Road Safety Report

Bengaluru Metropolitan Region

(2019 to 2022)

ACKNOWLEDGEMENTS

FOREWORD

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Road crash injuries are the 8th leading cause of death globally and the leading cause of death among those aged between 5-29 years. India witnesses 11% of the global road crash deaths as per the WHO Global Status Report on Road Safety 2023. Karnataka state accounts for 8.6% of the national share of road crash fatalities with the loss of 11,702 precious lives on the roads in 2022, higher than the last five years. The Bengaluru Metropolitan Region reported 1,724 deaths which is 15% of total fatalities in the state.

Post the lifting of mobility restrictions in late 2021, the number of crashes, deaths and injuries have been on an alarming rise in Karnataka. High-quality reliable data on road safety must serve as the base to plan evidence-based targeted interventions jointly by all the stakeholders. It also enables the Government to identify road safety challenges, frame effective policies, earmark adequate funding, and monitor the effectiveness of policies, implementation and investments.

This report presents the global best practices and methodologies used to analyse road safety data as well as highlights key elements of the dataset that are vital to making important decisions at the higher levels of the government. Through the heatmaps of blackspots and high-risk corridors, it identifies the areas that need immediate attention so that stakeholders can take preventive and corrective measures. This is the way forward to improve road safety data for analysis and policy-making and the Karnataka State Police is committed to ensure the same.

I would like to thank the Bloomberg Philanthropies Initiative for Global Road Safety and its partner Vital Strategies for their technical support in analysing the data in this report. The Police Department is also working with Vital Strategies to strengthen the surveillance data systems available at the department for their better usage in improving road safety within the Bengaluru Metropolitan Region. I would also request the citizens to support the Government by obeying traffic rules so that we can make Karnataka safer for all.

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ABBREVIATIONS

BIGRS	**Bloomberg Philanthropies Initiative for Global Road Safety**
BMR	**Bengaluru Metropolitan Region**
BTP	**Bengaluru Traffic Police**
KSP	**Karnataka State Police**
KSRSA	**Karnataka State Road Safety Authority**
LMV	**Light Motor Vehicle (includes cars, taxis and vans)**
HMV	**Heavy Motor Vehicle (includes bus, trucks, lorries)**
MoRTH	**Ministry of Road Transport and Highways**
NH	**National Highway**

EXECUTIVE SUMMARY

Over 6,500 people died on the roads of the Bengaluru Metropolitan Region (BMR) between 2019 and 2022. Road crash fatalities in the region fell by up to 20% in 2020 and 2021. In 2022, fatalities increased by 19% compared to the previous year, returning to levels not recorded since 2019. While highlighting the impact of restrictions on mobility due to the Covid-19 pandemic, this overall trend in fatalities underscores a worrying reality where the roads of the BMR are not safer than they were four years ago.

Seven out of 10 victims were between 20 and 60 years of age. Nearly nine out of 10 lives lost were those of vulnerable road users – 57% of victims were motorcycle users while 28% were pedestrians. Most pedestrians were killed in fatal collisions with motorcycles (27%) and light motor vehicles (25%).

There were 112 dangerous locations, or blackspots[1], in the BMR where road crashes claimed at least five lives over three consecutive calendar years in the aforementioned period. Nine corridors, or stretches of road, in various parts of the BMR were identified to be extremely dangerous for all road users – 10 or more lives were lost per kilometre of these corridors totalling 60 kilometres in length.

This report presents these findings by visualising road crash fatality data disaggregated in terms of road user groups, their gender and age groups, who-hit-whom matrices and heatmaps presenting temporal distribution of fatal crashes. Further, road crash fatalities in the BMR have been mapped to enable the identification of high-risk corridors and blackspots in the region.

The analyses presented aim to provide inputs to strengthen surveillance data systems, improve safety at blackspots, and inform mass media campaigns. The findings and recommendations of this report guide and empower key actors and stakeholders in BMR to build safer roads for all road users.

[1]Ministry of Road, Transport, and Highways (MORTH). (2015.) Protocol for identification and rectification of road accident blackspots on National Highways

1. INTRODUCTION

Road crashes are the leading cause of death worldwide for young people between 5 and 29 years of age. They are the 12th leading cause of death for all ages[2] .

Between 2019 and 2022, 6,19,830 lives were lost in India due to fatal road crashes. Karnataka accounted for 39,456 (6.4%) of those lives lost[3] .

The roads of the three districts of the Bengaluru Metropolitan Region (BMR) – Bengaluru Urban, Bengaluru Rural and Ramanagara – have witnessed at least 15% of all road crash fatalities in the state since 2019[4] , making them among the least safe in Karnataka.

Bengaluru Metropolitan Region
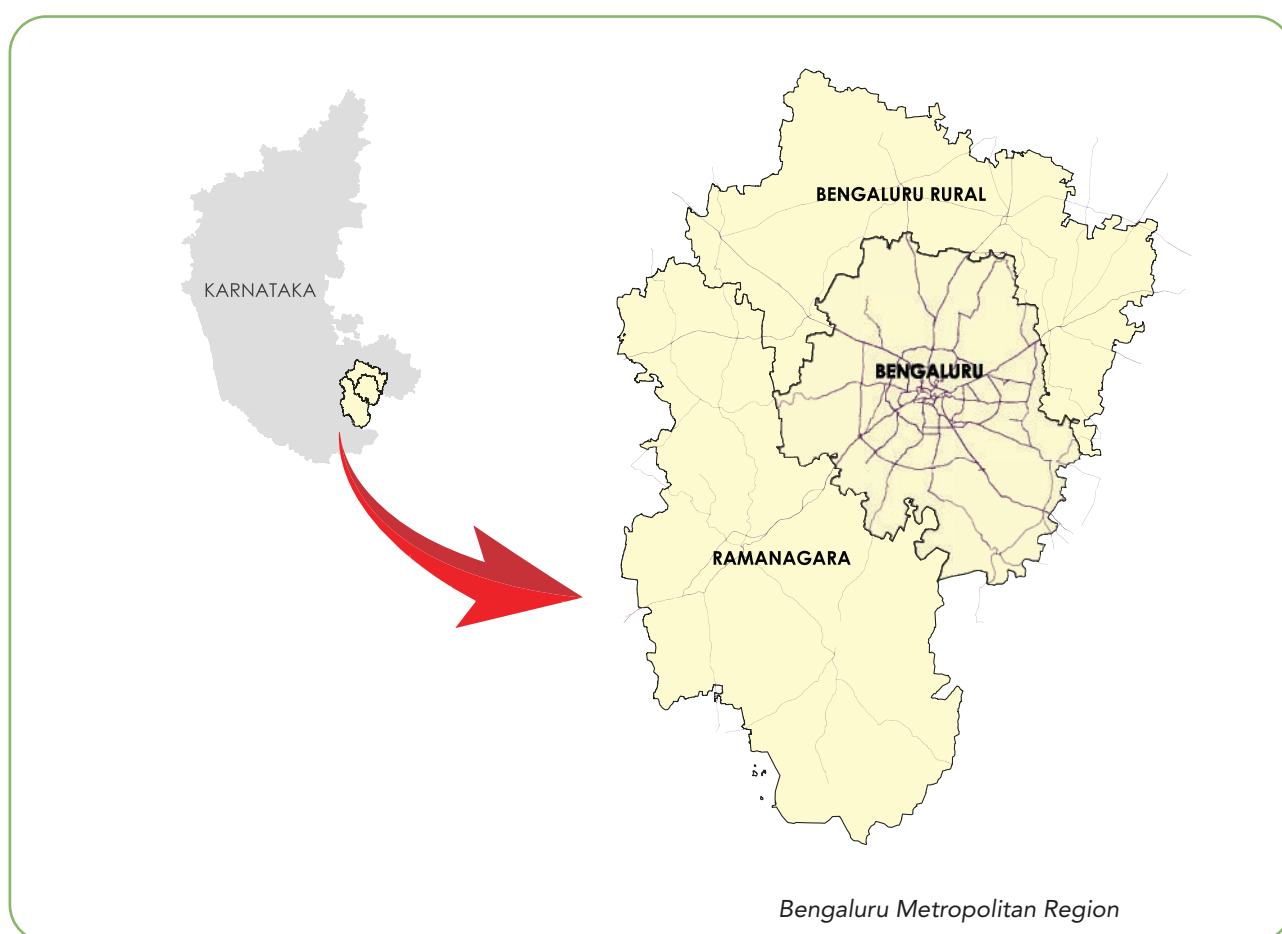
This report presents an analysis of fatal road crashes and fatalities in the BMR and each of its constituent districts from 2019 to 2022. The report also documents changes in trends in road fatalities during periods of restricted mobility due to the Covid-19 pandemic in 2020 and 2021.

The report is aimed at enabling a better understanding of fatal road crashes in the BMR by identifying vulnerable road user groups, locating blackspots and dangerous stretches of road, and other relevant factors to inform targeted interventions to improve road safety in the region. This report was prepared by analysing data collected and maintained by the Karnataka State Police (KSP).

[2]WHO(2023) Global Status Report on Road Safety
[3]MoRTH (2022) Road Accidents in India
[4]Karnataka State Police (2022) Road Accidents in Karnataka

2. METHODOLOGY

This report presents an analysis of data collected by the KSP during the registration and investigation of road crashes leading to fatalities in Bengaluru Urban, Bengaluru Rural and Ramanagara districts.

2.1 Crash Data Collection

Crash data collection by KSP begins immediately after a road traffic crash. Upon being notified of a crash, an Investigating Officer (IO) is dispatched to the crash site from the local police station.

At the crash site, the IO's duties include the transferring of victims to hospitals, the securing of vehicles involved in the crash and the collection of evidence and statements from witnesses. This forms the basis for the filing of the First Information Report (FIR) on the Police IT System, which is the first step in the preparation of a crash case file. The case file is further updated by the IO with data collected at each stage of the investigation.

This data from the crash case file contains both identifiable variables, including name and address of persons involved in the crash, and non-identifiable variables such as the location of the crash site, date and time of the crash, vehicle types involved in the crash, etc. Non-identifiable or non-personal data is data that does not contain any information that can be used to identify people involved in an event.

Non-identifiable data on fatal crashes registered from 2019 to 2022 in the BMR was provided by KSP to the Karnataka State Road Safety Authority (KSRSA) in the form of spreadsheets containing information on relevant parameters or variables from crash case files. These spreadsheets were made available to the Bloomberg Philanthropies Initiative for Global Road Safety (BIGRS) embedded team of the Karnataka Government.

2.2 Data Entry

As a first step, a data entry form with standardised indicators was designed in Microsoft Excel to organise the data received from the police. This data entry form enabled the conversion of the electronic dataset received from the police into a relational database better suited for analysis. The relational database contains three separate worksheets enumerating the details of the crash event, vehicles involved and person involved, linked using key variables.

2.3 Data Cleaning and Analysis

Once the first round of data entry was complete, the data entry team then consulted FIRs and chargesheets, and sought support from police stations to address data quality issues. The most common of these issues were missing data, especially the complete address of the crash site, updates to the severity of injuries sustained by victims and insufficient description of the crash event.

Once the issues were identified, interventions on the dataset were implemented to prepare it for analyses. For instance, details of individual vehicles involved in fatal crashes were organised into broader vehicle categories. Further, the geocoding of crash locations based on the address of the crash site or verifications of coordinates provided by the police was undertaken. The data on crashes and victims was also matched with the counts maintained at police stations.

The cleaned data was analysed using R Programming and the Geographic Information System (GIS) mapping of fatal crashes was done using QGIS. Both are open-source applications. The summary statistics were generated using Microsoft Excel. Blackspots were identified using the definition prescribed by MoRTH, which states that "a blackspot is a stretch of National Highway of about 500m in length in which either five road accidents took place in the last three calendar years, or 10 fatalities took place during the last three calendar years".

The analyses presented in this report were organised along administrative boundaries of the BMR.

2.4 Review

This report was reviewed and finalised by the Karnataka State Police and Karnataka State Road Safety Authority. It is important to note in this report that both of these agencies have consciously done away with the usage of traditional terminology of 'accidents' and have replaced the same by the term 'crashes'. This is owing to the fact that while 'accident' implies inevitable, unpredictable, and unmanageable nature of event, 'crashes' imply events that are amenable to rational analysis and remedial action. The agencies are cognizant of the fact that the way road crashes are framed plays a crucial role in how the masses perceive the issue and what can be done about it. It is believed that by adopting this significant change in reporting crashes, public support can be bolstered for demanding policy solutions to road crashes, such as for the implementations of drink driving checkpoints, speed cameras, reduced speed limits, helmet clasping laws, and more.

2.5 Report Preparation

3. ROAD SAFETY SITUATION IN THE BMR

3.1 Fatal Crashes and Fatalities in the BMR

A total of 6,219 fatal road crashes and 6,512 fatalities were recorded by the police in the BMR from 2019 to 2022.

Trends in fatal crashes and fatalities remained constant between 2015 and 2019, were in decline during 2020 and 2021 and most recently, saw an increase in 2022 of 21% in fatalities and 19% in fatal crashes compared to the previous year. Fatalities in 2022 were also over 11% higher than the average number of crash fatalities registered from 2019 to 2021 in the BMR.

Fig 3.1 Fatal Crashes and Fatalities

Bengaluru Metropolitan Region, 2019-22

Data Source: Karnataka State Police
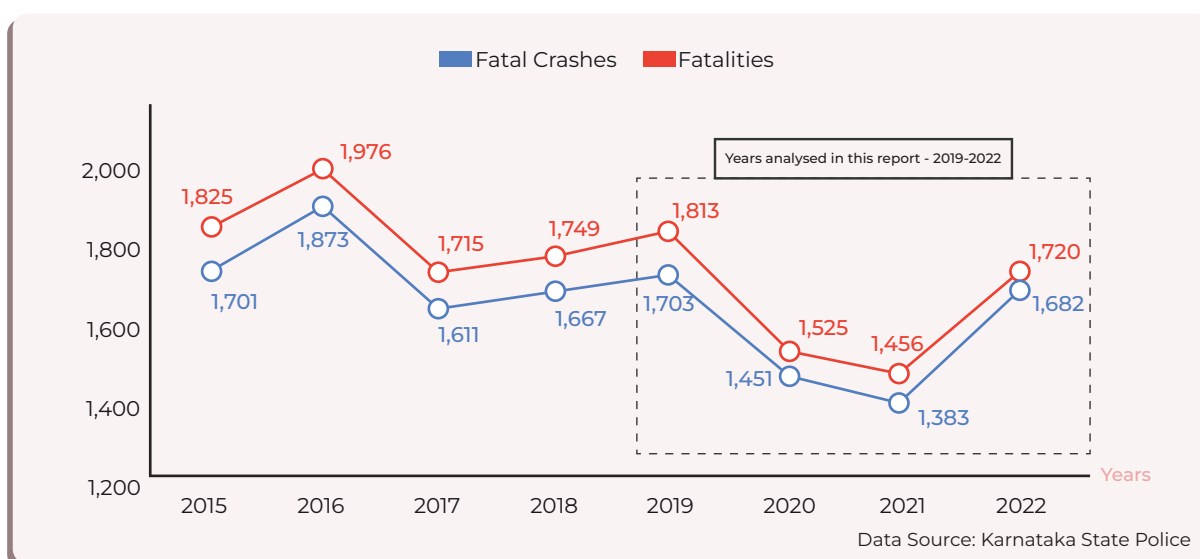
3.2 Fatal Crashes by Road User Categories in the BMR

The following graphs describe crash fatalities suffered by various road user groups in the BMR from 2019 to 2022. Motorcycle users and pedestrians were among the road user groups that lost the most lives, suffering 5,604 deaths – 86% of all lives lost on the roads of the Bengaluru Metropolitan Region.

Fig 3.2.1 Share of fatalities among road user groups
Bengaluru Metropolitan Region, 2019-22
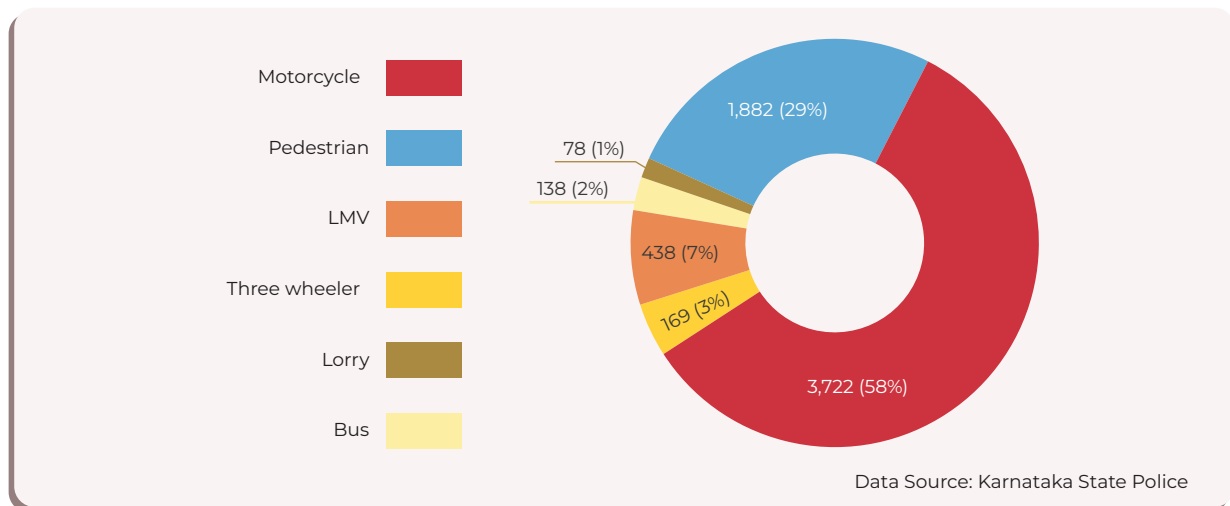
Legend:
- Motorcycle
- Pedestrian
- LMV
- Three wheeler
- Lorry
- Bus

1,882 (29%)
78 (1%)
138 (2%)
438 (7%)
169 (3%)
3,722 (58%)

Data Source: Karnataka State Police

Fig 3.2.2 Fatalities by Road User Groups
Bengaluru Metropolitan Region, 2019-22

Legend: Motorcycle, Pedestrian, LMV, Three Wheeler

Fatalities

Motorcycle: 948 (2019), 916 (2020), 873 (2021), 985 (2022)
Pedestrian: 570 (2019), 426 (2020), 380 (2021), 506 (2022)
LMV: 119 (2019), 100 (2020), 106 (2021), 113 (2022)
Three Wheeler: 50 (2019), 40 (2021), 42 (2022)

Years

Data Source: Karnataka State Police
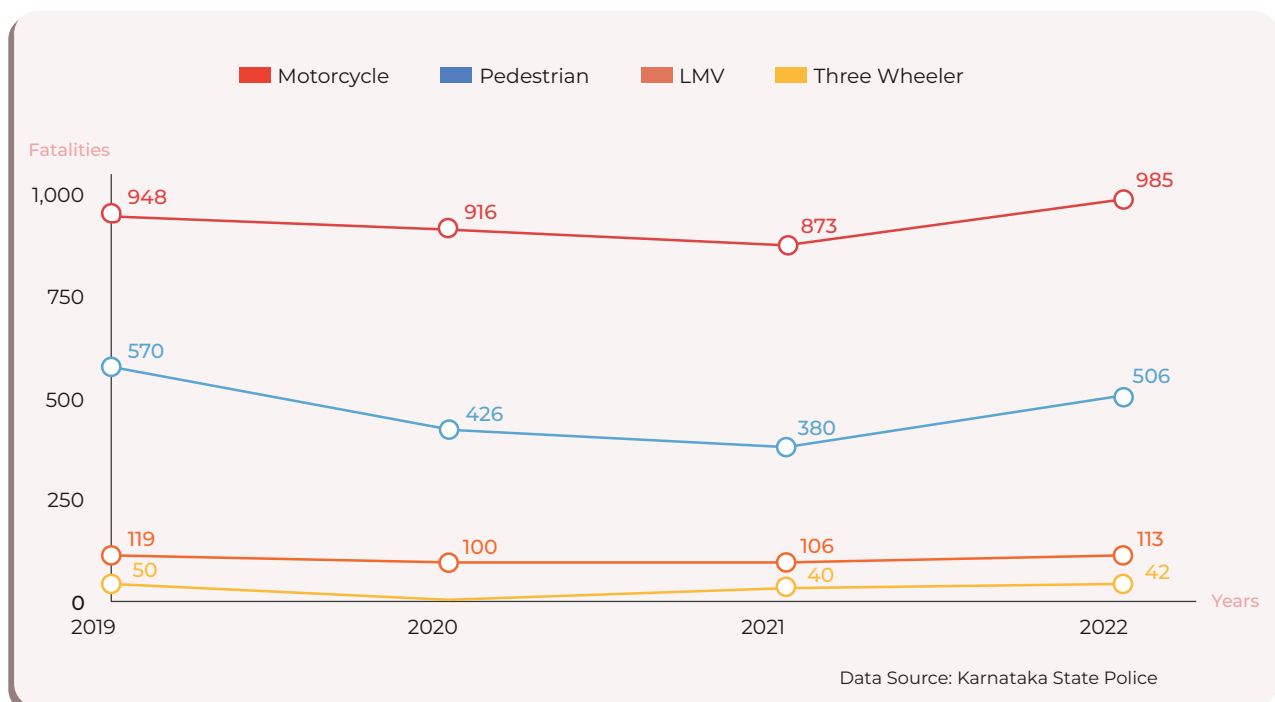
3.3 Fatal Hit and Run Cases in the BMR

The following graphs describe fatal road crashes in the BMR that were hit and run cases. Between 2019 and 2022, Bengaluru Traffic Police (BTP), Bengaluru Rural District Police and Ramanagara District Police had recorded 758 fatal hit and run crashes, or 12.2% of all 6,219 fatal crashes registered. Hit and runs were unknown in the case of 42 fatal crashes (0.7%).

