



Bloomberg
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Initiative for Global
Road Safety

MUMBAI ROAD SAFETY ANNUAL REPORT 2022



REPORT BY:



**TRAFFIC CONTROL BRANCH
MUMBAI POLICE**

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PREFACE



Shri. Vivek Phansalkar, IPS
Commissioner of Police, Greater Mumbai
Maharashtra, India

Globally, over 1.35 million continue to die in road crashes each year. Road crash fatalities are recognized as a serious public health problem and it's a concern in our country. Mumbai has recognized this 'silent pandemic' and is following a systematic approach to making city roads safe for all road users - pedestrians, motorcyclists, 3 & 4 wheeler-drivers, cyclists, etc.

Even with continued and collective efforts from policymakers, law enforcement agencies, local governments, and active citizens, we are a long way from achieving our targets. Improving the road safety situation requires planning and execution, and it is not a one-off undertaking. And systematic analysis of road crashes, that this annual report provides plays a pivotal role in devising effective enforcement measures and infrastructure changes.

I encourage all the government and private stakeholders to use the data, and analysis in the report to plan evidence-based road safety engineering efforts and enforcement measures.

The Mumbai Police is committed to making Mumbai roads safer for all users. Through scientific, evidence-based, and planned measures, road crashes, fatalities, and injuries are preventable. To achieve this goal, the Mumbai Traffic Control Branch (MTCB) has partnered with the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS) over the years.

I congratulate the Joint Commissioner of Police, Traffic, and BIGRS for releasing the seventh annual report and complimenting them on their joint efforts. I look forward to seeing more progress from this partnership.

Shri.Vivek Phansalkar, IPS



*Joint Commissioner of Police, Traffic, Greater Mumbai
Maharashtra, India*

After a brief halt during COVID-19, infrastructure, and development projects have regained their momentum in Mumbai. The city is in transition and going under enormous transformation. The mega projects and increasing population in Mumbai have made road safety even more crucial than it was before.

Road crash deaths continue to be the leading cause of death among young adults, worldwide and the situation in Mumbai is similar. We cannot continue to lose these young lives to road crashes.

Since 2015, there is a declining trend in road crash fatalities in Mumbai. Comparing 2015 to 2022, road crash fatalities in the city have decreased by over 40%. There is a slight increase in fatalities in 2021, however, the downward trend is still evident as the number of fatalities in 2022 is still less than pre-pandemic figures.

While the downward trend in road deaths is encouraging, we need to continue to work towards zero deaths on Mumbai roads. Road crash fatalities are unacceptable and preventable. It requires concerted efforts for effective prevention. Safety on roads is integral to a developed and inclusive city.

We aim to follow the UN decade of action for road safety to reduce road crash deaths to 50% by 2030. To achieve this goal, we continue our partnership with the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS). Since 2015, the Mumbai Traffic Control Branch (MTCB) with technical support from BIGRS has released crash reports, to provide evidence to different stakeholders working in road safety.

We acknowledge and appreciate the efforts made by the different stakeholders in the city that have significantly reduced deaths and injuries in Mumbai over the years. The MTCB is committed to providing our support to them and making efforts to ensure that people do not die on our roads.



Mirick Paala, MSc
Senior Technical Advisor
Vital Strategies

The effectiveness of decisions made in road safety reflects the quality of data that are collected, managed, and used by the city. This report marks the seventh year that we have collaborated with the MTCB to use data to inform evidence-based interventions in road safety. To this end, data have informed the design and development of road safety projects, leading to safer streets in Mumbai.

While there has been a steady decrease of road crash fatalities in Mumbai, at least one person is still killed every day by road crashes in the city, most of whom are vulnerable road users such as pedestrians. This is why we are supportive of the strong commitment and conviction of the MTCB and the city officials to improve road safety in the city. We hope that the city continues to implement proven approaches to saving lives such as safe infrastructure interventions, consistent enforcement, and targeted mass media campaigns.

Vital Strategies and BIGRS are committed to continually working and collaborating with the city to effectively and successfully save lives on the road.

A handwritten signature in black ink, appearing to read 'M Paala'.

Mirick Paala, MSc

ACKNOWLEDGEMENTS

The Mumbai Traffic Police has been working in association with the BIGRS since 2015. BIGRS partners provide technical assistance to the governments in Mumbai and Maharashtra to implement evidence-based interventions that could potentially help save lives.

We appreciate the initiative for their continuous support and engagement in making Mumbai roads safer. We gratefully acknowledge the financial support received from Bloomberg Philanthropies, which made the production of this report possible.

This report is the seventh Mumbai road safety annual report and this report was made possible with the supervision and direction from Hon. Shri. Vivek Phansalkar, IPS, Commissioner of Police, Mumbai. This report is the result of the support from the BIGRS technical partner, Vital Strategies.

Jagruti Karande (Surveillance Coordinator), BIGRS Maharashtra, was responsible for data management and analysis with support from Dr. Sara Whitehead, Mirick Paala, Grant Ennis, and Lievanta Millar from Vital Strategies. Preeti Iyer, Sanjana Bhalerao, Jagdish Sawant, Yogesh Ambe, and Nishant Sawant from BIGRS Maharashtra contributed critical guidance and support throughout the process.

ABBREVIATIONS

BEST	Brihanmumbai Electric Supply and Transport
BIGRS	Bloomberg Philanthropies Initiative for Global Road Safety
FIR	First Information Report
HV	Heavy Vehicles
iRAD	Integrated Road Accident Database
LV	Light Vehicles
BMC	Brihanmumbai Municipal Corporation
MHV	Medium-Heavy Vehicles
MORTH	Ministry of Road Transport and Highways
MTCB	Mumbai Traffic Control Branch
RTO	Regional Transport Office



EXECUTIVE SUMMARY

Globally, 1.35 million people continue to die and 50 million are injured in road crashes each year. Road crashes are the leading cause of death in people aged 5 to 29 years.¹ India has reported 150,000 deaths³ and Maharashtra has reported 13,528 deaths in 2021.⁴

Mumbai has reported 365 road crash deaths in 351 crashes in 2022, marking 40% reduction since 2015. The death rate shows that 2.8 people per 100,000 population died on Mumbai roads. As per road user type fatalities, two and three-wheeler passenger fatalities are the highest (49%), with pedestrians accounting for the second largest number of fatalities (44%). Vulnerable road users make up for 95% of fatalities.

Males continued to account for 85% of total deaths, with the 20-39 years age group making up most of the total deaths in males. Motorcyclist deaths were concentrated among the 20-29 years age groups.

Hit-and-run events accounted for 44% of all fatal crashes in 2022, and the majority of victims were pedestrians (48%). Many of these pedestrian deaths occurred at Amar Mahal Junction and Worli Seaface junction.

The peak hours for fatal crash deaths were observed between 23:00 to 24:00 hours on Mondays and Saturdays for the past three years.

Among the top 20 identified high risk corridors, Dr Babasaheb Ambedkar Marg and NS Road continue to lead with the highest deaths and injuries per kilometer. Furthermore, Kalanagar junction and Amar Mahal junction were found to be the highest risk junctions.

These data show the need for swift and meaningful action for the safety of pedestrians and motorcyclists. A safe systems approach is warranted and will include a combination of interventions on infrastructure, enforcement, and speed management. Examples include enhanced enforcement of correct helmet wearing, adequate and accessible pedestrian facilities for the elderly, and intersection treatments to reduce speeding. It is also crucial that data improvement programs are implemented and to combine outcome data with safety performance indicators.

This report is intended to provide information and guidance for all Mumbai city stakeholders to improve intervention planning and evaluation.

INTRODUCTION

Globally, 1.35 million people continue to die and 50 million are injured in preventable road crashes each year. Road crashes are the leading cause of death in people aged 5 to 29 years.¹ More than 90% of these global road crash deaths occur in low-and middle-income countries. In addition to the human tragedy of each of these deaths, this impacts the development of low-and middle-income countries as economically productive lives are lost.²

Reliable and accurate road crash data are crucial to effectively address road crash fatalities and injuries. It will enable governments to identify circumstances that lead to a crash, design interventions, monitor and evaluate progress, and implement a Safe Systems Approach to Road Safety.

This is particularly important in India where 150,000 road crash deaths have occurred in 2021³ and in Maharashtra, where 13,528 deaths have occurred in the same year.⁴

While road crash deaths in Mumbai have been declining since 2015, at least 1 person is killed every day on Mumbai's roads.

This warrants transforming data into effective and meaningful action. This annual report represents the commitment to use data to build safer roads. It aims to present and analyze the road safety situation in Mumbai especially for the year 2022. It seeks to show the nature of road crash fatalities and injuries to inform evidence-based programs and interventions in road safety.

¹ "Decade of Action for Road Safety 2021-2030", n.d. Accessed April 12, 2021.

<https://www.who.int/teams/social-determinants-of-health/safety-and-mobility/decade-of-action-for-road-safety-2022-2030>.

² World Bank (2019). *Guide for road safety opportunities and challenges: Low - and middle - income country profiles*. Washington DC, USA: World Bank.

³ Annual Report 2022-2022. 2022. Delhi, Delhi: Ministry of Road Transport and Highways.

https://morth.nic.in/sites/default/files/Annual%20Report_21-22-1.pdf.

⁴ Highway police of Maharashtra, 2021. *Road Accidents in Maharashtra*. Report, Mumbai: Accident research cell, Maharashtra.

METHODS

Mumbai has partnered with the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS) as one of the multiple locations working to reduce crashes, injuries, and deaths. One element of this work is to enhance road safety surveillance systems for outcome data including crashes, injuries, and deaths. In Mumbai, the surveillance system is composed of different actors collecting and using data to understand how and why crashes occur, address road crash risk, and prevent fatalities and injuries. The agencies involved in this system include the MTCB, the Regional Transport Office (RTO), the Brihanmumbai Municipal Corporation (BMC), Department of Health, among other relevant stakeholders. The following report presents an analysis of the MTCB's 2022 road crash injury data. It represents a process of digitizing existing data and mapping, analyzing, and compiling road crash deaths and injuries.

Data Sources

Road crash data in Mumbai comes from police crash reports which are compiled and maintained by the MTCB. Crashes are first documented using a narrative-based form called the First Information Report (FIR). This is also the same process used for crime reporting. The FIR can be filed by any witness or traffic police official, or even by a crash victim. The FIR is filed at the police station nearest to the crash location with relevant jurisdiction. It is the responsibility of this police station to examine the crash further and investigate it appropriately. The police gather data on the crash circumstances, victims involved, manner and behavior of the accused at the time of the crash, feedback from any witnesses, autopsy report of any fatal victim, and technical reports of the vehicle, along with internal investigation. Selected details are summarized monthly in a tabular format commonly referred to as the "data sheet" and submitted by the investigating police station to the MTCB Headquarters. Since 2018, a standardized crash report form issued by the Ministry of Roads, Transportation, and Highways (MORTH) is supposed to be completed for each crash and forwarded in place of the data sheet, but most police stations have not made this transition. Early in 2021, MORTH introduced an application called the Integrated Road Accident Database (iRAD) for crash data collection, management, and visualization and has rolled out a pilot across six states of India including Maharashtra. iRAD data is not yet complete and accessible for analysis by MTCB.

At the MTCB Headquarters, the summarized information is reviewed to avoid duplicate reporting before they are tallied manually. These tallies are compiled to prepare monthly and annual reports for the state and national level. For this report, both fatal and non-fatal injury crashes are digitized using the EpiInfo open-source software. The data entry form used on this platform is aligned with the set of variables from the iRAD application.

Analysis

The records were analyzed and compiled into summary statistics as shown in the tables and figures in the report. 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.

The road user types were grouped into the following categories: Pedestrians, Motorised Two and Three-Wheeler Occupants, Four-Wheeler Occupants, and Cyclists.

Limitations

The current data sheet summary formats can be inadequate, and some variables are inconsistently or rarely captured. Crash location information is not precise, and is manually pinned based on the available description of the location in the FIR. Information on helmet use, seatbelt use, and alcohol use are unavailable. The national iRAD crash data platform does not yet allow access to disaggregated records for analysis by MTCB for reports such as this one.

RESULTS

TREND IN ROAD CRASH DEATHS AND INJURIES

Fatal Crashes and Deaths, 2010 - 2022

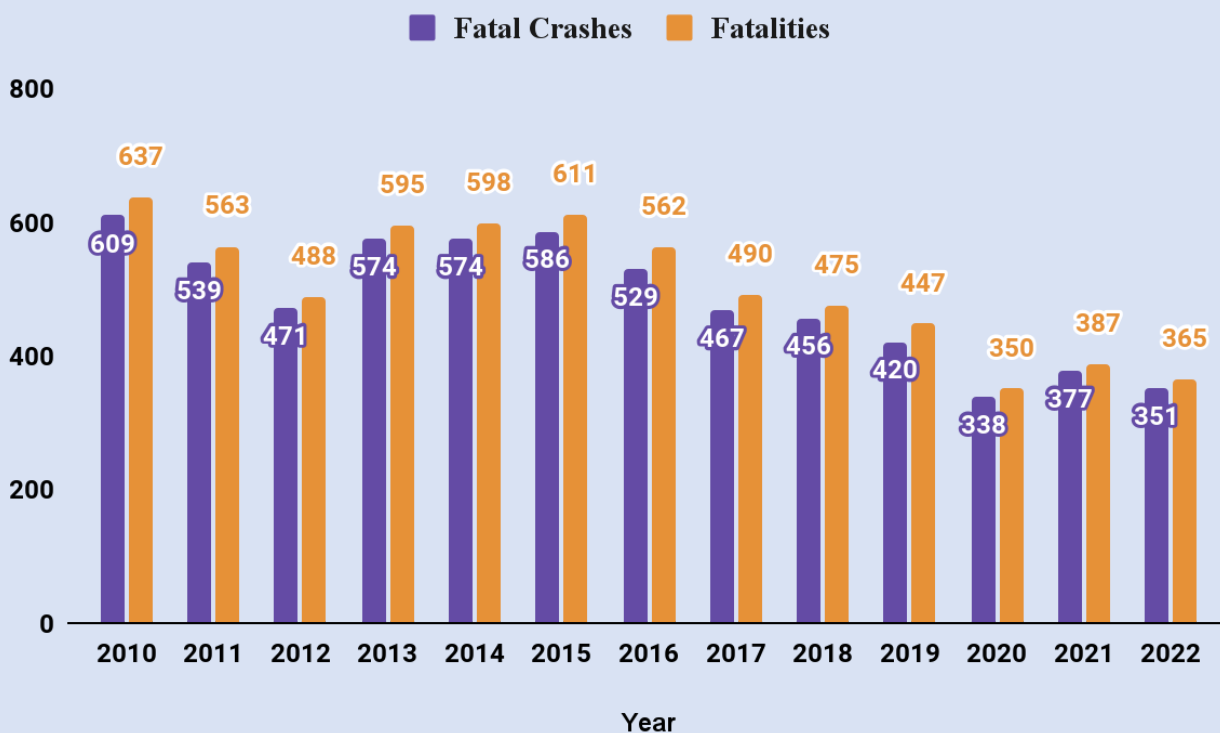


Figure 1

Mumbai has reported 365 deaths and 351 fatal road crashes in 2022. While this is a slight decrease from 2021, at least 1 person is still killed on Mumbai's roads every day. Compared to 2019 which is the year before the pandemic, there has been a reduction of 13% in deaths and 10% in fatal crashes in 2022. Moreover, the number of fatalities and injuries should also be viewed together with other safety performance indicators such as speeding which can confirm if roads have actually been made safer.

