the road.

- **Pseudo speed breakers before intersections,** left turn start of divider or nose of flyover, at place of merging traffic be provided.
- Speed calmers on major roads should be preceded and followed by the installation of **pseudo speed breakers**. It acts as better warning agents than display boards.

- **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.

- Pseudo two wheeler tracks can be made for safe and disciplined movement of two wheelers on major roads at two wheeler Accident Prone Zones.
- **Unnecessary cuts** on road medians should be **identified and closed.**
- The merging of **minor roads,** having movements of two wheeler and slow moving vehicles should be studied and planned to **avoid direct merging into highways and other major roads.**
- **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 vehicles and two wheelers prefer to move in shorter wrong direction to cross the road if 'U' turn or the proper road crossing passage is a far away (more than a km.)
- All the major **intersection should be made of a little elevated with roughened surface to slow down** vehicles at intersection.

- 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 a distance at each km.

- **The repair and construction work on road and road side should be well protected** with sufficient sign boards, reflectors, illuminators and appropriate number of volunteers to be deployed for managing traffic.
- There should be **strict time limit for these repair work** and relaying of roads by the repairing authority should be a made essential. It is found that many road owning as well as other agencies like Jal board, sewer repair units, leave the roads inlaid even after completion of work.
- **There should be coordination between different agencies which dig the road or road side** for fixing pipes (water, sever or gas), laying cables or repairing or upgrading footpath or divider etc. All the repairing **should be**

done with one time or minimum digging. It has been found that hardly few months after the first agency has finished its work, the other agency digs the road. And people using the road continue to suffer again and again.

- Quick repair of pot holes on the roads.
- **Repairing/re-fixing of worn out** speed calming measures like mastics strip, rumble strips, pseudo breakers and fixing of cats eye should be done at regular intervals as in around six months these gets worn out and becomes ineffective.
- **Public conveniences with parking facility should be provided on both sides** of NHs and on all major roads to deter people to park their vehicles road only or road where can cause conjuction and accidents. Similarly, dustbin should be provided at visible spots on main roads to stop people littering of empty water bottles and waste/packaging of food and eatables, which can cause accidents when thrown on road from moving cars or buses.
- **Regular survey of road by road** maintaining agency for improvement and repair on 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.
- Yearly road safety audit to be done on all major roads.

Use of Technology

In the digital world a lot many things are possible a lot more easily once our data is in digitized form. There is urgent need of digitization and integration of all the vehicular as well as driving license records data at all the authorities.

- The vehicle and the driver both are free to move anywhere in India hence can be involved in traffic violation or an accident anywhere in India. **This data should be centrally maintained can be accessed by officials from anywhere in India to ascertain the previous traffic violation and conviction in accidents.**
- **The Driving License data can be linked to the Adhaar Card to remove the duplicity.** It is found that the drivers are using more than one D/L issued from different authorities and their previous violations and involvement in accidents cannot be established.
- **Fixing of GPS device with display screen can be made compulsory in all the commercial vehicle.** This device will be help in:
  - Checking the speed of vehicle.
  - Checking entry conditions on roads.
  - Identifying the vehicle involved in accidents/crime.
  - It can act as medium to provide information to the user vehicle regarding entry condition/speed warning, jam condition and also his prosecution details.
- **Records and live data of GPS tracking to be kept at authority level it self, speed prosecution can be done directly by computers** using GPS information given by GPS device after giving warning at the authority it self or can act as the speed regulator according to the area.
- Road wise speed limit data and entry condition data can be made available to driver through GPS device.
- **It can give information, warning, can act as speed governer or even prosecute based its scientific information** if the speed exceed the limit or it enters in no entry area.

Alcohol Detection Systems:

Internationally, drunken 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.

Suggestions for Accident Prone Zones: -

The numbers of road accidents 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 accidents take place. Accordingly, corrective and preventive measures are required to be taken. There is no clear segregation of different types of traffic moving through an Accident-Prone Zone. However, the Accident-Prone Zones can be classified based on the type of victim/ offending vehicle involved in the occurrence of road accidents. Accordingly, steps can be taken to prevent road accidents.

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

I. Pedestrian Accident 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 an accident 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 accident 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. Wherever, there is heavy pedestrian movement at the intersections like Peera Ghari chowk, etc., it generally creates conflict with the vehicles. This makes them unsafe and also obstructs the vehicular movement which adds to congestion and pollution. Provision of elevated guided paths/FOBs can be designed for safe movement. This will ensure safety of pedestrians and would also help in checking of traffic congestion.

9. The arrangement of making FOB with guided paths should be preferred over pelican crossing or red light crossing for pedestrians on NHs and high-speed corridors because:
   a. The risk factor is higher in signal crossing due to possibility of human error and high speed of motor vehicles on corridors, especially during lean hours/night hours.
   b. Halting of traffic even for few seconds or minutes adds to congestion and pollution, especially during peak hours.
   c. Halting and slow movement of traffic on mass level adds to the burden on GDP due to extra fuel burning.
   d. Increases frustration in the minds of drivers and the pedestrians which sometimes lead to incidents of road rage.
10. 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.
11. Places where FOBs are needed should be identified and recommended.
12. 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.
13. 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 from proper/safe platform, without risking their lives.
14. Information regarding the modes of transport available for the users at the exchange hubs like ISBT and Mukarba chowk etc, should be more expressive and more user oriented so that people, particularly new comers can easily access information. This information can be in the form of:
   a. Route maps of the DTC/Cluster buses which may be displayed at the bus stands.
   b. Direction boards for the passengers to get to the next connecting mode of transport or to reach nearby important places safely through footpaths and foot over bridges.
15. 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 accidents and add the traffic congestion.
16. Boarding/de-boarding in 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 accidents.

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 Accident Prone Zones.

7. Two-wheelers have been victims in around 34% of fatal road accidents during the year 2019. 2110 people were injured and 496 lost their lives in two-wheeler accidents in the year 2019. Most of these deaths are caused due to head injury.

A (head immunization) 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 in two-wheeler riding.

Free-to-use helmets can also to 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 accident injuries/deaths.

- ***For a helmet to be effective it needs to be of sufficient quality to provide maximum protection 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 Accident Prone Zones:

1. Cyclist become victim in road accidents 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 accidents 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 accident. Illumination is important in preventing pedestrian and cyclist accidents.
3. Distribution of reflective stickers/jackets should be undertaken in cyclist Accident 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 eg. 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 accidents involving cyclists.

5. More number of FOBs/subways/small under passes should be provided on 6 and 8 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 be made safer for all.

IV. Accident Prone Zones of Hit and Run Cases:

1. CCTV camera should be installed at these points to identified the motor vehicles at fault and from investigation point of view.
2. CATS Ambulances and PCR Vans halting points can be made near such points to check hit and run cases and for immediate post-crash care.

V. HTVs Accident Prone Zones:

1. Effective and stringent prosecution of the offenders along with education measures of the respective type of vehicle involved in the accident at and near such locations.
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. Accident 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.

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Notes

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