Fig 3.3 Hit and Run crashes among Fatal Crashes.
Bengaluru Metropolitan Region, 2019-22

Legend: Not hit and Run | Hit and Run

2019: 214 (13%), 1,485 (87%)
2020: 214 (12%), 1,276 (88%)
2021: 137 (10%), 1,229 (90%)
2022: 237 (14%), 1,429 (86%)

Data Source: Karnataka State Police
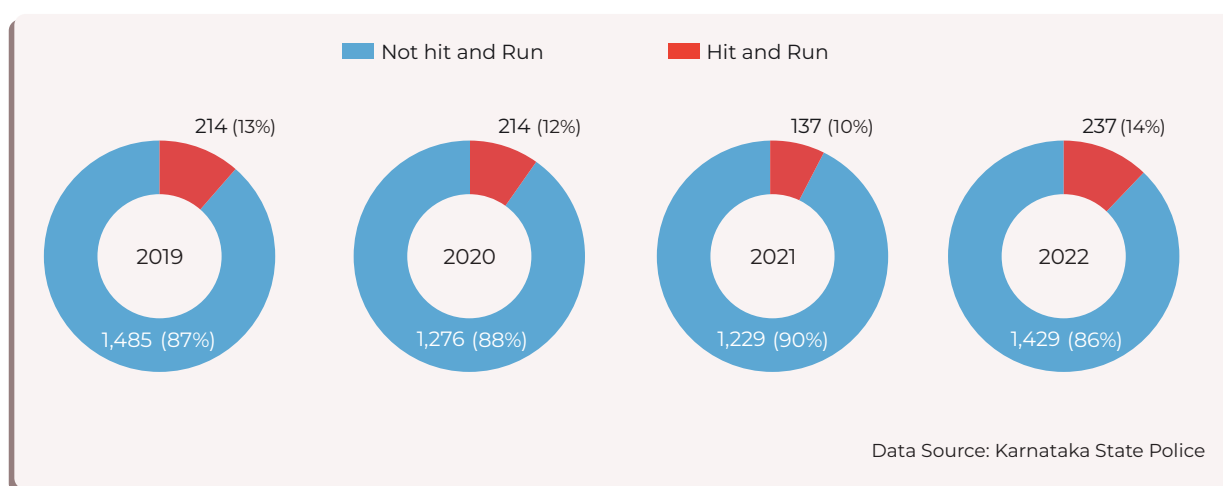
3.4 Road Crash Victims by Age and Gender

In terms of age of persons who lost their lives in fatal road crashes, 23.8% of victims were between 20 and 29 years old. A total of 4,449 victims (68.3%) were between 20 and 60 years of age as shown in Fig 3.4.1. The age of the victim was unknown in the case of 854 persons (13.1%).

Fig 3.4.1 Distribution of Road Traffic Fatalities - by Age
Bengaluru Metropolitan Region, 2019-22

Fatalities by Age:
- 0-9 years: 92
- 10-19 Years: 306
- 20-29 Years: 1,552
- 30-39 Years: 1,165
- 40-49 Years: 925
- 50-59 Years: 807
- Over 60 Years: 811

Data Source: Karnataka State Police
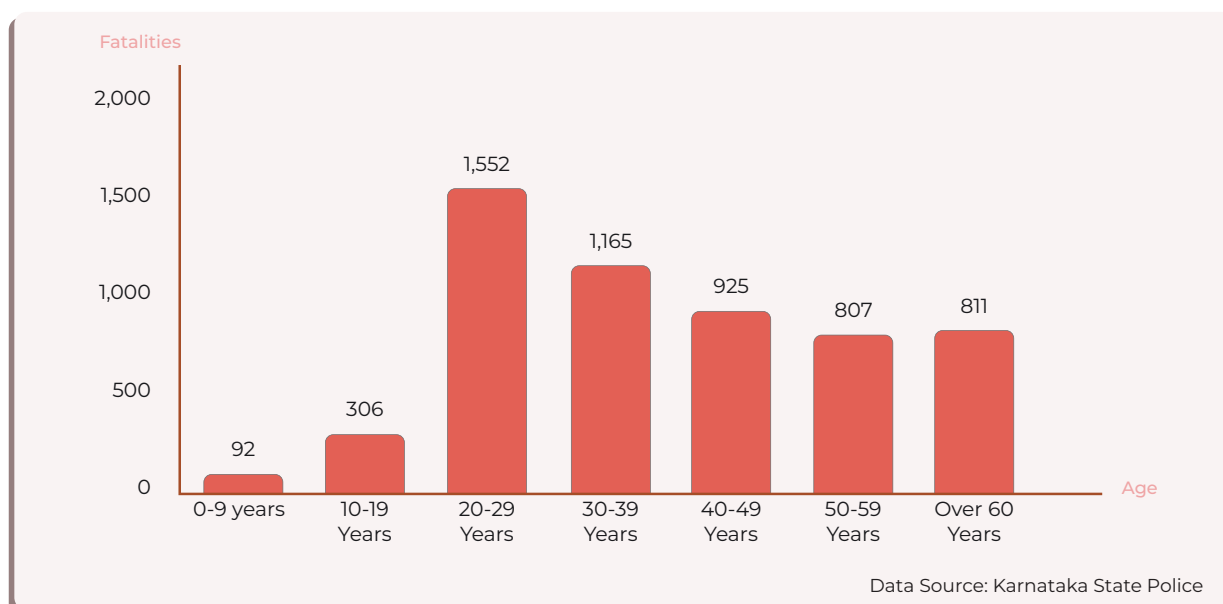
More men lost their lives on the roads of the BMR than women. In all, 5,533 victims were identified as male and 858 victims as female.

Fig 3.4.2 Fatalities by Road User Groups

Bengaluru Metropolitan Region, 2019-22

Male   Female

858 (13%)

5,533 (87%)

Data Source: Karnataka State Police
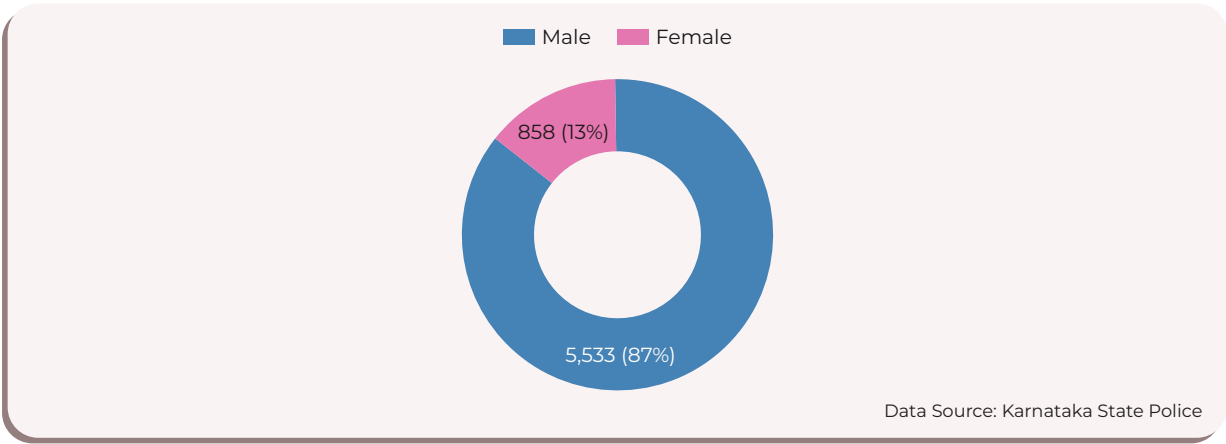
Most male deaths belong to the 20 to 29 age groups. On the other hand, most female deaths are over 60 years old.

Fig 3.4.3 Fatalities by Road User Groups

Bengaluru Metropolitan Region, 2019-22

Male   Female

Female	Age	Male
41	0-9 years	51
45	10-19 Years	261
117	20-29 Years	1,435
124	30-39 Years	1,041
138	40-49 Years	787
135	50-59 Years	672
167	Over 60 Years	644

Fatalities
1,500   1,000   500   0

0   500   1,000   1,500   Fatalities

Data Source: Karnataka State Police

8
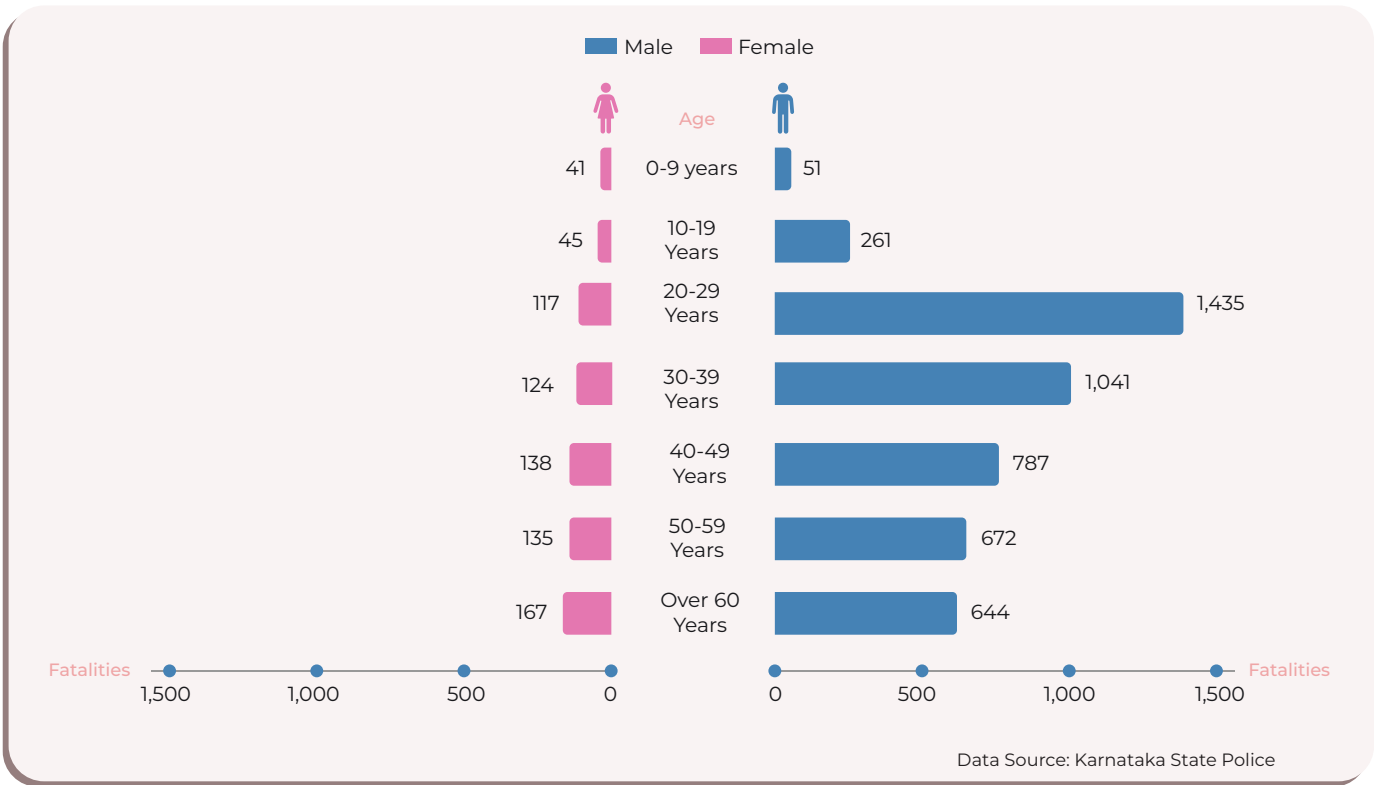
3.5 Distribution of fatal crashes in the BMR by time-of-day and day-of-week

Nearly 30% of all lives lost on the roads of the BMR from 2019 to 2022 were as a result of fatal crashes that occurred on Saturdays and Sundays.

The two hour period between 6 pm and 8 pm was the most unsafe in this period, claiming 930 lives (15%) as shown in Fig 3.5.1 below. Approximately 36% of lives were lost from 4 pm to 10 pm

Fig 3.5.1 Distribution of Fatal Crashes in the BMR - by time-of-day and day-of-week

Bengaluru Metropolitan Region, 2019-22

Crash Time	12am to 2am	2am to 4am	4am to 6am	6am to 8am	8am to 10am	10am to 12pm	12pm to 2pm	2pm to 4pm	4pm to 6pm	6pm to 8pm	8pm to 10pm	10pm to 12am	TOTAL
Sun	90	38	70	75	77	79	82	90	117	165	117	48	1,048
Mon	71	29	47	65	99	87	69	88	94	139	101	35	924
Tue	68	28	59	74	70	74	79	83	95	122	95	42	889
Wed	57	21	42	54	85	71	72	82	71	124	84	32	795
Thu	52	28	50	63	60	82	78	69	65	119	92	36	794
Fri	65	39	50	63	76	69	59	74	104	119	96	37	851
Sat	69	33	47	59	81	72	55	95	70	142	98	53	874
TOTAL	472	216	365	453	548	534	494	581	616	930	683	283	6,175

0   50   100   150   200

Crashes

Data Source: Karnataka State Police

3.6 High Risk Corridors in the BMR

Table-1 describes road corridors with the highest number of crash fatalities registered by the BTP from 2019 to 2022. These corridors were identified through a visual inspection of fatalities plotted on the map and their densities along major roads of the BMR using QGIS. The corridors identified have been ranked in the descending order of crash fatalities per kilometre.

Table-1 HIGH RISK CORRIDORS IN THE BMR

CORRIDOR (Length)	ROAD NAME	FATALITIES (2019-22)	FATALITIES PER KM
1. Hebbagodi Metro Station to Chandapura Rail Bridge (4.3km)	NH-44	97	23
2. Neraluru Bus Stop to Attibele Toll Gate (5.4km)	NH-44	101	19
3. Anchepalya to Sondekoppa Junction (9.6km)	NH-48	131	14
4. Hebbal Flyover to Allalasandra Junction (4.4km)	NH-44	60	14
5. Zilla Panchayat Bhavan to Kanakapura Circle (5km)	NH-275	59	12
6. Junction of Hirandahalli road to Government Hospital, Hosakote (8km)	NH-75	84	11
7. Kuluvanahalli to CISF 10th Reserve Junction (10.4km)	NH-48	108	10
8. Silk Board Junction to Electronic City Toll (10.1km)	NH-44	104	10
9. Bengaluru - Mangalore Highway (2.7km)	NH-75	26	10
10. Nelamangala Town to Thippagondanahalli (9.5km)	NH-48	89	9

3.7 Blackspots in the BMR

A road crash blackspot, as defined by MoRTH, is a 500 metre stretch of a road in which either five road crashes involving fatalities and grievous injuries or 10 fatalities took place in the last three calendar years. Table-2 lists the top blackspots identified in the BMR in the descending order of fatalities recorded from 2019 to 2022. These blackspots are marked in red and named in the following map.

Table-2 BLACKSPOTS IN THE BMR

SNO	RANK	LOCATION (Road)	FATALITIES WITHIN 250m RADIUS (2019-22)
1	1	Hebbagodi Metro Station (NH-44)	28
2	2	Kithiganahalli Bus Stop (NH-44)	18
3	2	Veerasandra Bus Stop (NH-44)	18
4	3	Electronic City Toll Plaza (NH-44)	17
5	3	Dabaspet Junction (NH-48)	17
6	3	Attibele Junction (NH-44)	17
7	4	Attibele Toll Gate (NH-44)	15
8	4	Byatarayanapura Junction (NH-44)	15
9	4	Byatarayanapura Post Office (NH-44)	14
10	4	Budihal Gate (NH-48)	14
11	4	Edehalli Junction (NH-48)	14

BENGALURU METROPOLITAN REGION
TOP 10 BLACKSPOTS, 2019-22

DABASPETE JUNCTION

BUDIHAL GATE

EDEHALLI JUNCTION

BYATARAYANAPURA
POST OFFICE

BYATARAYANAPURA
JUNCTION

ELECTRONIC CITY TOLL

HEBBAGODI
METRO STATION

VEERASANDRA BUS STOP

ATTIBELE TOLL

KITHIGANAHALLI BUS STOP

ATTIBELE JUNCTION

● Top 10 Blackspots
  Other Blackspots

0   10   20 km
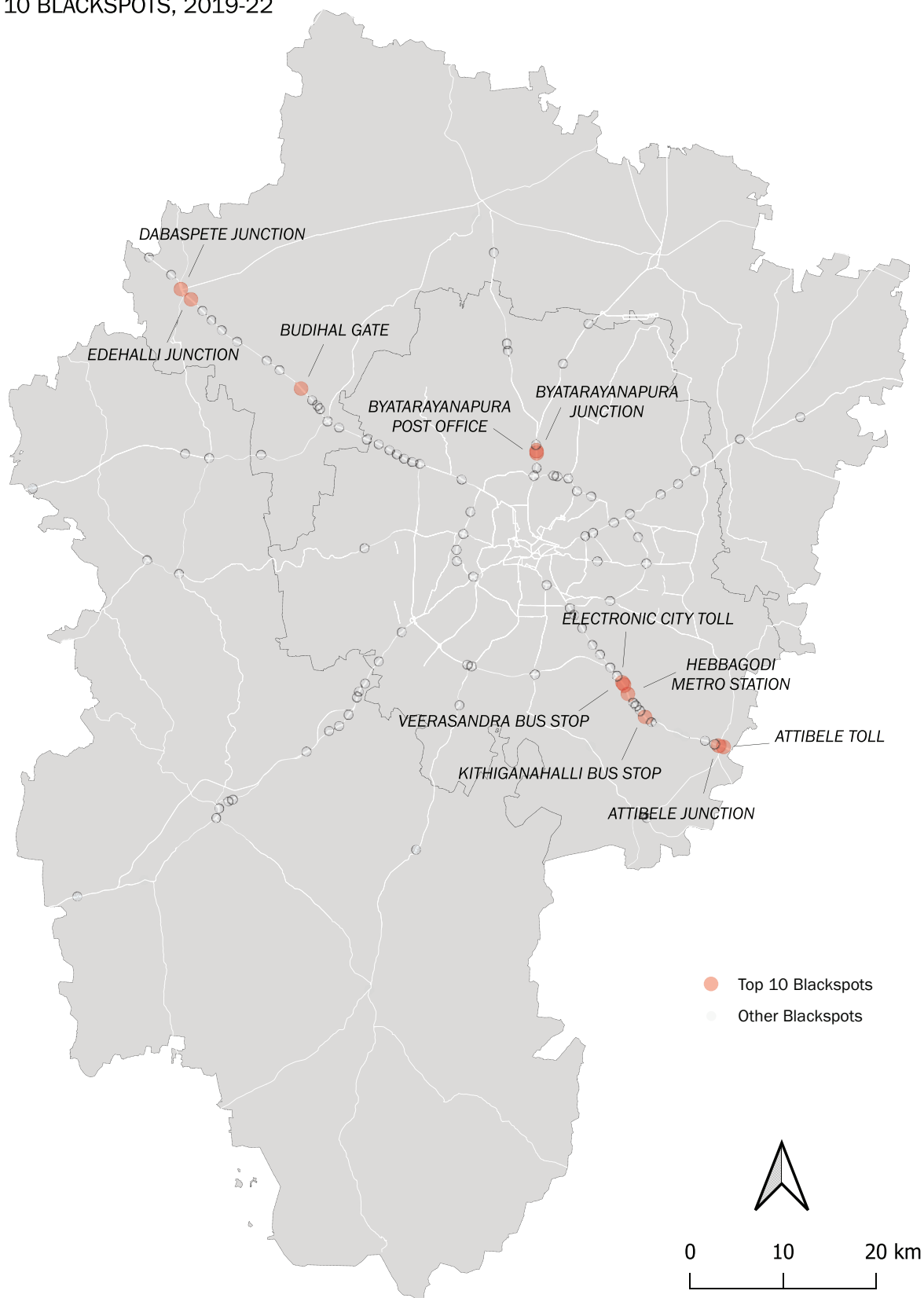
3.8 Vehicle interactions and victims

Table-3 below is a crash matrix describing fatal crashes in the BMR between 2019 and 2022 in terms of impacting vehicle categories and impacted vehicles or road users. The vehicle types mentioned in the rows are impacting vehicles while columns contain impacted vehicles and road users.

Lorries and LMVs were impacted vehicles in most fatal collisions in this period, each being involved in 1,356 fatal crashes with other vehicles and road users. Lorries fatally hit 831 motorcycles and 375 pedestrians. Together these two road user categories accounted for 89% of all fatal crashes involving lorries.

Where LMVs were impacted vehicles in fatal crashes, 54% of the crashes impacted motorcycle users while 37% impacted pedestrians.

Motorcycles were involved in most self crashes or single vehicle crashes, which are crashes that did not impact any other vehicle or road user except for the users of the impacting vehicle themselves. In cases where motorcycles fatally collided with other road users, pedestrians were worst hit being involved in about 58% of the cases.

Table-3, Impacting and Impacted Vehicles
Bengaluru Metropolitan Region, 2019-22

Impacting vehicle	Victim Vehicle/User								
	Bicycle	Motorcycle	Three-wheeler	LMV	Bus	Lorry	Self Crash	Pedestrian	Total
Motorcycle	9	346	10	24	6	22	1,117	567	2,101
Three-wheeler	1	37	0	3	0	3	67	85	196
LMV	2	732	28	48	6	26	142	508	1,492
Bus	0	240	6	16	4	3	21	168	458
Lorry	1	831	28	69	4	44	87	374	1,438
Total	12	2,186	72	160	20	98	1,434	1,702	11,369

Data Source: Karnataka State Police

3.9 Pedestrian deaths in the BMR

A total of 1,882 pedestrians lost their lives due to road crashes in the BMR between 2019 and 2022. About 81% of these pedestrians were identified as male and 17% as female. Gender of the victim was unavailable in the case of 37 pedestrian deaths.

Fig 3.9.1 Pedestrian Deaths - by Gender
Bengaluru Metropolitan Region, 2019-22

Data Source: Karnataka State Police
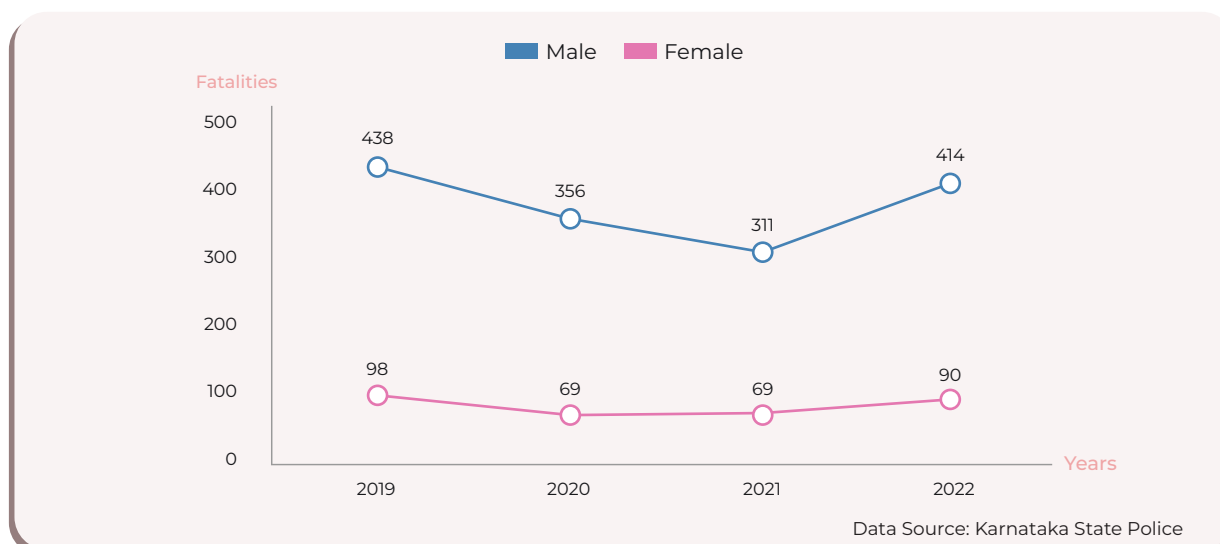
Fatal road crashes in the BMR registered between 2019 and 2022 killed more pedestrians aged over 60 years (26.2%) than other age groups. The age of the pedestrian victims was not known in the case of 161 (8.5%) deaths.