Road Crash Fatality Rates, 2011 - 2022

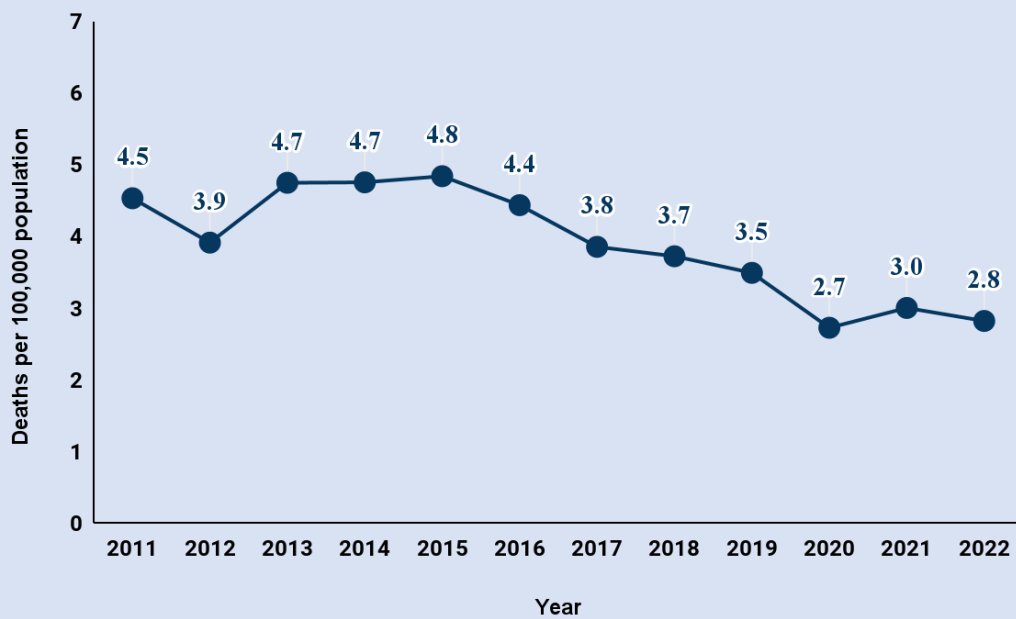


Figure 2

Figure 2 shows that 2.8 persons per 100,000 population were killed in road crashes in Mumbai in 2022. The death rates show a slight decrease compared to the rate in 2021. At the same time, the death rate in 2022 is lower than the rates in pre-pandemic years, showing a consistent decreasing trend for crash fatalities since 2015.

Injuries and Injury Crashes, 2010 - 2022

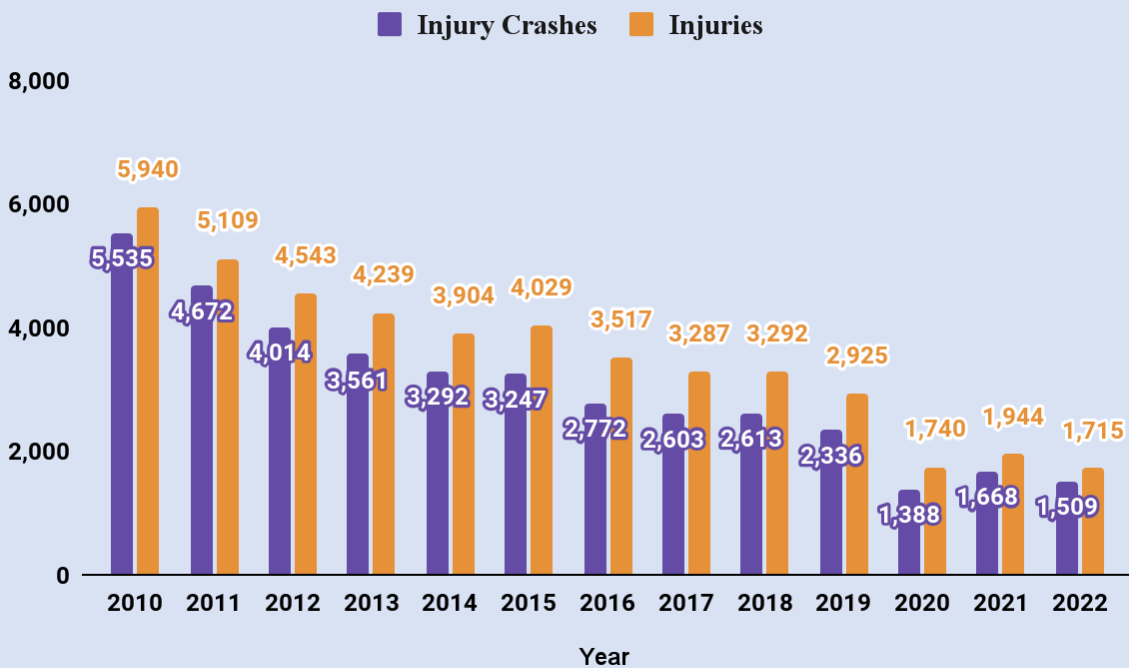


Figure 3

Similar to road crash deaths, the reported road crash injuries in 2022 decreased from 2021. Specifically, Mumbai reported 1,715 injuries and 1,509 injury crashes in 2022.

DEATHS AND INJURIES BY ROAD USER TYPE

Trend in Road Crash Deaths by Road User Type, 2015 - 2022

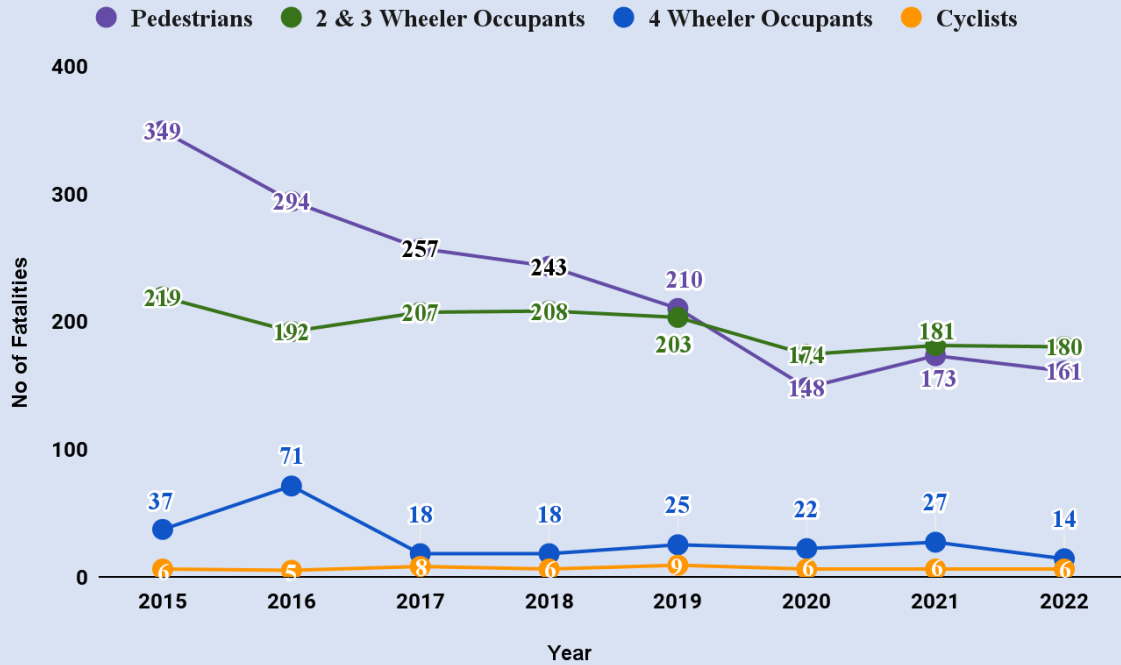


Figure 4

*Unknown road users are not included

Road crash deaths were highest among 2 & 3 wheeler riders in 2022, and for the third year, this group surpassed the number of pedestrian fatalities. This can be explained by a modal shift towards motorcycle use either for logistics or day-to-day personal travel during the severe mobility restrictions and thus increasing exposure to risk for motorcyclists. These 180 deaths include 163 two-wheeler riders and 17 three-wheeler (auto rickshaw) occupants.



Road Crash Deaths by Road User Type, 2022

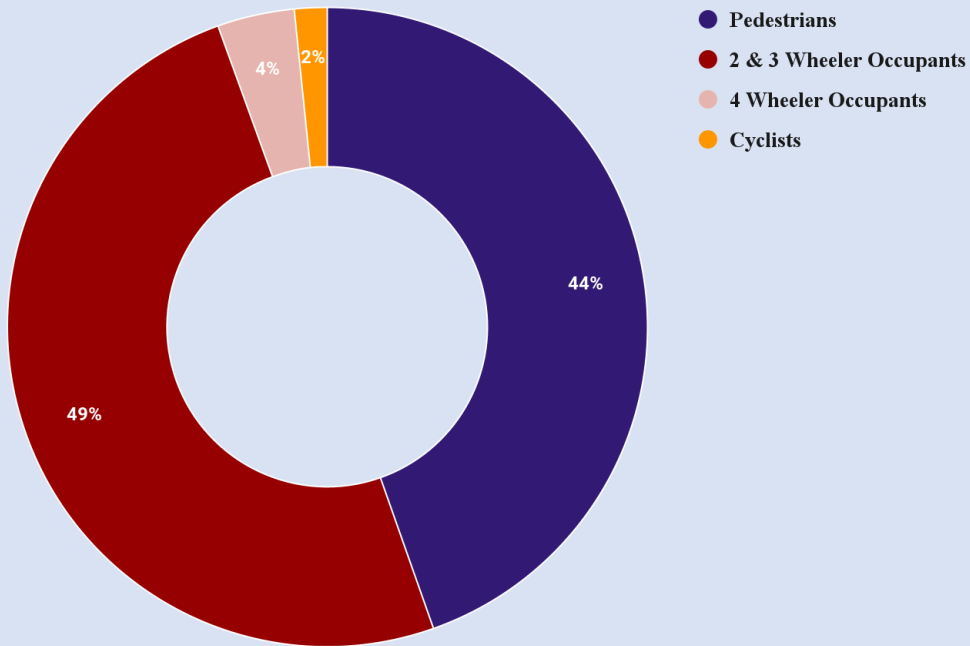


Figure 5

**Unknown Road User not included which makes up 1%*

Two and three-wheeler occupants (both drivers and passengers) accounted for 49%, and pedestrians accounted for 44% of all deaths in 2022. A total of 95% of deaths were among vulnerable road users: pedestrians, motorcyclists, three-wheeler occupants, and cyclists.

Non-Fatal Injuries by Road User Type, 2022

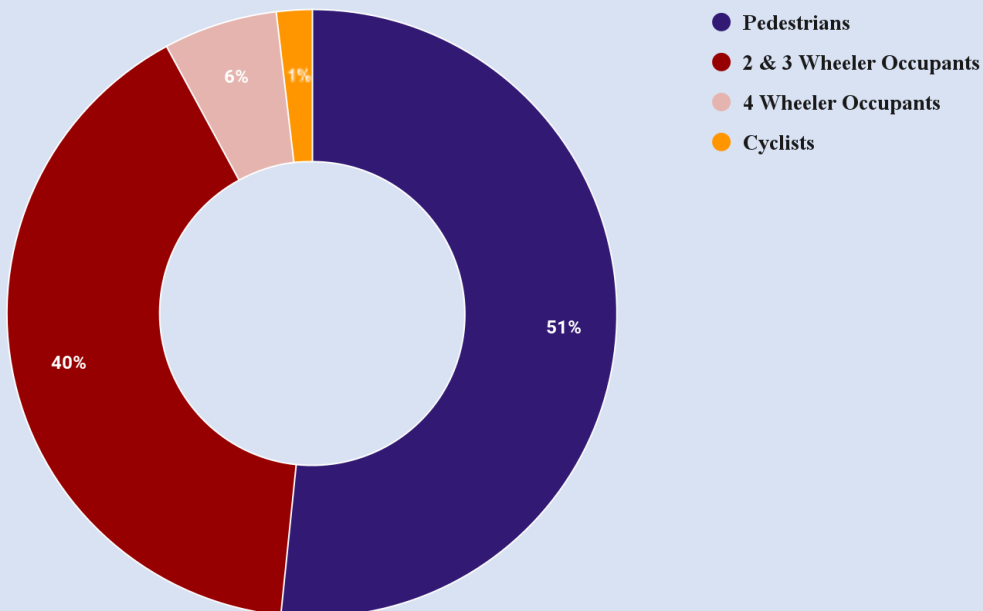


Figure 6

**Unknown Road User not included making up for 1%*

In 2022, 51% of non-fatal road injuries were among pedestrians. Two and three-wheeler occupants accounted for 40% of road crash injuries. A total of 93% of non-fatal injuries were among vulnerable road users.

