TRANSPORT DEPARTMENT
Government of NCT of Delhi

2022 DELHI ROAD CRASH FATALITIES REPORT

ANNUAL REPORT

REPORT BY:

TRANSPORT DEPARTMENT
Government of NCT of Delhi

DATA SUPPORT FROM:

SUPPORTED BY:

Bloomberg Philanthropies | Initiative for Global Road Safety

Vital Strategies

TRIP Centre
TRANSPORTATION RESEARCH & INJURY PREVENTION CENTRE

PREFACE

The 2022 Delhi Road Crash Fatalities Report is the third in the series by the Road Safety Lead Agency (RSLA) of the Delhi Transport Department. The yearly report is prepared to better understand road crash trends and identify needed countermeasures.

Through these reports, it has been made clear that pedestrians, cyclists and motorcyclists are most at risk of dying in road crashes.

1571 persons were killed in 1517 fatal crashes in 2022. That translates into at least four persons killed every day in preventable road crashes. It is concerning that these numbers represent a 28% increase from the previous year.

Evidence suggests that more footpaths, shorter pedestrian crossing distances on roads, raised crosswalks, more frequent public transport, and reducing key risk factors such as speeding, riding without a properly clasped helmet, drink driving, and failure to clasp seatbelts, can greatly contribute to reducing the rate of deadly crashes.

We are putting in evidence-based, tried and tested measures to reduce fatalities and injuries.

In the 2022 Delhi Road Crash Fatalities Report, the RSLA analysed the road crashes to identify when and where these crashes are occurring - known as 'crash prone spots' or 'blackspots'. The deep dive into data to geographically locate exactly at what time and where these crashes took place, helps inform our decision to rectify these crash prone spots.

Delhi Gate was one such example where a successful trial gave way to a permanent construction, transforming the crash prone intersection into a safer crossing for pedestrians.

Another such junction, Madhuban Chowk, reported 11 deaths between 2019-2021 and underwent a trial transformation in November 2023 in collaboration with the Transport Department and the Delhi Traffic Police. After the successful trial, “95% of users felt that intervention has improved safety for pedestrians while crossing the intersection.”

Following the successful trial, the Transport Department has shared the final findings with PWD for permanent construction.

We are working with road safety experts under the Bloomberg Philanthropies Initiative for Global Road Safety to expand our efforts to protect our citizens. We are currently working on 15 locations across Delhi to transform crash prone locations and make them safer. These interventions are in the benefit of all road users.

I commend the Road Safety Lead Agency for preparing this crucial report that will guide the road safety initiative of Delhi.

Sh. Prashant Goyal, IAS
Principal Secretary-cum-Commissioner,
Transport, GNCTD

ACKNOWLEDGEMENTS

Delhi is one of the 28 cities globally participating in the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS). In 2020, BIGRS started supporting the Delhi government to implement evidence-based road safety interventions and reduce road injuries and deaths.

One of the elements of the initiative is to strengthen road safety data, available with city authorities in order to improve data-led intervention planning, monitoring, and evaluation.

This work has been made possible with the continued support of the Road Safety Lead Agency of the Transport Department, Delhi Traffic Police, BIGRS, and all its partners working together to bring this report together.

We gratefully acknowledge the financial support received from Bloomberg Philanthropies, which made the production of this report possible.

ABBREVIATIONS

AIIMS	All India Institute of Medical Sciences
BIGRS	Bloomberg Philanthropies Initiative for Global Road Safety
CRRI	Central Road Research Institute
CSIR	Council of Scientific and Industrial Research
CSO	Civil Society Organisation
DHS	Demographic Health Surveys
DND	Delhi Noida Delhi
DM	District Magistrate
DRSC	District Road Safety Committee
DSL	Delhi Street Lab
DTC	Delhi Transport Corporation
DTP	Delhi Traffic Police
FIR	First Information Report
FOB	Foot Over Bridge
GDCI	Global Designing Cities Initiative
GIS	Geographic Information System
GT	Grand Trunk
HV	Heavy Vehicle
IACP	International Association of Chiefs of Police
IIT	Indian Institute of Technology
IPC	Indian Penal Code
IRAD	Integrated Road Accident Database
ISBT	Inter State Bus Terminal
JH-IIRU	Johns Hopkins International Injury Research Unit

KM	Kilometre
LMV	Light Motor Vehicle
MACT	Motor Accident Claims Tribunal
MCD	Municipal Corporation of Delhi
MoRTH	Ministry of Road Transport and Highways
MPD	Master Plan for Delhi
MTW	Motorised Two-Wheeler
NCR	National Capital Region
NCT	National Capital Territory
NGO	Non-Governmental Organisation
NH	National Highway
NHAI	National Highways Authority of India
NIC	National Informatics Centre
NSP	Netaji Subhash Place
PCR	Police Control Room
QGIS	Quantum Geographic Information System
RSLA	Road Safety Lead Agency
SKV	Sarvodaya Kanya Vidyalaya
SOP	Standard Operating Procedure
TRIP	Transportation Research and Injury Prevention
UTTIPEC	Unified Traffic and Transportation Infrastructure (Planning & Engineering)
UT	Union Territory
WDoR	World Day of Remembrance
WHO	World Health Organisation
WRI	World Resources Institute

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Road injuries are a leading cause of death globally, with over a million killed in preventable road crashes each year.[1] Up to 50 million suffer non-fatal injuries, with many of them incurring life-long disabilities.

Road crashes result in economic losses to the individuals involved, their families and the country as a whole. These losses are due to the cost of treatment, loss of income for those killed or injured, and family members taking time off to care for the injured. Roadcrashes cost India up to five percent of its gross domestic product.[2] The second United Nations Decade of Action for Road Safety 2011-2020 made some progress, but the burden of deaths and injuries still remains too high. According to WHO's 2023 Global Status Report on Road Safety, 49 percent of the world's road deaths are among pedestrians (23%), motorised two wheeler and three wheeler (21%), and cyclists (5%), also known as "vulnerable road users".

As per the Ministry of Road Transport and Highways (MoRTH)'s report on 2022 crash statistics, 1,68,491 persons were killed in road crashes in India.[3] According to the WHO, India accounts for nearly 1 in 5 of all road crash deaths globally.[4] 1.19 Million global deaths and 216,618 deaths in India according to the 2023 WHO Status Report

The Road Safety Lead Agency (RSLA) of the Delhi Transport Department, in its crash analysis, reported 4,720 crashes (including 1,199 fatal crashes and 1,238 fatalities), which increased to 5,652 crashes 19% (including 1,517 fatal crashes (26%) and 1,571 fatalities) in 2022 (27%).[5]

It is pertinent to note that fatal crashes and road crash deaths have surpassed the figures of pre-Covid-19 statistics. For instance, in 2019, 1,433 fatal crashes and 1,463 road crash deaths were reported. In 2022, motorcyclists 45% and pedestrians 50% accounted for 95 percent of all the fatalities.

A total of 97 percent of the deaths occurred among vulnerable road users (pedestrians, motorcyclists, cyclists and auto rickshaw occupants-both motorised and electric), which is higher than the national average of 70.8 percent.[6]

Of all the fatalities, 89 percent of deaths occurred among males and 11 percent among females. The largest proportion of deaths occurred among male adults aged between 30 to 39 years.

---

[1] World Health Organisation (WHO), 2023, https://www.who.int/publications/i/item/9789240086517

[2] World Bank, https://blogs.worldbank.org/endpovertyinsouthasia/how-do-poor-cope-road-crashes-india

[3] MoRTH, 2022, https://morth.nic.in/sites/default/files/RA_2022_30_Oct.pdf

[4] World Health Organisation (WHO), 2023, https://www.who.int/publications/i/item/9789240086517

[5] RSLA of the Delhi Transport Department, 2021, https://transport.delhi.gov.in/it/2021-delhi-road-crash-fatalities-report

[6] MoRTH, 2022, https://morth.nic.in/sites/default/files/RA_2022_30_Oct.pdf

Many road crash deaths happen from 21:00 to 1:59, most days of the week. Saturdays, Sundays, and Mondays recorded the highest deaths. Heavy vehicles and light motor vehicles (LMVs) were responsible for 81 percent of all reported crashes where the impacting vehicle was known.

The percentage of hit-and-run crashes remains the same at 59 percent in 2021 and 2022. This may indicate the need for enhanced enforcement measures in areas witnessing hit-and-run crashes to address this.

The data source for this report is police crash data records from the Motor Accident Claims Tribunal (MACT) Cells of the Districts. In addition, this data was supplemented by FIR lists from the Delhi Traffic Police.

There is an increase in the total number of fatal crashes and deaths in this report as compared to the figures reported by the Delhi Traffic Police's (DTP) Road Traffic Crash Report, 2022 because, this report includes the road crash deaths where victims have died after the registration of FIRs in serious injury crashes in the following year. This report also takes into account the road crash deaths which occurred on the date of the crash, whereas the Delhi Traffic Police's crash statistics are reported based on the date of lodging of the FIR in the calendar year.

This data calls for the need for more walkable streets, safer pedestrian and cycling infrastructure, reduced speed limits and an increase in the rate of challan repayment, enforcement of clasped motorcycle helmets and seat-belts with enhanced enforcement. This report is intended to inform and provide guidance to all city stakeholders.

INTRODUCTION

The Covid-19 pandemic changed our way of living and brought to light the importance of effective and inclusive cities and health systems. The public health emergency that claimed over seven million lives globally forced us to evolve, take stock of our losses and commit in urgency to saving lives.[7] Road crashes have been taking a far worse toll on us for decades and need to be treated with the same resolve - as a public health emergency.

Every year preventable road crashes kill over a million people globally and injure as many as 50 million, many of whom suffer life-long disability and a daily life of hardship. In India 1,68,491 fatal road crashes and 4,43,366 injuries were reported by the Police Departments of States and Union Territories (UTs) during 2022.[8]

The 2022 Delhi Road Crash Fatalities Report enables government to effectively respond to the growing number of road crashes. This report highlights the road crash trends in the National Capital Territory (NCT) of Delhi in 2022.

In NCT Delhi, the Transport Department, the Police and the Health Department work together to utilise and analyse crash data. These departments play a vital role in understanding the road injury situation and designing interventions to save lives.

The previous year's report identified 20 high risk corridors and 17 high risk areas which were then worked on by the Transport Department with support from leading urban planners and street design experts with global experience. Following the previous year's report, this annual report will further aid the road safety work in Delhi, providing updated data, crash patterns, and risk areas.

The report is prepared by the RSLA of the Transport Department in collaboration with BIGRS. The RSLA was set up in 2017 as per the directive of the Supreme Court Committee on Road Safety. It has been mandated to collate road injury crash data periodically, analyse the data to identify high risk areas/road stretches and at risk road user types. The following report presents an analysis of the data extracted from FIRs of fatal crashes reported in 2022.

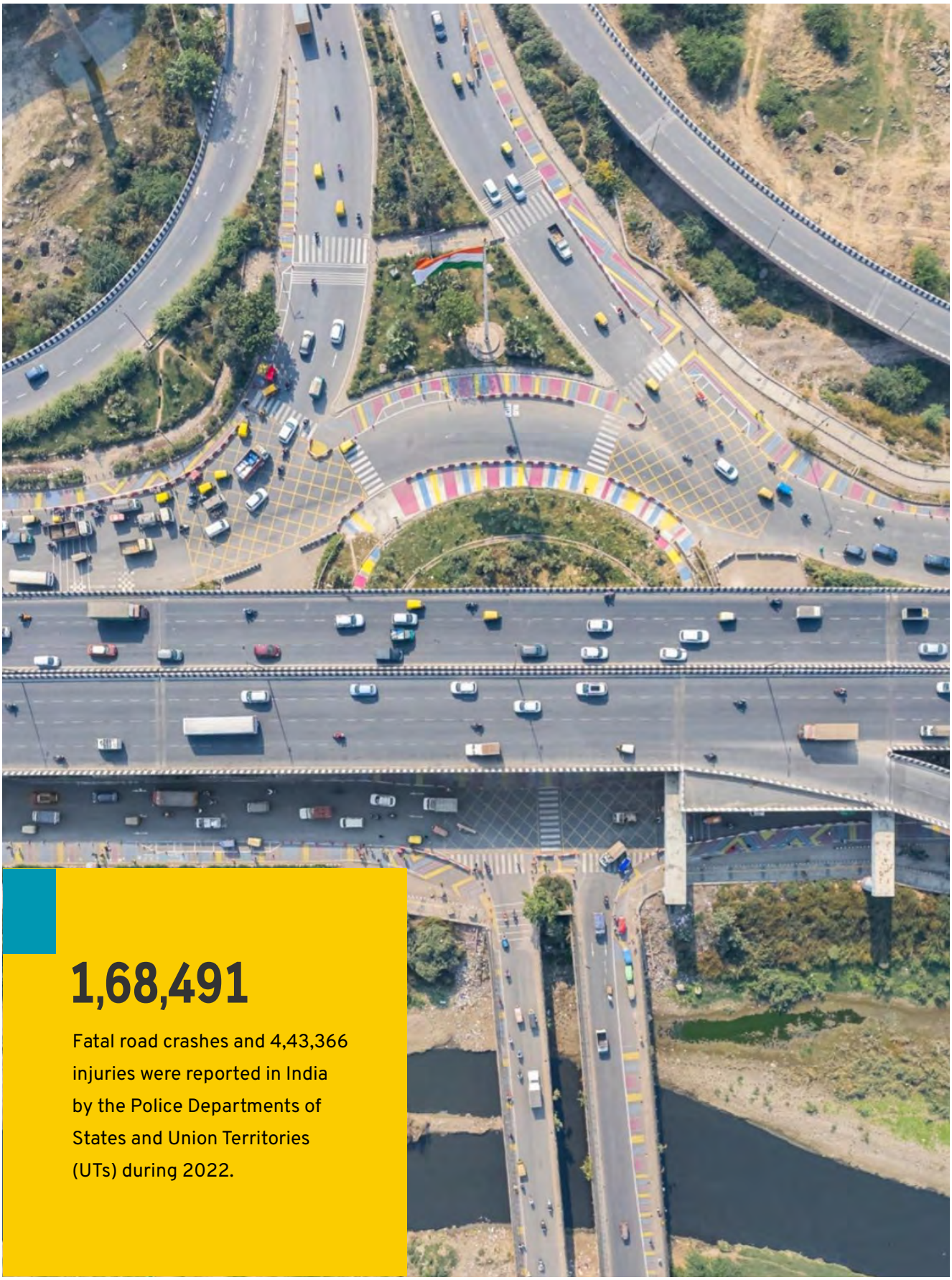
Using the data provided by this report police can be trained and deployed to target the most relevant risk factors, times, and places. Intersections and corridors highlighted based on the analysis in this report can be taken up by districts and relevant stakeholders to redesign to make them safer. Media can be aimed at key audiences.

---

[7]World Health Organization https://data.who.int/dashboards/covid19/deaths?n=c

[8]MORTH, Road Accidents in India 2022. Ministry of Road Transport and Highways of India. https://morth.nic.in/sites/default/files/RA_2022_30_Oct.pdf

The report brings together different stakeholders with different expertise and responsibilities to contribute to the road safety agenda. Ultimately, it will enable a systematic, shared, and informed approach to saving lives on the road.



1,68,491

Fatal road crashes and 4,43,366 injuries were reported in India by the Police Departments of States and Union Territories (UTs) during 2022.

METHODOLOGY

DATA SOURCES AND DATA COLLECTION

The primary source of data of this report was data retrieved from First Information Reports (FIR). These FIRs were completed by the Law-and-Order police whenever a crash is reported to the police. The DTP got copies of these FIRs and entered the details into their own system in the Crash Research Cell. They collated the FIR numbers from this dataset and shared them to the Transport Department who then downloaded the corresponding FIR in the Crime and Criminal Tracking Network and Systems (CCTNS).[9] The Transport Department then created their own digitised dataset based on details from the downloaded FIRs. Since the data from DTP did not contain the number of fatalities per FIR and since a single FIR did not account for all fatalities, the Transport Department supplemented the digitised dataset with data coming from the MACT cell of each district. The MACT Cell provided converted cases of FIRs, meaning, those which were recorded as a minor injury or serious injury but later on become a fatality. The completed dataset then which was used for this report was data coming from FIRs, from the DTP, and from the MACT of each district.

DATA ENTRY AND CLEANING

After collecting the data, the FIR data was entered into a Microsoft Access crash recording form which included the crash, vehicle and person forms. The crash form included the event of the road crash and its details; the vehicle form included details of all the vehicles involved in the crash; and the person form included details of the persons associated with the vehicles and event. The original data from DTP was supplemented with data from the MACT Cell Once the original and the converted cases dataset was encoded in these common crash recording forms, the data was cleaned. Data cleaning included filling in missing variables, standardising coding, resolving errors, deleting duplicates, among others. These data quality issues were noted down to support surveillance systems strengthening in the city.

DATA ANALYSIS

The data were analysed and presented as summary statistics in the form of tables, figures and heatmaps.The locations of fatal crashes were mapped by manually entering crash location descriptions into Google maps and identifying the coordinates based on the best available information.

---

[9]Delhi Police, https://cctns.delhipolice.gov.in/citizen/firSearch.htm

Road user types were grouped for most tables and graphs into the following four categories: pedestrians, motorised two and three-wheeler users, four-vehicle occupants, and cyclists. The corridor lengths were measured on Google Maps. Geospatial analysis was done using QGIs. Statistical analysis was done with Microsoft Excel. The crash cases that occurred before 2022 but were registered only in 2022 were excluded from this analysis.