Fig 3.9.2 Pedestrian Deaths - by Age

Bengaluru Metropolitan Region, 2019-22

Data Source: Karnataka State Police
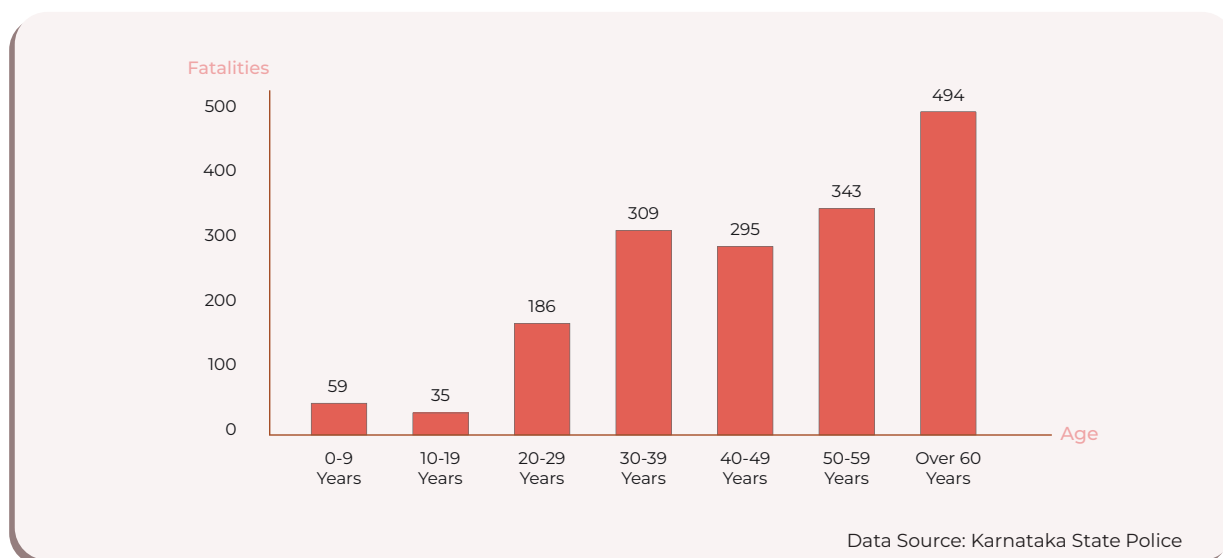
Of the 1,882 pedestrians killed, 502 (27%) died due to fatal collisions with motorcycles. LMVs were the impacting vehicles in the case of 474 (25%) pedestrian deaths. The impacting vehicle was unknown in the case of 342 (18%) pedestrian deaths

Fig 3.9.3 Pedestrian Deaths - by Impacting Vehicle

Bengaluru Metropolitan Region, 2019-22

Data Source: Karnataka State Police
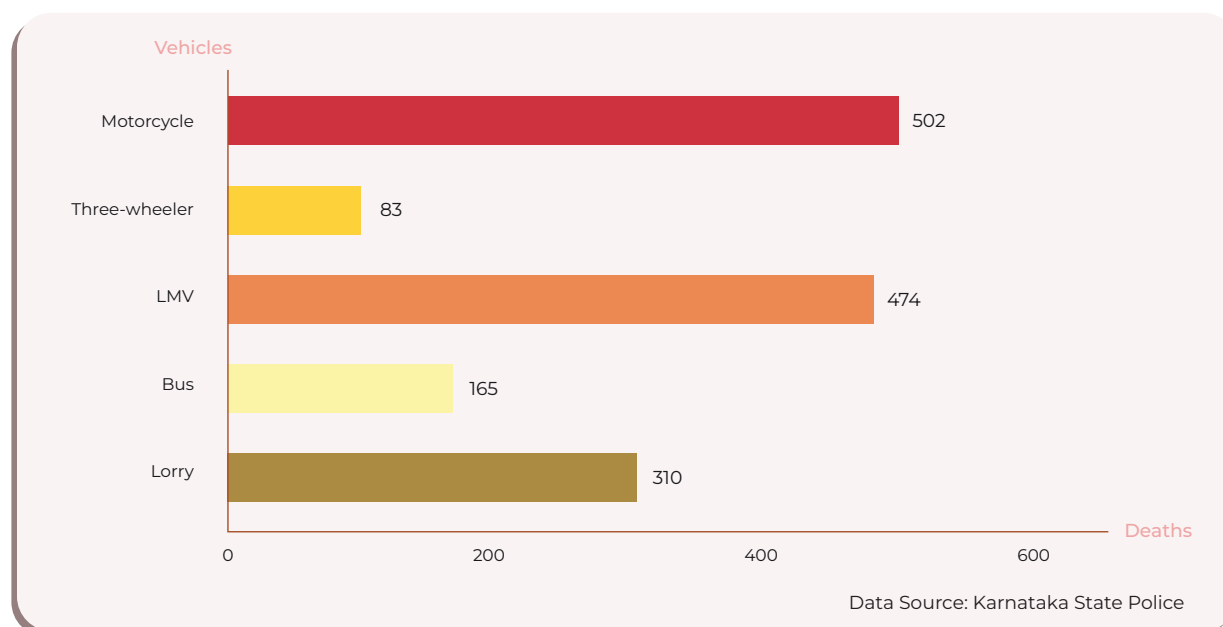
The subsequent sections of this report present the above findings individually for each of the three districts of the BMR – Bengaluru Urban, Bengaluru Rural and Ramanagara.

3.10 Motorcycle user deaths in the BMR

In the BMR, 89% of motorcycle users who died in fatal road crashes from 2019 to 2022 were identified as male, while 11% were identified as female.

Fig 3.10.1 Motorcycle User Deaths - by Gender

Bengaluru Metropolitan Region, 2019-22

Data Source: Karnataka State Police
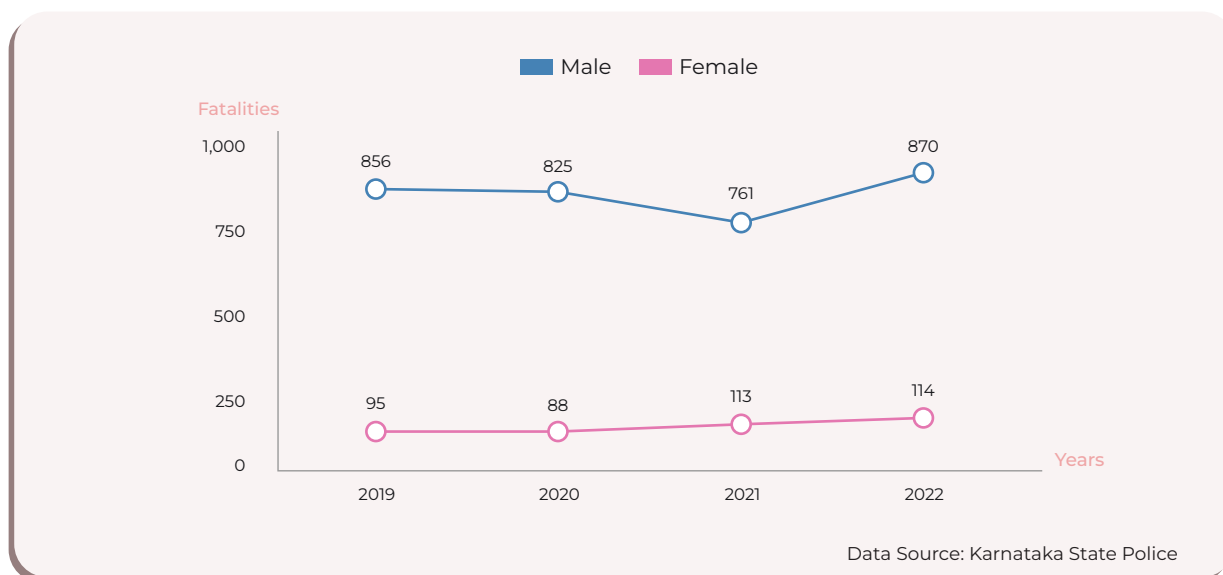
Many of the motorcycle users who died in fatal crashes in the BMR were aged between 20 to 29 years (31.5%). The age of the motorcycle user victim was unknown in the case of 438 (11.8%) deaths.

Fig 3.10.2 Motorcycle User Deaths - by Age

Bengaluru Metropolitan Region, 2019-22

Data Source: Karnataka State Police
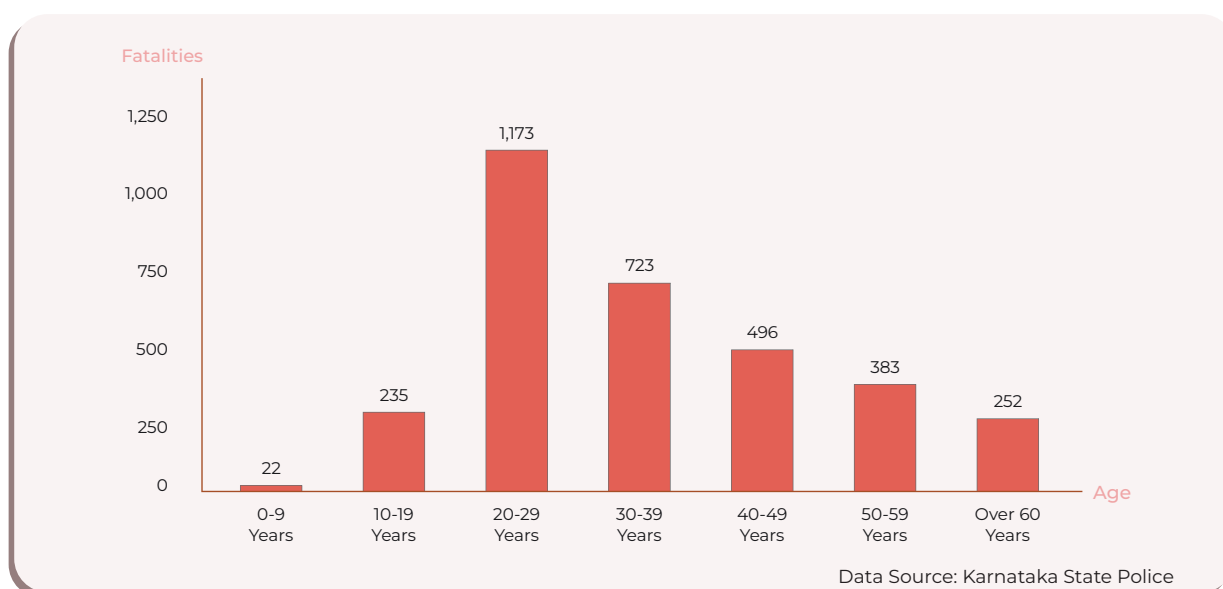
Lorries were the at-fault vehicle in fatal crashes with motorcycles in nearly 36% of cases. Motorcycle users were fatally hit by LMVs in 31.5% of cases. The at-fault vehicle was unknown in 138 (6%) fatal crashes with motorcycles.

Fig 3.10.3 Fatal Crashes with Motorcycle Users - by Impacting Vehicle

Bengaluru Metropolitan Region, 2019-22

Vehicles

Vehicle	Crashes
Motorcycle	346
Three-wheeler	37
LMV	732
Bus	240
Lorry	831

Data Source: Karnataka State Police
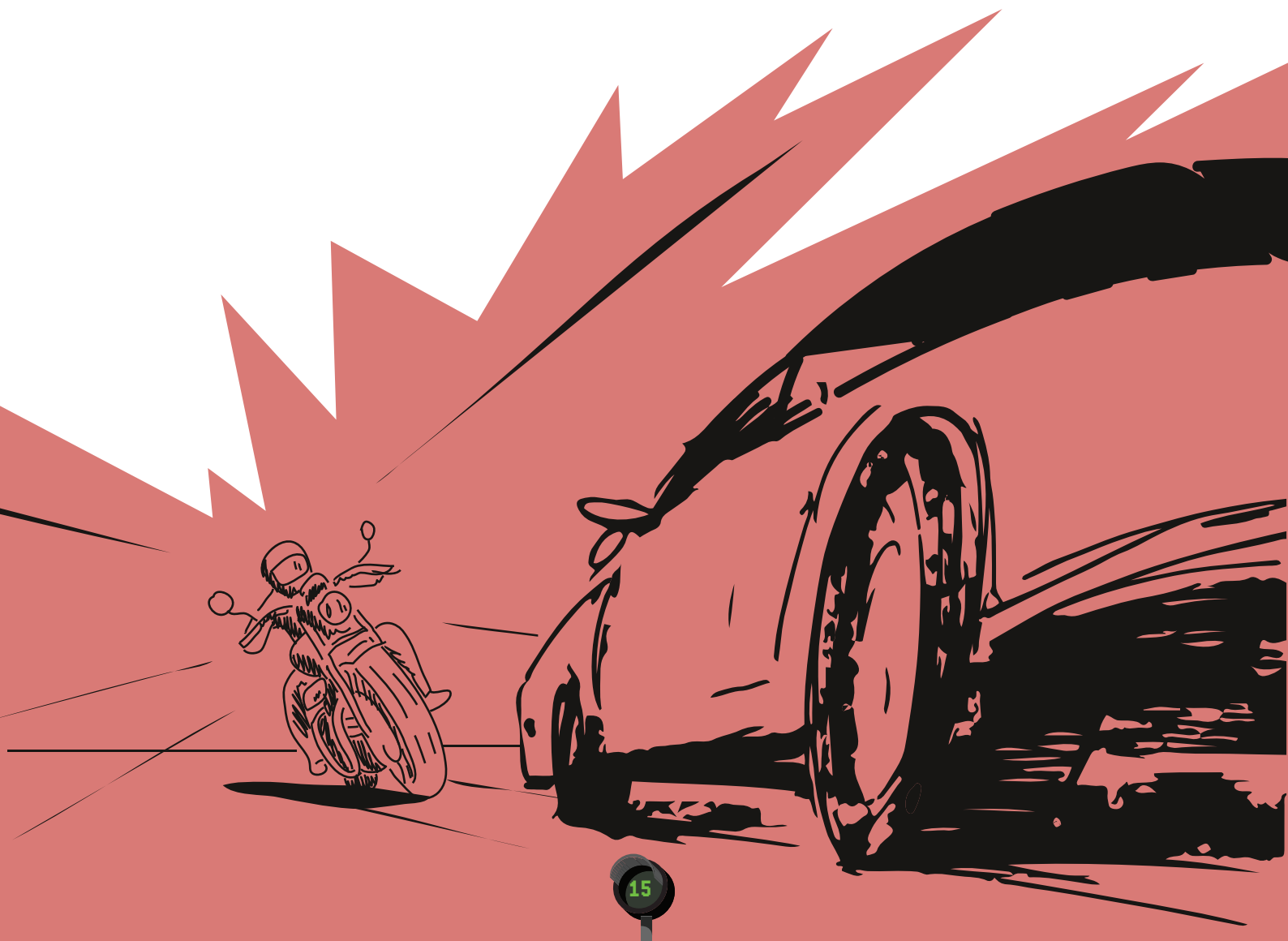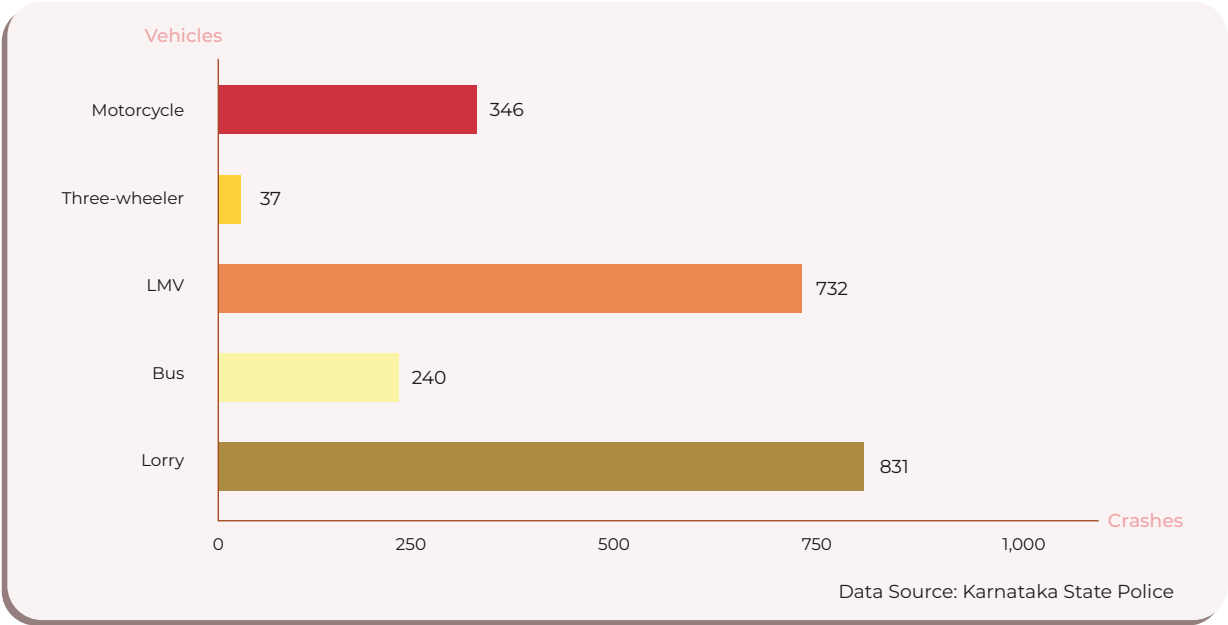
4. OVERVIEW OF FATAL CRASHES IN BMR DISTRICTS

This section presents an overview of fatal crashes and fatalities in the three districts of the BMR. While this report is concerned with the analyses of fatal crashes registered between 2019 and 2022, those registered in earlier years (2015-18) have also been included in the following graphs to provide context to the trends observed in the study period. Data on fatal crashes registered from 2015 to 2018 is available in KSP's annual publication titled Road Accidents in Karnataka.

In comparison with the average number of fatal crashes recorded from 2019 and 2021, the fatal crashes in 2022 had increased in all three BMR districts - 6.6% in Bengaluru Rural, 13.3% in Bengaluru Urban and 15.5% in Ramanagara. In terms of average number of fatalities, the records in 2022 were 11.6% and 14.7% higher than the average number of fatalities recorded between 2019 and 2021 in Bengaluru Urban and Ramanagara respectively. No change in fatality trends were observed in Bengaluru Rural.

Reduction in numbers observed during 2020 and 2021 were mostly due to mobility restrictions imposed by the Covid-19 pandemic.

4.1 Fatal Crashes and Fatalities in Bengaluru Urban

Fig 4.1 Fatal Crashes and Fatalities
Bengaluru Traffic Police, 2019-22
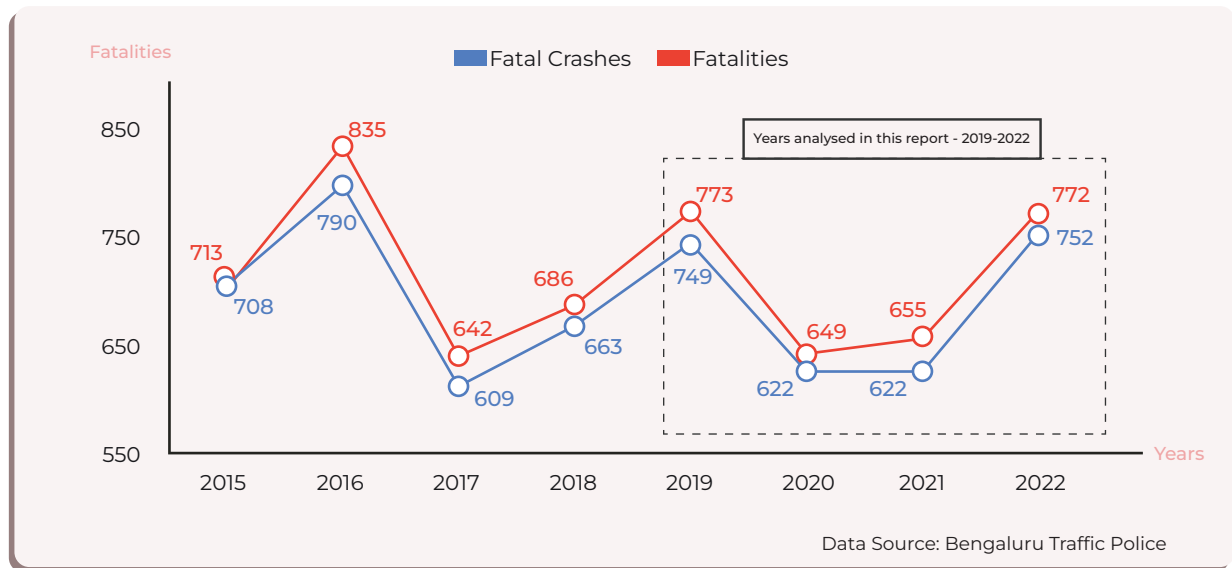
Fatal crashes and fatalities registered by the BTP in 2022 returned to the levels recorded in 2019, following a reduction due to the mobility restrictions imposed by the Covid-19 pandemic.