DEATHS AND INJURIES BY AGE AND GENDER

Fatalities by Gender, 2022

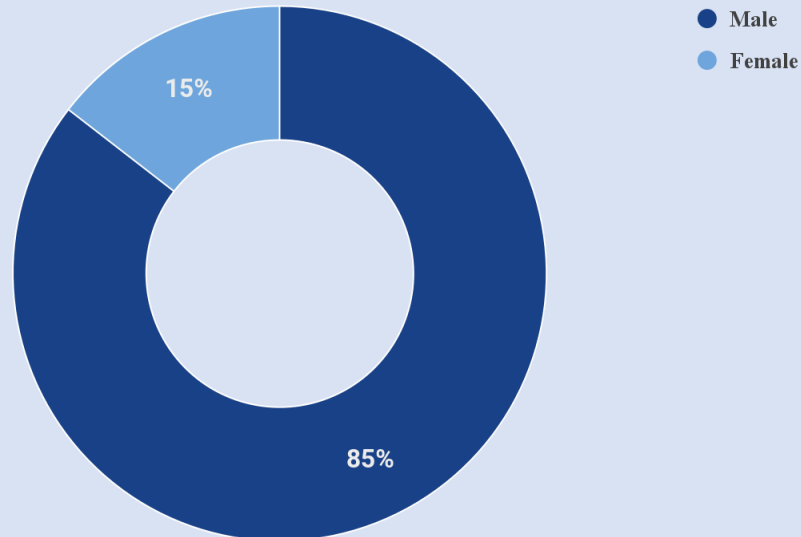


Figure 7

Men accounted for 85% of road crash deaths in 2022 while women accounted for 15% of road crash deaths. This may be attributed to the mode of transport used, types of journeys made, and gender-based risk behavior. It is crucial that further investigation is made to determine the journeys that make particular demographics more affected by road crash fatalities.

Injuries by Gender, 2022

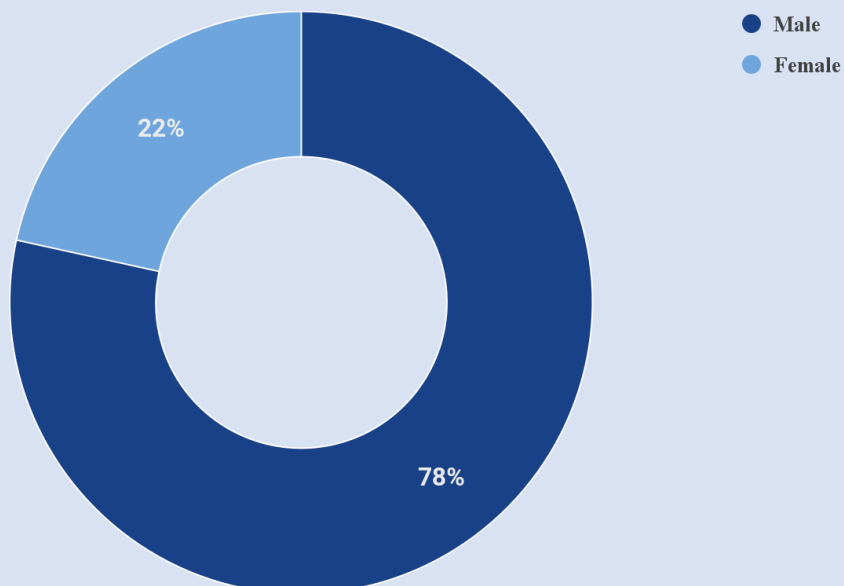


Figure 8

Men accounted for 78% of non-fatal road crash injuries while women accounted for 22% of non-fatal road crash injuries. It is notable that the proportion of women involved in injuries is greater than the proportion of women involved in crash fatalities. A further investigation on how road crash fatalities and injuries are reported is recommended as this might explain the discrepancy between the numbers.

Road Crash Deaths by Age Group and Gender, 2022

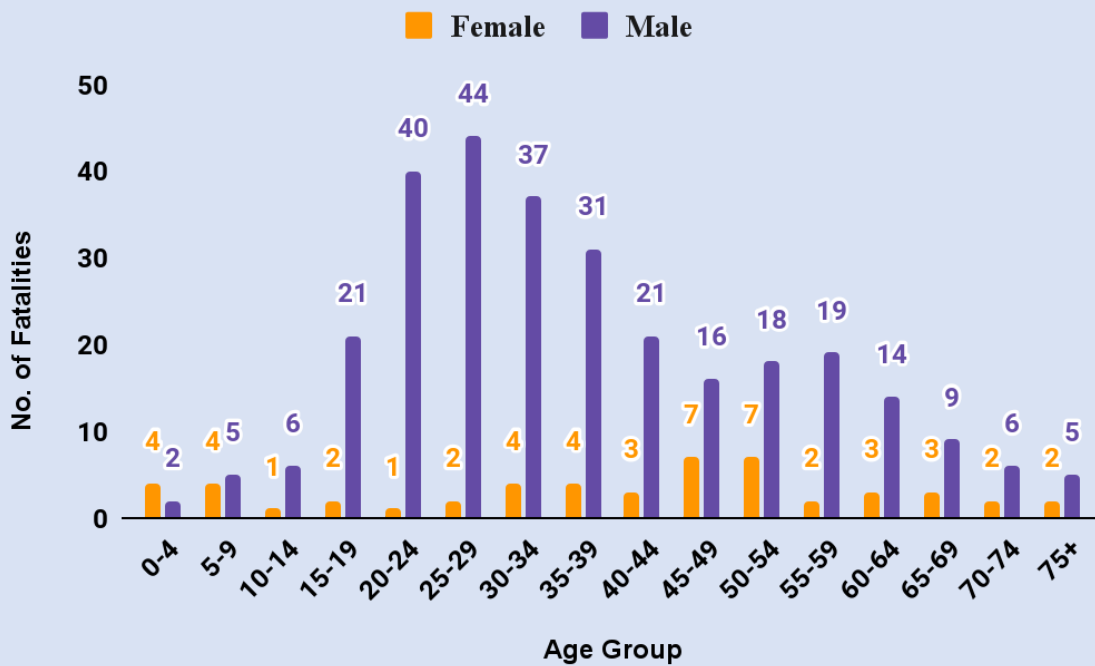


Figure 9

**Victims with unknown age and gender are not included*

Mobility and travel behavior can be influenced by a person’s age and gender and hence, each age and gender group are impacted by road risks differently. For men, deaths were largely among those in the age group of 20 to 39 years which can be explained by travel mode and gender and age-based risk-taking behavior. On the other hand, women’s deaths were frequently at ages 45 to 54 years, indicating an increased risk for elderly women.

Road Crash Death Rates by Age Group and Gender, 2022

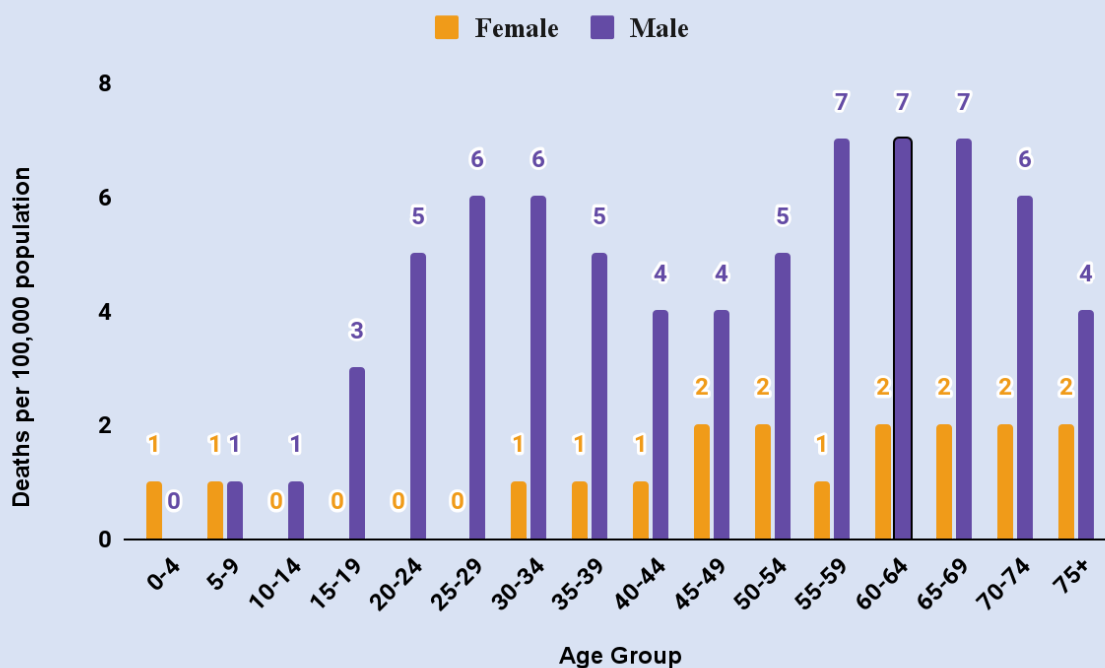


Figure 10

By contrast when comparing death rates per 100,000 population, deaths were largely in the age 55 to 69 years in men, and among 45 to 54 years and 60 to 75+ years in women. The vulnerability of the older population becomes apparent once the numbers are adjusted according to the underlying population in each age group. These numbers show that there is an increased road risk for the older population in Mumbai. A further investigation of the types of trips that the elderly use is recommended to design more targeted interventions.



Non-Fatal Injuries by Age Group and Gender, 2022

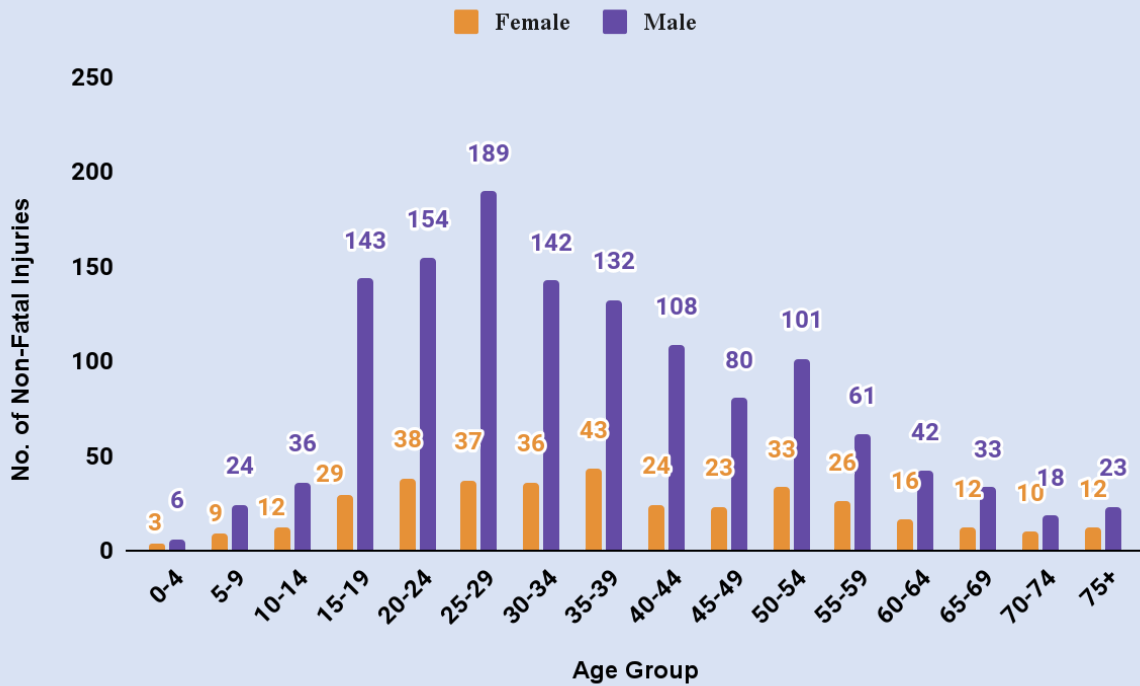
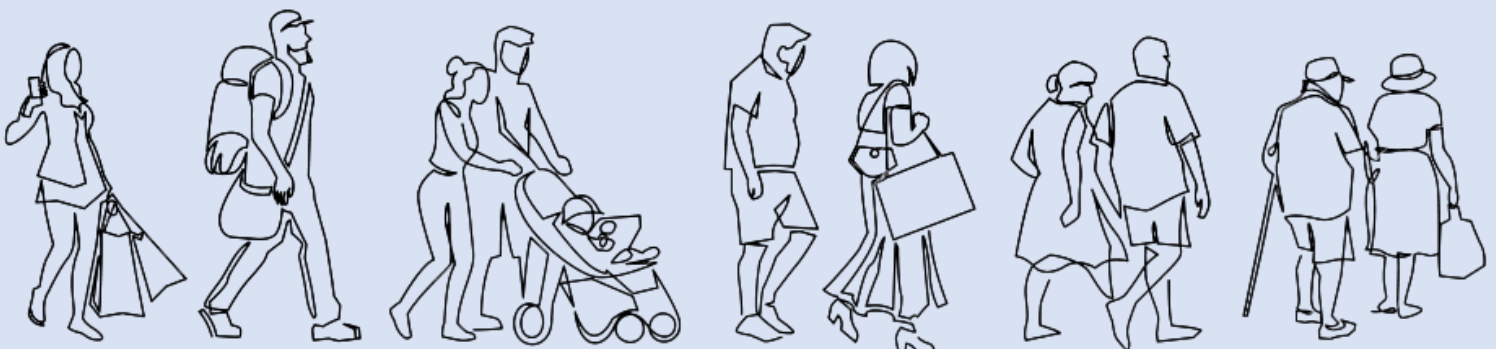


Figure 11

*Victims with unknown age and gender are not included

Crash injuries were most common among men in the age group of 15 to 29 years and women in the age group of 20 to 39 years.