LIMITATIONS

The data was abstracted from FIRs which contain information captured in the nascent stages of investigation. The FIR information is collected from the legal perspective. Some crash variables may not be available in FIRs which are later captured by the DTP for their crash analysis. The converted cases from IPC sections 337 (causing hurt by act endangering life and personal safety of others) and 338 (causing grievous hurt by act endangering life and personal safety of others) to IPC section 304-A (causing death by negligence) are recorded by the MACT Cells of the districts. The difference between the DTP's reporting of the crash figures is based on the death of the individual on the given date and the RSLA's encoding is based on the road crash date. FIRs capture limited information on road safety risk factors, road infrastructure details, circumstances that lead to crashes

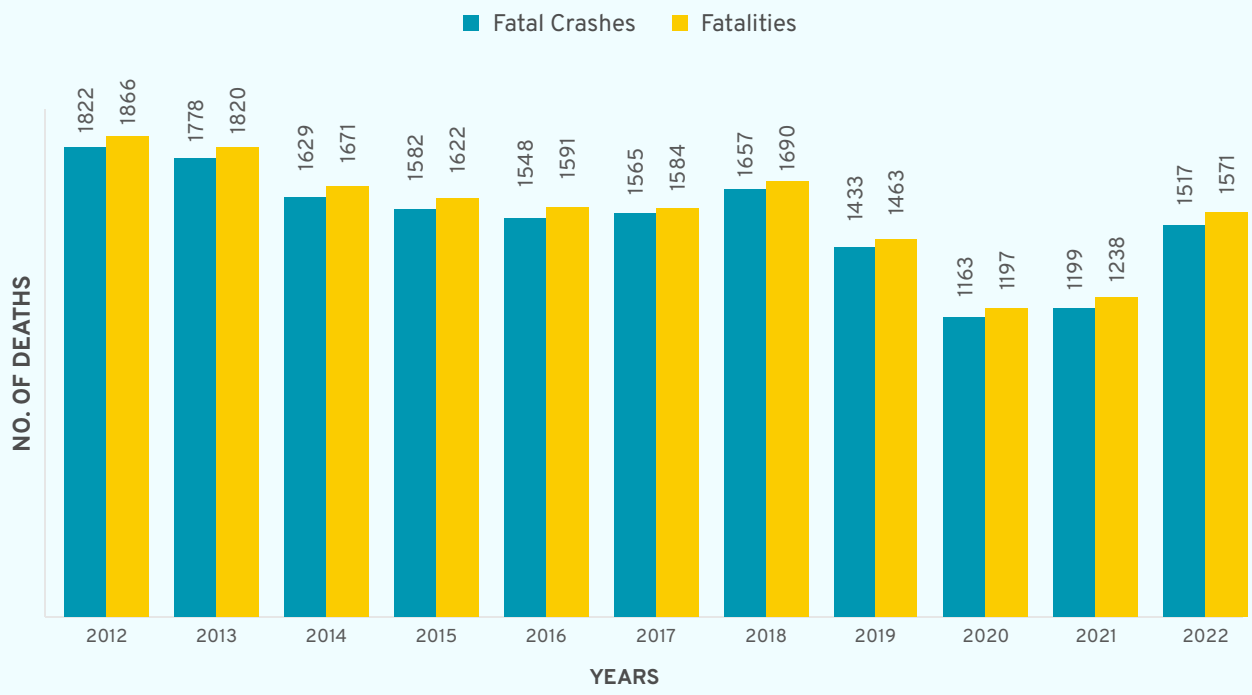
REPORT PREPARATION

This effort was made possible with the support of the Transport Department, the DTP, and the BIGRS. Ishan Gogoi, Surveillance Coordinator, BIGRS-Delhi embedded team was responsible for data cleaning, analysis with support from Dr. Sara Whitehead, Mirick Paala, Dr. Pratibha Pawar, Grant Ennis and Lievanta Millar, Vital Strategies; Rohit David, Farhan Shaikh, KL Yadav and Divya Jindal from the BIGRS Delhi embedded team provided critical guidance and support throughout the process. The report was also technically reviewed by Prof. Geetam Tiwari and Prof. Rahul Goel from IIT-Delhi's TRIP Centre.

TRENDS IN ROAD CRASH DEATHS

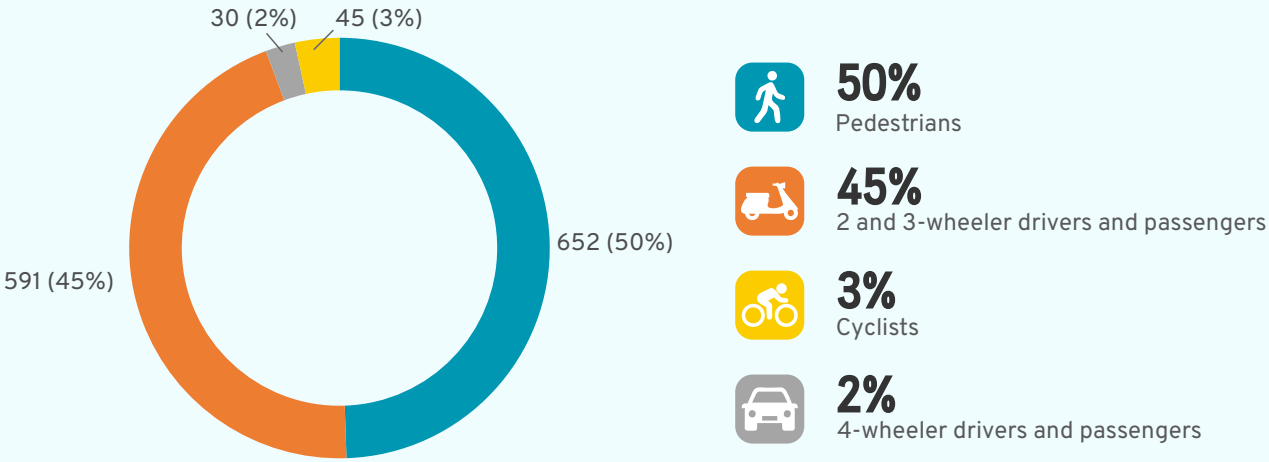
FATAL CRASHES AND FATALITIES IN DELHI, 2022

FATAL CRASHES AND FATALITIES, 2012-2022



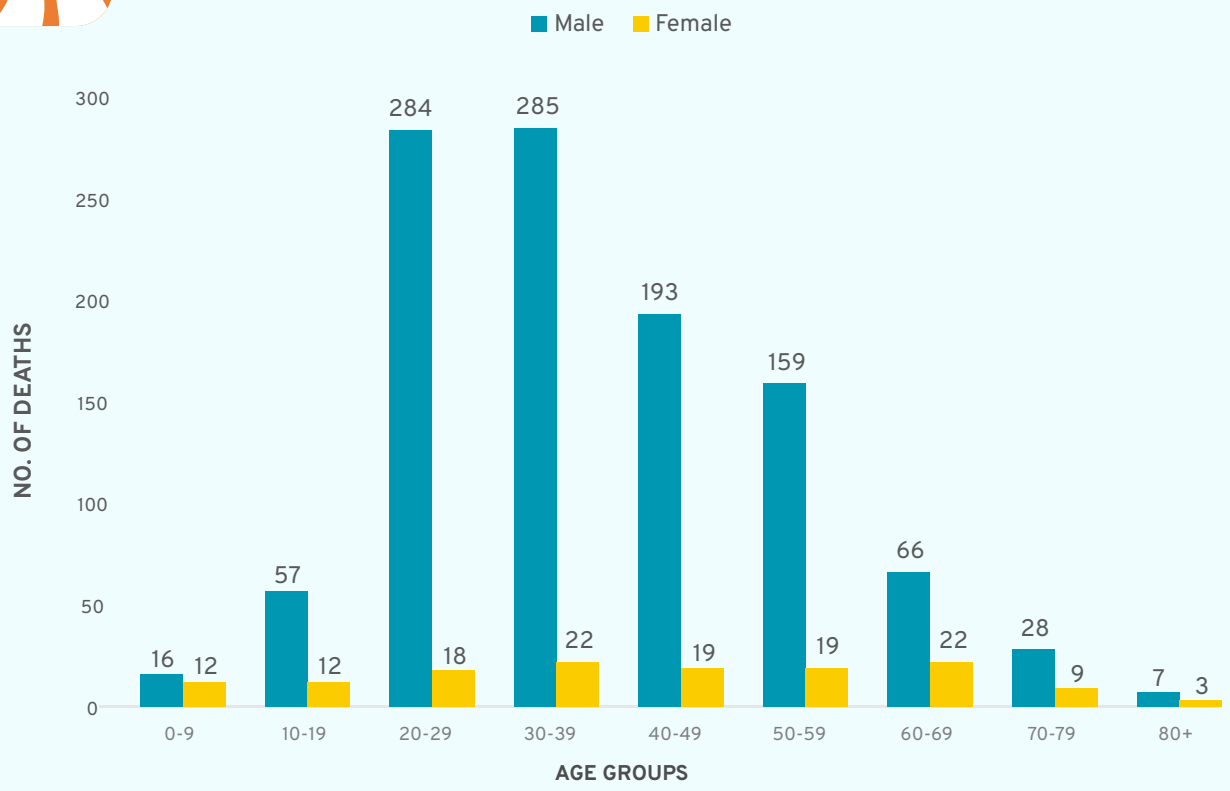
In 2022, 1,571 persons were killed. Compared to the average number of fatalities of 1,579 deaths three years prior to the pandemic (2017 to 2019), the latest number of road crash deaths almost stayed the same. This warrants the implementation of more impactful and effective measures to significantly bring down road crash fatalities in Delhi. The low number of road crash deaths in 2020 and 2021 may be attributed to mobility restrictions during the pandemic.

ROAD CRASH DEATHS BY ROAD USER TYPE 2022



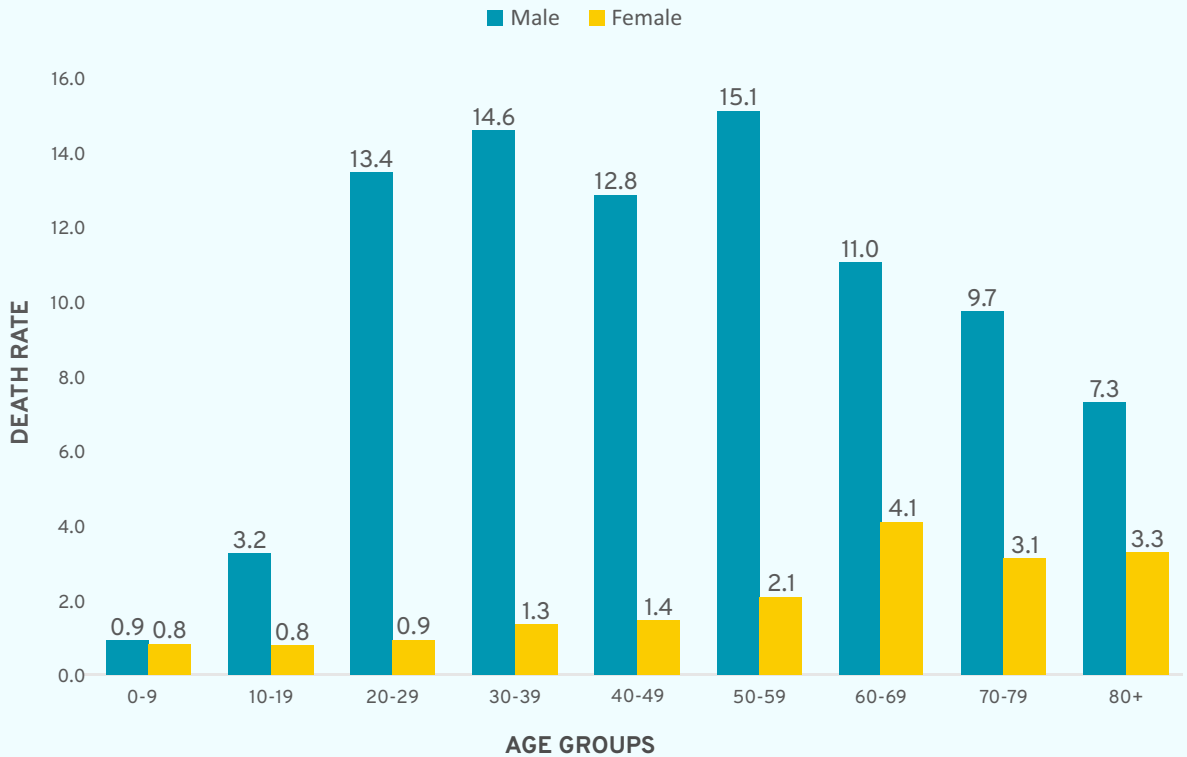
Pedestrians constituted 50% of all the road crash victims followed by motorised two-wheelers (motorcycles and scooters) and three-wheeler drivers and passengers (auto-rickshaws: passenger and goods) at 45%. Ninety-eight percent of fatalities are of vulnerable road users which include pedestrians, cyclists, motorcyclists and three-wheeler occupants.

ALL ROAD USER TYPE DEATHS BY AGE AND GENDER, 2022



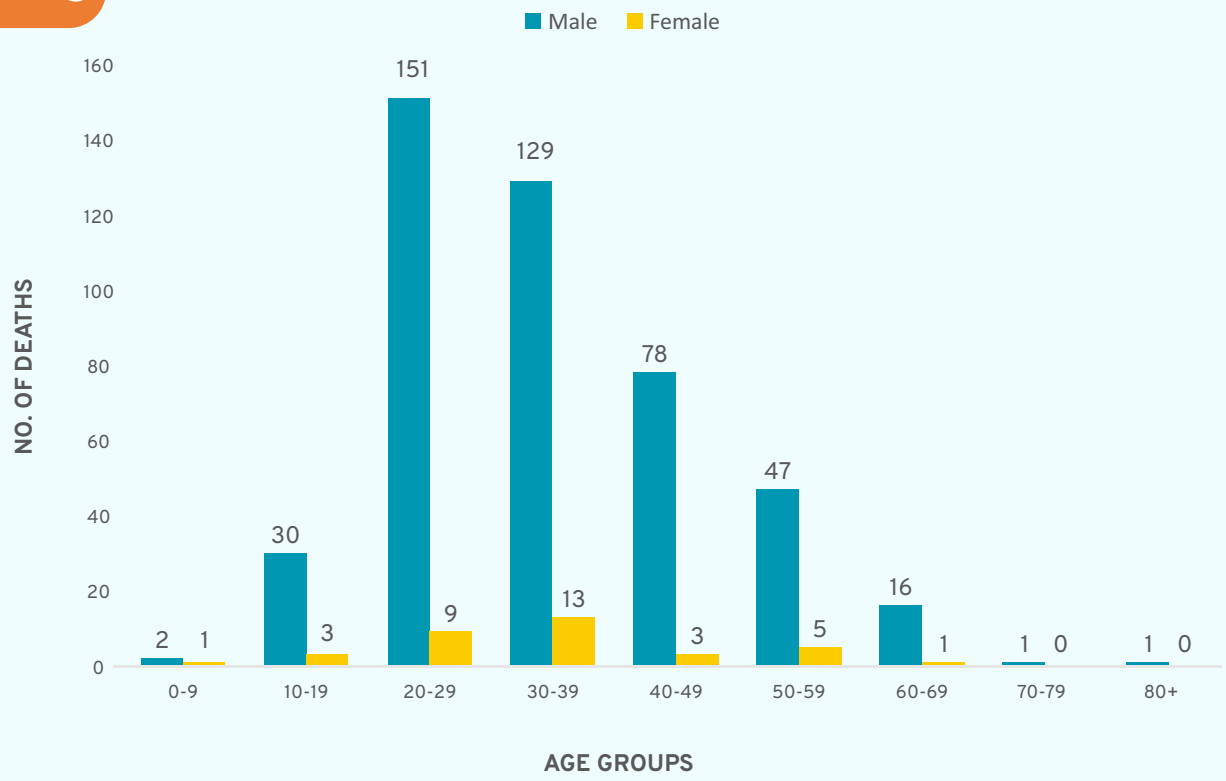
Adults aged between 20 to 39 years old made up for the largest proportion of road crash deaths (50% of all road crash deaths). No discernible pattern was noticed among females for road crash deaths.