4.2 Fatal Crashes and Fatalities in Bengaluru Rural

Fig 4.2 Fatal Crashes and Fatalities
Bengaluru District Police, 2019-22
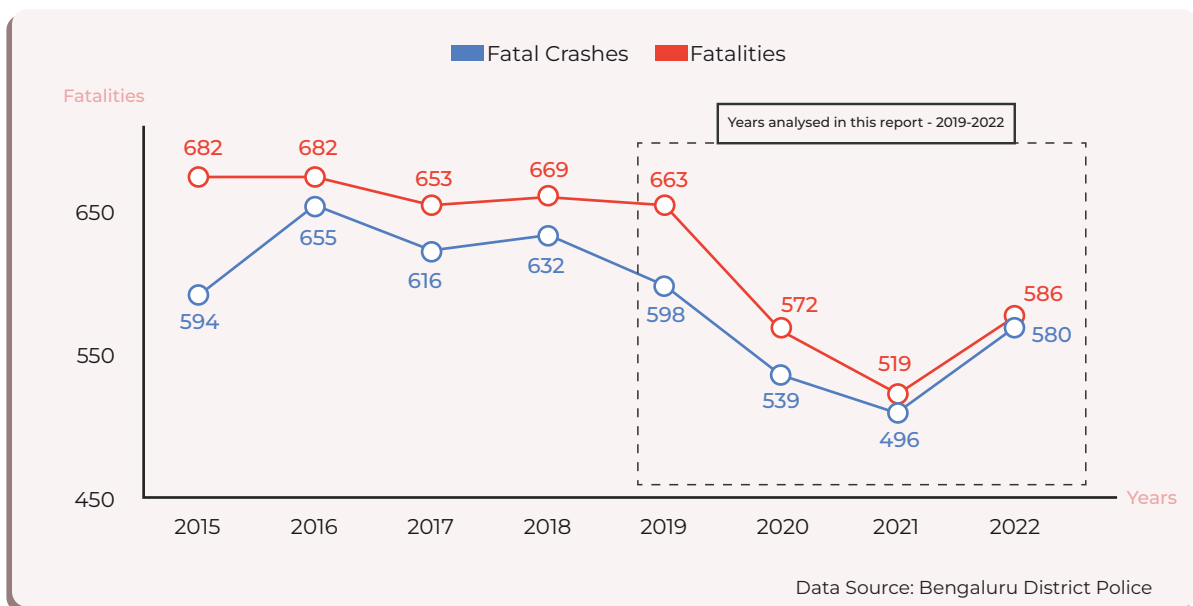
Only a minor reduction of less than 3% was observed in fatal crashes and fatalities in Bengaluru Rural district between 2015 and 2019. Fatalities in 2022 increased following a reduction due to the Covid-19 pandemic in 2020 and 2021. In terms of the average number of fatalities recorded from 2019 to 2021, fatalities in 2022 were marginally higher by 0.3%.

4.3 Fatal Crashes and Fatalities in Ramanagara

Fig 4.3 Fatal Crashes and Fatalities
Ramanagara District Police, 2019-22

Fatalities

Fatal Crashes ■ **Fatalities** ■

500							
		459					
	430		420				
		428		394			366
400	399		386		377		350
				372	356		
						304	
300						290	276
							265
200							

Years analysed in this report - 2019-2022

2015   2016   2017   2018   2019   2020   2021   2022

Years

Data Source: Ramanagara District Police
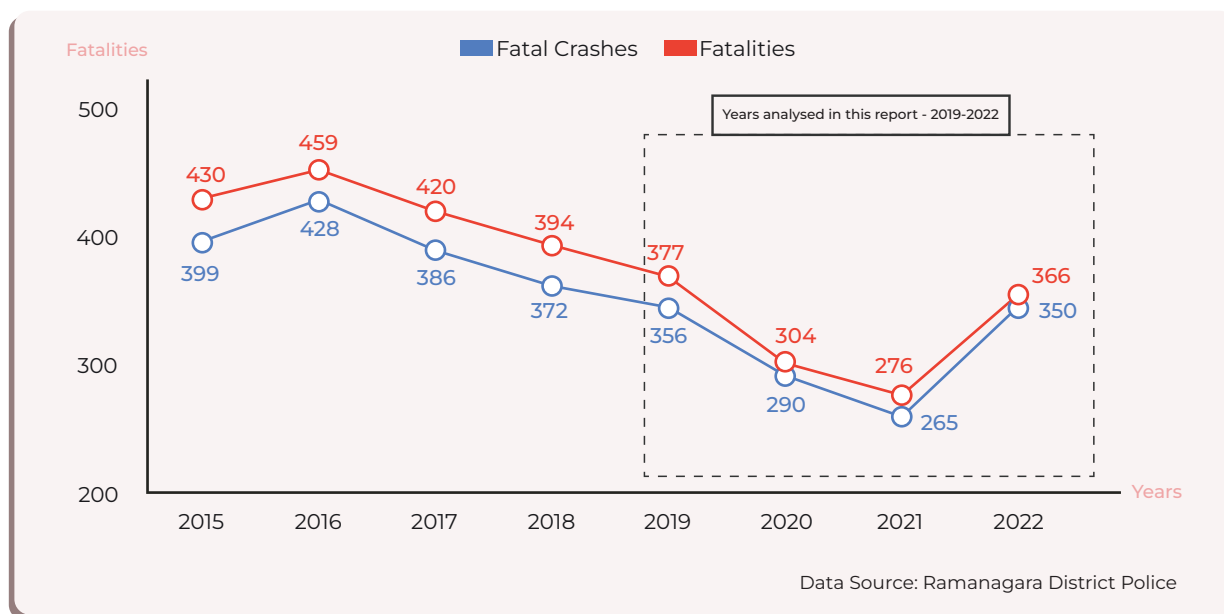
Fatal crashes and fatalities in Ramanagara district had fallen by about 11% between 2015 and 2019. Fatalities in 2022 were higher than the average number of fatalities recorded between 2019 and 2021 by 14.7%.

5. FATAL CRASHES BY ROAD USER CATEGORIES

This section describes crash fatalities suffered by various road user groups from 2019 to 2022. Cars of various types, including sports utility vehicles, as well as vans have been classified in this report as Light Motor Vehicles (LMV). Similarly, autorickshaws, regardless of their use as passenger or cargo vehicles have been classified as Three Wheelers. Buses and lorries are classified as Heavy Motor Vehicles (HMV).
The following graphs describe the share of total road crash fatalities among various road users and trends in fatalities in terms of road user groups respectively.

5.1 Bengaluru Urban

A total of 1,655 motorcycle users and 798 pedestrians lost their lives in the roads of the Bengaluru Urban district, constituting 86% of the 2,849 lives lost in this period. Road user groups involved in fatal crashes were not known in the case of 56 fatalities.

Fig 5.1.1 Share of fatalities among road user groups
Bengaluru Traffic Police, 2019-22

Motorcycle
Pedestrian
LMV
Three wheeler
Lorry
Bus

798 (29%)
49 (1%)
55 (2%)
143 (5%)
78 (3%)
1655 (60%)
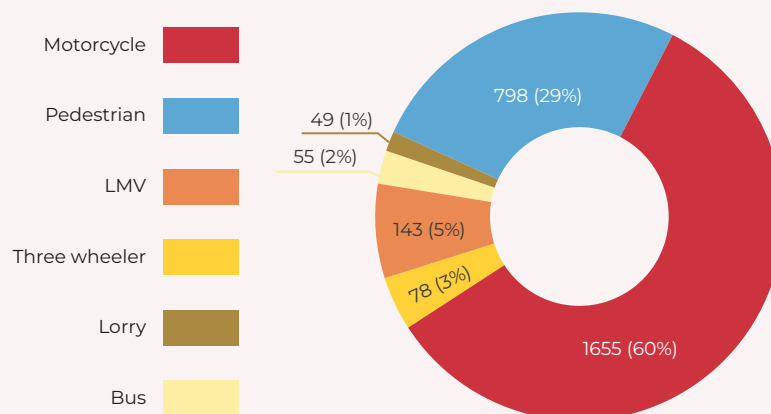
Data Source: Bengaluru Traffic Police

Fig 5.1.2 Fatalities by road user groups
Bengaluru Traffic Police, 2019-22

Fatalities

Motorcycle — Pedestrian — LMV — Three Wheeler

Year	Motorcycle	Pedestrian	LMV	Three Wheeler
2019	390	244	30	22
2020	420	156	34	16
2021	407	162	41	20
2022	438	236	38	20

Years

Data Source: Bengaluru Traffic Police
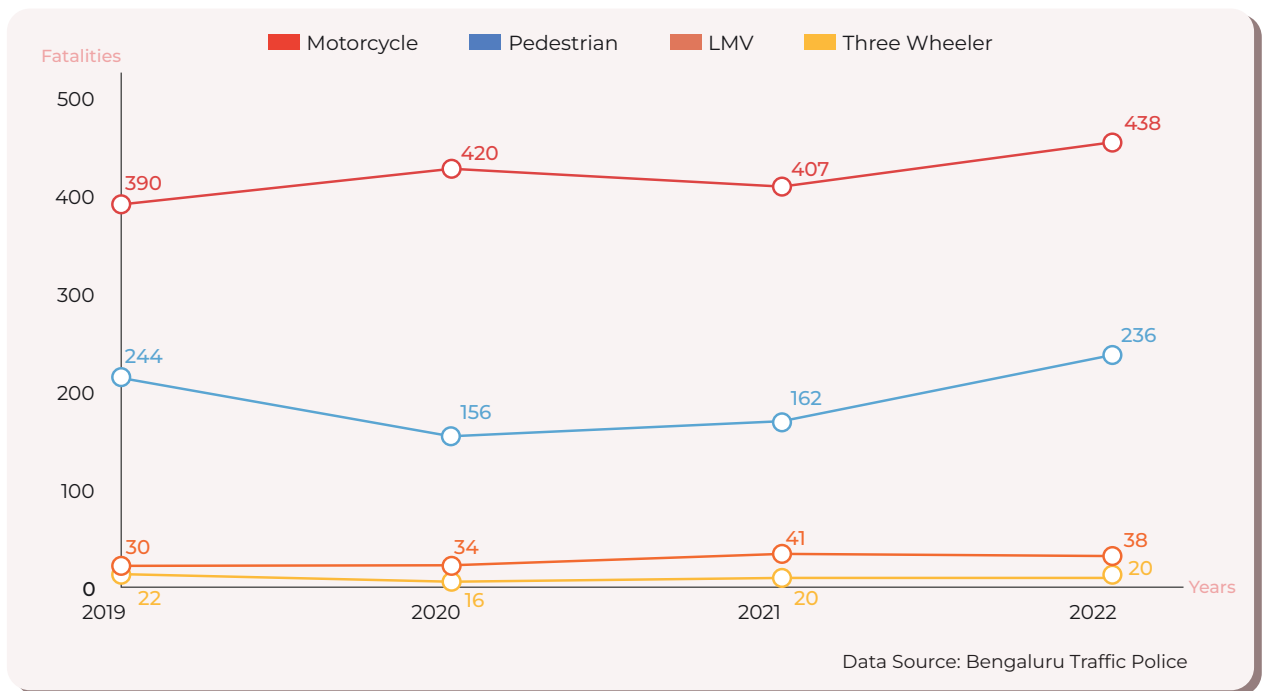
5.2 Bengaluru Rural

Deaths were highest among two-wheeler users and pedestrians, with 1,320 and 731 lives lost respectively. These deaths constitute 87% of all lives lost in the district from 2019 to 2022.

Road user groups involved in fatal crashes were not known in the case of 11 fatalities.

Fig 5.2.1 Share of fatalities among road user groups
Bengaluru District Police, 2019-22
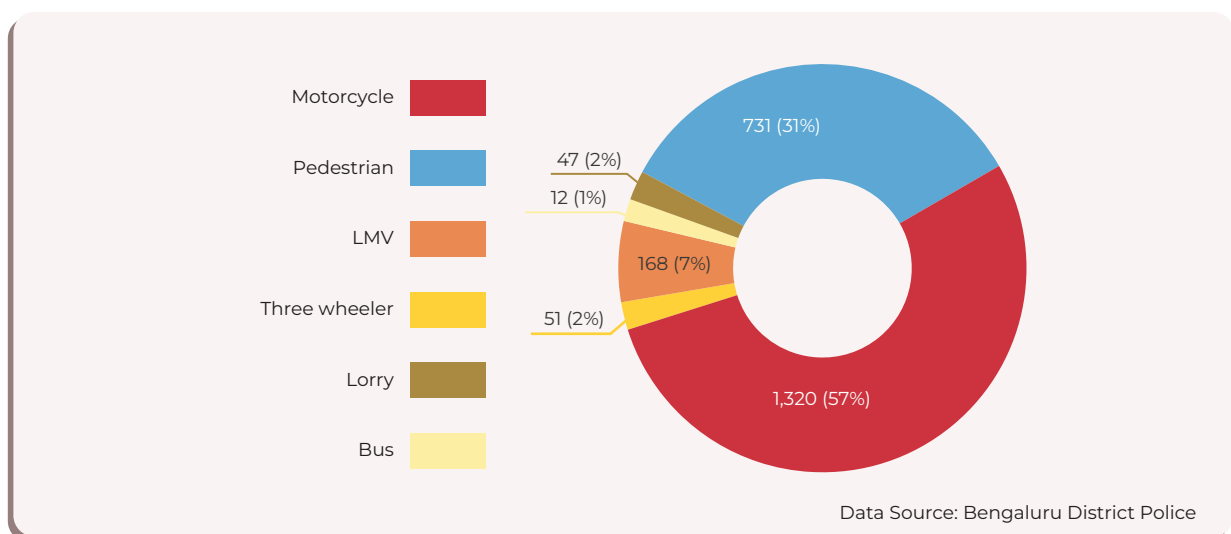
Motorcycle
Pedestrian
LMV
Three wheeler
Lorry
Bus

731 (31%)
47 (2%)
12 (1%)
168 (7%)
51 (2%)
1,320 (57%)

Data Source: Bengaluru District Police

20

Fig 5.2.2 Fatalities by road user groups

Bengaluru District Police, 2019-22

Data Source: Bengaluru District Police
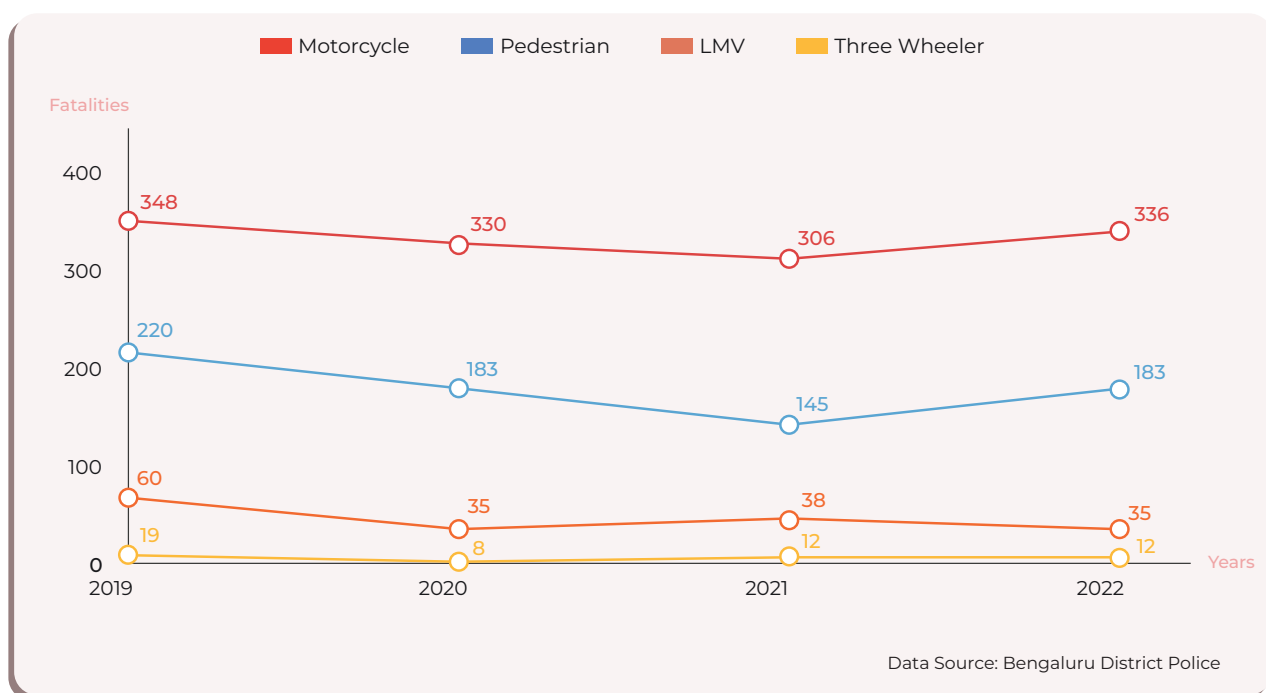
5.3 Ramanagara

Road crash deaths in Ramanagara were highest among two-wheeler users and pedestrians, who made up 83% of the 1,323 deaths due to road crashes in the district from 2019 to 2022.

Fig 5.3.1 Share of fatalities among road user groups

Ramanagara District Police, 2019-22

Data Source: Ramanagara District Police
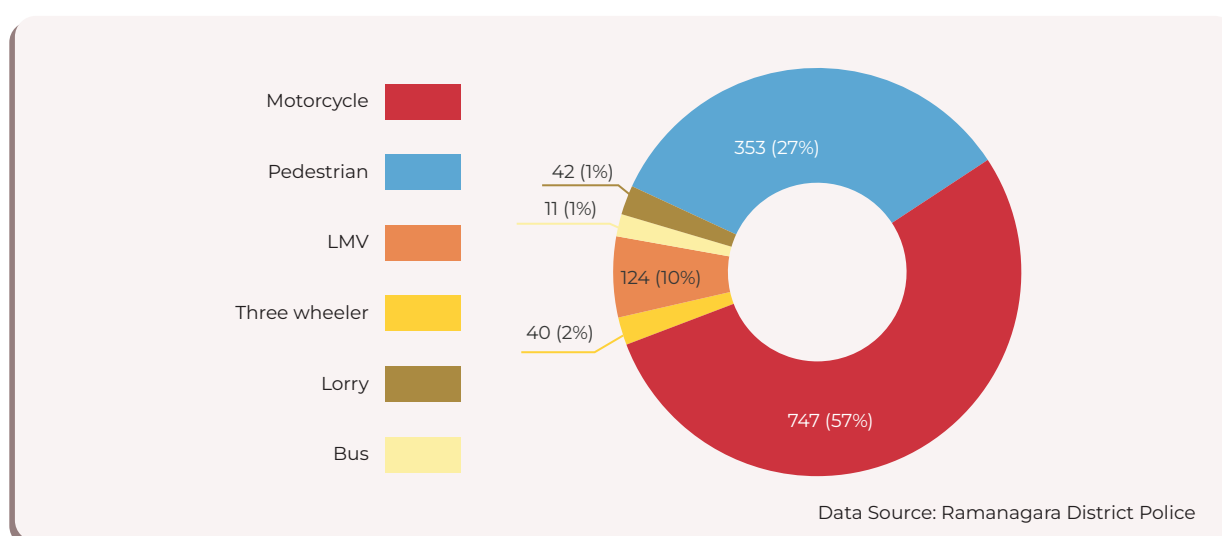
Fig 5.3.2 Fatalities by road user groups
Ramanagara District Police, 2019-22

Fatalities

Legend: Motorcycle | Pedestrian | LMV | Three Wheeler | Bus

Year	Motorcycle	Pedestrian	LMV	Three Wheeler	Bus
2019	210	106	29	12	5
2020	166	87	31	7	2
2021	160	73	27	11	4
2022	211	87	40	10	0

Years

Data Source: Ramanagara District Police
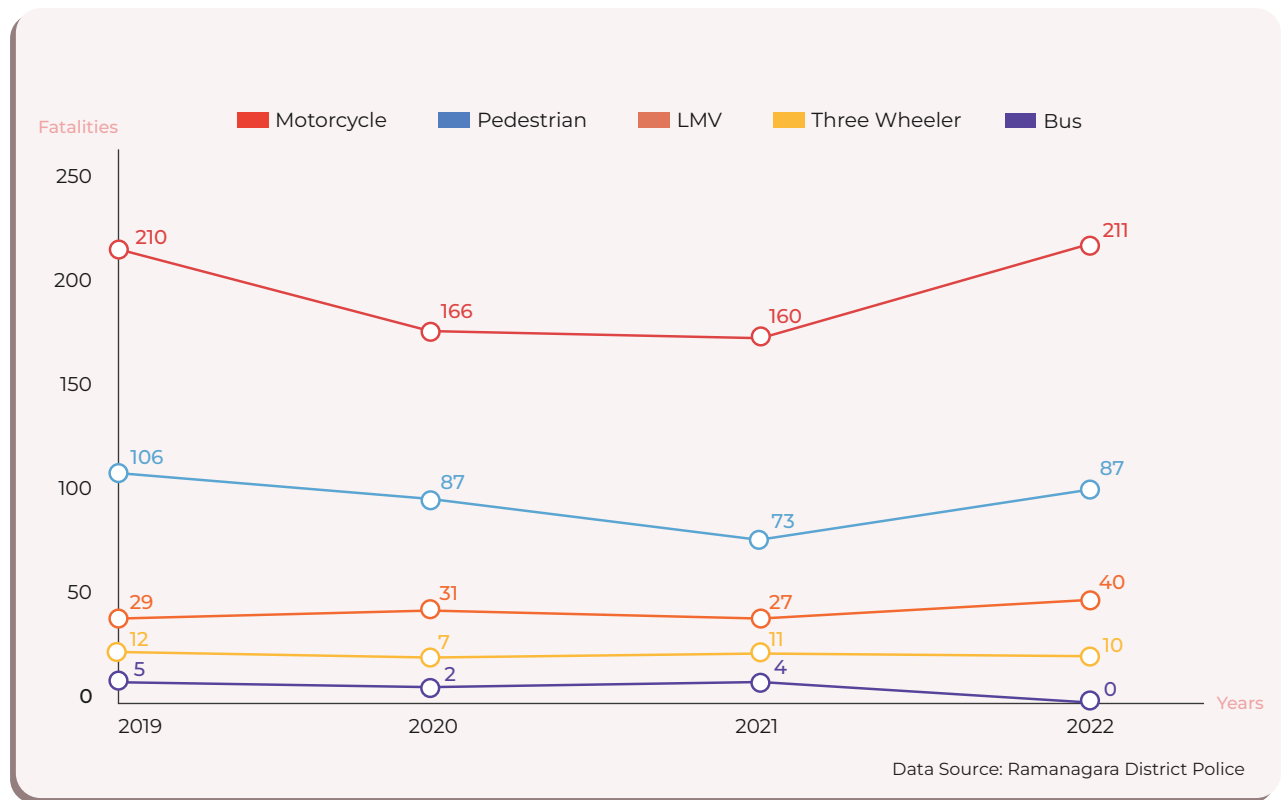
6. FATAL HIT AND RUN CASES

6.1 Bengaluru Urban

Fig 6.1 describe fatal road crashes registered by BTP that were hit and run cases. A total of 356 fatal crashes, or 12.9% of the 2,745 fatal crashes registered between 2019 and 2022 were hit and run cases.