Motorcyclist Deaths by Age and Gender, 2022

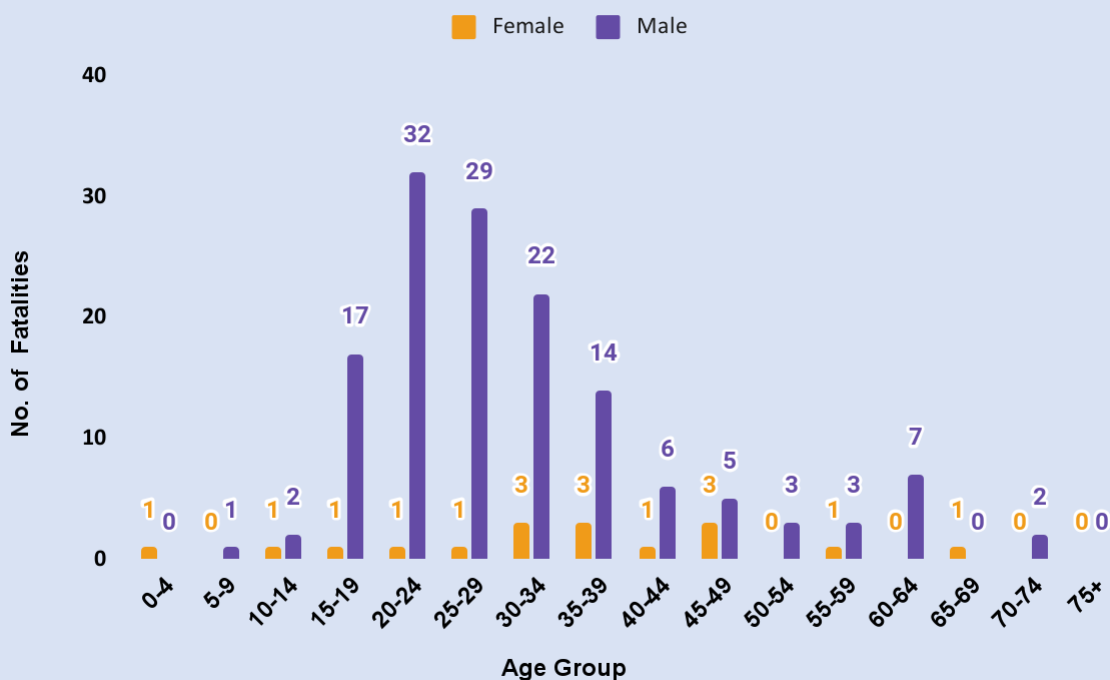


Figure 12

**Motorcyclist with unknown age and gender are not included*

Deaths among motorcyclists were much more concentrated among younger men compared to other road crash deaths. Men in the age group of 20 to 29 years who also represent workers account for most of the motorcyclist deaths.

Motorcyclist Death Rates by Age and Gender, 2022

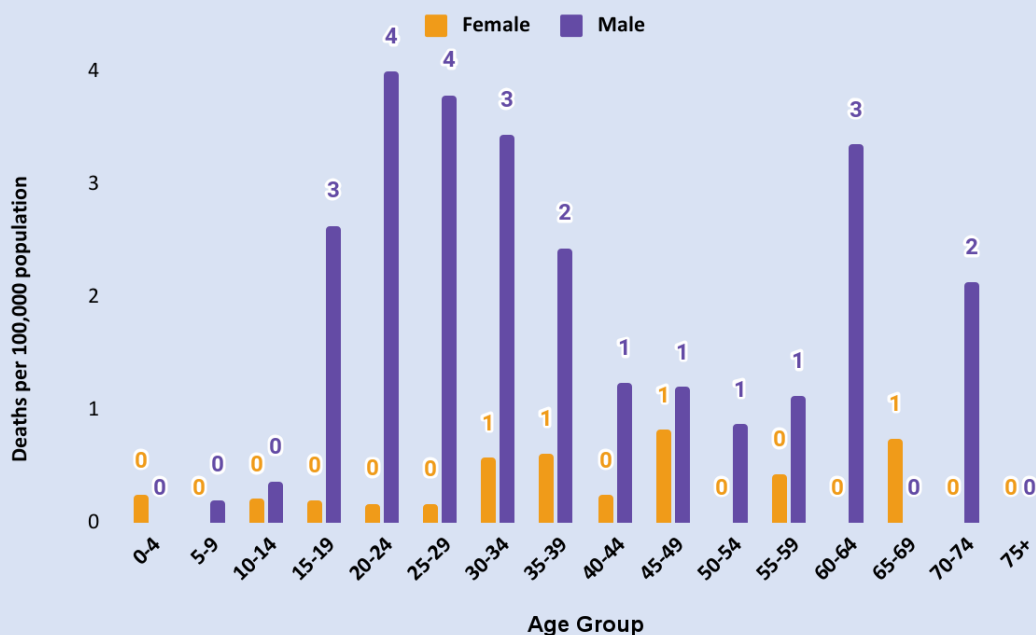


Figure 13

Motorcyclist death rates per 100,000 population show that men in the age group of 15 to 24 years were at the highest risk.

Pedestrian Fatalities by Age and Gender, 2022

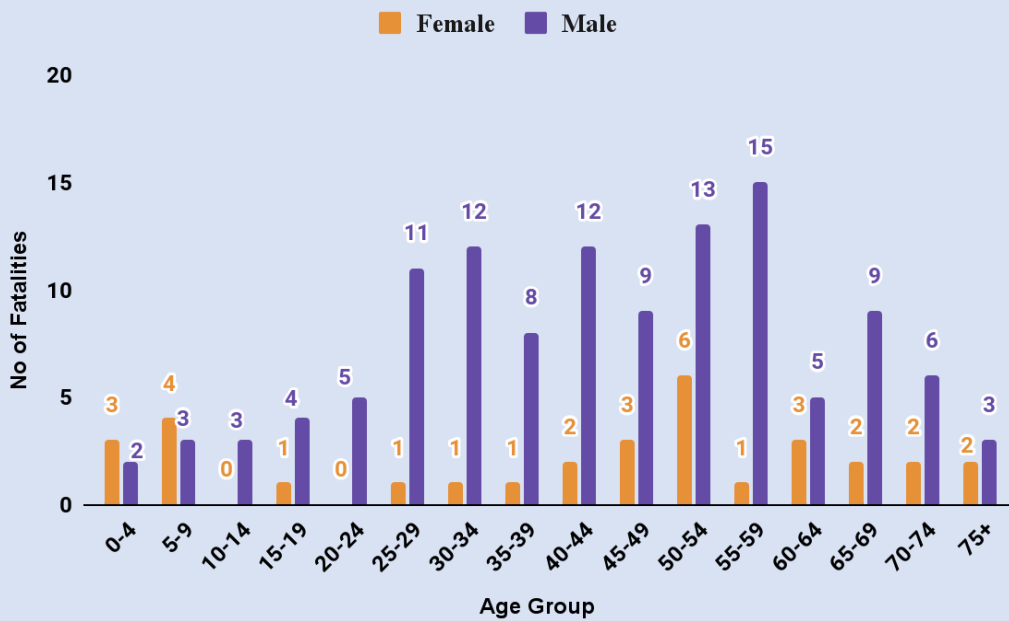


Figure 14

**Pedestrians with unknown age and gender are not included*

In 2022, the highest number of pedestrian deaths was among men, and in the age group of 55 to 59 years. Among women, the figures were highest in the 50 to 54 years age group.

Pedestrian Fatality Rate by Age and Gender, 2022

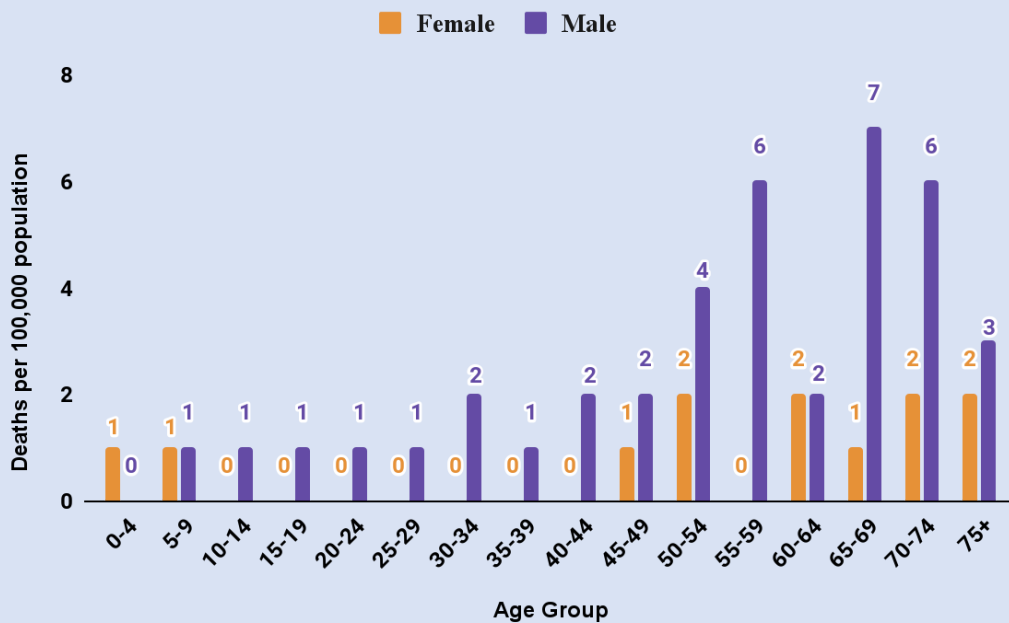


Figure 15

Age and gender-specific pedestrian death rates show an increasing risk by age among both men and women. The rates were significantly higher among men in the age group of 65 to 69 years and among women aged 50 years and above. This warrants the development of safe, accessible, and adequate pedestrian infrastructure, especially for the elderly.

AT-FAULT DRIVERS AND VEHICLE TYPES

At-Fault Drivers in Fatal Crashes by Gender, 2022

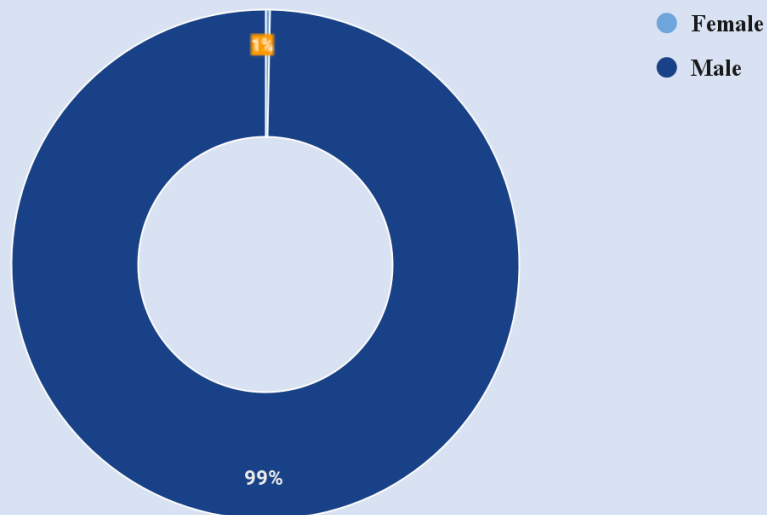


Figure 16

**Cases with unknown driver gender excluded*

Male drivers are found at fault in most fatal crashes over the past six years. The cases with unknown gender for persons involved, such as the driver and hit-and-run crashes were not included in the analysis.

At-Fault Drivers in Fatal Crashes by Age, 2022

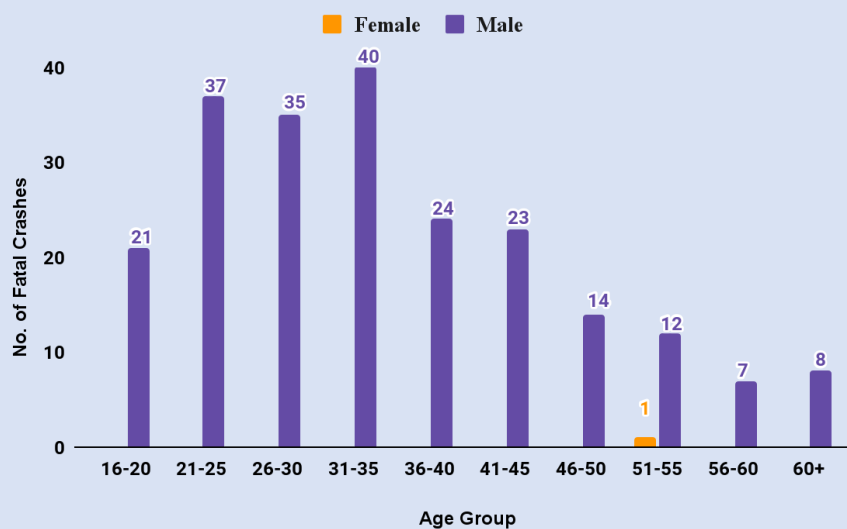


Figure 17

**Drivers with unknown age excluded*

Those aged between 21 to 35 years were the largest group found at fault in fatal crashes. The age of at-fault drivers was frequently not recorded, or not available in the case of hit-and-run fatal crashes.