ALL ROAD USER DEATH RATE BY AGE AND GENDER, 2022



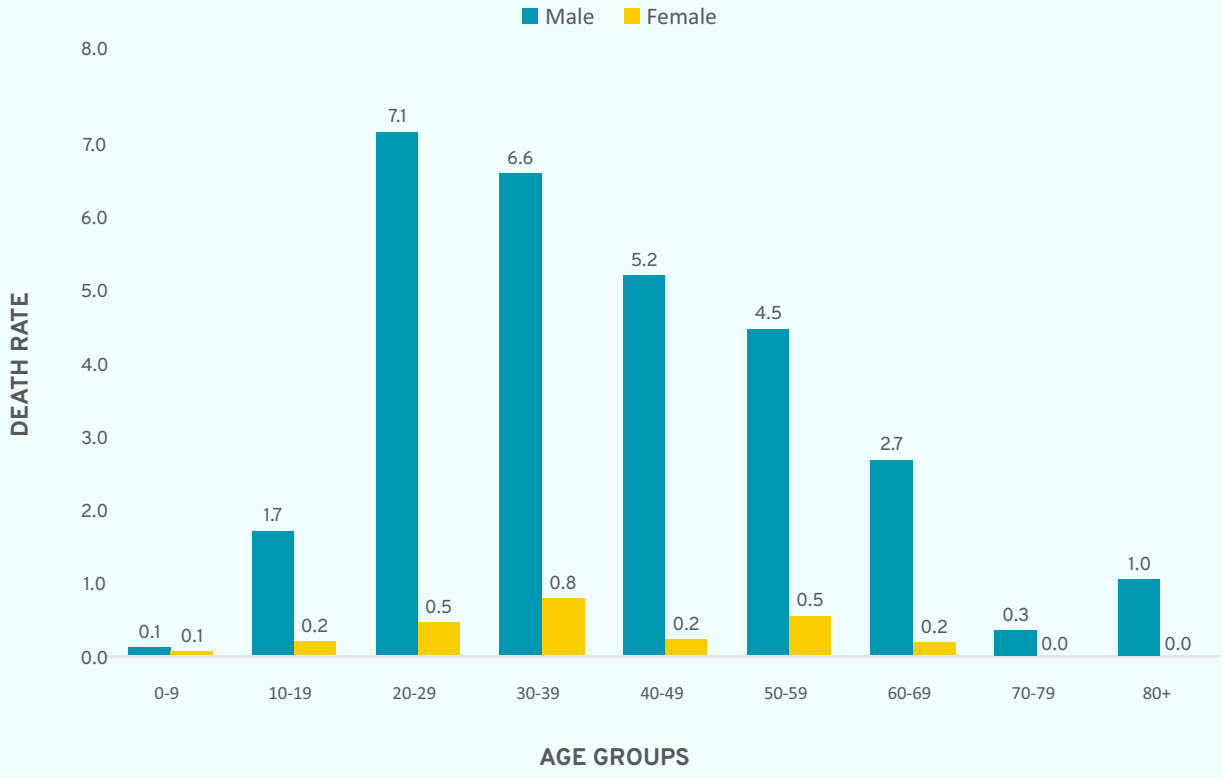
Road crash deaths per 100,000 population

MOTORCYCLE (RIDER + PILLION) DEATHS BY AGE AND GENDER, 2022



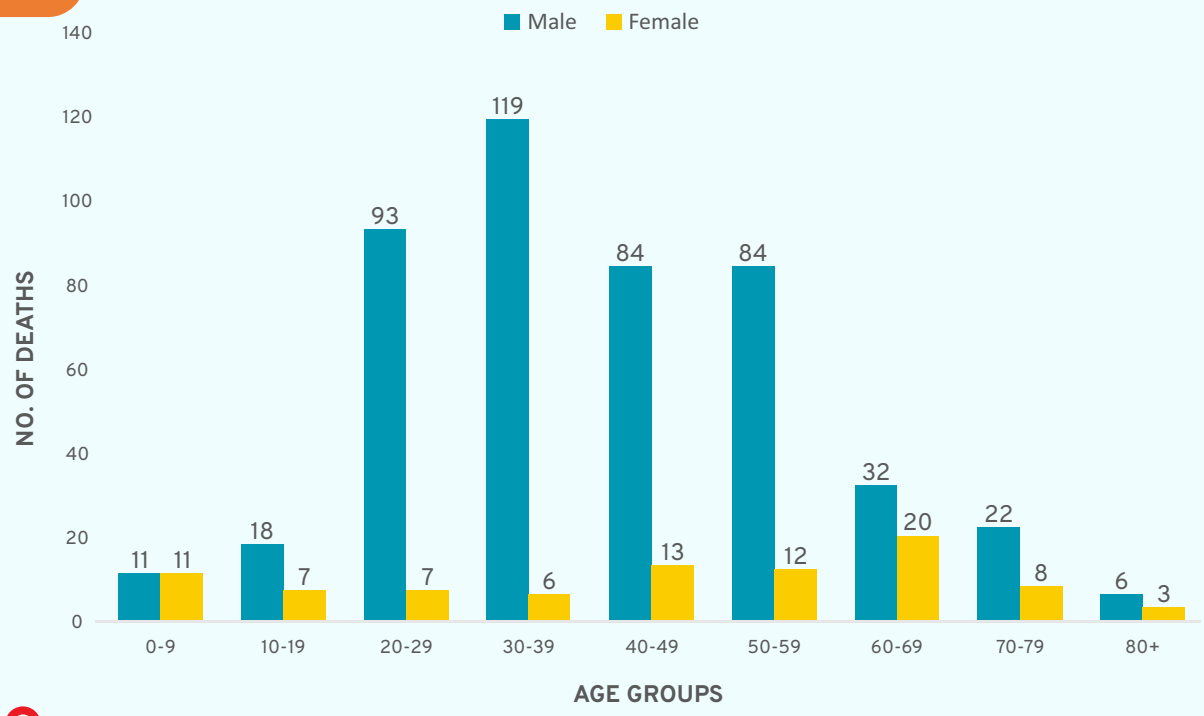
Males of age groups 20-29 and 30-39 comprised the vast majority of motorcycle fatalities with 33% and 29% deaths respectively.

MOTORCYCLE (RIDER + PILLION) DEATH RATE BY AGE AND GENDER, 2022



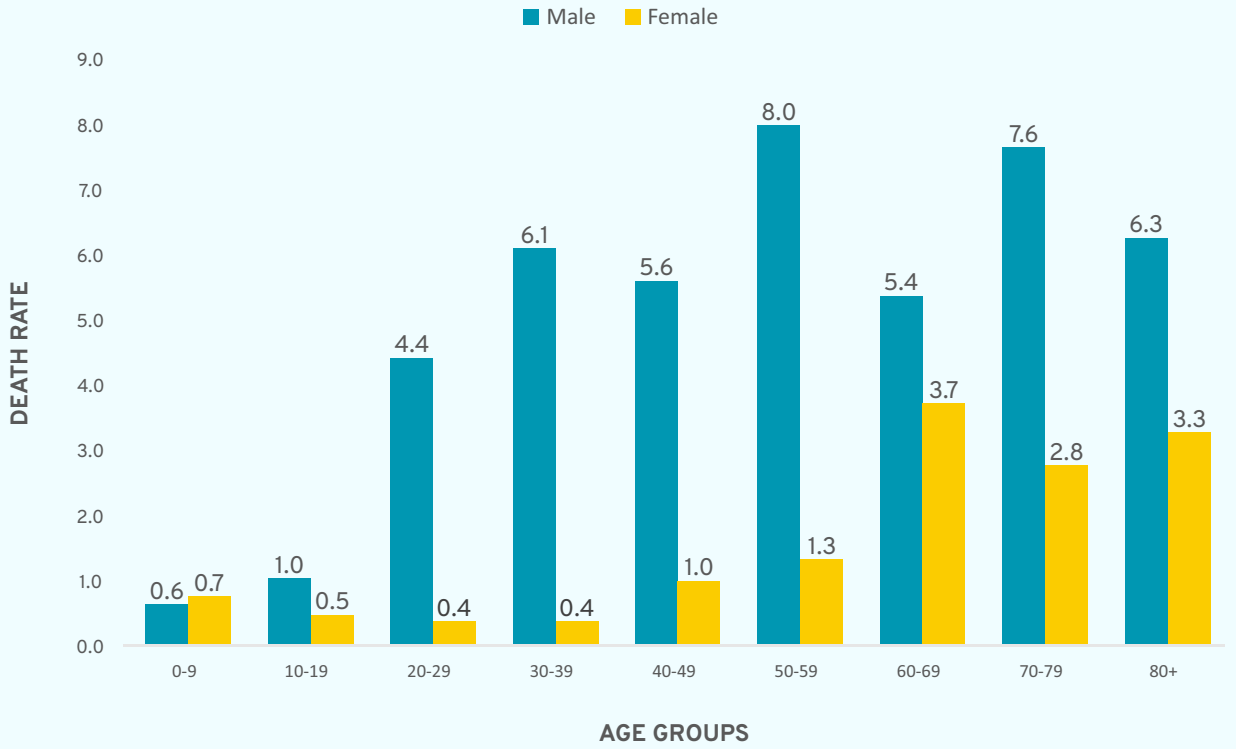
There is a relatively higher death rate in motorcycle fatalities in age groups 20-29 and 30-39. We can also see that there is relatively higher death rate for females in the age group 30-39.

PEDESTRIAN DEATHS BY AGE AND GENDER, 2022



Pedestrians in age groups of 20-29 years and 30-39 years were most at-risk by different modes of transport at 18% and 22% deaths respectively.

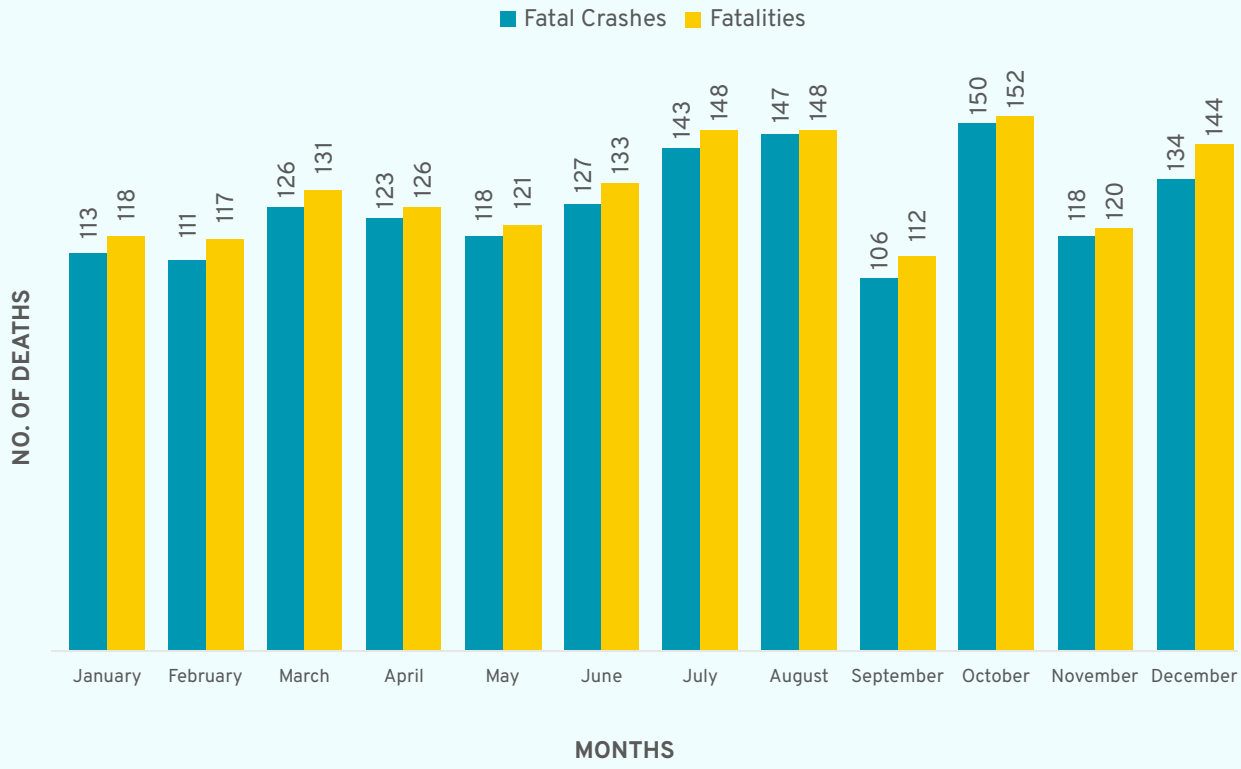
PEDESTRIAN DEATH RATE BY AGE AND GENDER, 2022



Pedestrians belonging to the age group 45 and above were at a higher risk of getting killed in pedestrian deaths as compared to younger age groups. Female pedestrians above the age group of 60 were more vulnerable as compared to younger female pedestrians.

ROAD CRASH DEATHS BY MONTH, DAY AND TIME, 2022

MONTHWISE FATAL CRASHES AND FATALITIES, 2022



July, August, October and December witnessed the highest number of road crash deaths in 2022.

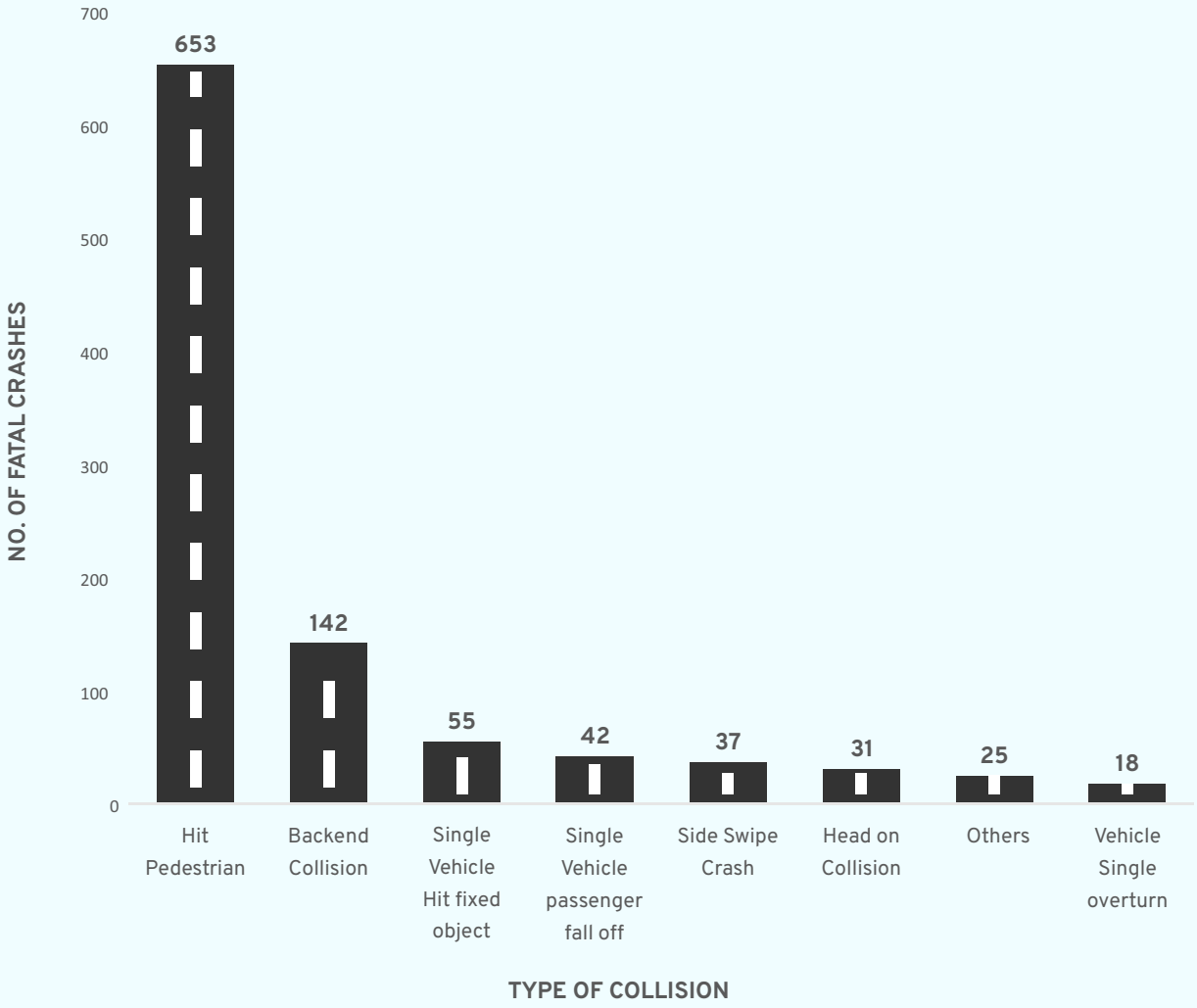
ROAD CRASH DEATHS BY TIME AND DAY OF THE WEEK:

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
00:00-00:59	15	17	10	11	14	15	19	101
01:00-01:59	9	17	12	20	7	9	17	91
02:00-02:59	10	5	9	11	11	12	8	66
03:00-03:59	5	7	4	9	6	4	11	46
04:00-04:59	8	9	8	2	8	6	11	52
05:00-05:59	5	9	7	5	9	8	11	54
06:00-06:59	13	8	7	3	4	10	7	52
07:00-07:59	6	5	3	8	0	9	8	39
08:00-08:59	11	9	10	8	5	1	5	49
09:00-09:59	5	7	9	8	2	7	6	44
10:00-10:59	5	4	6	2	12	9	7	45
11:00-11:59	4	7	2	8	5	9	7	42
12:00-12:59	7	6	6	6	5	7	7	44
13:00-13:59	8	9	4	10	2	7	6	46
14:00-14:59	11	8	3	9	12	8	5	56
15:00-15:59	9	8	7	5	5	6	11	51
16:00-16:59	9	9	10	8	10	7	1	54
17:00-17:59	5	3	8	4	7	7	7	41
18:00-18:59	8	8	6	10	8	5	5	50
19:00-19:59	14	9	7	12	5	9	9	65
20:00-20:59	11	8	12	9	9	11	15	75
21:00-21:59	13	16	15	22	13	14	10	103
22:00-22:59	21	14	9	16	18	22	13	113
23:00-23:59	13	10	17	12	20	19	22	113
Total	225	212	191	218	197	221	228	1492

Many road crash deaths happen from 21:00 to 1:59, most days of the week. This is a result of higher speeds at night or early in the morning. This is also the time when a lot of hit-and-run cases occur.

TYPE OF COLLISIONS IN FATAL ROAD CRASHES

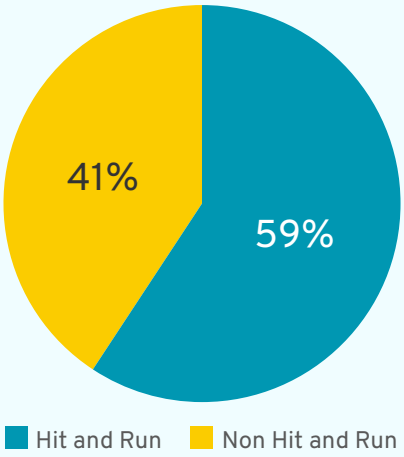
CRASH WISE COLLISION TYPE, 2022



The crash wise collision types are recorded as per their description in the FIR by the informant. Due to the high magnitude of pedestrian crashes, the 'hit pedestrian' crashes are more as compared to the other types of collision. In cases where the impacting vehicle is unknown, the collision type is unrecorded as well, which constitute 34% of all collisions.