Fig 6.1 Hit and Run among Fatal Crashes
Bengaluru Traffic Police, 2019-22

Not hit and Run   Hit and Run

86 (12%)	116 (19%)	53 (9%)	101 (13%)
2019	2020	2021	2022
663 (88%)	506 (81%)	569 (91%)	651 (87%)

Data Source: Bengaluru Traffic Police
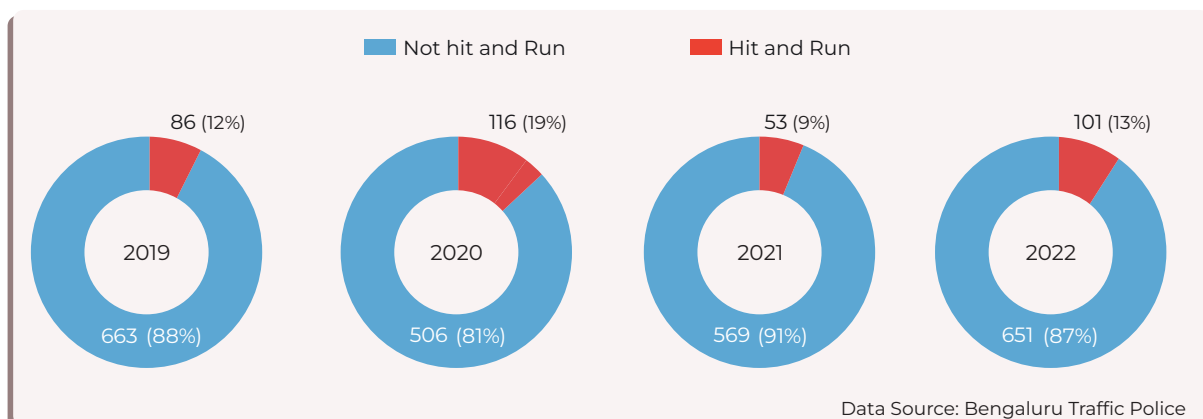
6.2 Bengaluru Rural

Fig 6.2 describes fatal road crashes in Bengaluru Rural district that were hit and run cases. In all, out of 2,213 fatal crashes registered in the district between 2019 and 2022, 254 (11.5%) were hit and run cases.

Fig 6.2 Hit and Run among Fatal Crashes

Bengaluru District Police, 2019-22

Legend: Not hit and Run / Hit and Run

- 2019: 93 (16%) Hit and Run / 505 (84%) Not hit and Run
- 2020: 36 (7%) Hit and Run / 503 (93%) Not hit and Run
- 2021: 40 (8%) Hit and Run / 456 (92%) Not hit and Run
- 2022: 85 (15%) Hit and Run / 488 (85%) Not hit and Run

Data Source: Bengaluru District Police
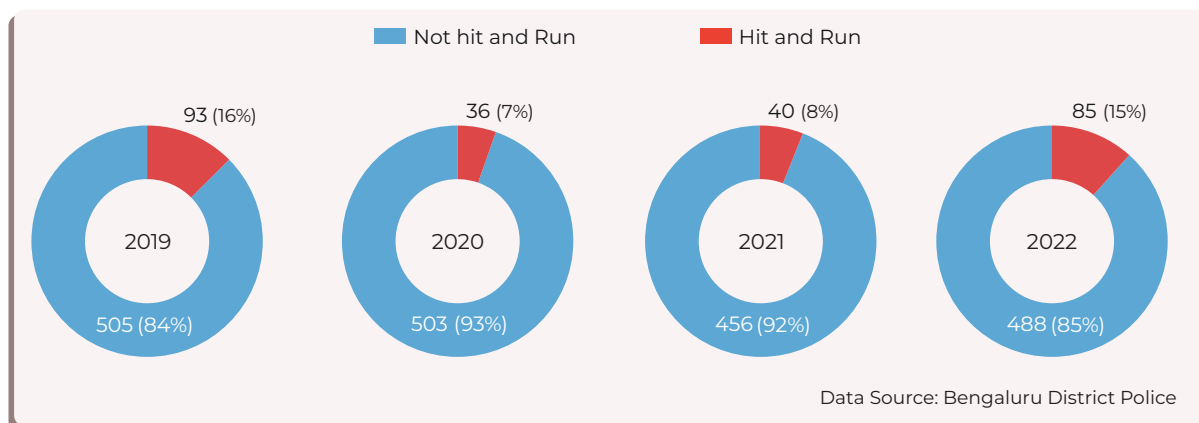
6.3 Ramanagara

In Ramanagara, 148 fatal crashes, or 11.7% of all 1,261 fatal crashes registered in the district between 2019 and 2022 were hit and run cases. Fig 6.3 depict trends in the four years analysed.

Fig 6.3 Hit and Run among Fatal Crashes

Ramanagara District Police, 2019-22

Legend: Not hit and Run / Hit and Run

- 2019: 35 (10%) Hit and Run / 317 (90%) Not hit and Run
- 2020: 18 (6%) Hit and Run / 167 (94%) Not hit and Run
- 2021: 44 (18%) Hit and Run / 204 (82%) Not hit and Run
- 2022: 51 (15%) Hit and Run / 290 (85%) Not hit and Run

Data Source: Ramanagara District Police
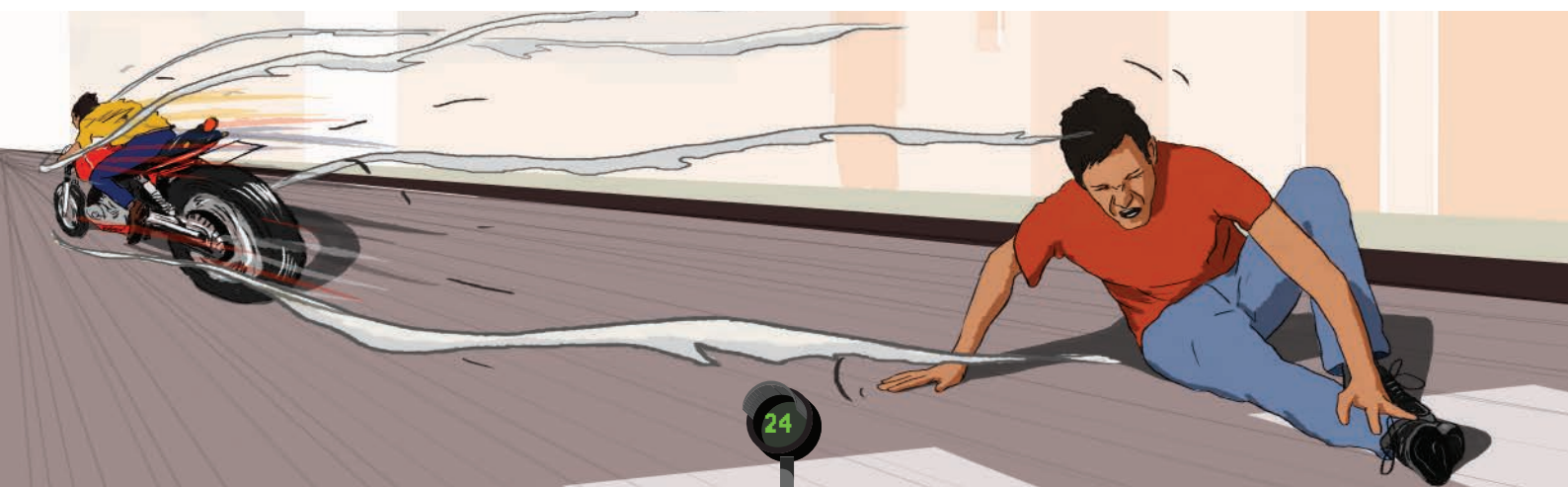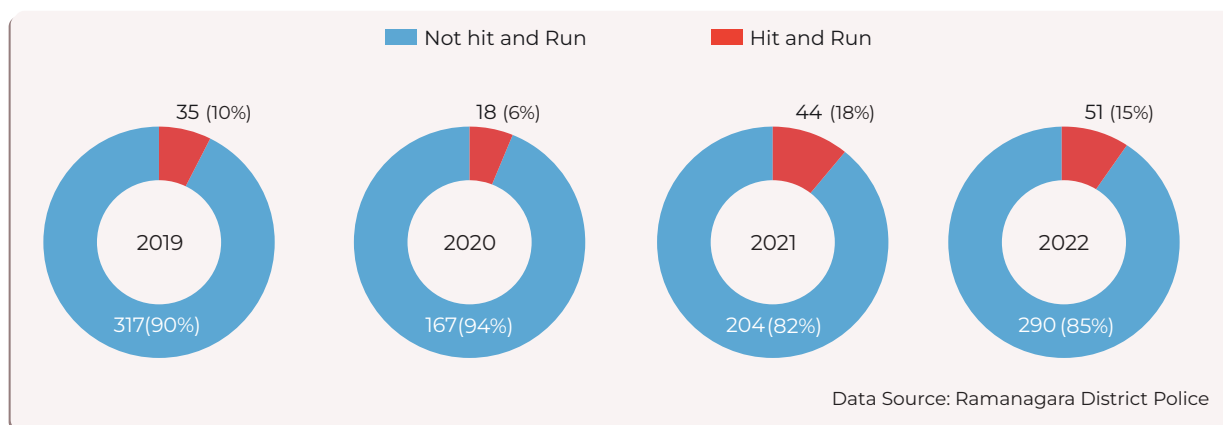
7. ROAD CRASH FATALITIES BY AGE AND GENDER OF VICTIMS

7.1 Bengaluru Urban

Many victims of fatal road crashes in Bengaluru Urban were aged between 20 and 29 years of age. Of the 2,849 lives lost, 26% of the victims belonged to this age group.

Nearly 70% of all victims were aged between 20 and 60 years of age while 6% of victims were aged under 20 years of age.

Fig 7.1.1 Distribution of Road Traffic Fatalities - by Age
Bengaluru Traffic Police, 2019-22
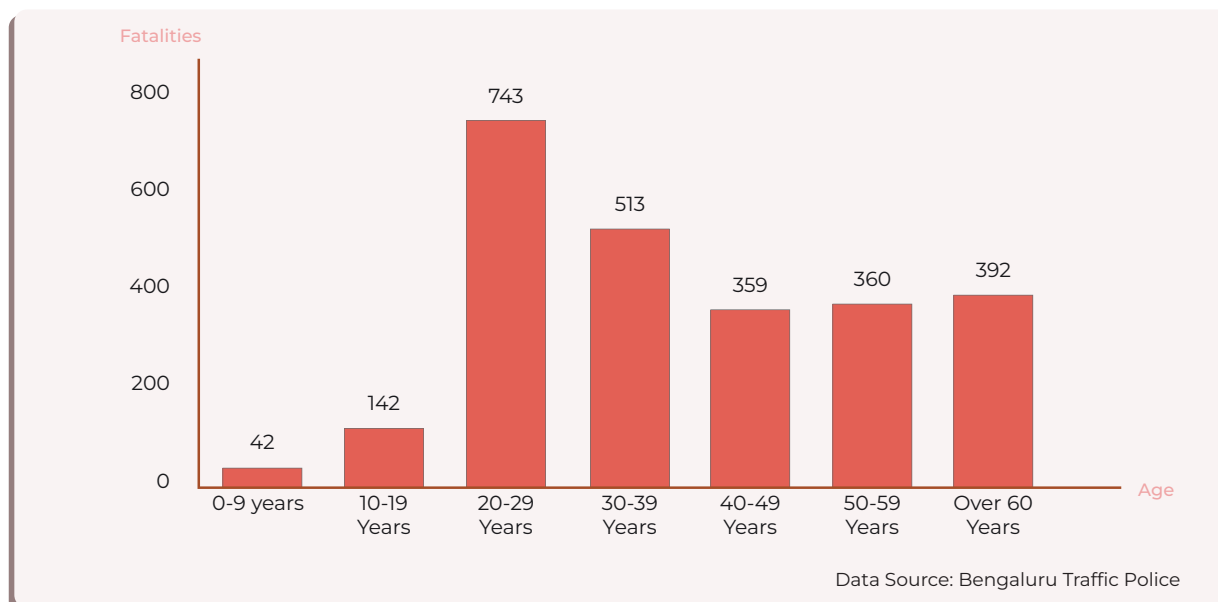
Data Source: Bengaluru Traffic Police

Fig 7.1.2 Distribution of Road Traffic Fatalities - by Gender
Bengaluru Traffic Police, 2019-22

■ Male ■ Female

392 (14%)

2,432 (86%)

Data Source: Bengaluru Traffic Police

Fig 7.1.3 Distribution of Road Traffic Fatalities - by Age and Gender
Bengaluru Traffic Police, 2019-22

■ Male ■ Female

Age

	Female	Age	Male
	24	0-9 years	18
	27	10-19 Years	115
	65	20-29 Years	678
	55	30-39 Years	458
	58	40-49 Years	301
	64	50-59 Years	296
	85	Over 60 Years	307

Fatalities 800 600 400 200 0

0 200 400 600 800 Fatalities
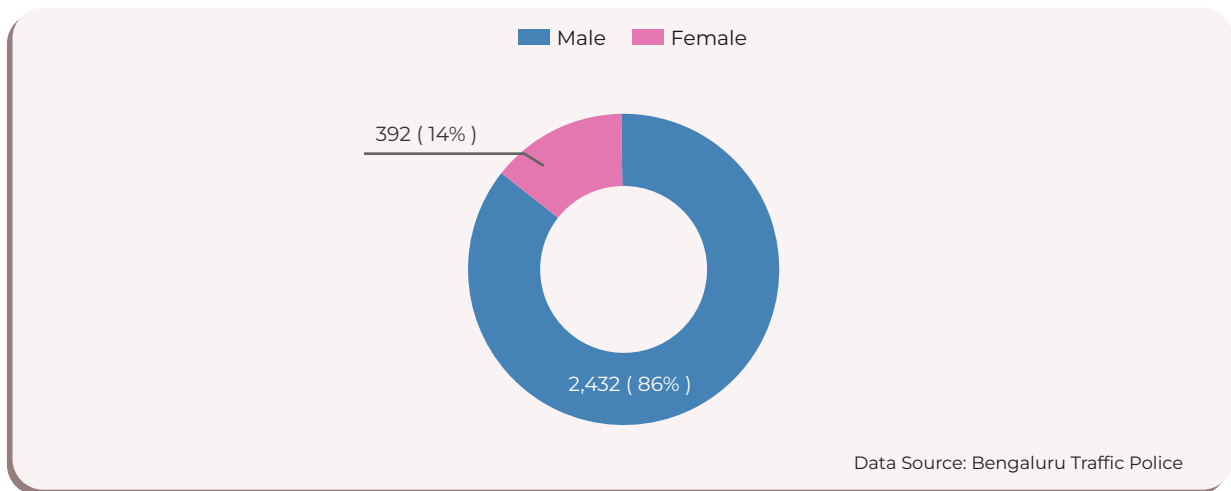
Data Source: Bengaluru Traffic Police
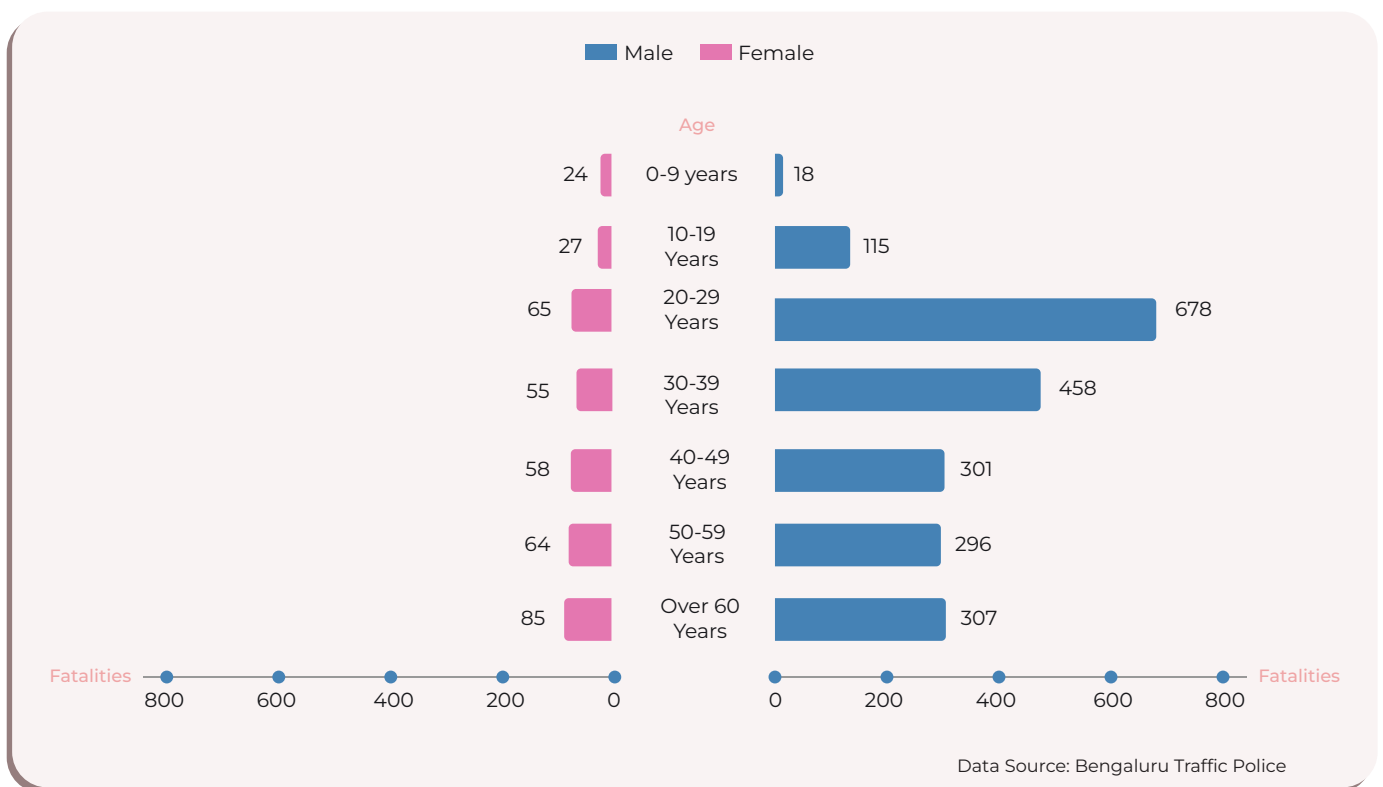
7.2 Bengaluru Rural

Similar trends were observed in Bengaluru Rural, where nearly 24% of victims who lost their lives due to fatal road crashes in the district were aged between 20 and 29 years. 69% of all road crash victims were aged between 20 and 60 years of age in Bengaluru Rural district.

Fig 7.2.1 Distribution of Road Traffic Fatalities - by Age
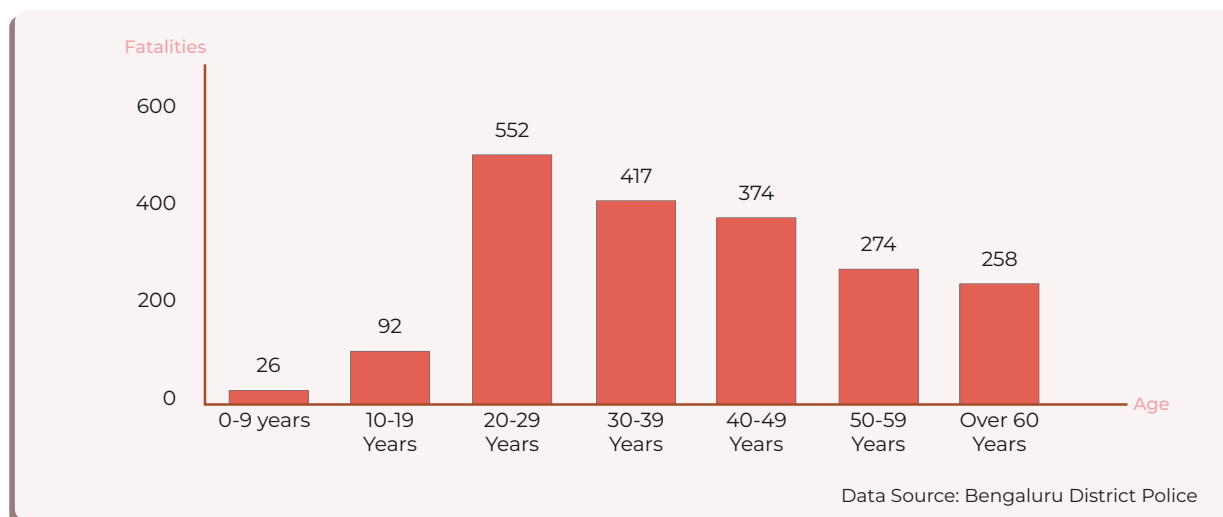
Bengaluru District Police, 2019-22

Data Source: Bengaluru District Police

Fig 7.2.2 Distribution of Road Traffic Fatalities - by Gender

Bengaluru District Police, 2019-22

Data Source: Bengaluru District Police

Fig 7.2.3 Distribution of Road Traffic Fatalities - by Age and Gender

Bengaluru District Police, 2019-22

Male ■ Female ■

Age

Female	Age	Male
10	0-9 years	16
13	10-19 Years	79
36	20-29 Years	516
44	30-39 Years	373
54	40-49 Years	320
37	50-59 Years	237
43	Over 60 Years	215