Hit-and-Run Drivers in Fatal Crashes, 2022

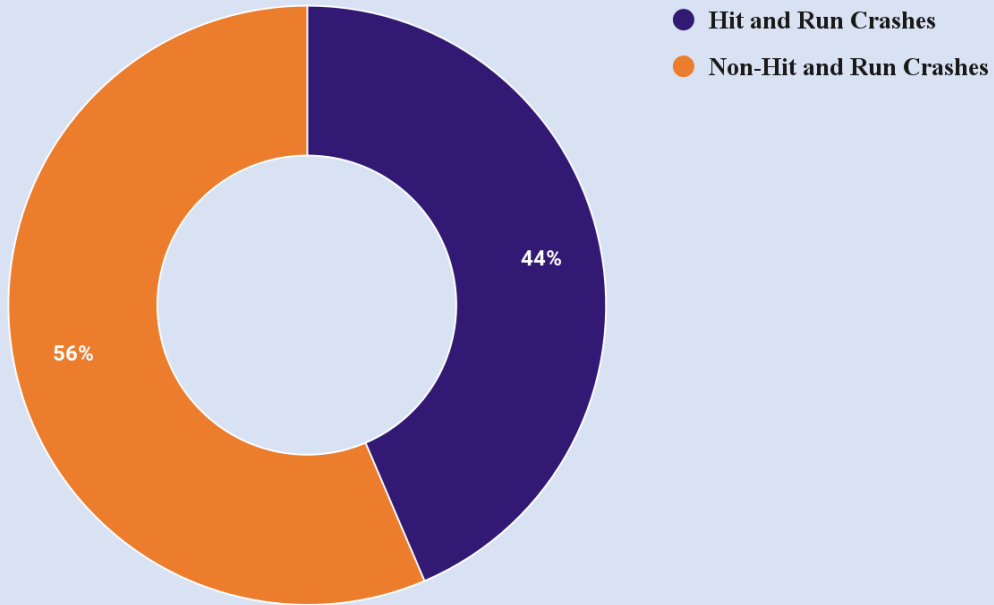


Figure 18

A total of 44% of all road crash deaths were in hit-and-run cases where the at-fault driver and vehicle could not be identified.

Hit-and-Run Fatal Crash Victim by Road User Type, 2022

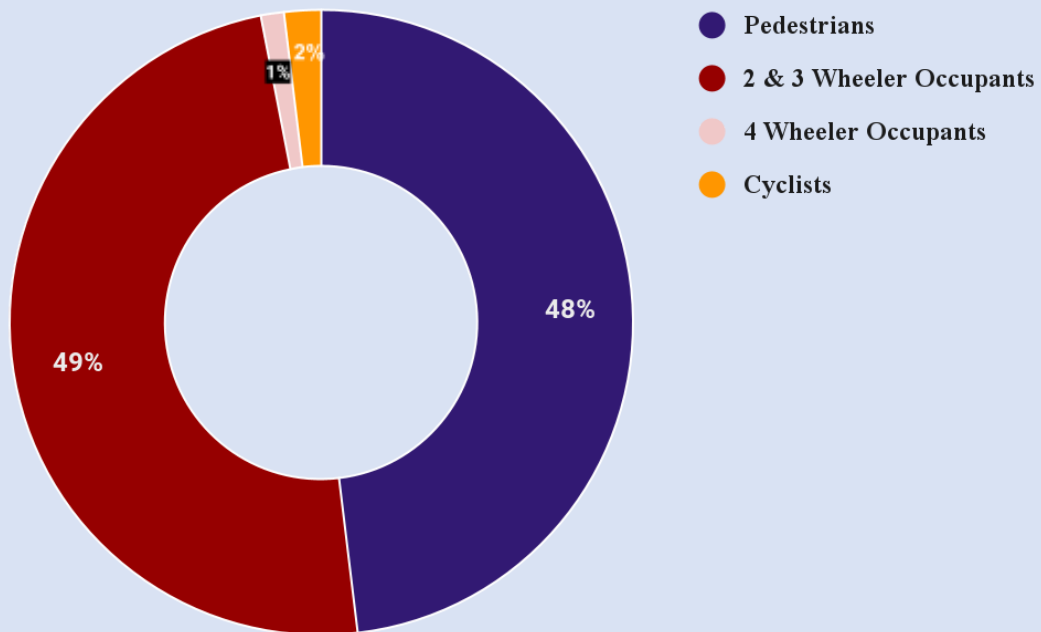


Figure 19

Almost all killed by hit-and-run drivers were vulnerable road users, primarily pedestrians (48%) and motorcyclists (43%).

Black Spot Junctions for Pedestrian Hit-and-Run Fatalities **2020 - 2022**

Rank	Black Spot Name	Pedestrian hit and run fatalities 2020-2022 with in 250 mt radius
1	Amar Mahal Junction, Tilak Nagar, Ghatkopar	5
2	Worli Seaface Junction, Worli	5
3	Intersection of Sion Panvel Highway and Ghatkopar Mankhurd Link Road, Mankhurd	4
4	Intersection of Sant Rohidas Marg and Dharavi Depot	4
5	Priyadarshini Junction	3
6	Ovaripada Metro Station Junction, Borivali	3
7	IIT Main Gate Junction	3
8	Intersection of JVLR and Eastern Express highway, Vikhroli	2
9	Intersection of WEH and 90 feet Road, Dattani Park junction, Kandivali	2
10	Intersection Kamlakar Pant Walawalkar Marg and P Tandon Marg	2
11	Dr. Kashinath Ghanekar Chowk Prabhadevi	2
12	Intersection of LBS road & Santacruz Chembur Link Road	2
13	Intersection of Sion Panvel Highway and Eastern Free Way (Shivaji Chowk)	2
14	Intersection of WEH and Dattapada Road, Magathane depot junction, Borivali	1
15	Intersection of Western Express Highway and Mathuradas Vasanji Road	1

Table 1

The above table shows the high-risk junctions for pedestrian hit-and-run fatalities for the past three years. These junctions can be studied further to identify the causes for the hit-and-run crashes, and corresponding interventions to minimize pedestrian fatalities. The installation of cameras at these locations to aid improved crash investigation are recommended.

Distribution of At-Fault Vehicles to Fatal Crash Victims, 2022

Victim/Vehicle	Auto Rickshaw	Bus	LV	HV	MHV	Two Wheelers	Single vehicle crash	Cyclist	Missing	Total
Pedestrians	13	13	45	15	28	20	0	0	27	161
Motorcyclists	6	10	29	30	21	18	33	0	20	167
Three-Wheeler occupants	2	1	4	4	0	0	6	0	0	17
Four-Wheeler occupants	1	0	3	2	0	0	8	0	0	14
Cyclists	0	0	0	1	1	0	0	0	0	2
Missing	0	0	0	2	0	0	0	0	2	4
Total	22	24	81	54	50	38	47	0	49	365

Table 2

Table 2 shows the types of vehicles that were responsible for deaths of each type of road user. Most of the pedestrian deaths were caused by cars, medium-heavy vehicles, and unknown vehicles. The highest number of motorcyclist deaths occurred in single-vehicle crashes, followed by light, medium-heavy, and heavy vehicles in approximately equal proportions. It also has to be highlighted that a significant portion of fatal crash victims have missing at-fault vehicle types, indicating a need to improve investigation and reporting.

Distribution of At-Fault Vehicles to Non-Fatal Crash Victims, 2022

Victim/ Vehicle	Auto Rickshaw	Bus	LV	HV	MHV	Two Wheelers	Single vehicle crash	Cyclists	Missing	Total
Pedestrian	103	54	271	26	66	313	0	1	46	880
Motorcyclist	49	25	229	50	65	100	51	0	17	586
Three wheeler occupants	8	5	41	3	15	12	15	0	3	102
Four wheeler occupants	6	4	41	12	12	2	26	0	0	103
Cyclist	2	1	15	2	4	7	0	0	1	32
Missing	0	0	4	2	0	1	1	0	4	12
Total	168	89	601	95	162	435	93	1	71	1715

Table 3

Table 3 shows road user types among non-fatal injuries and the corresponding vehicles at fault. Pedestrians were most frequently injured by motorcyclists and car drivers, whereas motorcyclists were most frequently injured by cars and other motorcycle drivers.

LV - Light vehicle (includes Car, Jeep, Van, Taxi)

MHV - Medium heavy vehicle (includes Tempo, Tractor, Truck, Lorry)

HV - Heavy vehicle (includes Heavy articulated vehicles, Trolleys)

Road Crash Deaths Caused by Buses, 2015 - 2022

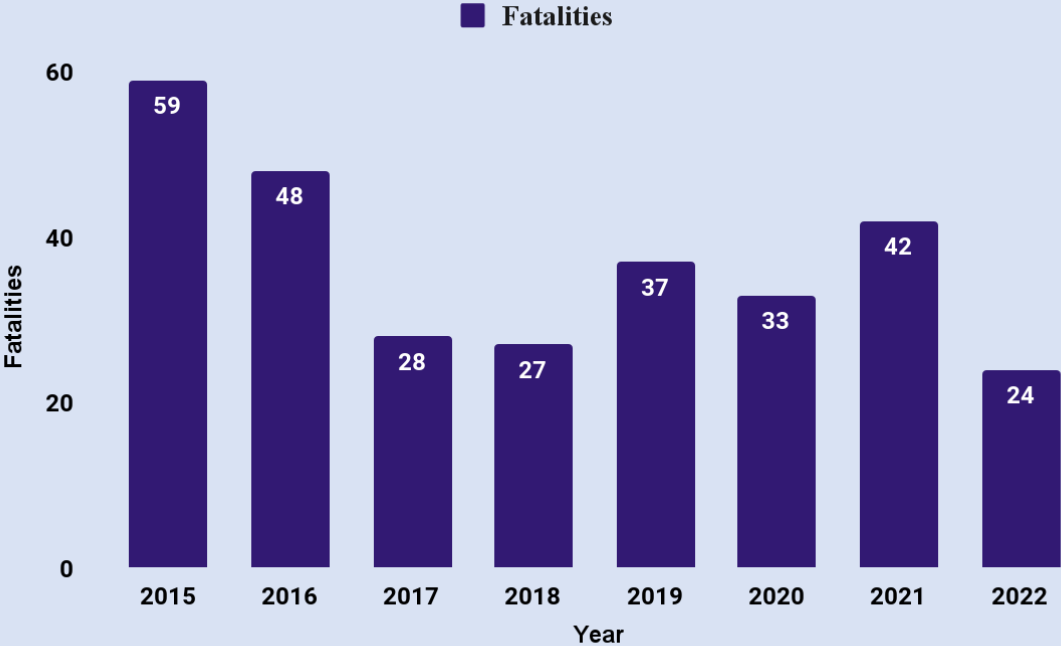


Figure 20

In 2022, buses caused 24 deaths, most of whom were pedestrians and motorcyclists. The deaths caused by buses have decreased compared to 2021. This category includes Brihanmumbai Electric Supply and Transport (BEST) buses, private buses, school buses, and luxury buses.



DEATHS & INJURIES BY MONTH, DAY AND TIME

Fatal and Non-Fatal Injury Crashes by Month, 2022

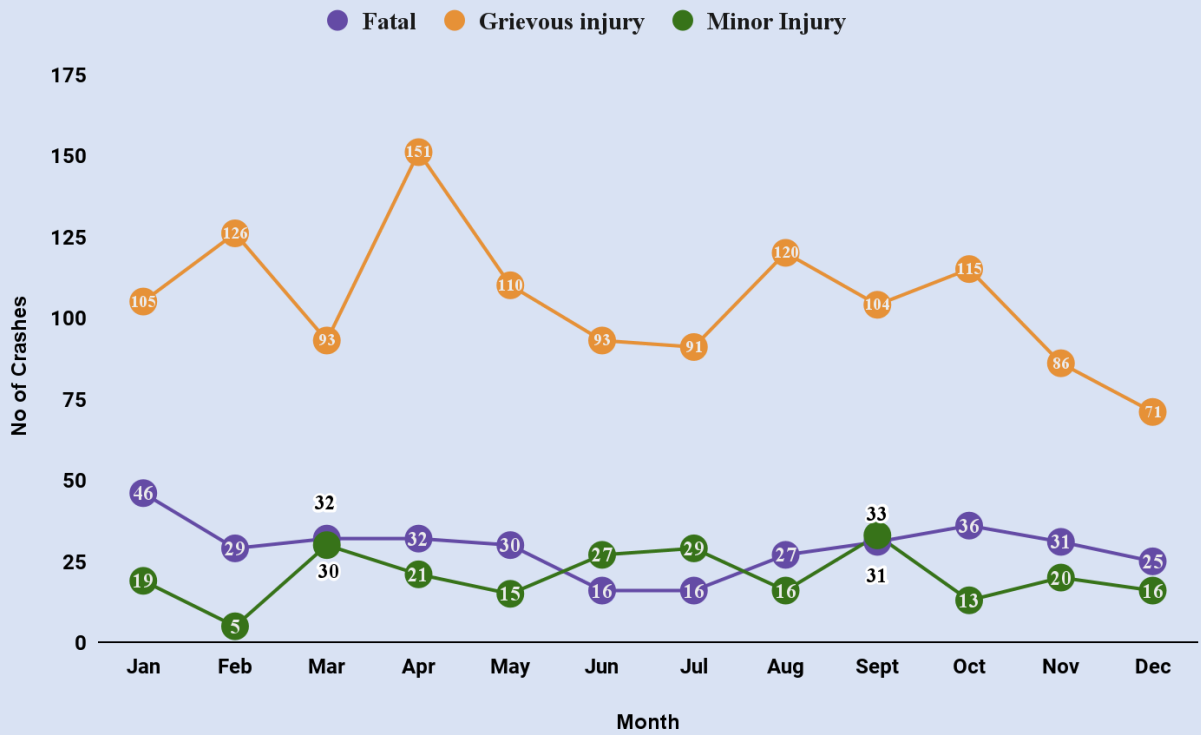


Figure 21

There is no significant pattern in fatalities by month in 2022. The reason for the high number of serious injuries in April needs further investigation.