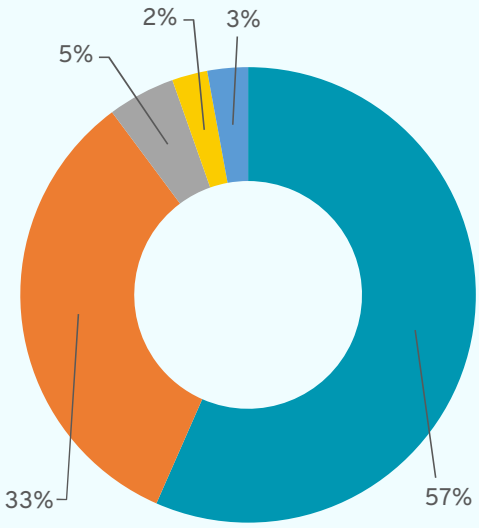
HIT-AND-RUN CASES IN ROAD CRASHES, 2022

HIT-AND-RUN CASES AND NON-HIT-AND-RUN CASES, 2022



Of all the documented fatal road crashes, 59% of them are hit-and-run cases in Delhi. Out of the 59% documented hit-and-run cases, pedestrians are the most affected at a staggering 57% followed by motorcycle riders at 33%.

HIT-AND-RUN ROAD CRASH DEATHS BY ROAD USER TYPES, 2022



57% Pedestrians

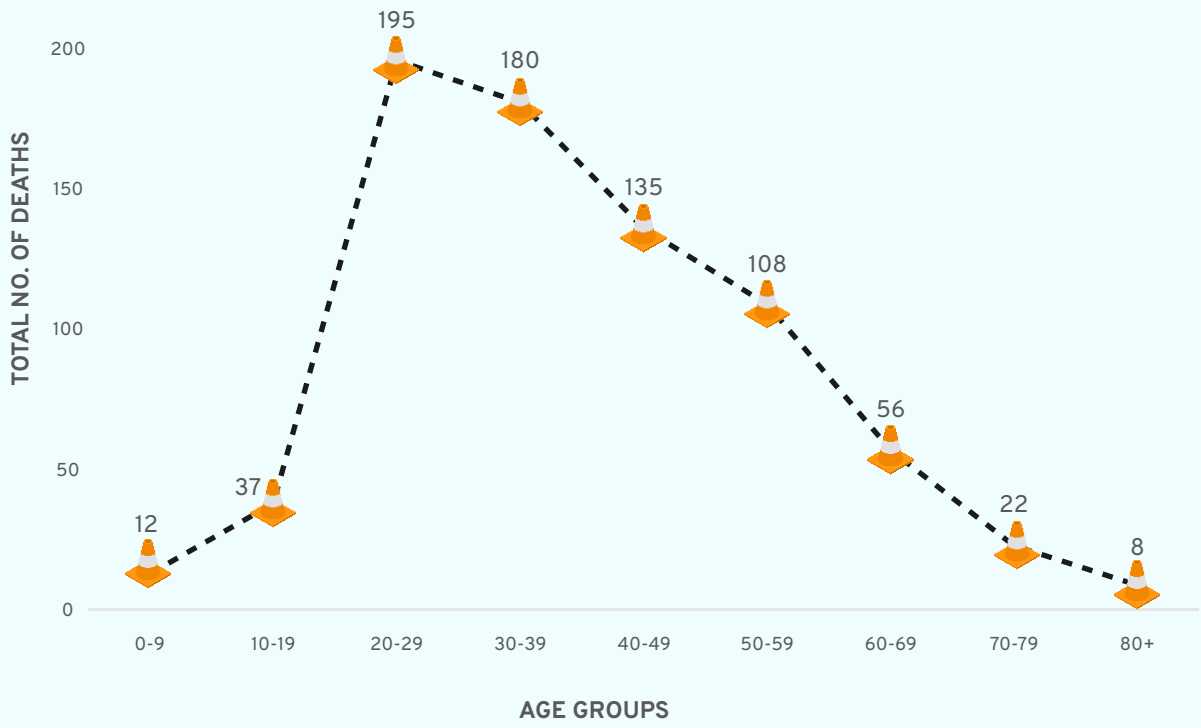
33% Motorcycle riders

5% Pillion riders

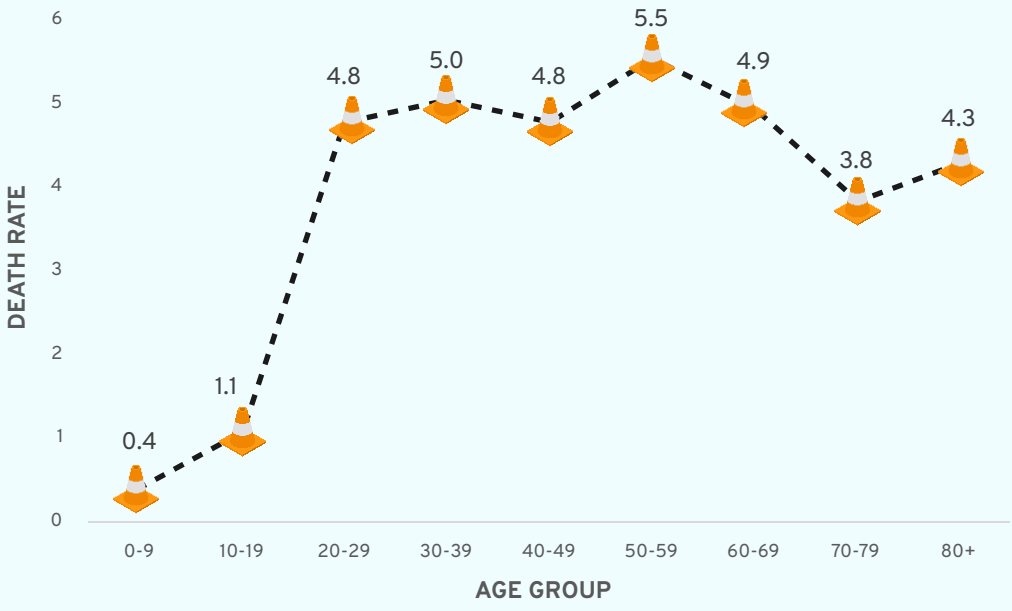
2% Cyclists

3% Autorickshaw passengers

HIT-AND-RUN DEATHS BY AGE 2022



HIT-AND-RUN DEATH RATE 2022



WHO HIT WHOM MATRIX

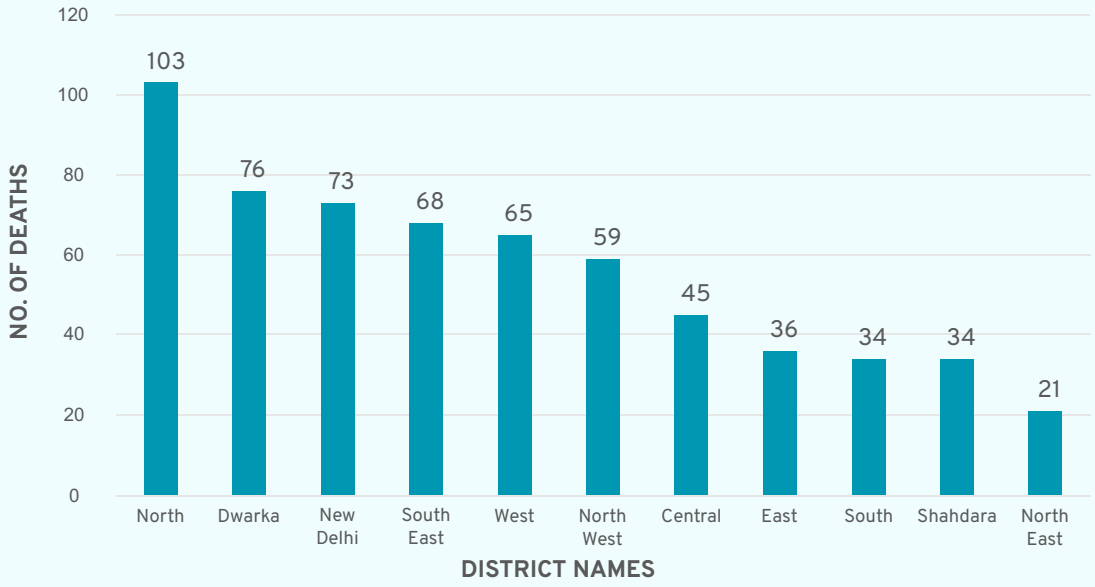
Road User Type	Impacting vehicle								
	Auto Rickshaw	Bus	Light Vehicle	Heavy Vehicle	3 wheeler and 4 wheeler total	Two wheeler	Single vehicle Crash	Unknown	Total
Pedestrian	13	32	86	96	227	60	0	359	646
Motorcyclist	5	44	89	130	268	16	32	261	577
Three wheeler occupants	2	6	15	7	30	2	3	19	54
Four wheeler occupants	0	7	3	13	23	3	13	9	48
Cyclist	0	2	10	11	23	6	0	15	44
Bus, Truck and Tractor	0	0	4	10	14	0	4	7	25
Total	20	91	207	267	585	87	52	670	

The who hit whom matrix (above) shows the type of vehicles impacting/responsible/ involved with the type of victim vehicles. The matrix also highlights that 55% of the impacting vehicles are unknown in case of pedestrian fatalities, and 35% of them are due to three-wheelers and four-wheelers. In the case of motorcyclists, 22% of the crashes are due to heavy vehicles and 45% of them are due to unknown vehicles.

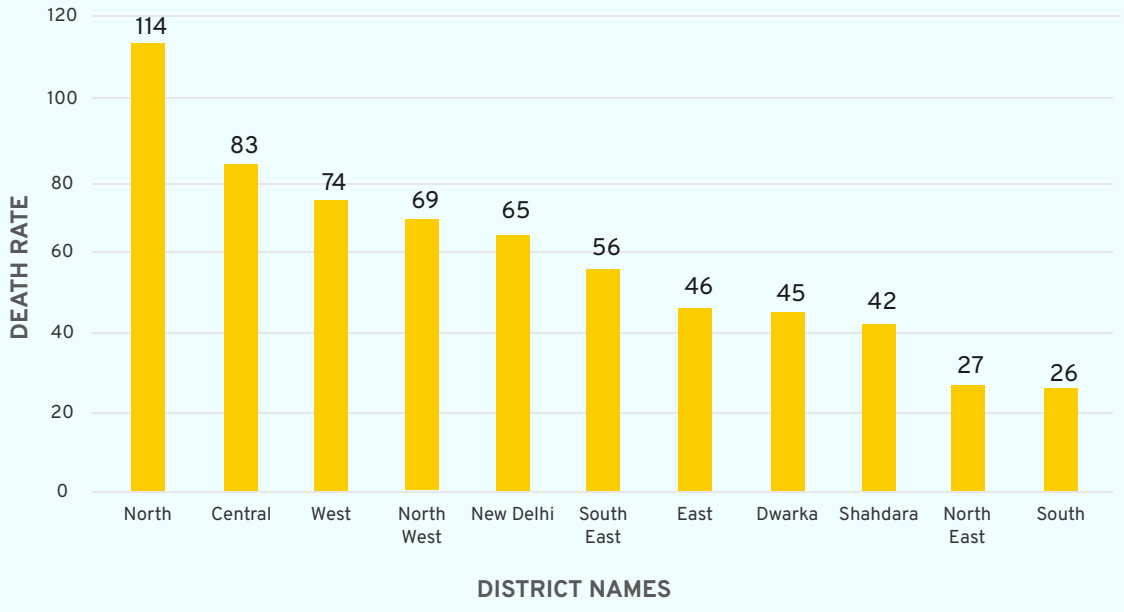
ROAD CRASH DEATHS BY DISTRICTS

DEATHS BY DISTRICTS			
Sr. No.	**District name**	**Fatal crashes**	**Hit and run crashes**
1	North	260	150
2	New Delhi	187	104
3	West	158	97
4	North West	150	82
5	South East	150	96
6	Central	143	84
7	Dwarka	132	75
8	East	104	64
9	Shahdara	92	63
10	South	65	36
11	North East	53	34

MOTORISED TWO WHEELER (RIDER + PILLION) DEATHS PER DISTRICT



PEDESTRIAN DEATHS PER DISTRICT



In the figures above, we can see out of the 11 districts, w.r.t pedestrian and motorcycle fatalities, North District is the most affected, followed by Dwarka in case of Motorcycle fatalities and Central and West districts.

HIGH RISK LOCATIONS AND CORRIDORS

HIGH RISK CORRIDOR WITH TWO OR MORE DEATHS PER KM, 2022

Sr. No.	Corridor name	Kilometers	Total crashes	Deaths pear km
1	Azadpur flyover to Punjabi Bagh Chowk	5.6	26	5
2	Grand Trunk Road: Kundli to Mukarba Chowk	14	49	4
3	Tikri Border to Punjabi Bagh Chowk Mukarba Chowk	17.6	58	3
4	Outer Ring Road: Mukarba Chowk to Shivaji Park	14.6	37	3
5	Mahatma Gandhi Marg:Dhaula Kuan Flyover to Rajouri Garden Metro	8	21	3
6	Ghazipur Road	5.5	19	3
7	Lala Lajpat Rai Path	6.8	14	2
8	NH8: Gurgaon Border to Dhaula Kuan flyover	12.38	23	2

HIGH RISK CORRIDORS WITH TWO OR MORE PEDESTRIAN DEATHS PER KM, 2022

Sr. No.	Corridor name	Kiloametres	Total crashes involving pedestrians	Pedestrian deaths per km
1	Punjabi Bagh junction to Netaji Subhash Place metro station interchange	2.6	13	5
2	Punjabi Bagh to Peeragarhi Chowk	4.5	16	4
3	Ghazipur Road	5.5	16	3
4	Mukarba Chowk to Budhpur	5.8	15	3
5	Khajoori Khas to Loni Roundabout	3.5	9	3
6	Deshbandhu Gupta Road	2.5	6	2
7	Tikri Border to Peeragarhi Chowk	16	33	2

HIGH RISK CORRIDORS WITH TWO OR MORE MOTORCYCLE DEATHS PER KM, 2022

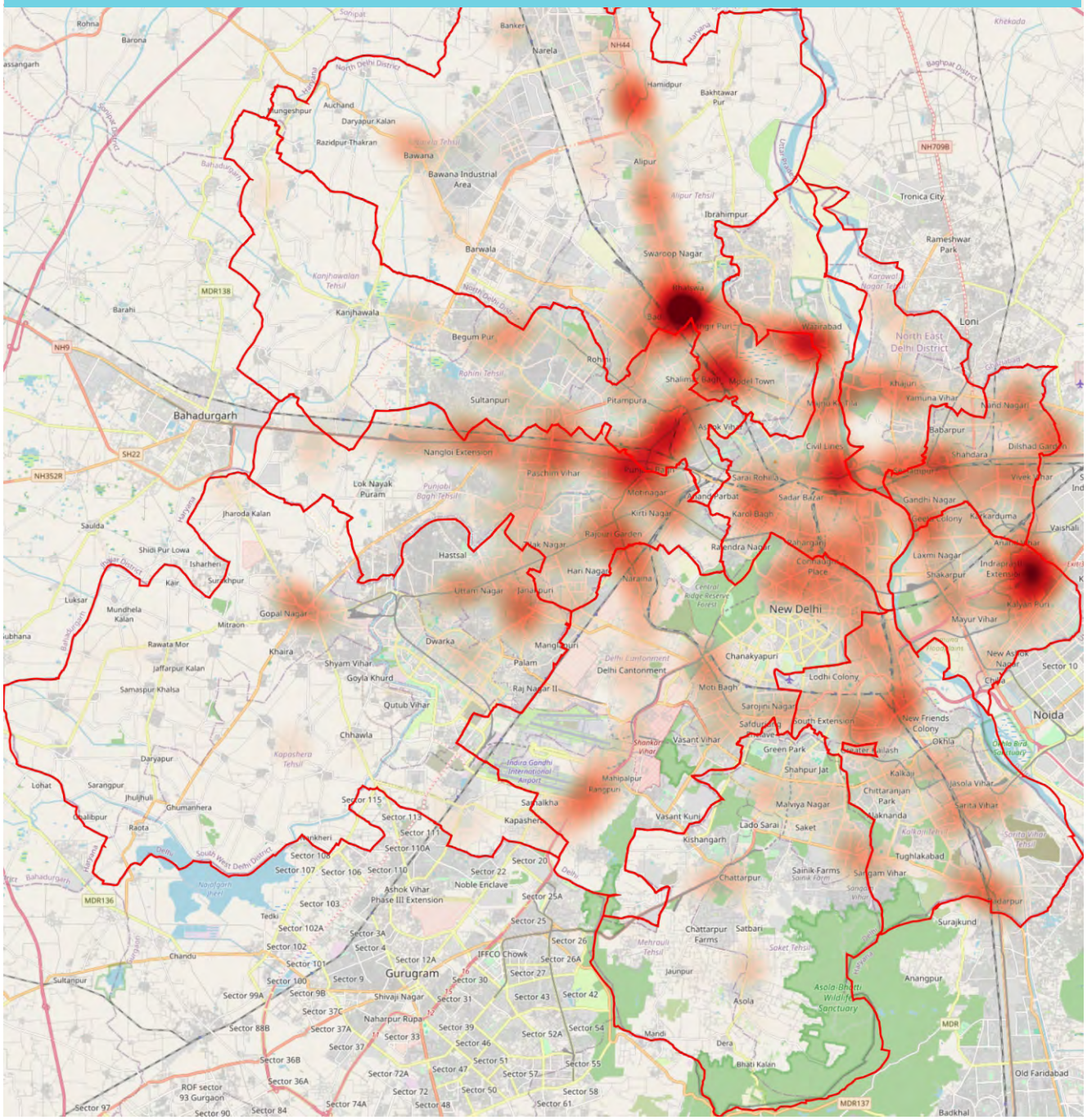
Sr. No.	Corridor name	Kiloametres	Total crashes involving pedestrians	Pedestrian deaths per km
1	Signature Bridge	1.4	13	9
2	Gokulpuri Metro Station to Wazirabad-Ghaziabad border	4.5	14	4
3	Mukarba Chowk to Signature bridge entry	8	30	4
4	Delhi Meerut Expressway NH24: Ghazipur stretch	2.4	9	4
5	Nh9: Mundka Industrial area to Peeragarhi Chowk	7.5	21	3
6	Ring road: Azadpur Chowk to Vishwakarma chowk	9.6	25	3
7	Outer ring road: Mukarba chowk to Shivaji Marg	14.5	24	2