Fatalities 600 400 200 0   0 200 400 600 Fatalities
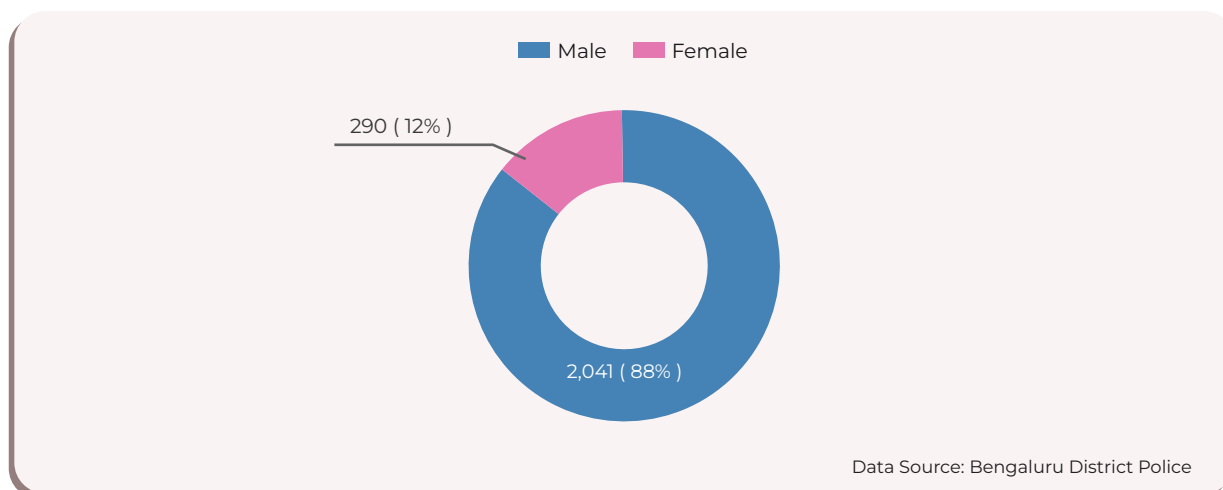
Data Source: Bengaluru District Police
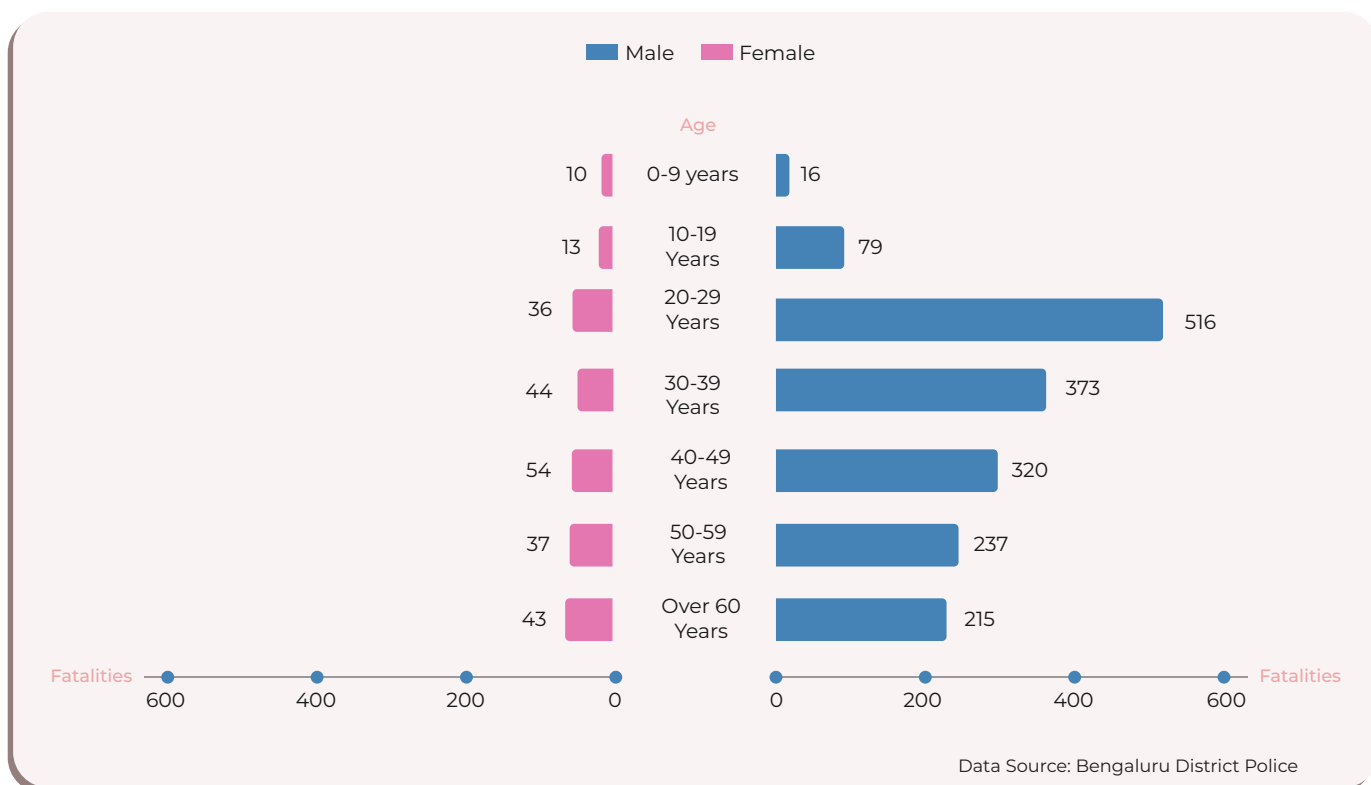
7.3 Ramanagara

In Ramanagara, people in the age groups 20-29 years and 30-39 years respectively made up nearly 19% and 18% of all victims who had lost their lives in fatal road crashes. Nearly 65% of victims in the district were aged between 20 and 60 years of age. The age of the victim was unknown in the case of 15.8% of victims.

Fig 7.3.1 Distribution of Road Traffic Fatalities - by Age

Ramanagara District Police, 2019-22

Fatalities

Age	Fatalities
0-9 years	24
10-19 Years	72
20-29 Years	257
30-39 Years	235
40-49 Years	192
50-59 Years	173
Over 60 Years	161

Data Source: Ramanagara District Police
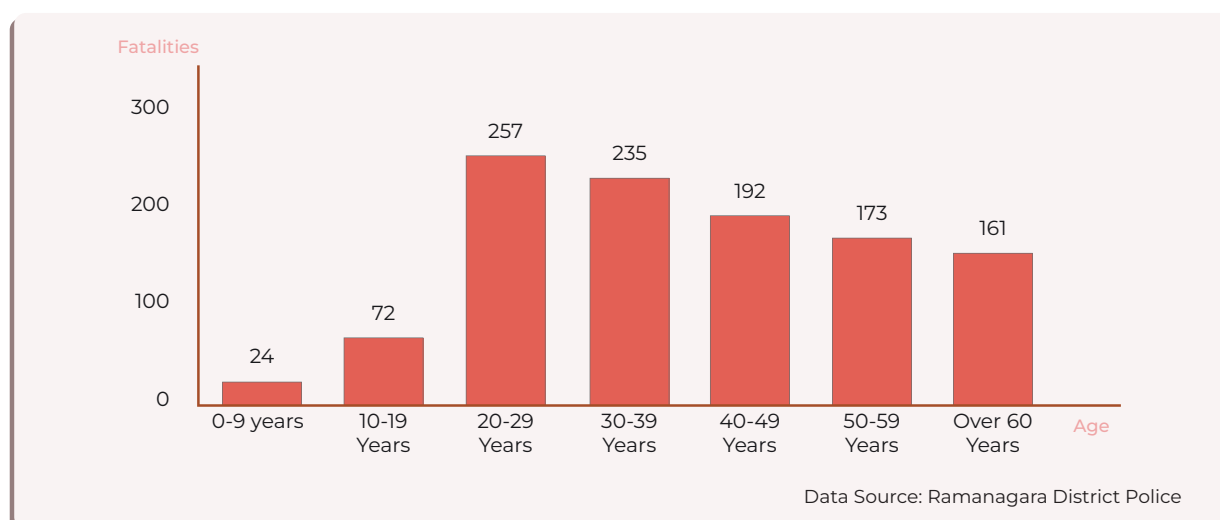
Fig 7.3.2 Distribution of Road Traffic Fatalities - by Gender

Ramanagara District Police, 2019-22

■ Male ■ Female

176 (13%)

1,150 (87%)

Data Source: Ramanagara District Police
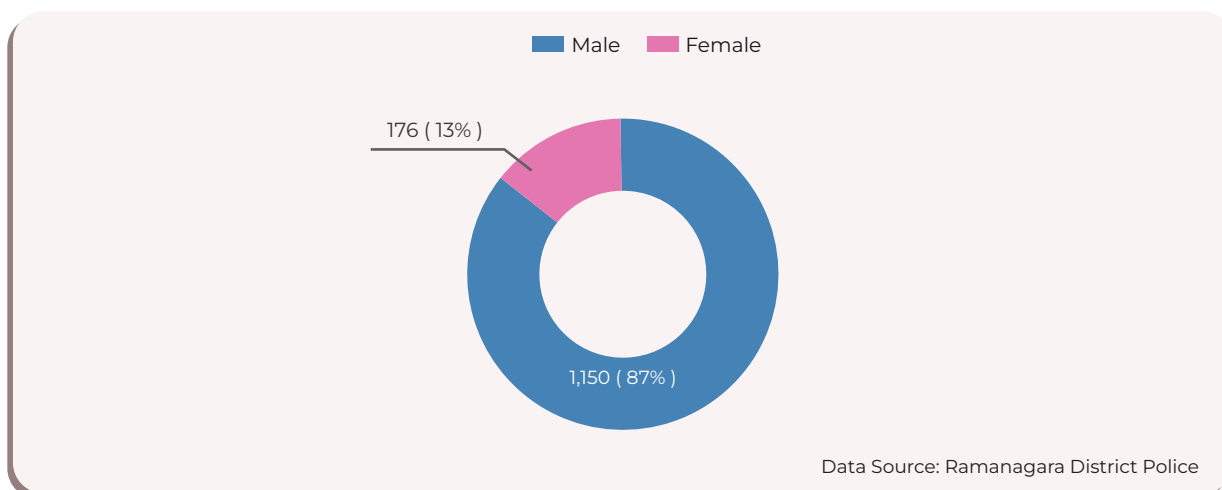
Fig 7.3.3 Distribution of Road Traffic Fatalities - by Age and Gender

Ramanagara District Police, 2019-22

■ Male ■ Female

Female	Age	Male
7	0-9 years	17
5	10-19 Years	67
16	20-29 Years	241
25	30-39 Years	210
26	40-49 Years	166
34	50-59 Years	139
39	Over 60 Years	122

Fatalities 250 200 150 100 50 0   0 50 100 150 200 250 Fatalities

Data Source: Ramanagara District Police

29
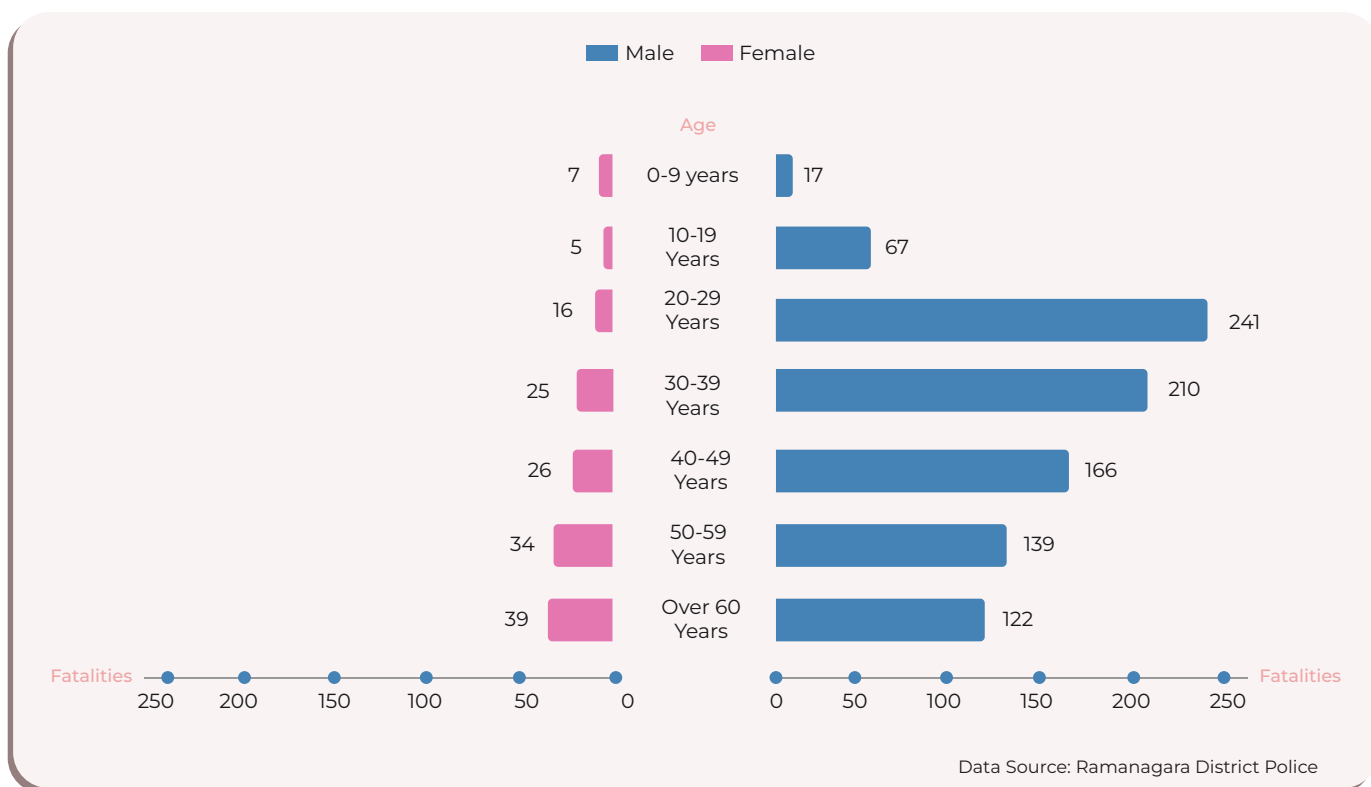
8. FATAL ROAD CRASHES BY TIME-OF-DAY AND DAY-OF-WEEK

8.1 Bengaluru Urban

In Bengaluru Urban district, most fatal crashes occurred between 6pm to 8pm, as shown in Fig 8.1.1. In this period, BTP recorded 337 fatal cases, or 12.2% of all fatal cases registered between 2019 and 2022. Over 30% of fatal crashes were recorded in the evening rush hours, between 4pm and 10pm.

Roads of the Bengaluru Urban district were most dangerous on Sundays, when 444 (16.4%) fatal crashes were recorded from 2019 to 2022.

Fig 8.1.1 Distribution of Fatal Crashes in Bengaluru Urban - by time-of-day and day-of-week
Bengaluru Traffic Police, 2019-22

Crash Time	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
12am to 2am	52	41	48	37	29	33	35	275
2am to 4am	22	11	16	12	14	21	17	113
4am to 6am	35	20	30	23	24	24	16	172
6am to 8am	33	22	34	30	22	32	25	198
8am to 10am	37	40	28	48	28	37	41	259
10am to 12pm	28	34	36	36	39	30	31	234
12pm to 2pm	32	22	39	36	38	27	28	222
2pm to 4pm	35	30	35	37	32	26	41	236
4pm to 6pm	39	33	35	24	21	37	23	212
6pm to 8pm	54	58	45	45	51	36	48	337
8pm to 10pm	55	40	36	45	33	46	41	296
10pm to 12am	22	18	27	19	19	17	25	147
Total	444	369	409	392	350	366	371	2,701

Data Source: Bengaluru Traffic Police

30

8.2 Bengaluru Rural

The period between 6pm and 8pm proved most fatal in Bengaluru Rural district as well as shown in Fig 8.2.1. Bengaluru District Police recorded 414 fatal crash cases during this time between 2019 and 2022, accounting for nearly 19% of all fatal crash cases recorded during these four years.

Most fatalities recorded in the Bengaluru Rural district from 2019 and 2022 were recorded on Sundays, when 376 (17%) lives were lost. A third (33.2%) of all crash fatalities in the district were due to road traffic crashes on Sundays and Mondays.

Fig 8.2.1 Distribution of Fatal Crashes - by time-of-day and day-of-week
Bengaluru District Police, 2019-22

Crash Time	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
12am to 2am	20	16	14	8	14	21	22	115
2am to 4am	9	13	6	5	11	11	11	66
4am to 6am	22	17	20	13	14	17	20	123
6am to 8am	25	24	28	13	22	19	19	150
8am to 10am	18	40	31	20	22	25	27	183
10am to 12pm	30	33	24	14	27	23	20	171
12pm to 2pm	37	30	25	20	25	17	18	172
2pm to 4pm	28	32	22	30	23	32	35	202
4pm to 6pm	50	38	26	28	29	46	32	249
6pm to 8pm	81	59	49	57	46	58	64	414
8pm to 10pm	36	44	41	25	43	36	42	267
10pm to 12am	20	14	12	10	13	14	18	101
Total	376	360	298	243	289	319	328	2,213

Data Source: Bengaluru District Police

8.3 Ramanagara

Similar trends were observed in Ramanagara, where most fatal crashes occurred between 6pm and 8pm. Over 14% of all fatal crashes recorded between 2019 and 2022 in the district occurred during this time.

Most fatalities (18%) were recorded on Sundays in Ramanagara as well.

Fig 8.3.1 Distribution of Fatal Crashes in Ramanagara -
by time-of-day and day-of-week
Ramanagara District Police, 2019-22

Crash Time	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
12am to 2am	18	14	6	12	9	11	12	82
2am to 4am	7	5	6	4	3	7	5	37
4am to 6am	13	10	9	6	12	9	11	70
6am to 8am	17	19	12	11	19	12	15	105
8am to 10am	22	19	11	17	10	14	13	106
10am to 12pm	21	20	14	21	16	16	21	129
12pm to 2pm	13	17	15	16	15	15	9	100
2pm to 4pm	27	26	26	15	14	16	19	143
4pm to 6pm	28	23	34	19	15	21	15	155
6pm to 8pm	30	22	28	22	22	25	30	179
8pm to 10pm	26	17	18	14	16	14	15	120
10pm to 12am	6	3	3	3	4	6	10	35
Total	228	195	182	160	155	166	175	1,261

Data Source: Ramanagara District Police
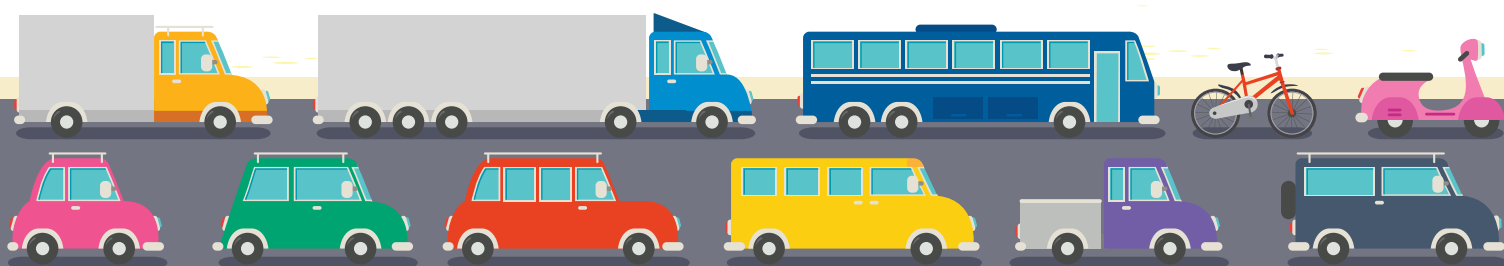
9. CRASH MATRICES

9.1 Bengaluru Urban

Table-4 below is a crash matrix describing fatal crashes registered by BTP, between 2019 and 2022, in terms of impacting vehicle categories and impacted vehicles or road users.

Of the 2,745 fatal crashes registered by BTP in this period, 818 (30%) were single vehicle crashes, where the impacting vehicle was not involved in a collision with any other vehicle or road user.

In terms of fatal collisions involving multiple vehicles or road users, lorries were observed to be impacting vehicles in 565 cases, or 29% of all fatal crashes excluding single vehicle crashes. Of these 565 cases, motorcycles were the fatally hit or impacted vehicle in 363 (64%) cases.

Motorcycles were involved in most single vehicle crashes. When involved in collisions with other vehicles or road users, motorcycles fatally hit pedestrians the most.

Table-4 Impacting and Impacted Vehicles
Bengaluru Traffic Police, 2019-22

	Victim Vehicle/User									
Impacting vehicle	**Bicycle**	**Motor-cycle**	**Three-wheeler**	**LMV**	**Bus**	**Lorry**	**Unknown**	**Self Crash**	**Pedestrian**	**Total**
Motorcycle	7	120	7	19	1	11	0	602	252	1,019
Three-wheeler	0	19	0	3	0	2	0	40	56	120
LMV	2	278	13	21	3	9	3	84	182	595
Bus	0	124	2	3	2	2	1	13	90	237
Lorry	1	363	13	13	1	18	1	73	155	638
Unknown	5	44	0	0	0	0	0	6	81	136
TOTAL	15	948	35	59	7	42	5	818	816	2745

Data Source: Bengaluru Traffic Police

9.2 Bengaluru Rural

Table-5 below is a crash matrix describing fatal crashes registered by Bengaluru District Police between 2019 and 2022 in terms of impacting vehicle categories and impacted vehicles or road users.

Similar to fatal crashes in Bengaluru Urban, Lorries and LMVs were involved in most fatal collisions with other vehicles and road users in Bengaluru Rural between 2019 and 2022. Excluding single vehicle crashes they were involved in, lorries and LMVs fatally hit 356 and 263 motorcycles respectively.

Single vehicle crashes accounted for 15% of all fatal crashes registered by Bengaluru District Police.

Table-5 Impacting and Impacted Vehicles
Bengaluru District Police, 2019-22

Impacting vehicle	Victim Vehicle/User								
	Bicycle	Motor-cycle	Three-wheeler	LMV	Bus	Lorry	Single Vehicle Crash	Pedestrian	Total
Motorcycle	2	120	1	2	2	5	309	217	661
Three-wheeler	1	9	0	0	0	1	15	15	41
LMV	0	270	8	21	3	9	52	205	571
Bus	0	61	3	5	0	1	9	47	126
Lorry	0	368	9	36	0	18	25	151	609
Unknown	1	58	0	1	0	0	0	145	205
Total	4	886	21	65	5	34	410	780	2,213

Data Source: Bengaluru District Police

9.3 Ramanagara

Table-6 describes fatal crashes registered by Ramanagara district police in terms of impacting vehicles and impacted vehicles or road user groups between 2019 and 2022.

In Ramanagara district, LMVs were involved in most fatal crashes excluding single vehicle crashes. LMVs fatally hit motorcycles (15%) and pedestrians (9.6%) the most.

Table-6 Impacting and Impacted Vehicles
Ramanagara District Police, 2019-22

Impacting vehicle	Victim Vehicle/User								
	Bicycle	Motor-cycle	Three-wheeler	LMV	Bus	Lorry	Single Vehicle Crash	Pedestrian	Total
Motorcycle	0	108	2	3	3	6	205	98	425
Three-wheeler	0	9	0	0	0	0	21	14	44
LMV	0	191	7	10	0	10	39	121	378
Bus	0	56	1	8	2	0	6	31	104
Lorry	0	112	6	21	3	8	10	68	229
Unknown	2	20	1	1	0	0	0	57	81
Total	2	496	17	43	8	24	281	389	1,261

Data Source: Ramanagara District Police

10. PEDESTRIAN DEATHS

10.1 Bengaluru Urban

In fatal road crash cases registered by BTP between 2019 and 2022, 77.4% of pedestrians who lost their lives were identified as male and 18.4% as female. The gender of the pedestrian victim was unknown in 33 cases during this period.