Road Crash Deaths by Time of Day, 2022

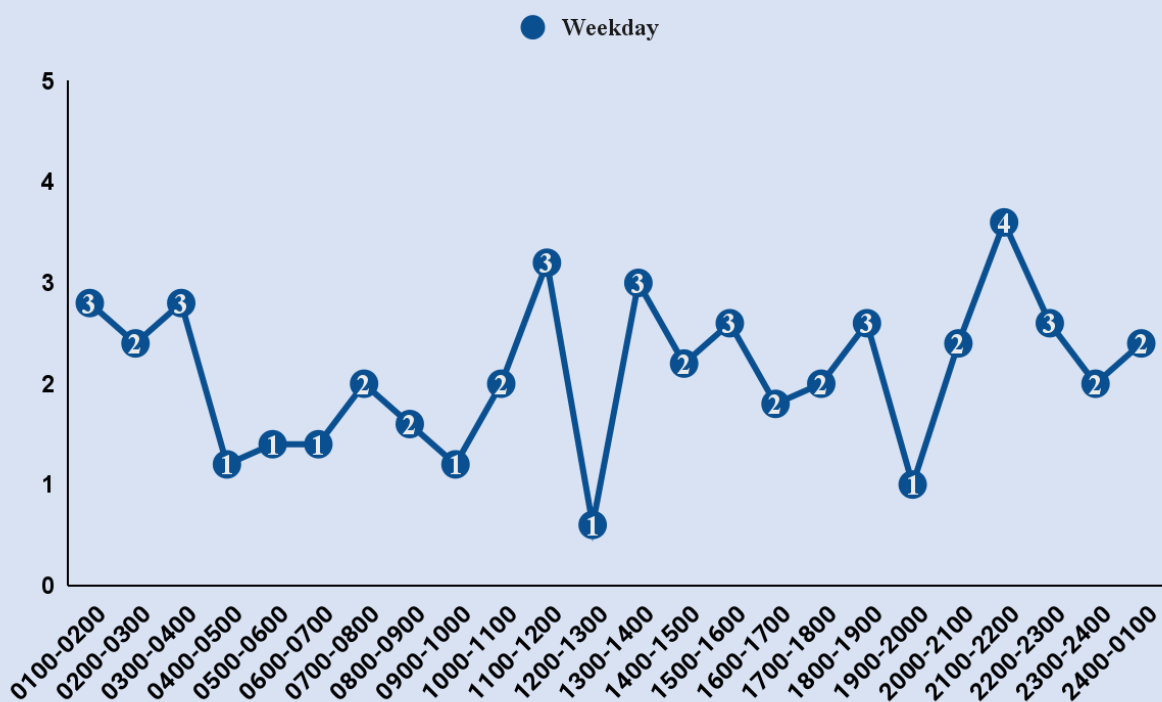


Figure 22

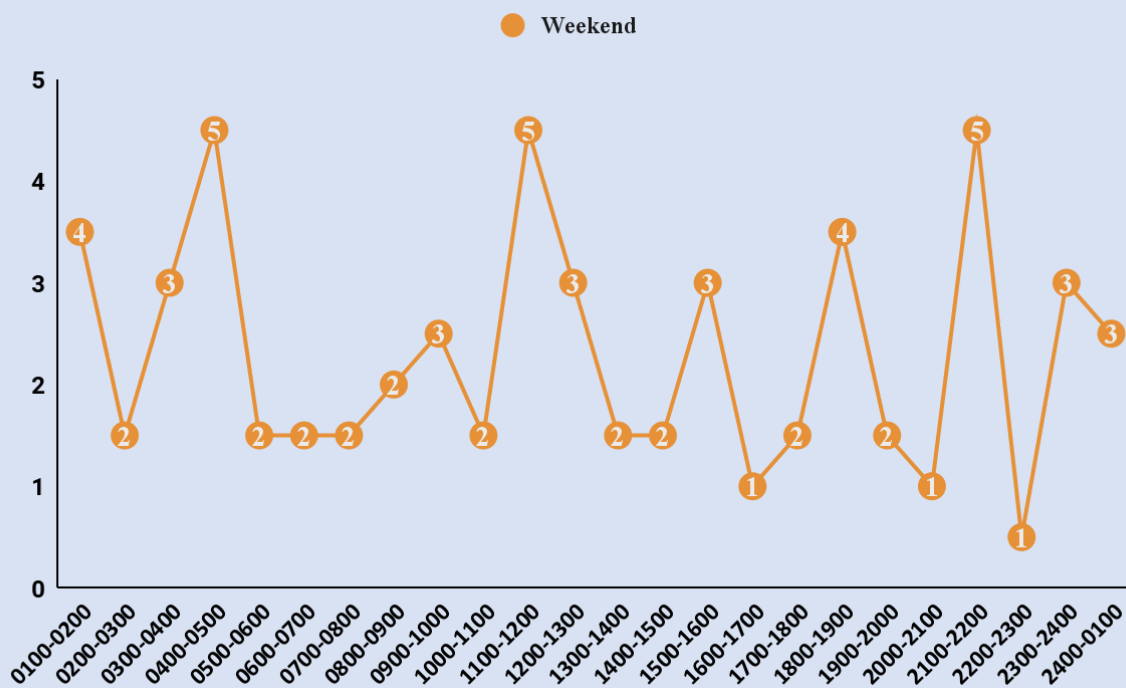


Figure 23

There was no clear pattern in time of day for fatal crashes on weekdays. On weekends, the highest number of fatalities occur during the early morning, midday, and late at night.

Road Crash Deaths by Time and Day of Week, 2020 - 2022

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Grand Total
0100-0200	4	7	7	6	5	4	8	41
0200-0300	11	7	10	5	3	8	6	50
0300-0400	5	4	3	6	13	11	7	49
0400-0500	3	6	6	3	5	8	8	39
0500-0600	3	4	5	7	8	3	5	35
0600-0700	5	4	6	4	3	5	5	32
0700-0800	7	7	6	2	6	5	5	38
0800-0900	8	6	5	7	1	3	6	36
0900-1000	5	6	5	5	5	8	4	38
1000-1100	9	7	1	5	10	4	5	41
1100-1200	13	5	4	7	6	6	12	53
1200-1300	6	5	7	7	7	7	7	46
1300-1400	6	8	13	4	10	6	5	52
1400-1500	7	7	8	8	5	13	2	50
1500-1600	9	7	9	9	6	9	6	55
1600-1700	7	5	7	8	6	7	2	42
1700-1800	7	11	6	6	7	12	2	51
1800-1900	6	7	7	5	8	6	7	46
1900-2000	4	6	8	3	6	6	7	40
2000-2100	6	6	6	5	9	6	3	41
2100-2200	13	12	11	7	5	12	12	72
2200-2300	5	10	8	5	3	2	7	40
2300-2400	15	7	11	7	6	13	9	68
2400-0100	5	10	7	8	4	10	3	47
Total	169	164	166	139	147	174	143	1102

Table 4

The highest number of deaths came from crashes occurring on Monday night between 23:00 to 24:00 hours. On weekends most deaths occurred on Saturday night between 23:00 to 24:00 hours and afternoon between 14:00 to 15:00 hours.



Road Crash Deaths and Injuries by Time and Day of Week, 2022

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Grand Total
0100-0200	7	16	16	16	13	9	14	91
0200-0300	14	7	21	8	9	12	9	80
0300-0400	6	14	6	6	8	12	7	59
0400-0500	4	5	10	3	9	12	18	61
0500-0600	8	5	7	6	9	5	2	42
0600-0700	9	7	7	11	7	11	10	62
0700-0800	14	7	19	12	4	10	9	75
0800-0900	15	6	13	6	11	9	13	73
0900-1000	8	14	16	9	14	10	6	77
1000-1100	22	14	18	22	20	17	12	125
1100-1200	26	18	16	9	12	14	16	111
1200-1300	14	12	19	13	20	18	14	110
1300-1400	14	17	15	9	15	8	12	90
1400-1500	10	11	12	6	17	19	13	88
1500-1600	10	6	16	16	18	12	11	89
1600-1700	17	10	9	8	9	15	10	78
1700-1800	10	12	19	22	18	13	17	111
1800-1900	18	14	23	11	14	8	12	100
1900-2000	14	15	13	13	15	14	9	93
2000-2100	16	13	12	13	22	12	11	99
2100-2200	23	14	9	11	14	9	25	105
2200-2300	10	12	11	17	17	13	8	88
2300-2400	13	11	13	9	14	14	22	96
2400-0100	12	7	5	13	13	16	11	77
Total	314	267	325	269	322	292	291	2080

Table 5

Table 5 shows fatal and non-fatal injuries were more frequent between 21:00 to 24:00 hours on weekends. On weekdays there were generally more injuries in the evenings.

DISTRIBUTION OF FATALITIES BY LOCATION

Fatal & Non-Fatal Injuries attributed to Drink - Driving 2015 - 2022

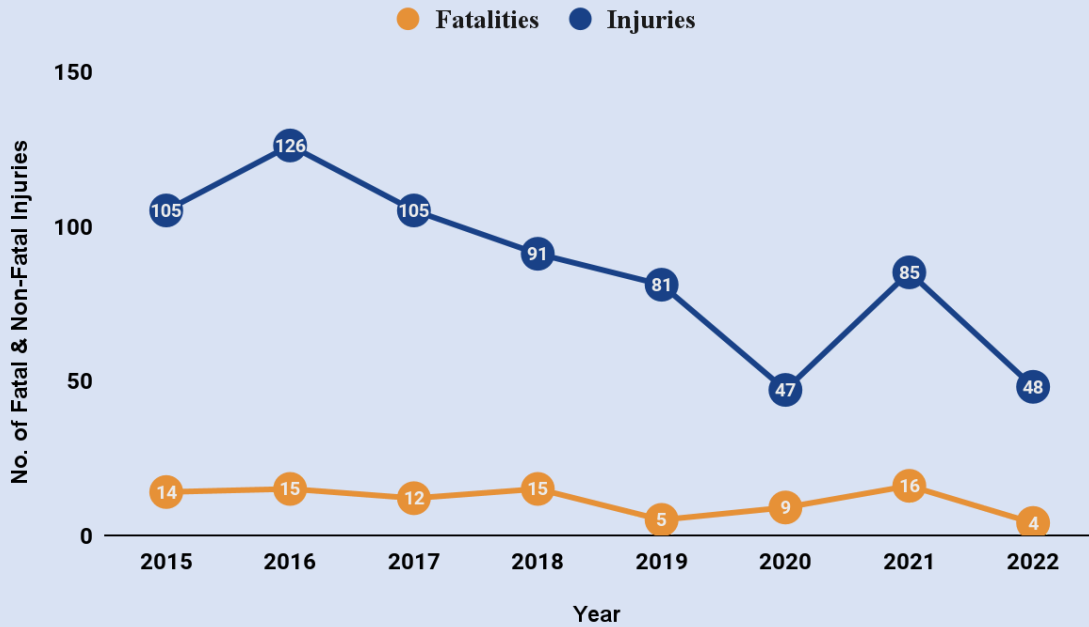


Figure 24

Figure 26 shows that deaths and injuries attributed to drink driving have gone down in 2022. These figures may be underestimated due to limitations in alcohol testing. The numbers only reflect an alcohol charge given by the police.



Causes of Fatal and Non-Fatal Injury Crashes, 2022

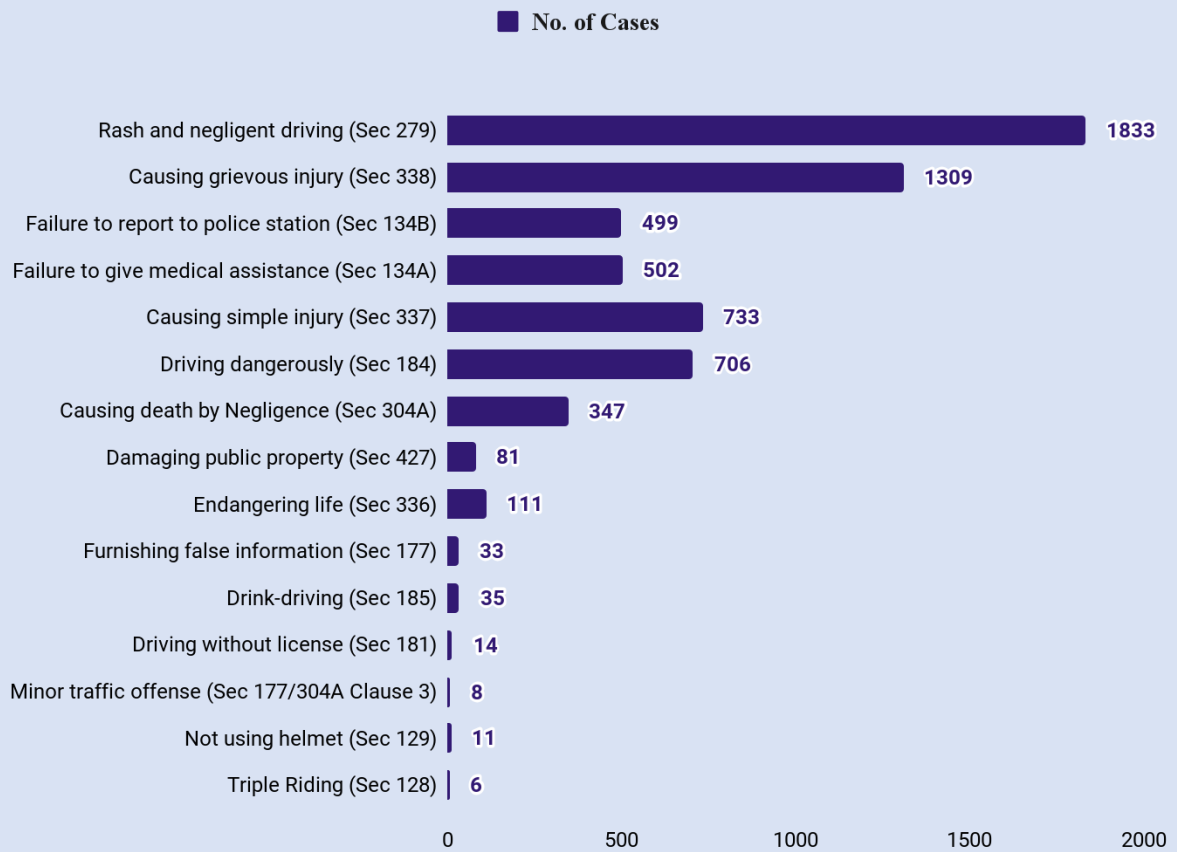


Figure 25
List of causes associated with fatal or injury crashes cited in 2022.