HIGH RISK LOCATIONS (2019, 2021, 2022)

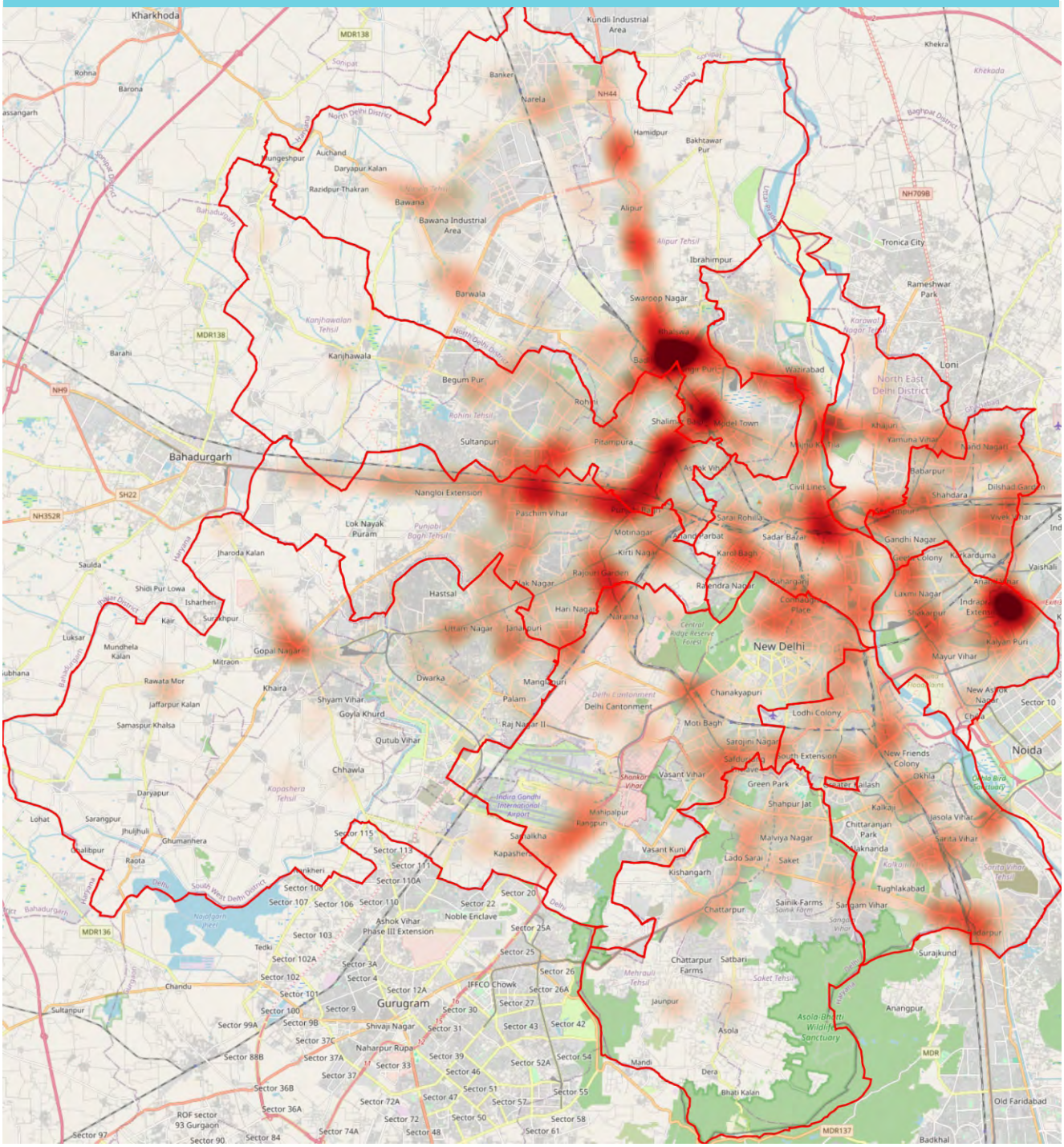
Sr. No.	Junction / Intersection Name	Total fatal crashes
1	Mukarba Chowk	22
2	Kashmere Gate Metro Station	19
3	Intersection at GT-Libaspur Road	19
4	Punjabi Bagh Intersection	17
5	Ring Road Hanuman Setu	17
6	Dhansa Bus Stand	15
7	Peeragarhi Chowk	14
8	Britannia Chowk	14
9	Intersection at Outer Ring Road- Wazirabad Road	14
10	Exit from Signature Bridge to Outer Ring Road	14
11	Madhuban Chowk	13
12	Mukundpur Chowk	13
13	Wazirpur Industrial Area	13
14	Azadpur Mandi	13
15	Ghazipur Mandi	13

CRASH HEAT MAPS

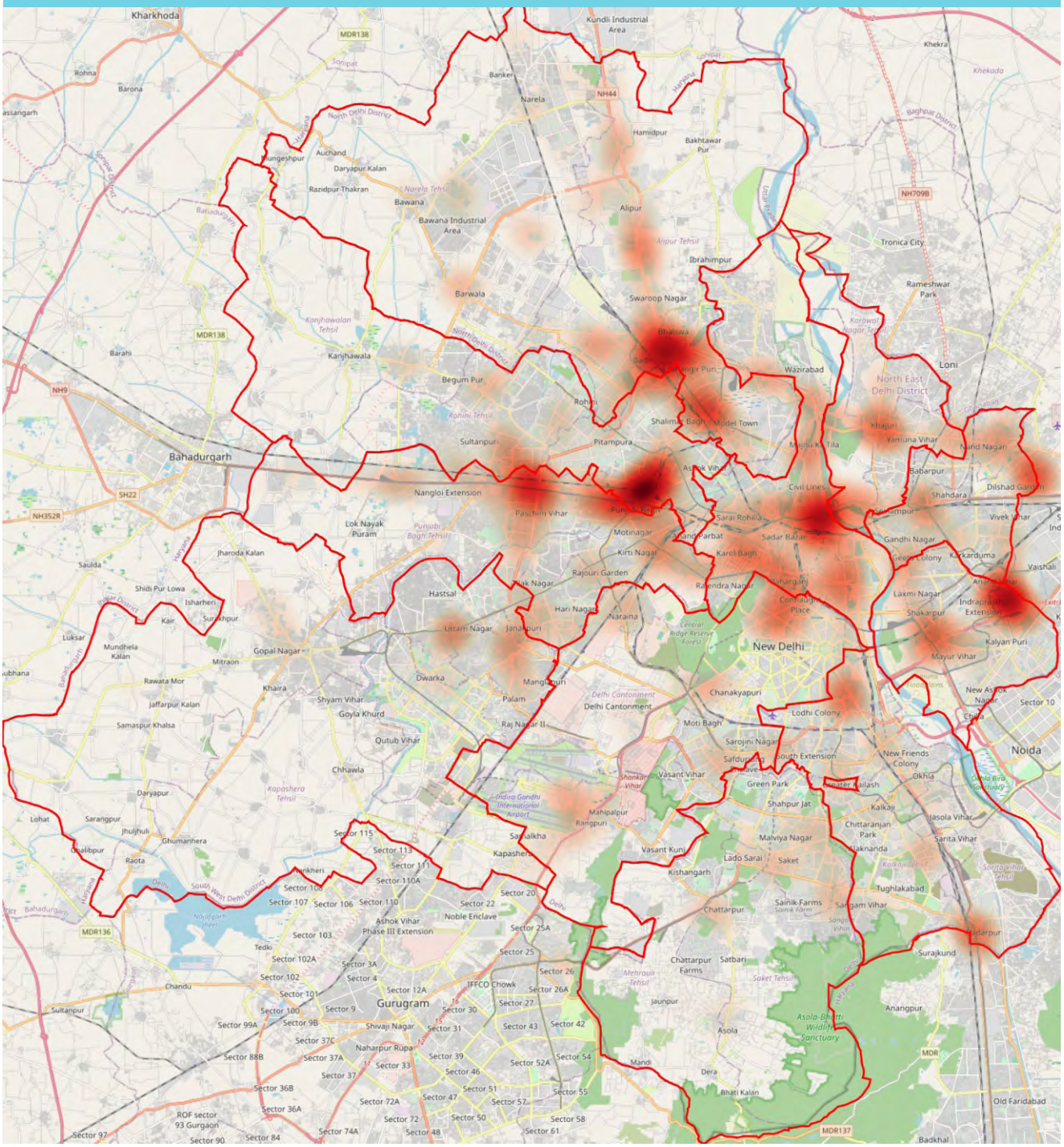
ALL FATAL ROAD CRASHES HEAT MAP 2022



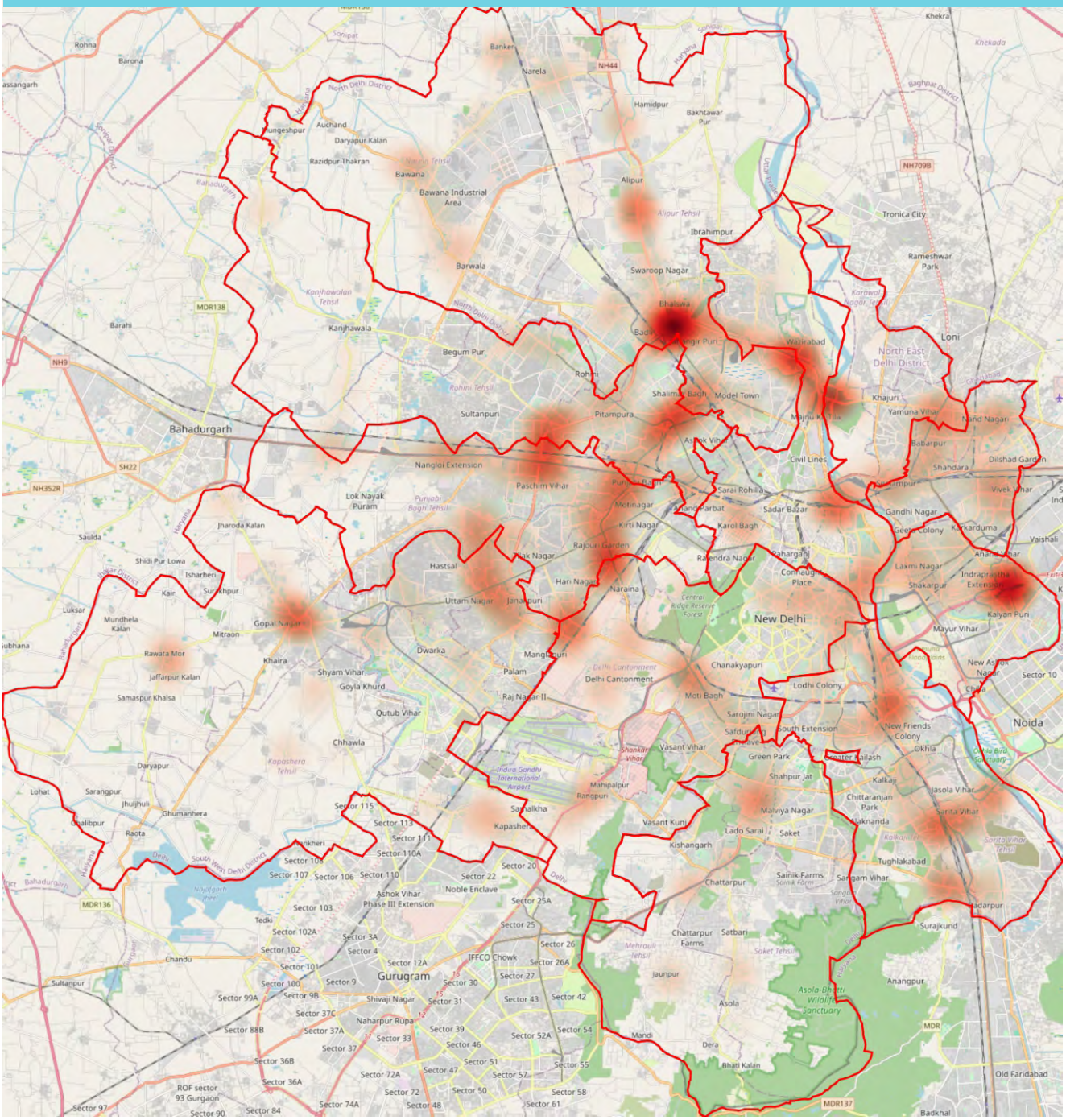
FATAL HIT-AND-RUN CRASHES HEAT MAP 2022



PEDESTRIANS INVOLVED IN FATAL ROAD CRASHES HEAT MAP 2022



MOTORCYCLES (RIDER AND PILLION) INVOLVED IN FATAL ROAD CRASHES HEAT MAP 2022



TRANSFORMING DATA INTO ACTION: JUNCTION REDESIGN WORK

GLOBAL DESIGNING CITIES INITIATIVE(GDCI): MANGOLPURI FLYOVER

Crash Data:

It is a 5-road intersection below the flyover and is partially signalised. In addition to large motorist and pedestrian movement, it has all types of other road users such as transit riders, service providers, and people doing business. The table below shows the crash data for 2018 and 2019, most of the victims were vulnerable road users such as pedestrians and motorcyclists with most crashes happening during night time.

Year	Simple crashes	Fatal crashes	Total crashes	Persons injured	Persons killed
2018	5	2	7	12	2
2019	5	6	11	9	6

Source: Road Accidents in Delhi 2019, Traffic Police

Site Description:

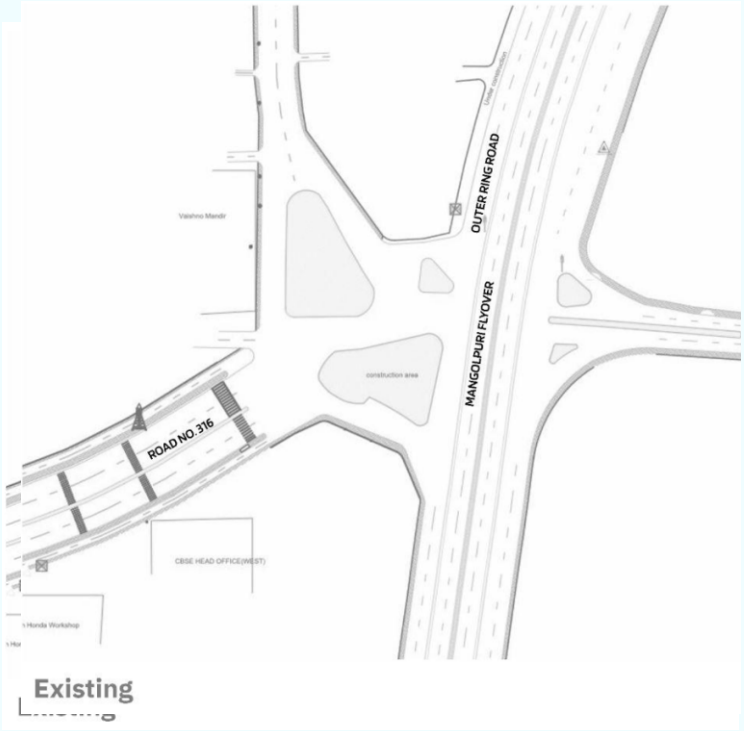
- Mangolpuri Flyover intersection is located in North West Delhi, on the Outer Ring Road which is a continuous high-speed road that encircles Delhi.
- The Outer Ring Road consists of multiple flyovers, footover bridges, pedestrian underpasses and very few traffic signals.
- The area has dense commercial and residential use resulting in high volumes of pedestrians and vulnerable road users.
- Vehicular traffic has been given top priority in the way the Outer Ring Road has been designed making it less safe for pedestrians and cyclists.
- Currently, the corridor also has Delhi Metro construction work underway.


A
B
C
D

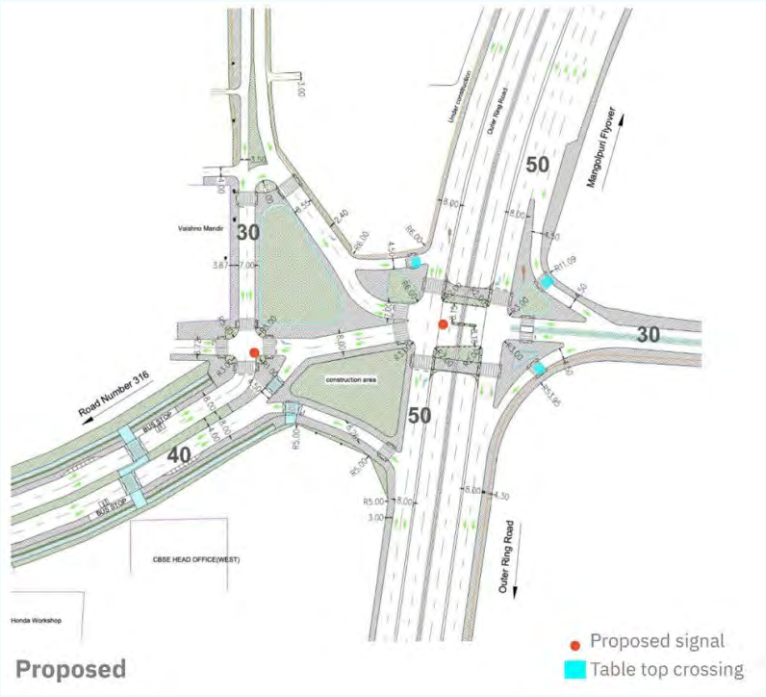

D
C
A
B

Existing and Proposed Design

Existing



Proposed



Suggested interventions:

- Breaking down the larger junction into separate intersections with corresponding traffic signals installed for smoother movement of all road users.
- At-Grade pedestrian crossings and table top crossings on slip lanes to reduce speeds and increase visibility.
- Continuous clear paths for walking with 2.40mts (desirable) clear paths, higher visibility for pedestrians.
- Introduction of safe and accessible refuge islands along all corridors to reduce speeds and provide pedestrians with a safe space.
- Redistribution of space under flyover with median and protected pedestrian crossings.
- Introduction of bulb outs to reduce crossing distances.
- Travel lane alignment, roads intersecting closer to 90 degrees, thereby increasing visibility and reducing conflicts.
- Tightening turning radii at all locations to reduce turning speeds.
- Dedicated and accessible parking spaces for vehicles, autos, two wheelers, buses.
- Work status: Implementation started, 20% complete.