Fig 10.1.1 Pedestrian Deaths - by Gender
Bengaluru Traffic Police, 2019-22

Data Source: Bengaluru Traffic Police
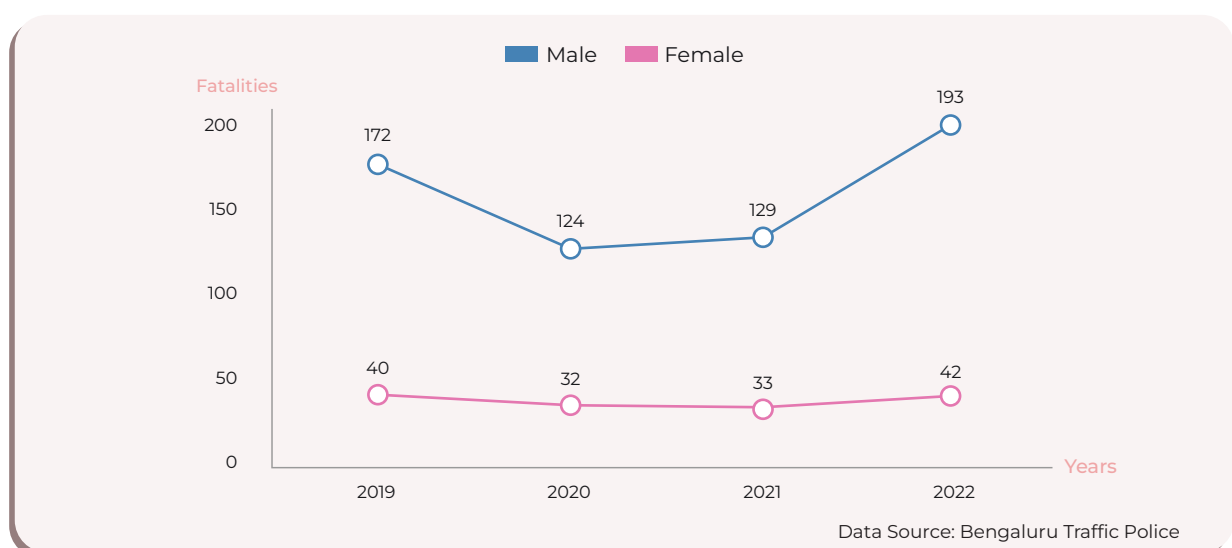
Nearly 30% of all pedestrians who died due to fatal crashes in Bengaluru Urban belonged to ages over 60 years. Pedestrian fatalities were higher among older age groups. The age of the pedestrian victim was not known in the case of 48 (6%) deaths.

Fig 10.1.2 Pedestrian Deaths - by Age

Bengaluru Traffic Police, 2019-22

Data Source: Bengaluru Traffic Police
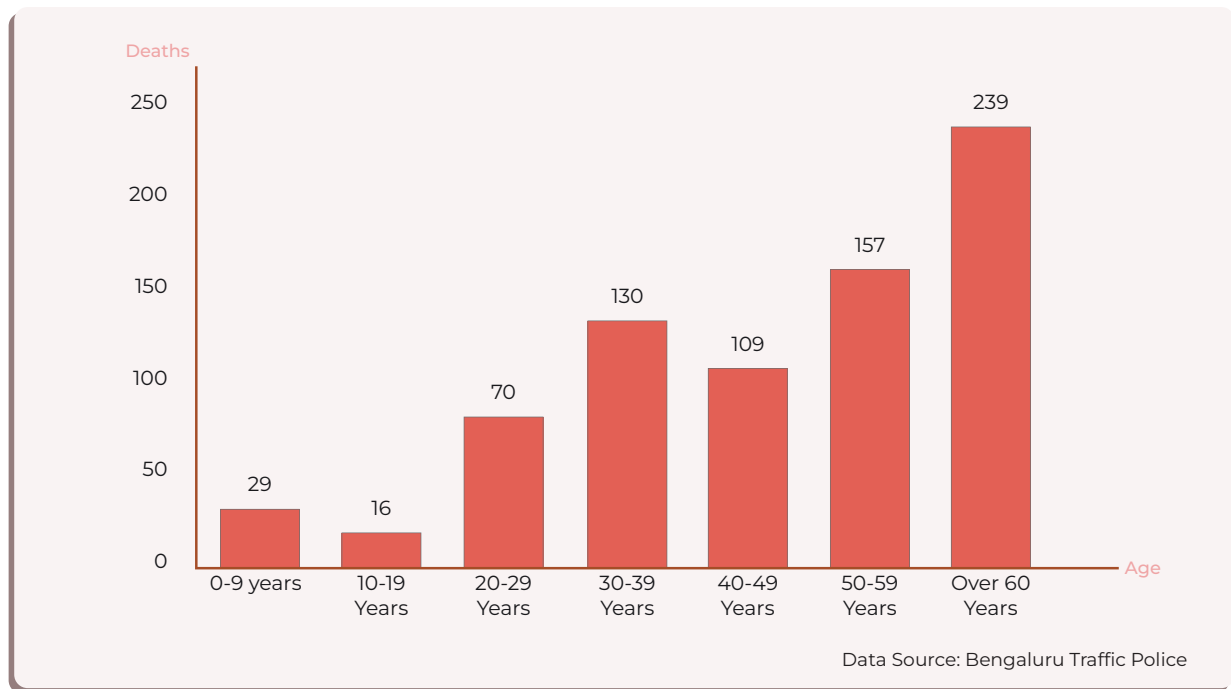
Most pedestrian deaths were caused by motorcycles (30%) and LMVs (22%). Vehicles responsible were unknown in the case of 117 (14.7%) of pedestrian deaths.

Fig 10.1.3 Pedestrian Deaths - by Impacting Vehicle

Bengaluru Traffic Police, 2019-22

Data Source: Bengaluru Traffic Police
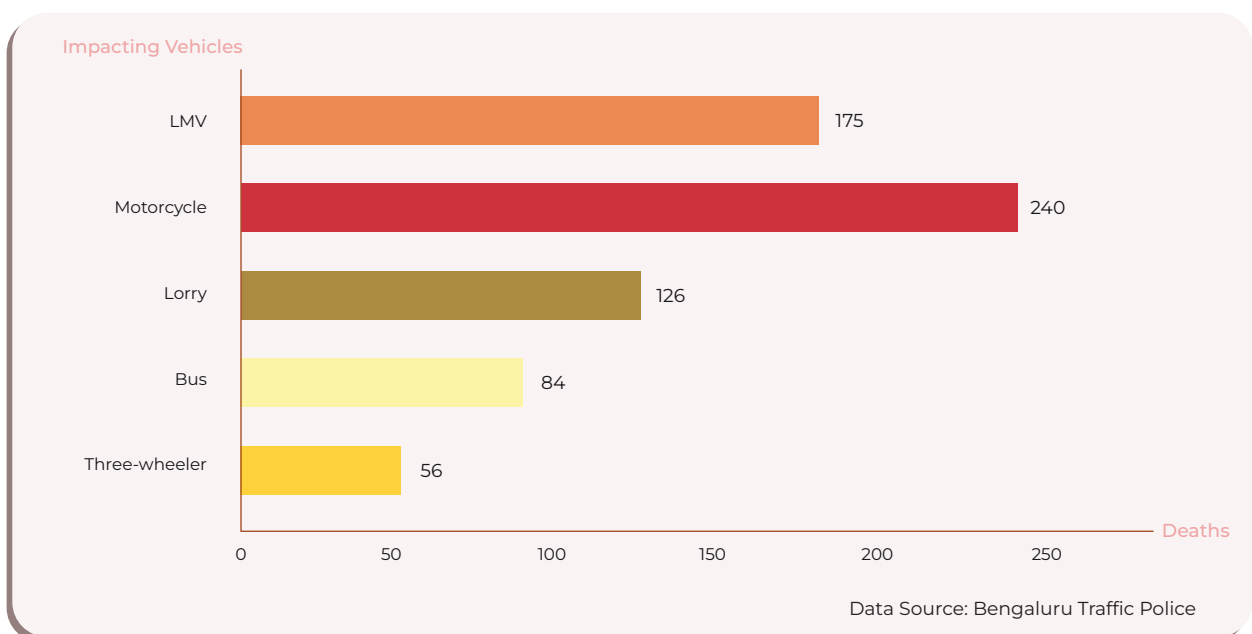
10.2 Bengaluru Rural

Nearly 85% of pedestrian victims in fatal road crashes, registered by Bengaluru District Police, were identified as male while 15% were identified as female.

Fig 10.2.1 Pedestrian Deaths - by Gender

Bengaluru District Police, 2019-22
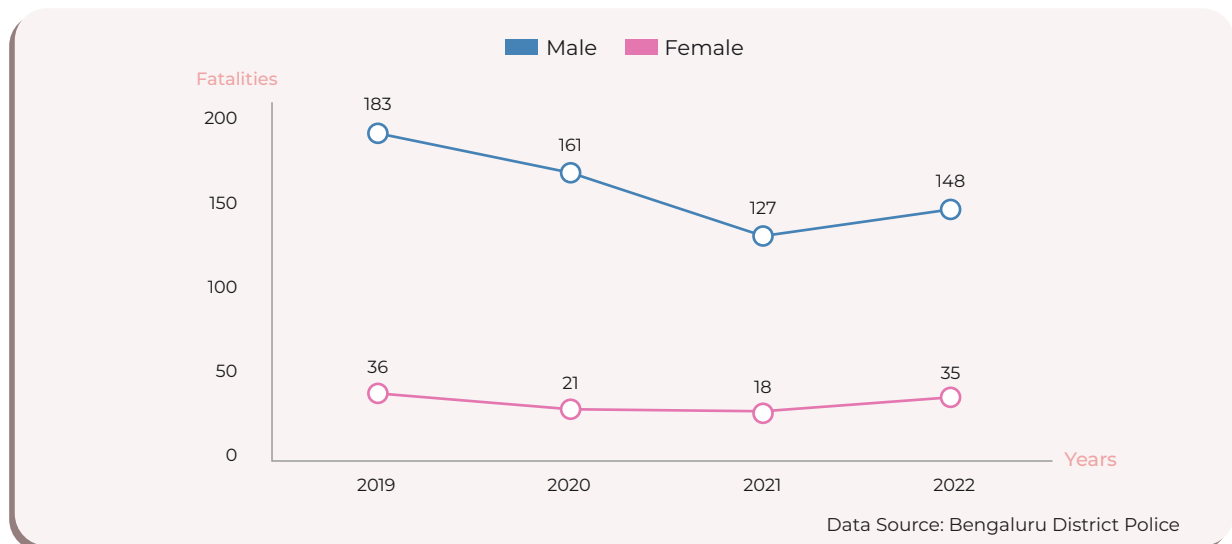
About 23% of all pedestrians who died due to fatal crashes in Bengaluru Rural district belong to ages over 60 years. The age of the pedestrian victim was unknown in the case of 72 (9.8%) deaths.

Fig 10.2.2 Pedestrian Deaths - by Age

Bengaluru District Police, 2019-22
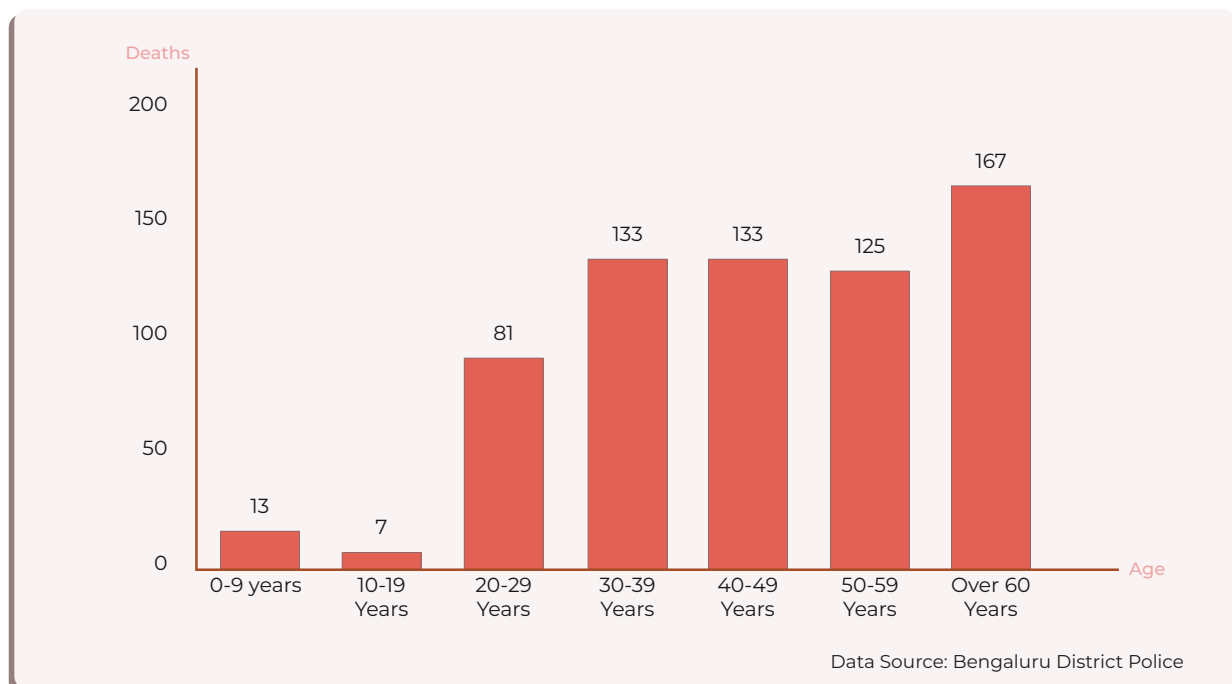
LMVs and motorcycles were respectively responsible for about 26% and 24% of all pedestrian deaths registered by Bengaluru District Police between 2019 and 2022. The impacting vehicle was unknown in the case of 172 (23.5%) pedestrian deaths in this period.

Fig 10.2.3 Pedestrian Deaths - by Impacting Vehicle

Bengaluru District Police, 2019-22

Impacting Vehicles

Vehicle	Deaths
Motorcycle	189
Three-wheeler	172
LMV	132
Bus	51
Lorry	15

Data Source: Bengaluru District Police
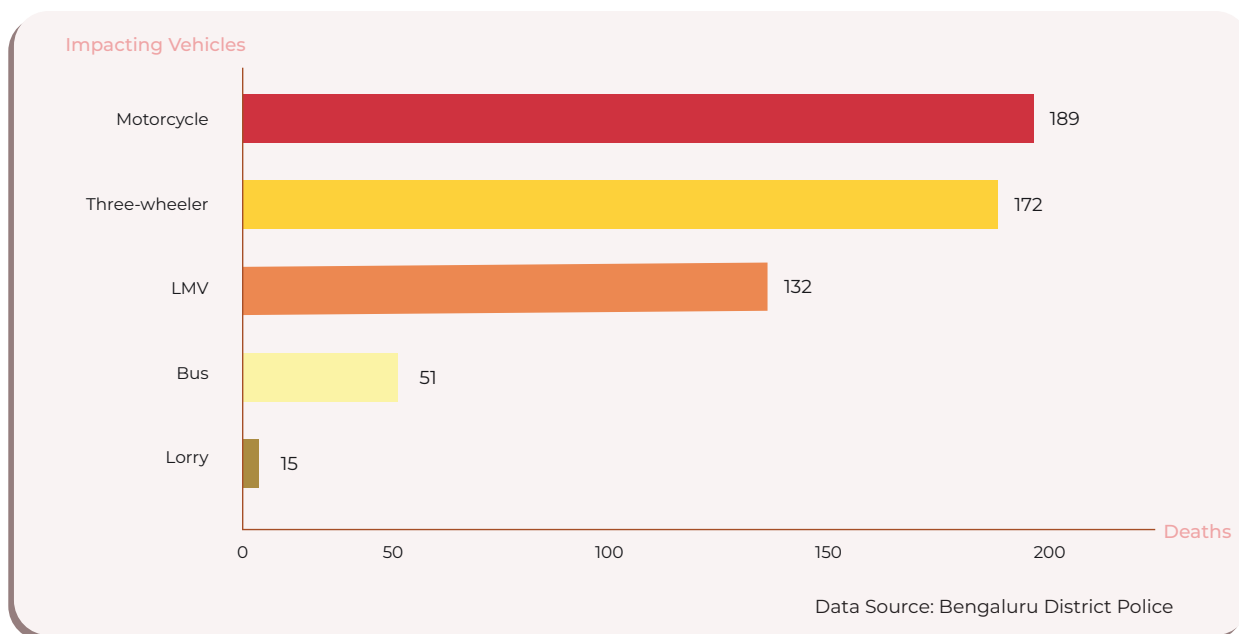
10.3 Ramanagara

About 80% of pedestrians killed in road crashes, registered by Ramanagara District Police between 2019 and 2022, were identified as male and 20% as female.

Fig 10.3.1 Pedestrian Deaths - by Gender

Ramanagara District Police, 2019-22

Male   Female

Fatalities

Year	Male	Female
2019	83	22
2020	71	16
2021	55	18
2022	73	13

Data Source: Ramanagara District Police
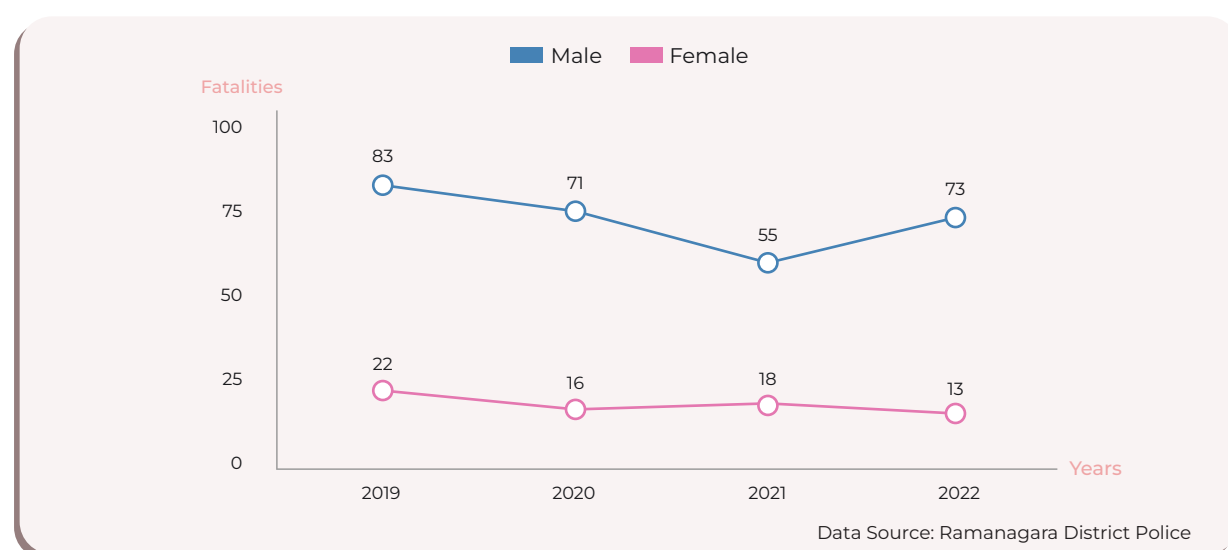
Pedestrian fatalities in Ramanagara district were higher among age groups older than 40 years of age. 25% of all pedestrians who died in the district were aged over 60 years. The age of the pedestrian was unknown in the case of 41 (11.6%) deaths.

Fig 10.3.2 Pedestrian Deaths - by Age

Ramanagara District Police, 2019-22

Data Source: Ramanagara District Police
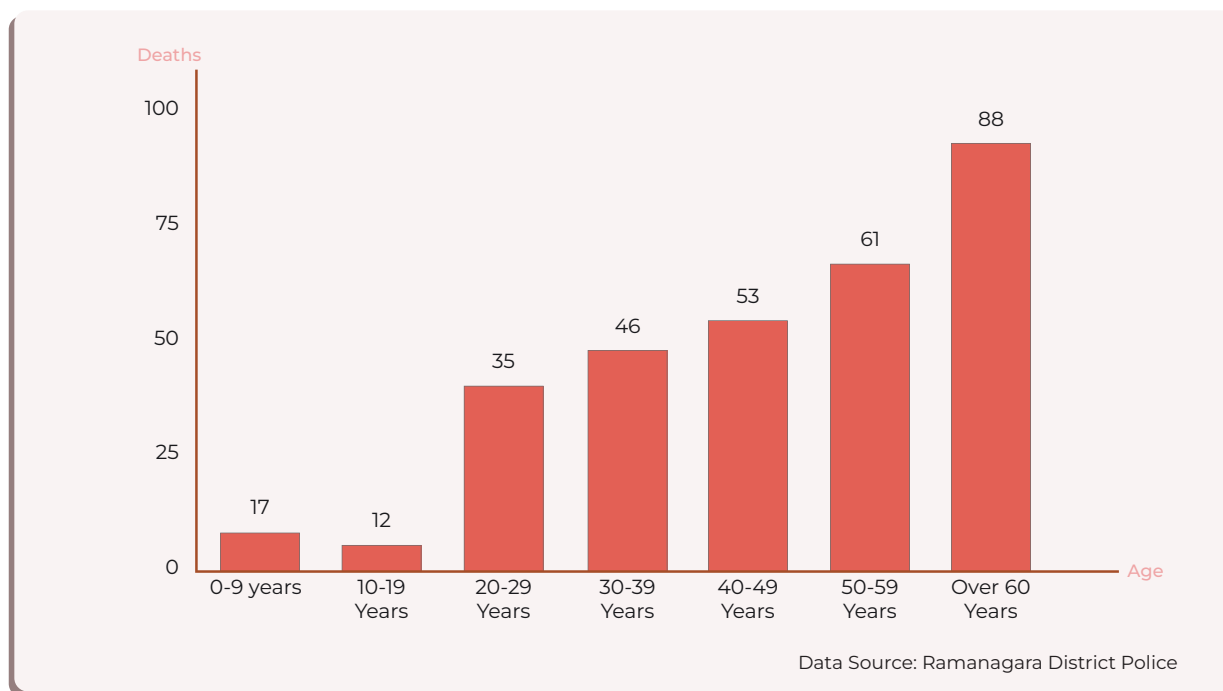
Most of the pedestrian deaths in the district were caused by LMVs (31%) and motorcycles (25%). Heavy vehicles (buses and lorries) were responsible for 23% of all pedestrian deaths between 2019 and 2022. The impacting vehicle was unknown in the case of 59 (16.7%) pedestrian deaths.