High Risk Corridors, 2020 - 2022

Rank	Road Name	Deaths per km	Injuries per km	Deaths & Injuries per km	Fatal 2020-22	Serious Injuries 2020-22	Total
1	Dr Babasaheb Ambedkar Marg (1.22km)	12	41	53	15	50	65
2	NS Road (1km)	3	25	28	3	25	28
3	Ghatkopar - Mankhurd Link Road (4km)	5	12	17	18	47	65
4	Western Express Highway (25.33km)	4	10	14	99	241	340
5	Eastern Express Highway (23.55km)	3	6	9	67	141	208
6	New Link Road (10km)	2	7	9	17	67	84
7	Jogeshwari - Vikhroli Link Road (10.6km)	3	5	8	29	51	80
8	Swami Vivekanand Road (25km)	1	5	6	29	128	157
9	Marve Road (7.72km)	1	5	6	8	40	48
10	Bombay Port Trust Road (3.9km)	2	4	6	9	16	25
11	Sion Panvel Highway (9.1km)	1	4	5	13	39	52
12	Senapati Bapat Marg (11.2km)	2	3	5	17	34	51
13	LBS Marg (21km)	1	3	4	14	72	86
14	Santacruz Chembur Link Road (6.45km)	2	2	4	15	16	31
15	Eastern Freeway (16.8km)	1	2	3	18	32	50

Table 6

Dr. Babasaheb Ambedkar Marg and NS Road continue to have the highest number of deaths per kilometer. However, Western Express Highway and Eastern Express Highway have recorded the highest total number of fatal and serious injuries. These corridors once prioritized for interventions represent the highest potential to reduce the overall road risk in the city. This list also includes two new roads in addition to the list published in the 2021 annual report.

Blackspot Junctions, 2020 - 2022

Rank	Junction Name	Fatalities 2020-2022 within 250mt radius	Serious Injuries 2020-2022 within 250mt radius	Grand Total
1	Intersection of Western Express Highway and Sion Bandra Link Road (Kalanagar Junction)	15	36	51
2	Amar Mahal Junction Tilak Nagar Ghatkopar	13	37	50
3	Intersection of JVLR and Eastern Express highway	12	26	38
4	Intersection of Western Express Highway and Jawaharlal Neharu Road	7	26	33
5	Intersection Of Ghatkopar Andheri Link Road and Eastern Express Highway	8	17	25
6	Intersection of Sion Panvel Highway and Ghatkopar Mankhurd Link Road	10	14	24
7	Intersection of Ghatkopar Mankhurd Link road and Eastern Freeway	5	19	24
8	Sion Circle Junction (Rani Laxmi Bai Udyan)	4	18	22
9	Priyadarshini Junction	4	17	21
10	Intersection of JVLR and Western Express highway	3	17	20
11	Intersection of Western Express Highway and Akurli Road	6	13	19
12	Sanjay Ghandhi National Park Junction	6	13	19
13	Intersection of Goregaon Mulund Link Road and Western Express Highway	5	14	19
14	Intersection of Western Express highway and N.S.Phadake Marg	4	11	15
15	King Circle Junction, Matunga	3	12	15

Table 7

The table above shows the road junctions with the greatest number of fatal and serious injuries in the past three years. The Kalanagar Junction and Amar Mahal junction recorded the most deaths and injuries during that time. This list includes one new junction in addition to the list published in the year 2021 annual report.

Technical note: Fatal and serious injuries were searched within 250 meters of radius for each junction for the past three years.

EEH - Eastern Express Highway
WEH - Western Express Highway
JVLR - Jogeshwari Vikhroli Link Road

Road User Fatalities by Road User Type and Zone, 2022

Zone	Cyclists	Four Wheeler Occupants	2&3 Wheeler Occupants	Pedestrians	Grand Total
Port	1	1	9	3	14
Zone I	0	0	4	9	13
Zone II	1	0	1	10	12
Zone III	0	2	7	14	23
Zone IV	0	3	11	16	30
Zone IX	0	0	11	13	24
Zone V	0	0	8	11	19
Zone VI	1	4	28	29	62
Zone VII	0	3	23	14	40
Zone VIII	1	3	23	6	33
Zone X	2	0	15	12	29
Zone XI	0	0	20	7	27
Zone XII	0	2	20	17	39
Total	6	18	180	161	365

Table 8

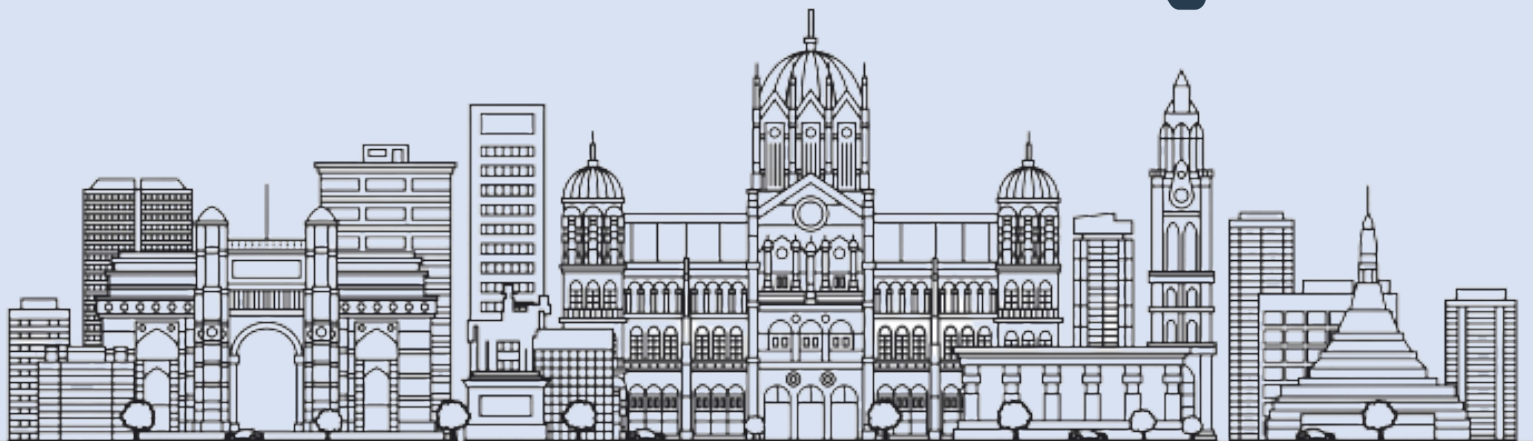
Table 8 shows that the highest number of pedestrian deaths occurred in Zone VI. On the other hand, two- and three- wheeler occupant deaths were most frequent in Zone VI.

Note: Zone is the sub-head administration authority of a group of police stations in Mumbai.

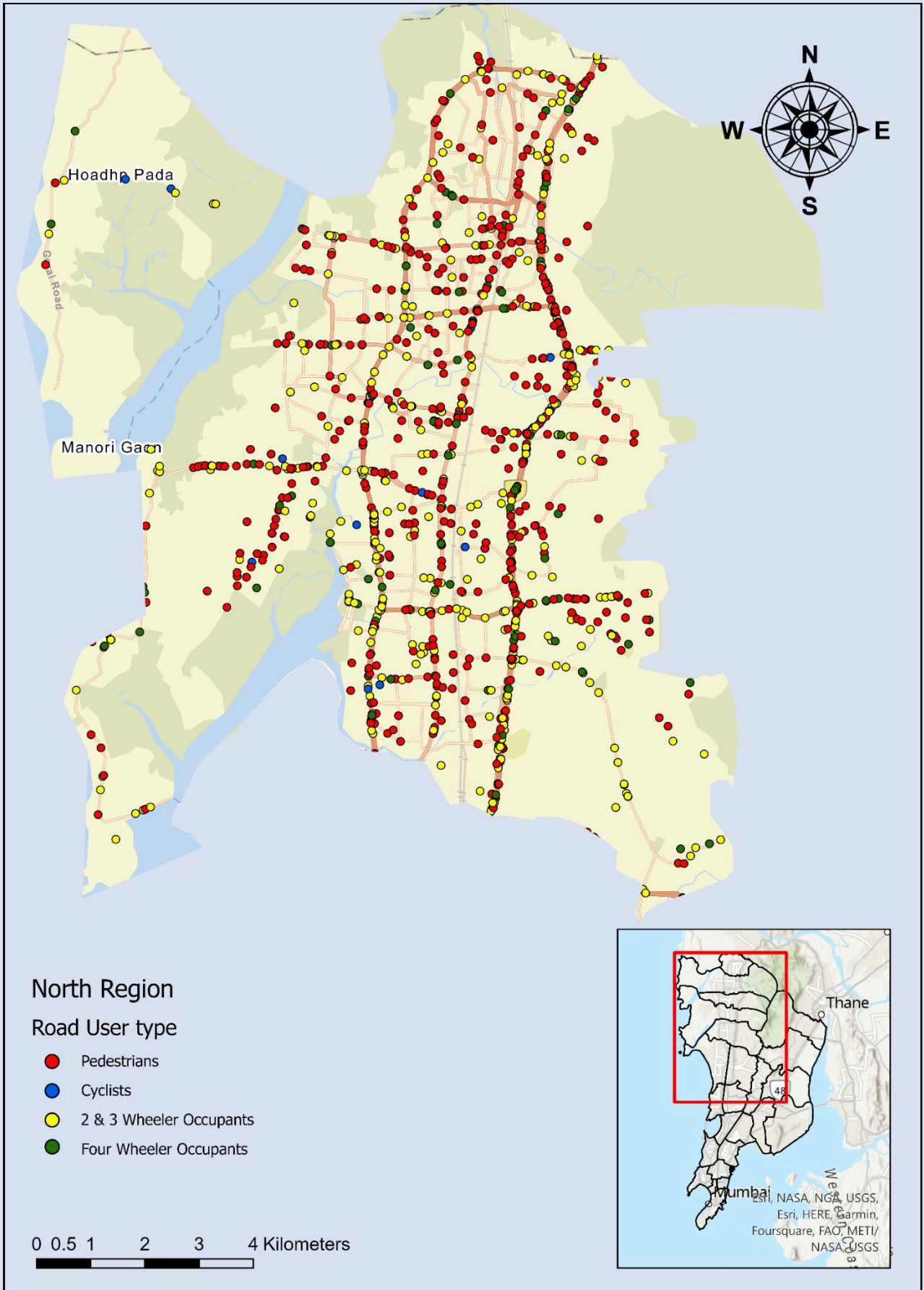


CRASH MAPS, 2019 - 2022

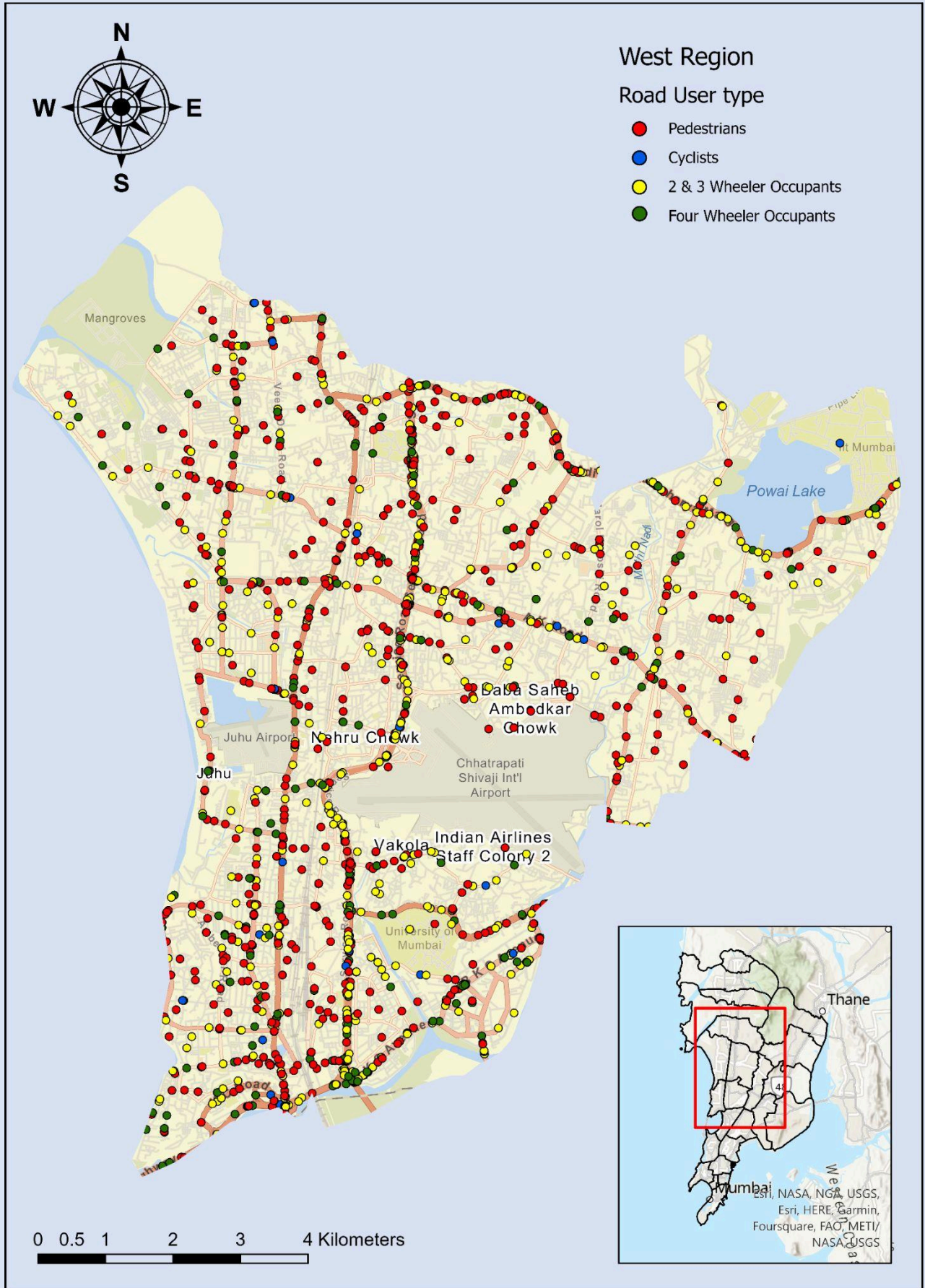
Mumbai is divided into five regions: North, West, East, Central, and South. The following spot maps show fatal and injury crashes across Mumbai by region for the years 2018 - 2022. These maps also show the road user types by colour.