Photographs from the site visit and the implementation

GLOBAL DESIGNING CITIES INITIATIVE(GDCI): POWER HOUSE PITAMPURA

Crash Data:

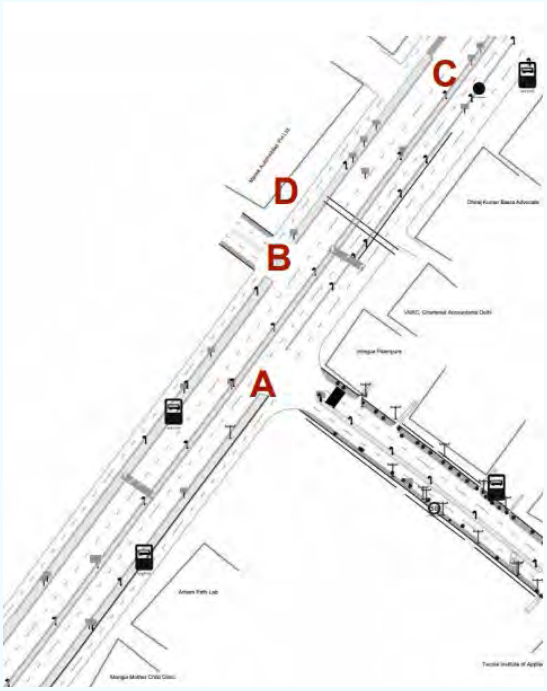
It is a high-speed, 6 lane corridor with a high volume of buses and heavy vehicles. In addition to large motorist and pedestrian movement, it has large amounts of commercial activity that sees service providers and people doing business. The table below shows the crash data for 2019, which highlights that most of the victims were vulnerable road users.

Year	Simple crashes	Fatal crashes	Total crashes	Persons injured	Persons killed
2019	8	5	13	10	5

About the site:

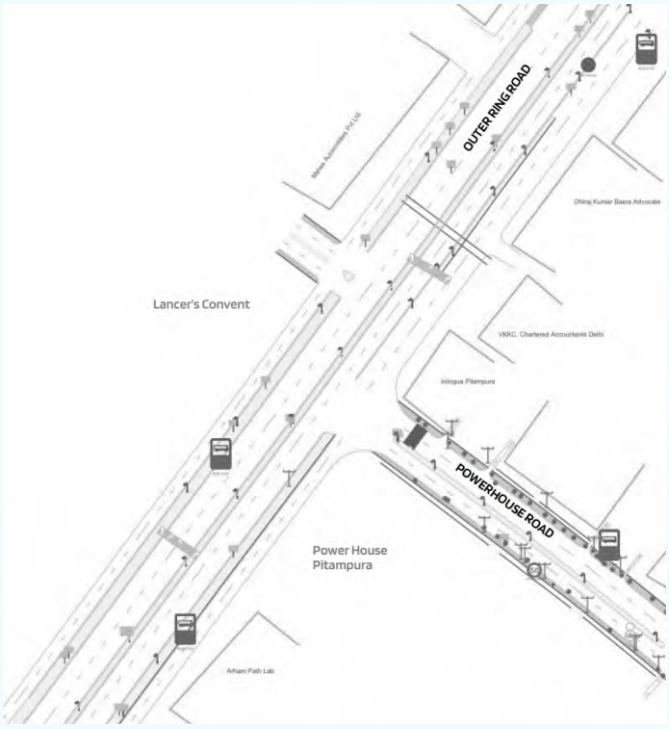
- Power House Pitampura is located in North West Delhi, on the Outer Ring Road which is a continuous high-speed road that encircles Delhi.
- The area has dense commercial and residential use, so high volumes of pedestrians and vulnerable road users.
- Vehicular traffic has been given top priority in the way the Outer Ring Road has been designed making it less safe for pedestrians and cyclists.
- Currently, the corridor also has Delhi Metro construction work underway.


A
B
C
D

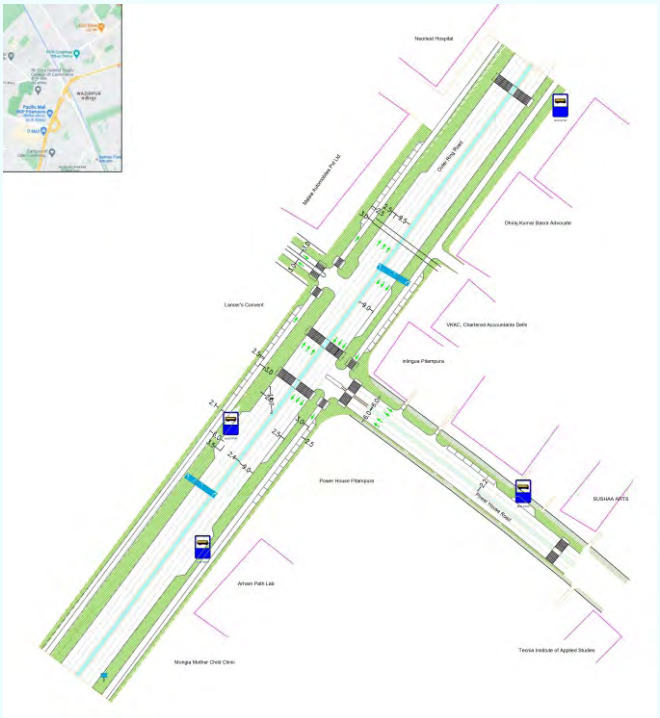

C
D
B
A

Existing and Proposed Design

Existing



Proposed



Suggested interventions:

- At grade pedestrian crossings at maximum 200 mts intervals with table top facilities
- Continuous clear path for walking with minimum width of 1.80 - 2.40 mts
- Introduction of safe and accessible refuge islands along all corridors to reduce speeds and provide pedestrians with a safe space
- Tightening turning radii at all locations to reduce turning speeds and Introduction of bulb outs to reduce crossing distances
- Dedicated and accessible parking spaces for vehicles, autos, two wheelers, buses
- Work status- implementation yet to start, all necessary approvals obtained and project tendered

WORLD RESOURCES INSTITUTE(WRI): DELHI GATE JUNCTION

Crash Data:

Black Spot	Simple crashes	Fatal crashes	Total crashes	Persons injured	Persons killed
Delhi Gate Intersection	11	7	19	14	8

Source: Delhi Road Crash Report 2017, Traffic Police

Report link: https://drive.google.com/file/d/1Hhsfp9zAgm1zCuzVL6wF-PR4CNpximUI/view?usp=sharing

Photo before trial

Photo during trial

Aerial shot

Photos after execution

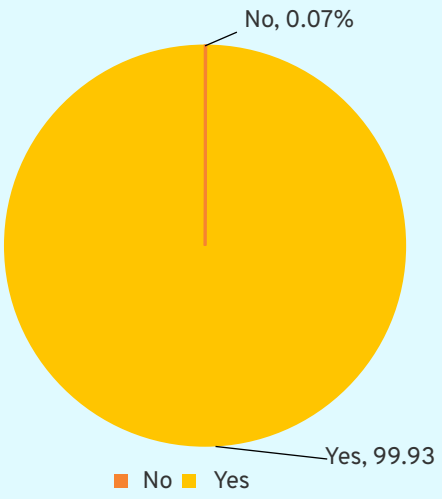
Suggested design:

- To enhance safety at the high-risk Delhi Gate Junction in Delhi, WRI India collaborated with the Delhi Transport Department, Public Works Department, and the Traffic Police Department through the Bloomberg Philanthropies Initiative for Global Road Safety. Situated in Shahjahanabad, the Delhi Gate Junction serves as a crucial link connecting various landmarks. Due to its expansive unmanaged crossing and traffic area, coupled with a lack of pedestrian facilities, it stood out as a notable risk for road safety. Over the period from 2017 to 2020, the junction witnessed 49 crashes, resulting in 18 fatalities.

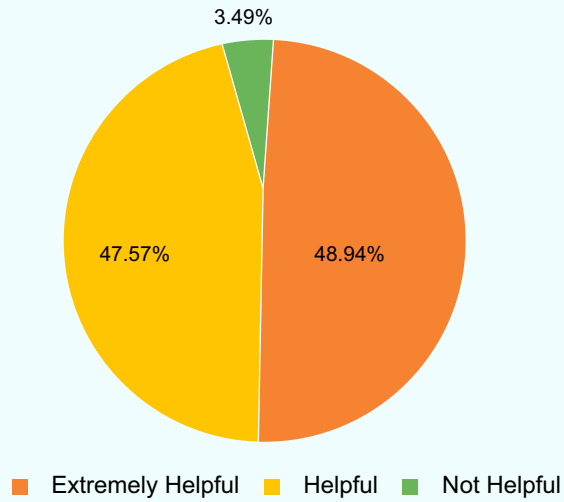
- On April 2nd, the Traffic Police and WRI team collaborated to execute the trial for testing the design on ground. The strategic aim was to offer the government an opportunity to test the project before making a substantial investment.

- The trial demonstrated promising outcomes, with an average reduction of about 70% in conflict areas, a 33%-35% decrease in pedestrian & Vehicular crossing distances. Additionally, the initiative successfully reclaimed 2500 square metres of refuge islands & median which was later transformed into public space. Notably, despite these changes, there was no reduction in the number of traffic lanes.

- Following are the results of the perception survey conducted by WRI India during the trial.

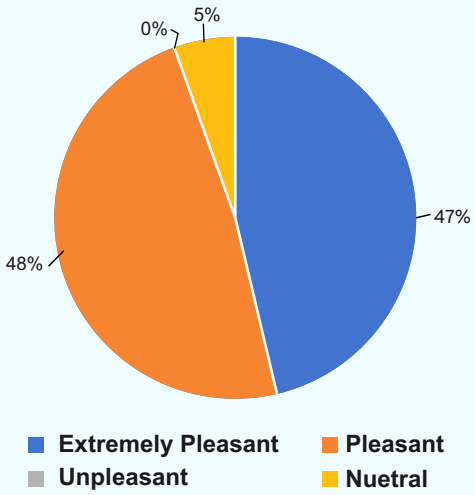


99.93% of pedestrians feel safe at the junction after the trial.



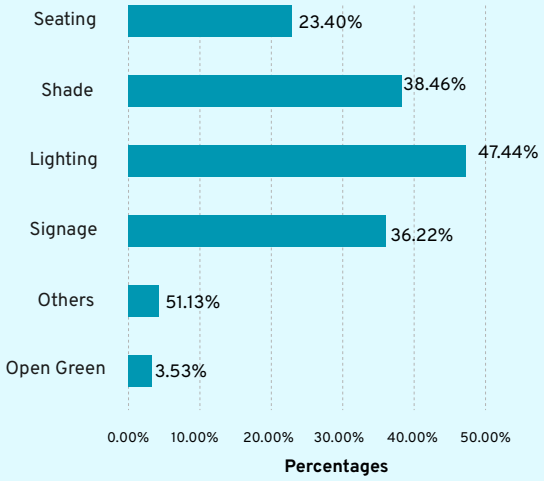
96.51% of pedestrians feel refuge areas are helpful for crossing

Junction Experience Of People Who Have Visited the Junction Before trial



95.03% of people among pedestrians who used the junction before the trial felt pleasant at the Junction after the trial.

Desired Improvements



Desired improvements: Street lighting and shade from the sun were two other important factors demanded by the users. (Which has been incorporated in the main design)

- Based on the trial following recommendations for permanent implementation were suggested to the executing agencies (For the details Please refer to the report link)
    - Focus on Resolving Geometry.
    - Provide adequate pedestrian infrastructure.
    - Utilise Residual spaces.
    - Necessary safety measures.

- Based on the recommendation PWD has completed the permanent implementation by, May 2023 under multimodal integration project.

Status of work

Stages	
Site visit & Data Collection	Completed
Conceptual Recommendations submission	Completed
Stakeholder engagement & Discussion	Completed
Tactical Urbanism Trial	Completed
Perception Survey	Completed
Permanent design implémentation on Site	Completed

WORLD RESOURCES INSTITUTE(WRI): MADHUBAN CHOWK

Crash Data:

Black Spot	Simple Crashes		Fatal Crashes		Total Crashes		Persons Injured		Persons Killed	
	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Madhuban Chowk	8	4	5	1	13	5	9	6	5	1

Source: Delhi Road Crash Report 2021, Traffic Police

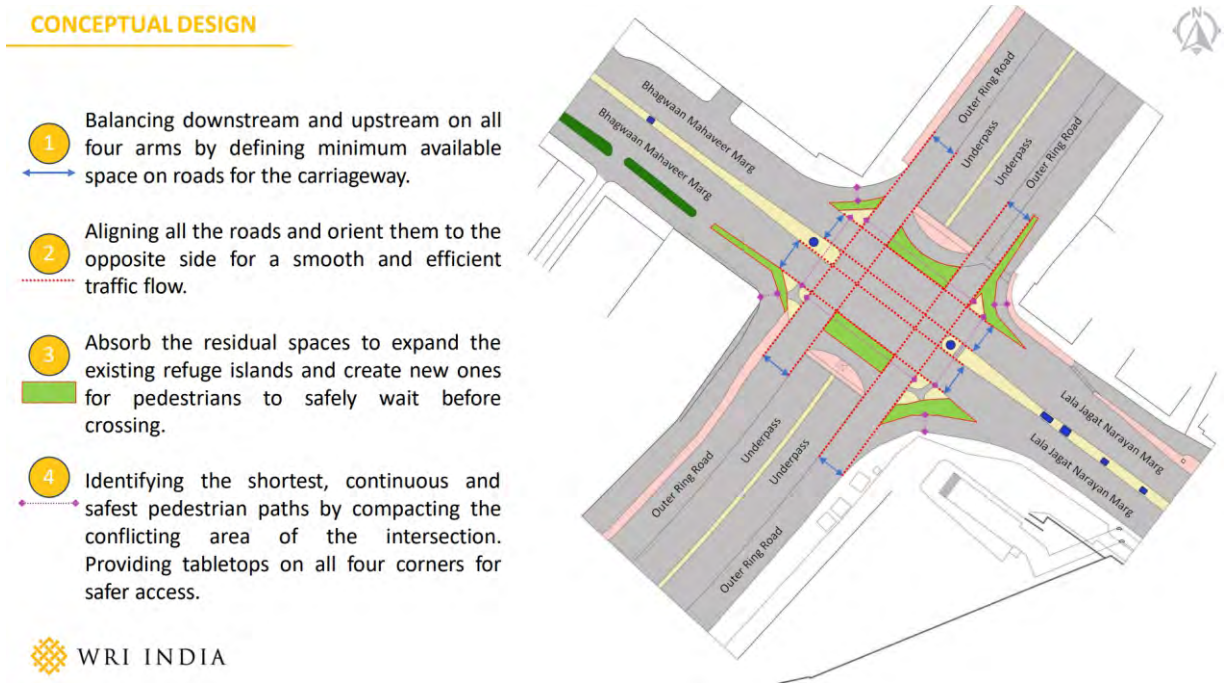
Report Link: https://drive.google.com/file/d/1mIhhgIzjwRJsRb4Bb1uSZf3r7TID_aK-/view?usp=sharing

Before & After intervention adding refuge areas to the median island & secured pedestrian continuity at metro station exit gate no -2.

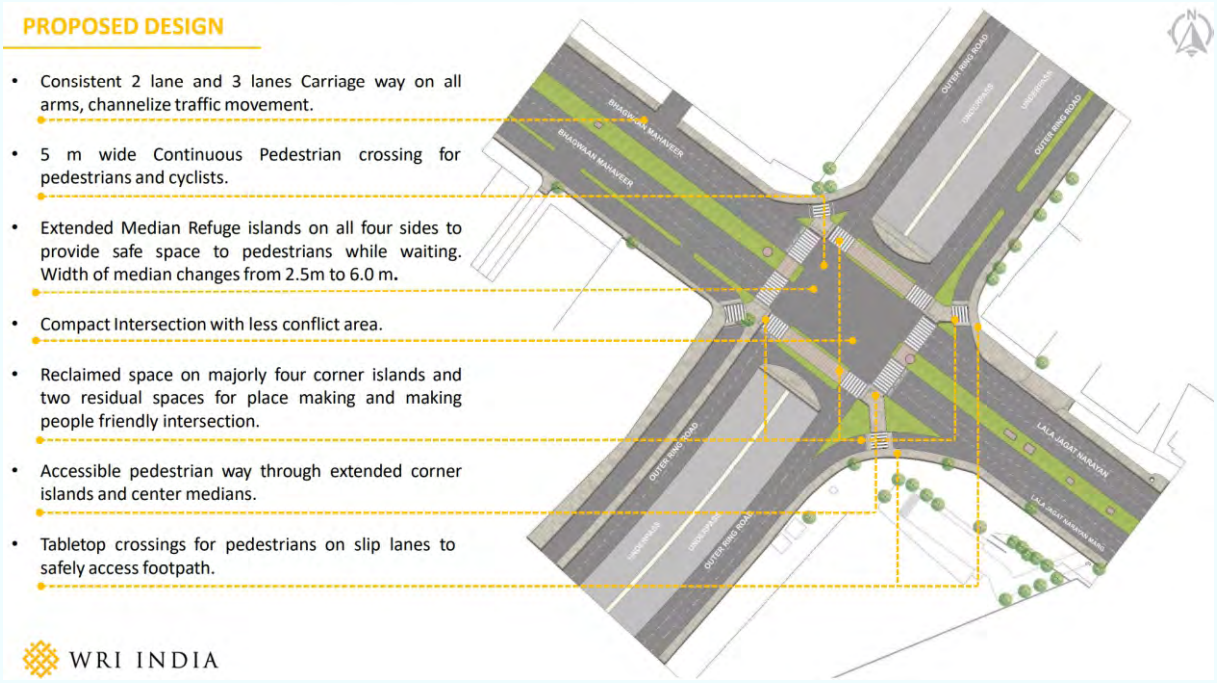
Before & after safe pedestrian crossing adding buffer to pedestrian-vehicular conflict.