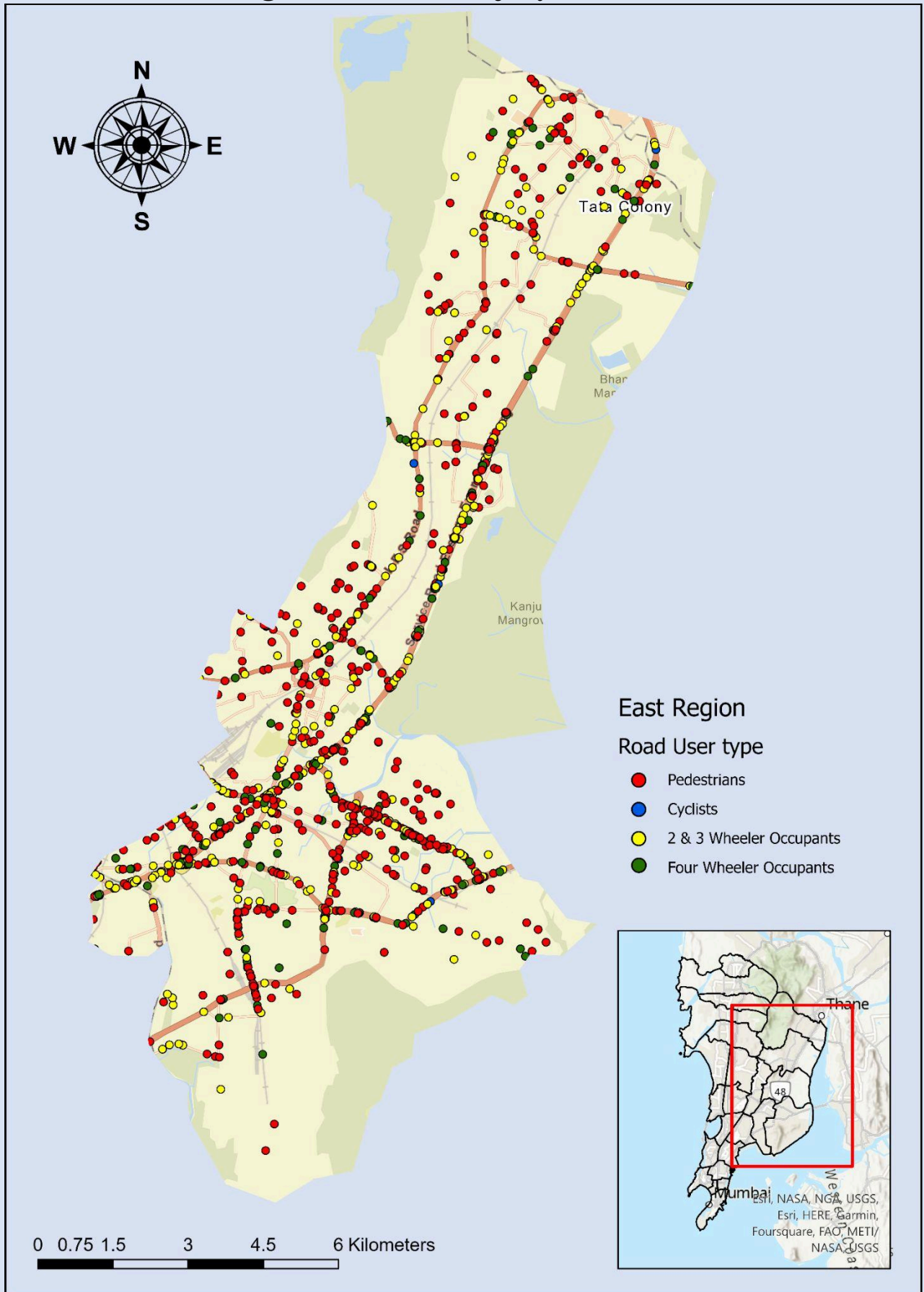
Mumbai North Region, Fatal and Injury Crashes, 2020 - 2022



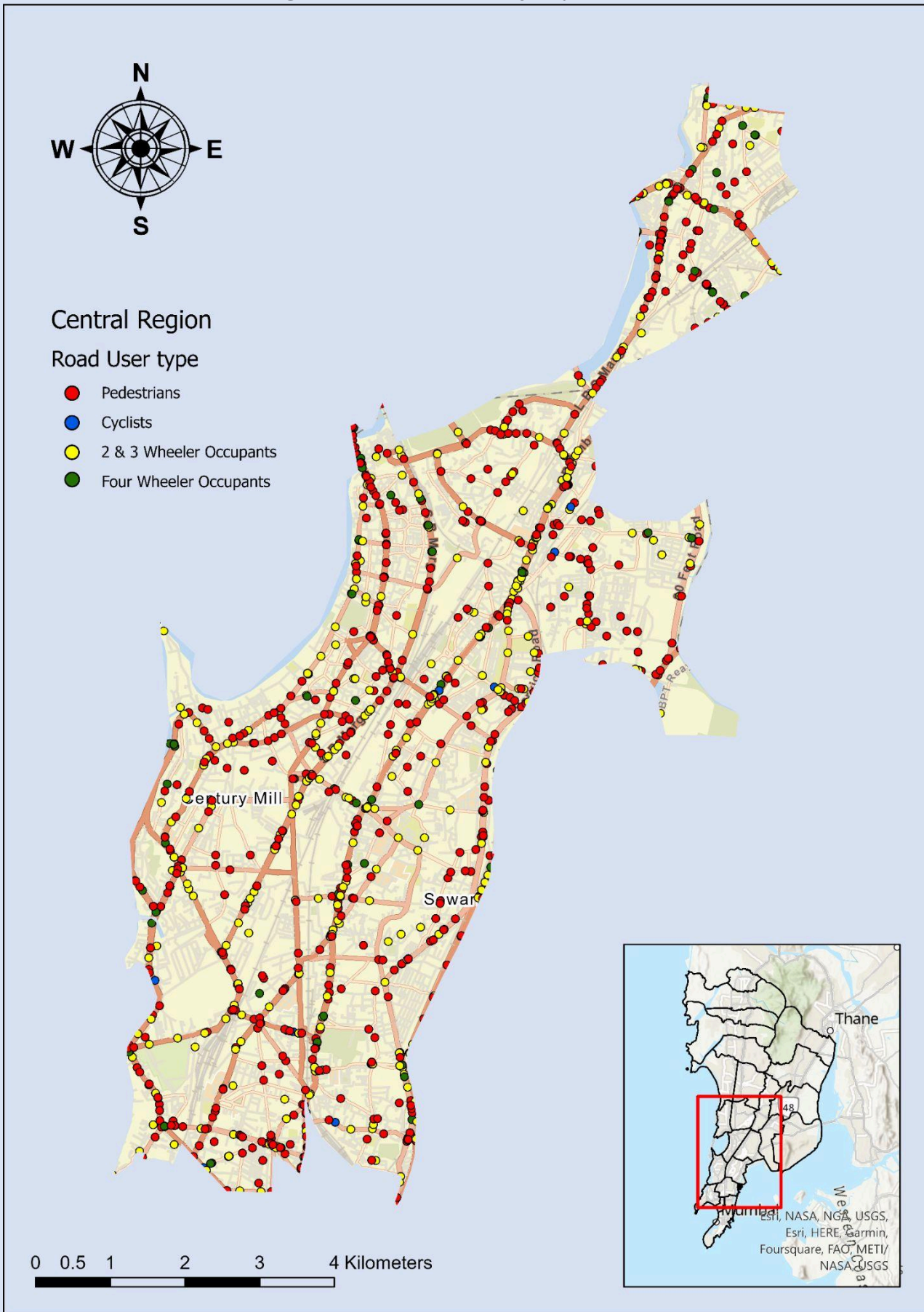
Mumbai West Region, Fatal and Injury Crashes, 2020 - 2022



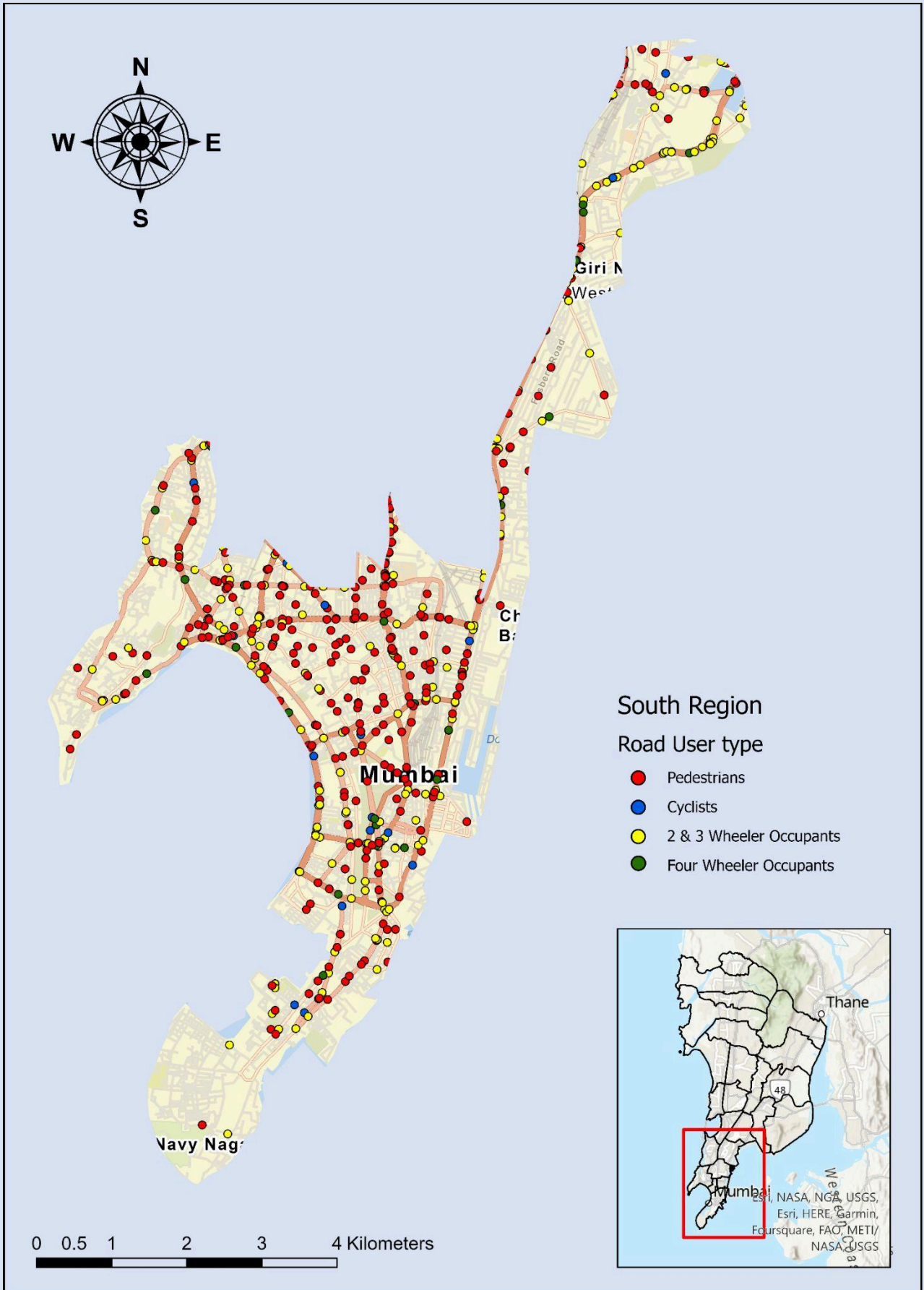
Mumbai East Region, Fatal and Injury Crashes, 2020 - 2022



Mumbai Central Region, Fatal and Injury Crashes, 2020 - 2022



Mumbai South Region, Fatal and Injury Crashes, 2020 - 2022



HEAT MAP OF FATAL CRASHES, 2020 – 2022

The following heat map shows the density of fatal and injury crashes throughout Mumbai in the past three years. The crash frequency is reflected in the “heat” or orange to red colours, indicating higher frequency of fatal crashes. This provides a visual map of high risk locations throughout Mumbai which helps identify priorities for targeted enforcement and engineering interventions.