Suggested Designs: (For the details Please refer to the report link)

- Intersection space needs to be compacted by balancing downstream and upstream on all four arms and aligning all the roads for a smooth and efficient traffic flow, well integrated with the U-turns present on the Ring Road.
- There is a need to create permanent corner refuge islands and central medians as demonstrated during the temporary installation to create safe and secure waiting spaces for crossing the intersection.
- Permanent pedestrian crossing & road markings need to be aligned with the post geometrical correction to provide a shortest, continuous pedestrian infrastructure.
- Additionally to support the execution of the proposed design traffic signals should be placed at appropriate locations as per the suggested geometrical correction, to improve the efficiency of the traffic movement.
- To make it inclusive and safer for all road users some key elements such as lighting, Signages, table tops at the slip lanes, rumble strips, and horticulture need to be incorporated at the time of implementation.



Conceptual proposal submitted to transport department based on Data & Site studies (Part A)



Conceptual proposal submitted to transport department based on Data & Site studies (Part B)

Trial:

The trial was conducted on the night of 22 November (On-going). Transport department, Traffic Police, PWD and the WRI team together executed the trial with approximately 500 cones provided by PWD and enforced by Traffic police.

Immediate Outcome:

A perception survey of approximately 500 commuters was also conducted by WRI India, where it has been found that **95% users felt marked pedestrian crossing helpful & 96% users felt the refuge island/ waiting space are helpful. Overall, 95% of users felt that intervention has improved safety for pedestrians while crossing the intersection. Status of Work:**

Stages	
Site visit & Data Collection	Completed
Conceptual design submission	Completed
Stakeholder engagement & Discussion	Completed
Design Demonstration/ Tactical Urbanism Trail	Completed
Permanent implementation	Pending

WORLD RESOURCES INSTITUTE(WRI): KASHMERE GATE ISBT

Crash Data:

Black Spot	Fatal Crashes		Injury Crashes		Non- Injury Crashes	Total Crashes		
	2020	2021	2020	2021	2020	2021	2020	2021
Boulevard Road	2	2	7	14	0	0	9	16

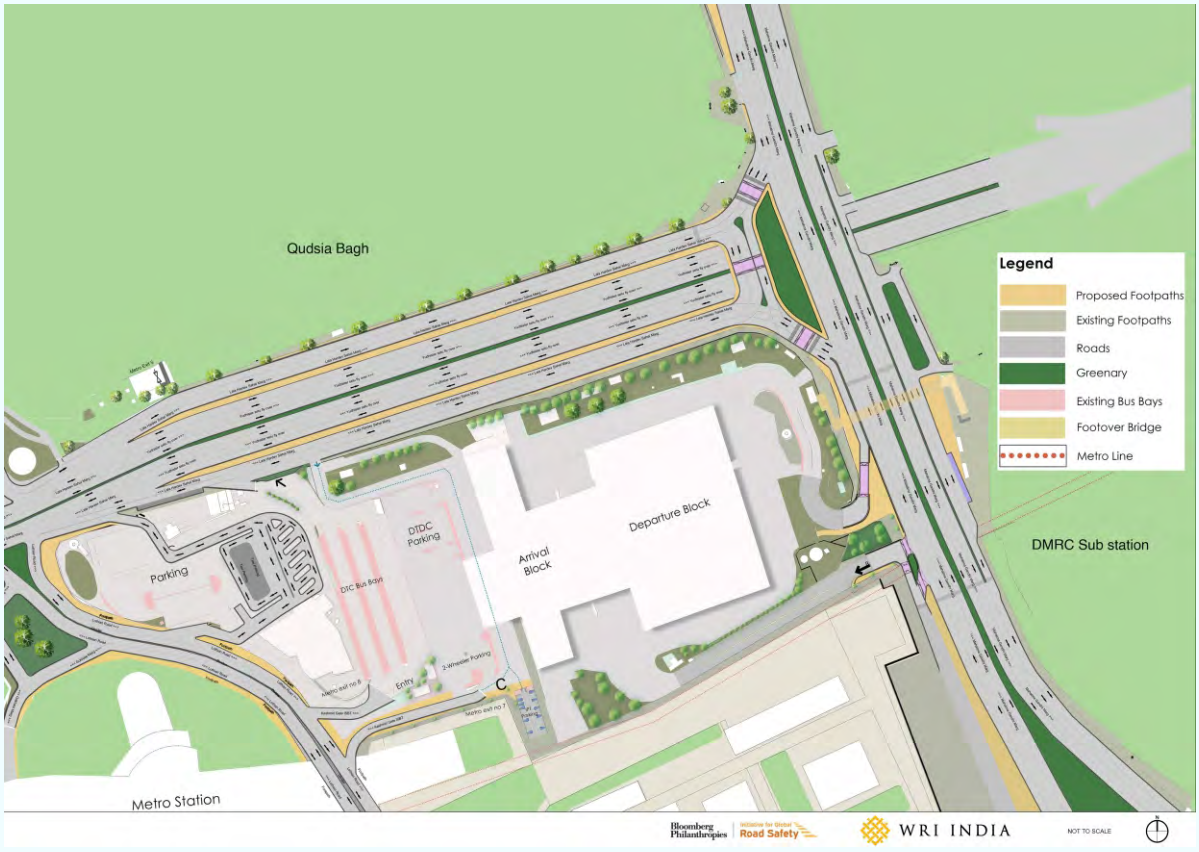
Source: Delhi Road Crash Report 2021, Traffic Police

Year	Simple crashes	Fatal crashes	Total crashes	Persons injured	Persons killed
2018	14	10	24	22	10
2018	10	5	15	13	5

Report Link: https://drive.google.com/file/d/1GTGHq0AKTK5R-ODNYef6FwJJW2-tkUor/view?usp=sharing

Suggested recommendation: As an area level circulation & accessibility WRI has shared the following measures:

- Circulation strategy & Geometrical corrections.
- Signage & Internal improvement measures.



Recommendations:

- Suggested circulation for bus exit from the terminal & improving the bus merging in the moving traffic.
- Additional continuous footpath from Flyover to the slip lane towards Tis-Hazari along the boundary wall of the ISBT complex as a safe & comfortable pedestrian infrastructure along with the adequate number of Table-tops at the entry exits of the complex maintaining safer speeds & conflict reduction.
- Rectifying the geometry of the slip lane going towards Tis-Hazari Road for achieving safer speeds while turning with an additional raised crossing tabletop for pedestrian movement.
- Suggested a buffer either by railing or hedges along the footpath, segregating the pedestrian movement from the high-speed traffic on the ring road, which will drastically reduce the spillover activities further reducing the conflicts.
- Cautionary & informatory signages have been also provided with the circulation plan.

Suggested recommendation to integrate the metro & ISBT plaza with safe pedestrian crossing & refuge island. To further reduce the conflict along the Lothian Road, addition of refuge island segregated entry of buses from the exiting vehicles. Hence benefiting the over all safety & comfort for all road users.

A brief suggestion has been shared with DTIDC which is to be carried forward.

Status of work

Stages	
Site visit & Data Collection	Completed
Conceptual design submission	Completed
Stakeholder engagement & Discussion	In process
Internal improvement measures	Internal legibility improvement has been done but overall legibility of the precinct is dependent on ground implementation.
Permanent implementation	Pending

WORLD RESOURCES INSTITUTE(WRI): 5TH PUSHTA USMANPUR

Crash Data:

Black Spot	Simple Accidents		Fatal Accident		Total Accidents		Persons Injured			Persons Killed
	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
5th Pushta Usmanpur	11	10	7	6	18	16	12	11	7	6

Source: Delhi Road Crash Report 2019, Traffic Police

Report Link: https://drive.google.com/file/d/1-bzWcGeR5GaT5FUaq4myjmtZ4f9O2zTC/view?usp=sharing

Suggested design recommendations:

- Compacting the Intersection by aligning 3 3-lane carriage ways on the Yamuna Marginal Bandh Marg and 2 lanes Carriage way on 5th Pushtha Road to streamline the traffic movement & reducing conflicts.
- Extended central median refuge islands on three sides to provide safe waiting area for pedestrian while crossing. A continuous 3m wide pedestrian crossing passing through these three central medians will create shortest & safe pedestrian infrastructure at the intersection.
- Create two bulbouts segregating Yamuna Marginal Bandh Marg & service lane along Gamdi Village. This will help in forming a 90 degree angled three armed intersection rather than an acute angle merging of 5th pushta road into Yamuna marginal bandh marg. The bulbout will also provide waiting space for pedestrians while crossing the road.
- To make it inclusive and safer for all road users some key elements such as lighting, Signages, table tops at the slip lanes, rumble strips and horticulture needs to be incorporated at the time of implementation.

CONCEPTUAL DESIGN

1. Balancing downstream and upstream on all four arms by defining minimum available space on roads for the carriageway.
2. Aligning all the roads and orient them to the opposite side for a smooth and efficient traffic flow.
3. Absorb the residual spaces to expand the existing refuge islands and create new ones for pedestrians to safely wait before crossing.
4. Identifying the shortest, continuous and safest pedestrian paths by compacting the conflicting area of the intersection. Providing tabletops on all four corners for safer access.
5. No waiting or stopping area

PROPOSED DESIGN

- Consistent 3 lanes carriage way on the Yamuna Marginal Bandh Marg and 2 lanes Carriage way on 5th Pushtha Road. Hence channelizing traffic movement.
- 3 m wide Continuous Pedestrian crossingfor pedestrians.
- Compacting Intersection with less conflict area.
- Extended Median Refuge islands on three sides to provide safe space to pedestrians while waiting
- Reclaimed space on majorly four corner islands and two residual spaces for place making and making people friendly intersection.
- Accessible pedestrian way through extended corner islands and center medians.

Conceptual plan Shared with Transport department, Traffic police & NHAI

Status of work

Stages	
Site visit & Data Collection	Completed
Conceptual Recommendations submission	Completed
Stakeholder engagement & Discussion	On Going
Incorporation of the design proposal in the overall development plan proposed for expressway.	On Going
Permanent implementation	Pending

WORLD RESOURCES INSTITUTE(WRI): MUKARBA CHOWK

Crash Data:

Crash Spot	No of Deaths from 2019 to 2021
Mukarba Chowk	19

Source: Data to action report issued by Transport department

Year	Simple Crashes	Fatal Crashes	Total Crashes	Persons Injured	Persons Killed
2020	6	8	14	7	8
2021	11	7	18	15	7
2022	10	12	23	14	12
Total	**59**	**48**	**108**	**81**	**48**

Source: Delhi Road Crash Report 2018,2020,2021,2022. Issued by Delhi traffic police.

Report Link: https://drive.google.com/file/d/1SAVvdrMLfAmHGZ-D-bing_jAKP5XiO_V/view?usp=sharing

Suggested recommendations:

- The infrastructure has been designed in purview to accommodate vehicular demands, without incorporating human-scale components. Hence it is suggested to develop a comprehensive public space beneath this intersection at ground level, which is vibrant with multiple activities, supported by adequate lighting & directional signage.

The infrastructure has been designed in purview to accommodate vehicular demands, without incorporating human-scale components. Hence it is suggested to develop a comprehensive public space beneath this intersection at ground level, which is vibrant with multiple activities, supported by adequate lighting & directional signage.

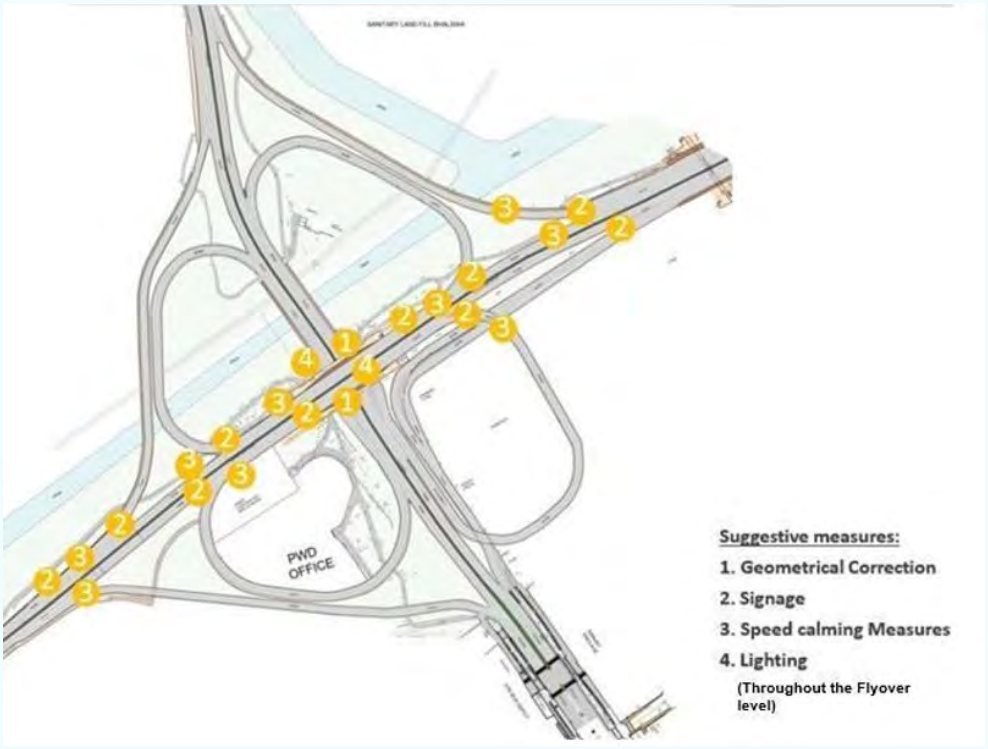
A comprehensive public space design needs to be developed for approx. 92,000 Sq.m at the ground level completely segregated from the current vehicular infrastructure.

In addition to public space intervention, there is a need to improve vehicle infrastructure for the safety of all road users.

Improvement of the existing infrastructure on three levels at the centre of the intersection is crucial as it is a public transport interchange hub, due to the presence of bus stops & IPT systems for last-mile connectivity at multiple levels. Pedestrians commuting to reach their destinations frequently board and alight from buses and IPT at these levels, raising multiple conflicts with vehicular movements.

To address these pressing issues the road crashes at Mukarba Chowk should be investigated on the spot for better understanding of causes and remedial measures. Meanwhile at the existing infrastructure, WRI India has suggested six key measures, i.e Geometrical correction, Signage, Speed calming measures, Lighting, CCTV surveillance & road marking to improve the safety & security of the intersection at three levels as marked on the conceptual drawings submitted to PWD & Transport department.

The above mentioned recommendations have been identified on the conceptual plans below for all the three levels.



Suggested measures at flyover level

Suggested measures at ground level

Suggested measures at subway level

Status of work

Stages	
Site visit & Data Collection	Completed
Recommendations suggested	Completed
Stakeholder engagement & Discussion	In process
Develop comprehensive public space plan with consultant.	Pending
Suggested interventions at intersection such as speed calming, lighting, maintenance, Signage etc	Pending
Public space design implementation	Pending

SAVE LIFE FOUNDATION : BURARI CHOWK

Crash Data:

The Delhi Traffic Police Crash report recorded a total of 39 incidents over the span of five years (2017 to 2021), with 18 of them classified as fatal crashes.



Connected pedestrian pathway along with zebra crossing; Illusion Tabletop Crossing connecting Footpath

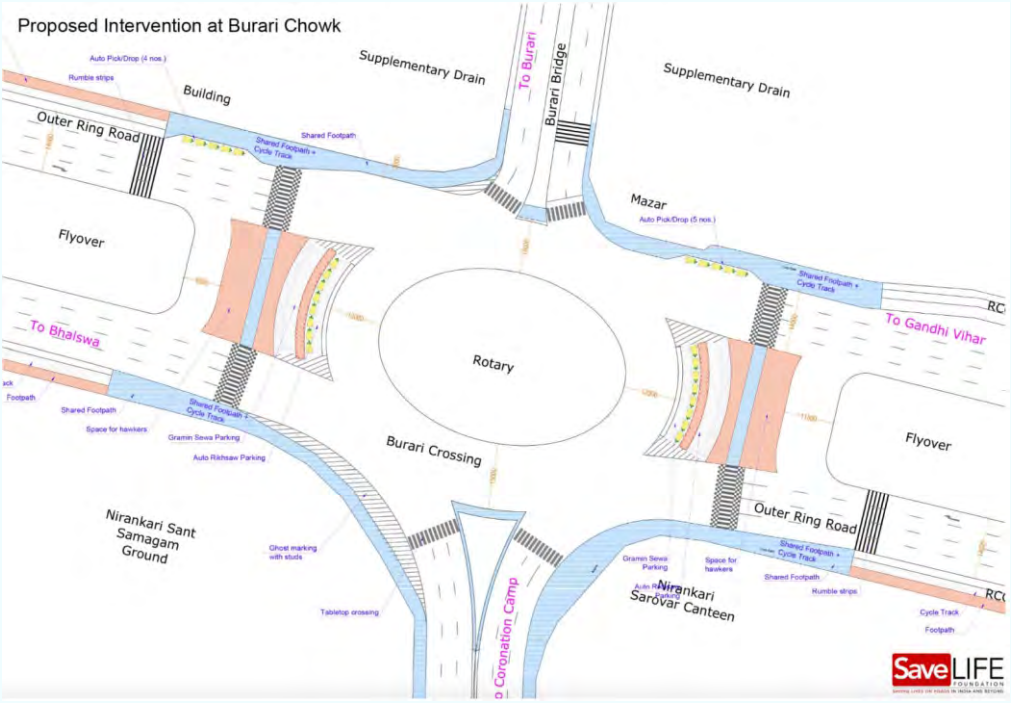

IPT Stand Under Flyover; Footpath Extension around Traffic island


Construction of Footpath along the main carriageway; Median Extension

Established a secure pedestrian zone beneath the flyover, along with the installation of a designated zebra crossing, that significantly enhanced safety for pedestrians.

Proposed Intervention:

Developed a structured vending and parking zone beneath the flyover that has effectively mitigated illegal parking on the main carriageway while providing an organised space for vendors and hawkers.



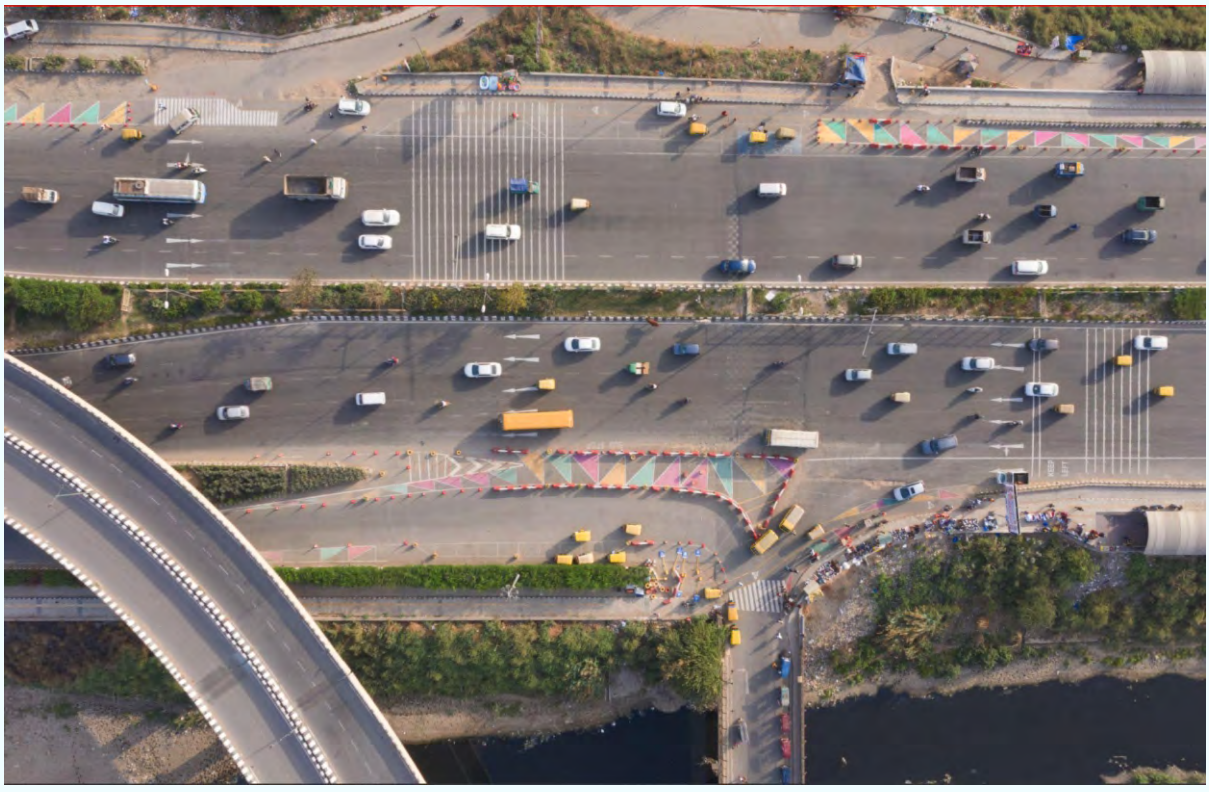
Status of Burari Chowk:

- Demolition and construction for provision of auto bays, seating and vending space under the flyover.
- Widening of the footpath from Burari village towards ISBT.
- Provision of illusional table top, installation of bollards, cycle tracks, pedestrians crossings and signages is completed.
- Rectification of ramps is in process.
- Installation of road studs and demarcation of bus boxes are pending.
- Ramps in process, opening for pedestrian access from the rotary, pruning of bushes. (still pending)

SAVE LIFE FOUNDATION(SLF): GANDHI VIHAR

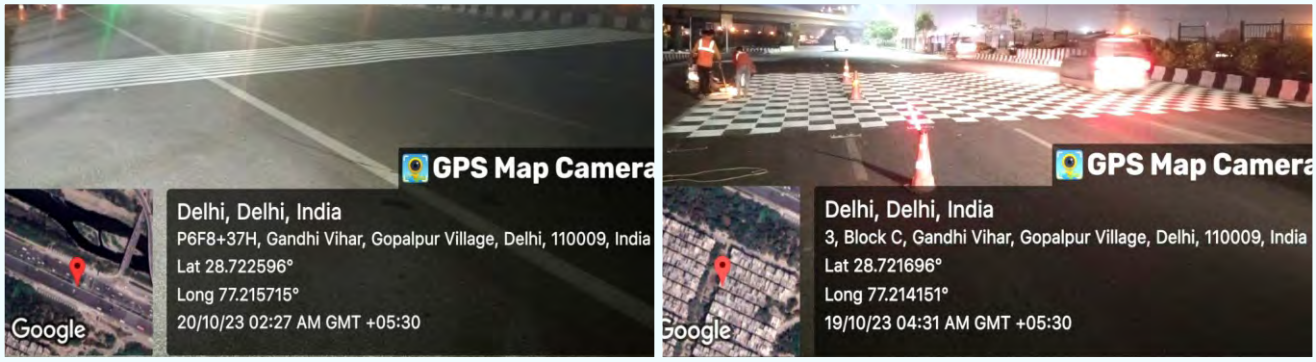
Crash Data:

The Delhi Traffic Police Crash report recorded a total of 46 incidents over the span of five years (2017 to 2022), with 16 of them classified as fatal crashes. There were no fatal crashes in 2021.



Installation of hazard marker and formation of island

Installation of informatory signages



Traffic Calming Measure: Rumble strips; Road Marking:Chequered Box

Proposed Design:

Status of Gandhi Vihar:

- Ramps are constructed to increase accessibility.
- Traffic island demarcation at tri-junction.
- Marking of auto bays.
- Signage installation has been completed.
- Stairs and ramps near the subway are pending.
- Demarcation of Bus box, demarcation of Auto stand (towards Burari), Installation of bollards, repair and closure of PGR, lane marking, thermoplastic marking and installation of road studs are pending.

SAVE LIFE FOUNDATION: SIGNATURE BRIDGE

Crash Data:

In the last 4 years (2018 to 2021), the selected section of Signature Bridge - Timarpur, designated Black Spots have recorded 10 fatalities and 33 minor injuries in a total of 24 road crashes. Year 2019 has recorded the highest number of fatalities, followed by the year 2018. No road crash fatalities were recorded in the year 2020.

Year	Total Crashes	Fatal Crashes	Minor Crashes	Fatalities	Minor Injuries
2018	4	2	2	3	2
2019	16	7	9	7	21
2020	4	0	4	0	8
Total	**24**	**9**	**15**	**10**	**31**

Source: Save Life Foundation

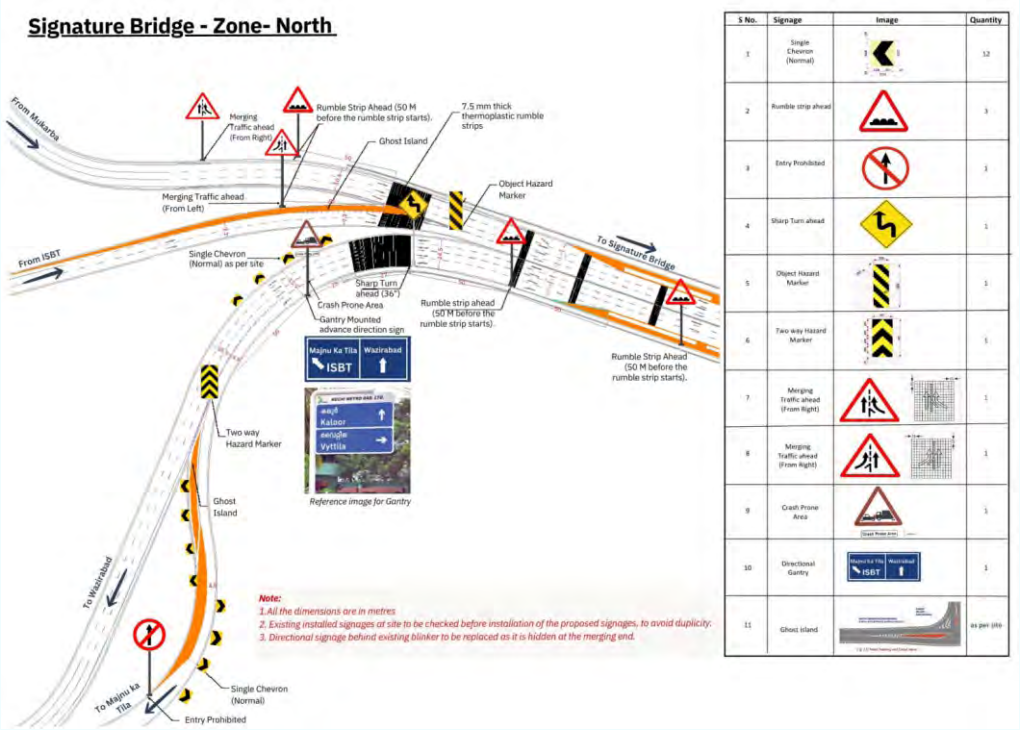
As per DTP Report(2018-2021) , 53 total crashes and 17 fatalities.



Addition of thermoplastic layers for required thickness of TBMs.; Diversion extended with the help of spring posts towards Majnu ka tila.; Cautionary and informative Signages have been installed.


Cautionary and informative Signages have been installed. Kerb/median has been freshly painted.

Proposed Design:



Work Status:

- Transverse and longitudinal marking.
- Extension of diversion with the help of spring posts towards Majnu ka tila.
- Installation of cautionary and informative Signages
- Installation of road studs
- Marking of Ghost island and horizontal directional marking.
- Enforcement (by traffic police) to control wrong side movement - not yet started.

SAVE LIFE FOUNDATION: MUKUNDPUR ROUNDABOUT

Crash Data:

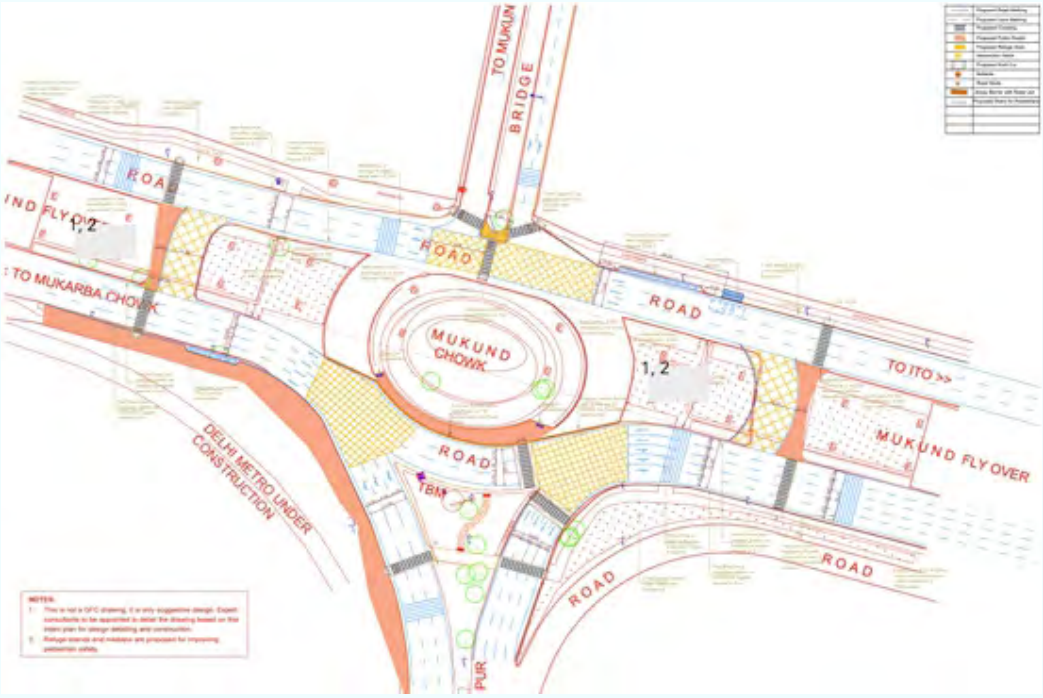
In the last 5 years (2017 to 2021), the selected sections of Black Spot have recorded 10 fatalities and 35 minor injuries in a total of 32 road crashes. Year 2021 has recorded the highest number of fatalities, followed by the year 2020. No road crash fatalities were recorded in the year 2018.

Year	Total Crashes	Fatal Crashes	Minor Crashes	Fatalities	Minor Injuries
2017	9	1	8	1	9
2018	3	0	3	0	4
2019	6	2	4	2	6
2020	7	3	4	3	8
2021	7	4	3	4	8
2021	32	10	22	10	32

Installation of box markings

Demolition of planters for construction of the designated auto stand and bus stop (Mukarba to ITO approach, R.H.S

Proposed Design:



Work Status:

- Complete: Transverse and longitudinal marking.
- Complete: Designated pedestrian crossing under the flyover on both the sides.
- Complete: Demolition of planters for the construction proposed autostand.
- Ongoing: Construction of the proposed autostand is pending.
- Ongoing: Median extension towards Mukundpur village is pending.
- Ongoing: Installation of signages is pending.
- Ongoing: Installation of road studs and demarcation of bus boxes are pending.
- Ongoing: Ramps, pruning of bushes is still pending

Note: Work was halted due to the construction ban under GRAP 3 guidelines from 01st October-29th November 2023.

SAVE LIFE FOUNDATION: BHALSWA CHOWK

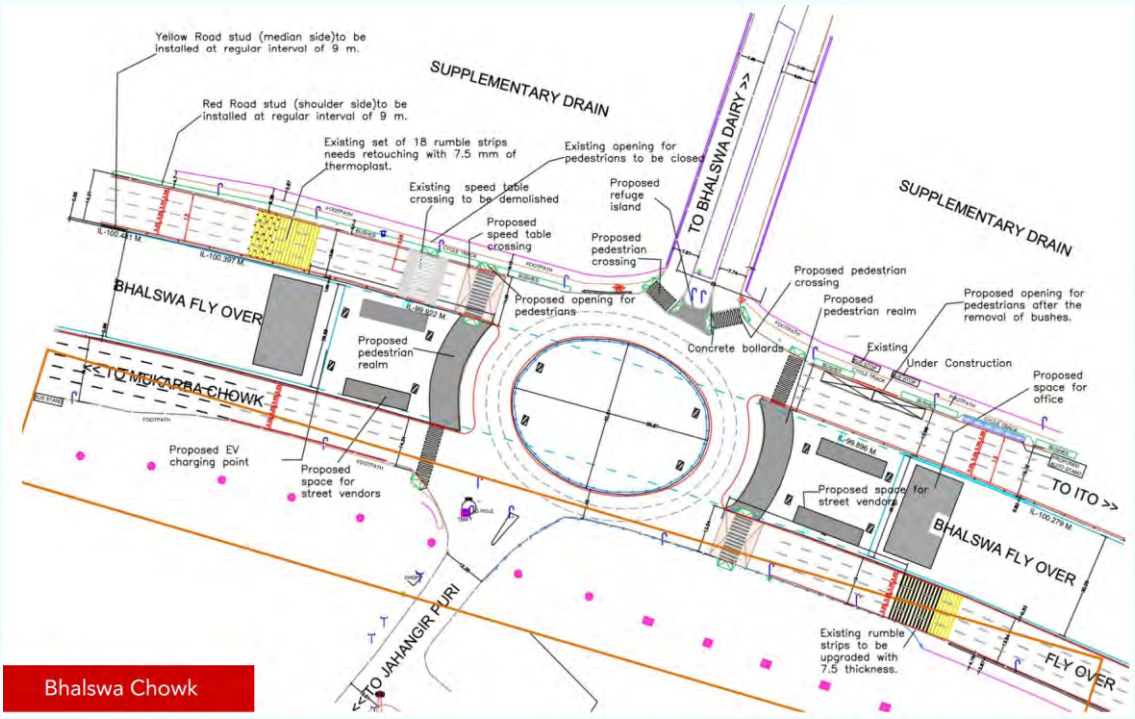
Crash Data:

The Delhi Traffic Police Crash report recorded a total of 39 incidents over the span of five years (2017-2021), with 18 of them classified as fatal crashes.

Installation of informative signages

Installation of hazard markers

Proposed Design:



Work Status:

- Complete: Pedestrian crossings are completed on both the and is connected by a pedestrian path of 3m wide in the vacant space under the flyover.
- Marking for pending bus and auto bays.
- Signage installation has been initiated by PWD. (In-process)
- Demolition for Median extension. (still pending)
- Transverse Bar markings on the proposed location. (still pending)

Note: Work was halted due to the construction ban under GRAP 3 guidelines from 01st October-29th November 2023 and the construction/demolition work is halted on the Towards Mukarba Chowk approach due to the ongoing DMRC construction.

NOTES

NOTES

NOTES

NOTES