Fig 10.3.3 Pedestrian Deaths - by Impacting Vehicle

Ramanagara District Police, 2019-22

Data Source: Ramanagara District Police
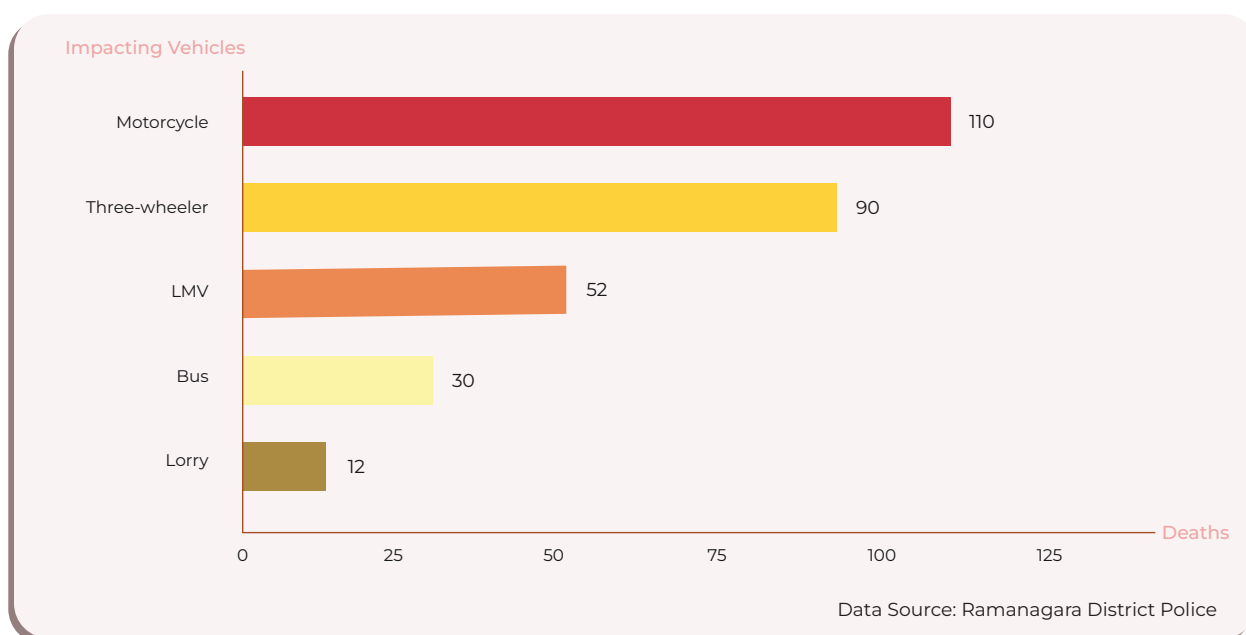
11. MOTORCYCLE USER DEATHS

11.1 Bengaluru Urban

About 88% of all motorcycle users who died in fatal road crashes in Bengaluru Urban district were identified as male, and 12% as female.

Fig 11.1.1 Motorcycle user deaths - by Gender

Bengaluru Traffic Police, 2019-22

Data Source: Bengaluru Traffic Police
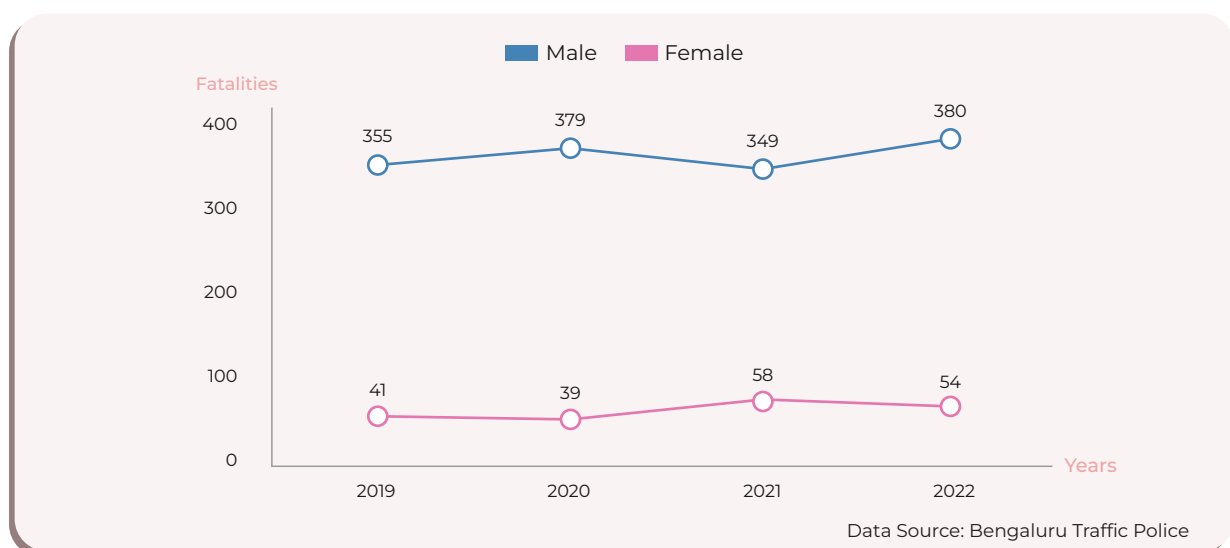
Motorcycle users aged between 20 and 29 years made up 36% of all motorcycle user deaths in Bengaluru Urban district. The age of the motorcycle user was unknown in the case of 110 (6.6%) of deaths.

Fig 11.1.2 Motorcycle user deaths - by Age

Bengaluru Traffic Police, 2019-22

Data Source: Bengaluru Traffic Police
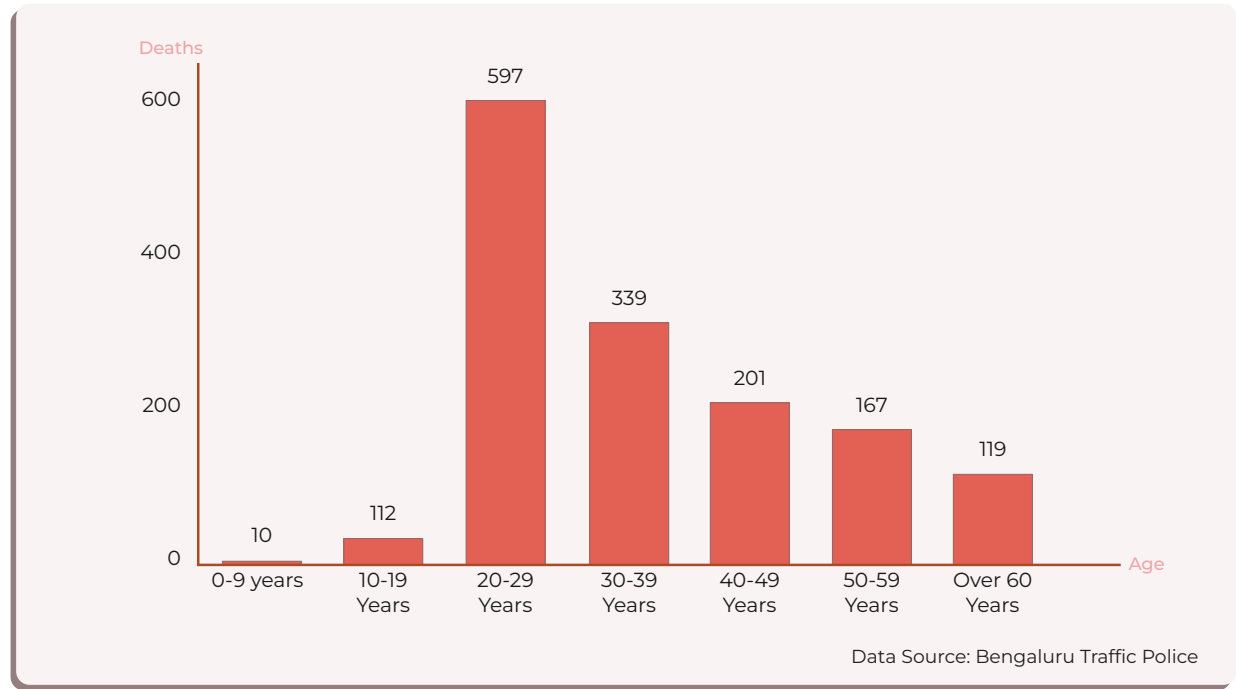
Lorries were impacted in 38% of fatal crashes with motorcycle users in the Bengaluru Urban district from 2019 to 2022, while Light Motor Vehicles (LMV) were responsible in nearly 30% of cases where a motorcycle user was fatally hit. The impacting vehicle was unknown in 44 (4.6%) of fatal crashes with motorcycle users.

Fig 11.1.3 Fatal crashes with motorcycle users - by Impacting Vehicle

Bengaluru Traffic Police, 2019-22

Data Source: Bengaluru Traffic Police
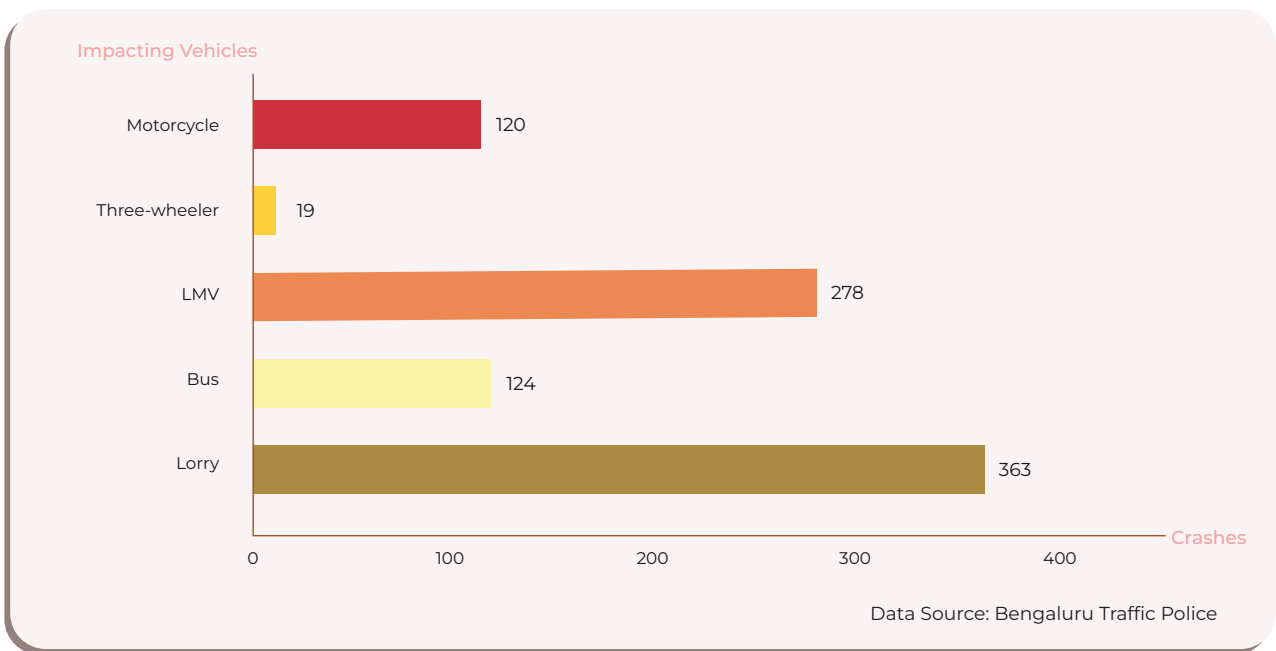
11.2 Bengaluru Rural

Over 89% of motorcycle users who died due to fatal crashes in Bengaluru Rural district were identified as male, while 11% were identified as female.

Fig 11.2.1 Motorcycle user deaths - by Gender

Bengaluru District Police, 2019-22

Data Source: Bengaluru District Police
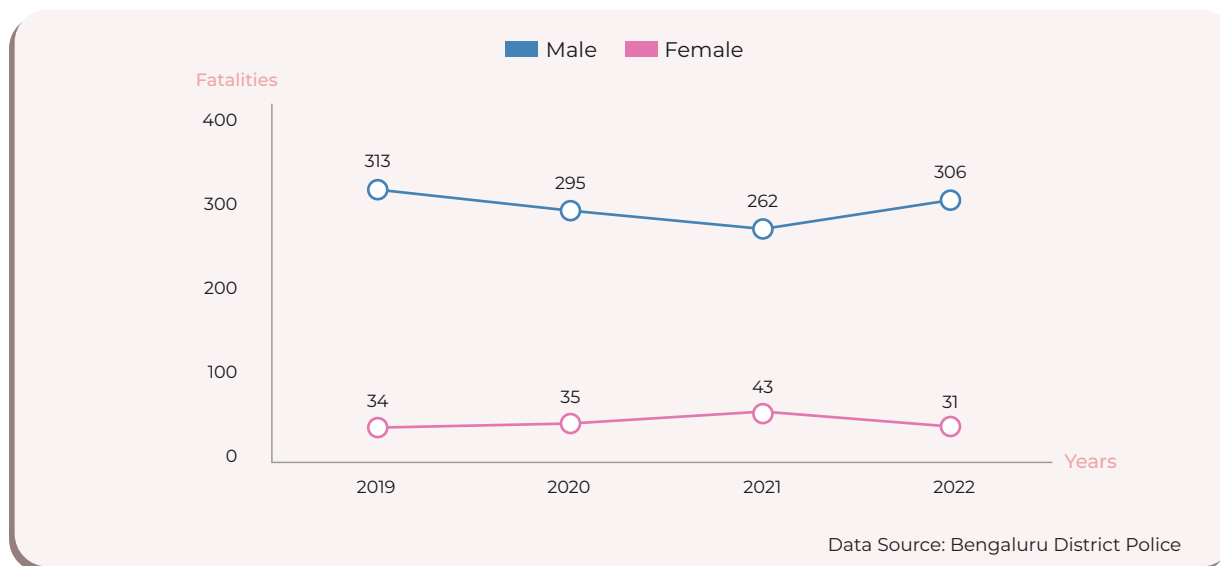
Similar to Bengaluru Urban, deaths among motorcycle users in Bengaluru Rural district was the highest in the 20 to 29 years age group, making up 30% of all motorcycle user deaths. The age of the motorcycle user was unknown in the case of 209 (15.8%) deaths.

Fig 11.2.2 Motorcycle user deaths - by Age

Bengaluru District Police, 2019-22

Data Source: Bengaluru District Police
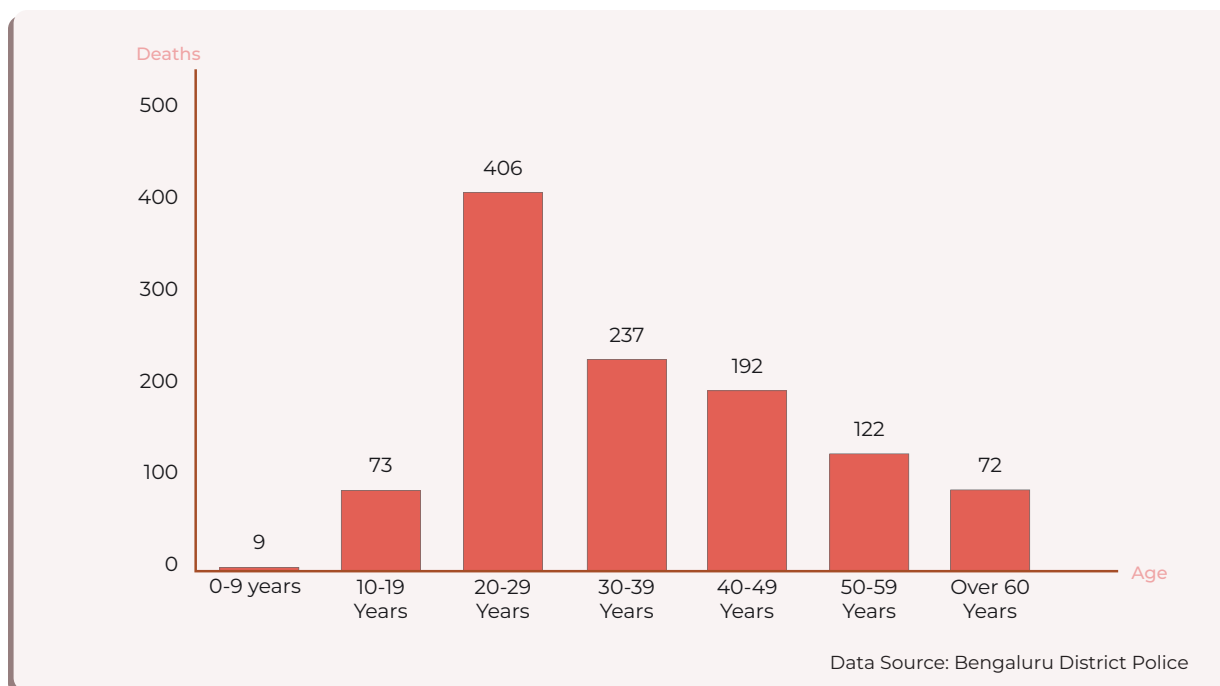
In the Bengaluru Rural district, in fatal crashes where motorcycle users were hit, lorries were impacted in 40% of cases and LMVs in 30% of cases. The at fault or impacting vehicle was unknown in the case of 74 (8.4%) fatal crashes.

Fig 11.2.3 Fatal crashes with motorcycle users - by Impacting Vehicle

Bengaluru District Police, 2019-22

Impacting Vehicles

Vehicle	Crashes
Motorcycle	118
Three-wheeler	9
LMV	263
Bus	60
Lorry	356

Data Source: Bengaluru District Police
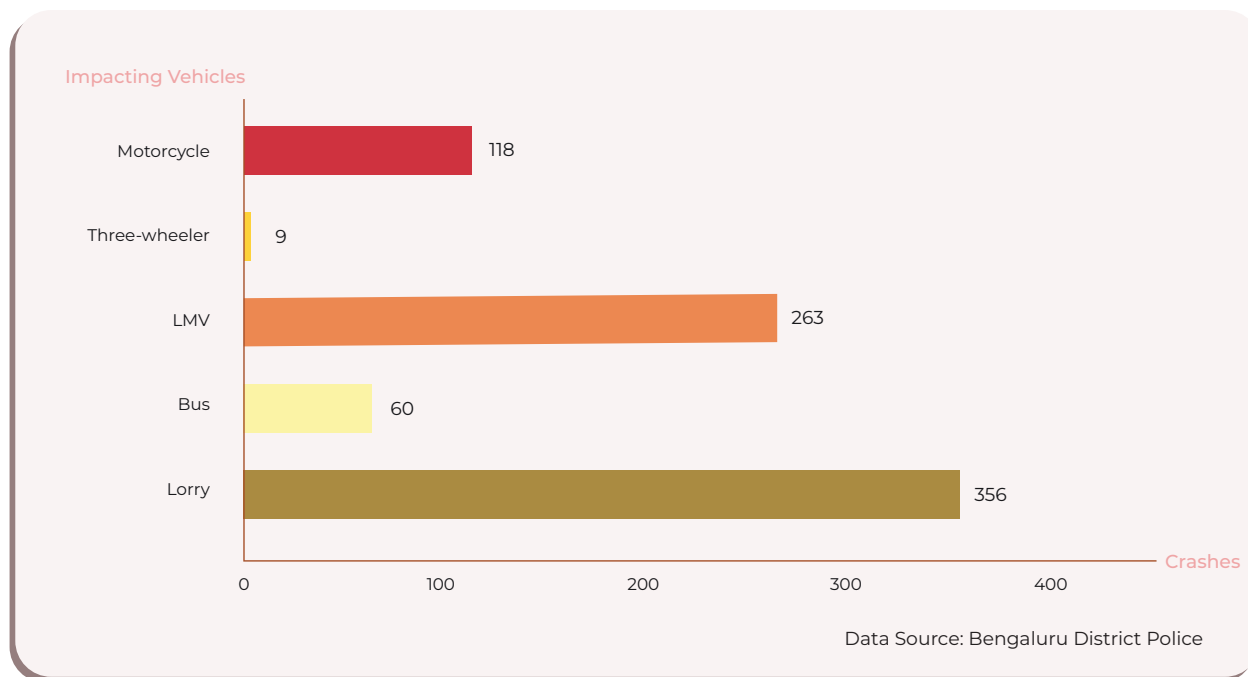
11.3 Ramanagara

Similar to the trend observed in the other districts of the BMR, about 90% of motorcycle users who died in Ramanagara were identified as male, while 10% were identified as female.

Fig 11.3.1 Motorcycle user deaths - by Gender

Ramanagara District Police, 2019-22

Male — Female

Fatalities

Year	Male	Female
2019	191	19
2020	152	13
2021	149	11
2022	182	30

Data Source: Ramanagara District Police
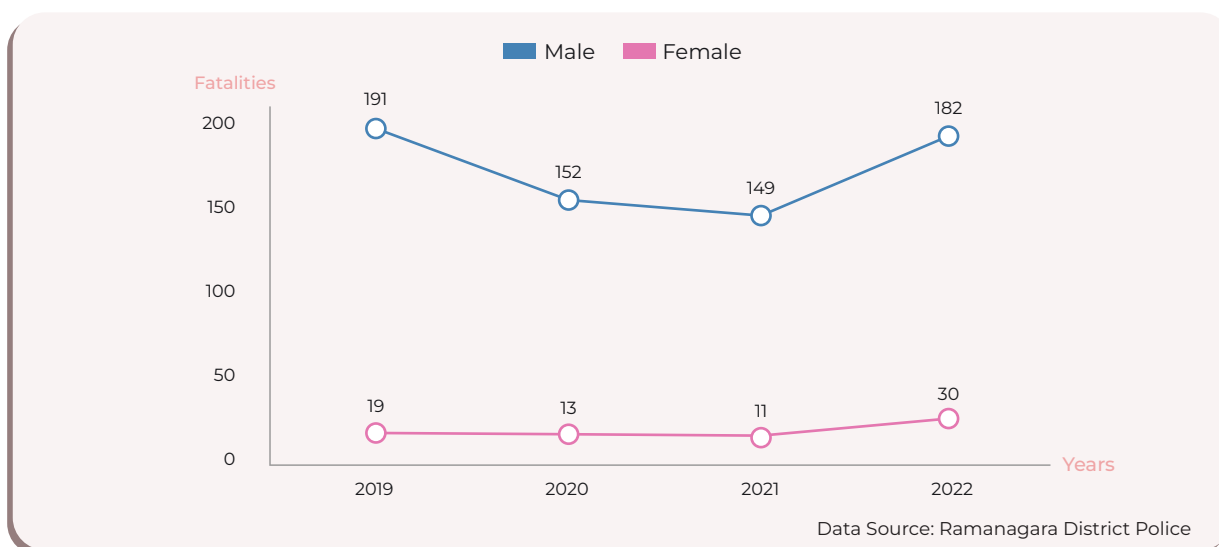
Motorcycle user deaths in Ramanagara district was highest among the 20 to 29 years age group (22.7%) followed by the 30 to 39 years age group (19.7%). The age of the motorcycle user was unknown in the case of 119 (15.9%) deaths.

Fig 11.3.2 Motorcycle user deaths - by Age

Ramanagara District Police, 2019-22

Data Source: Ramanagara District Police
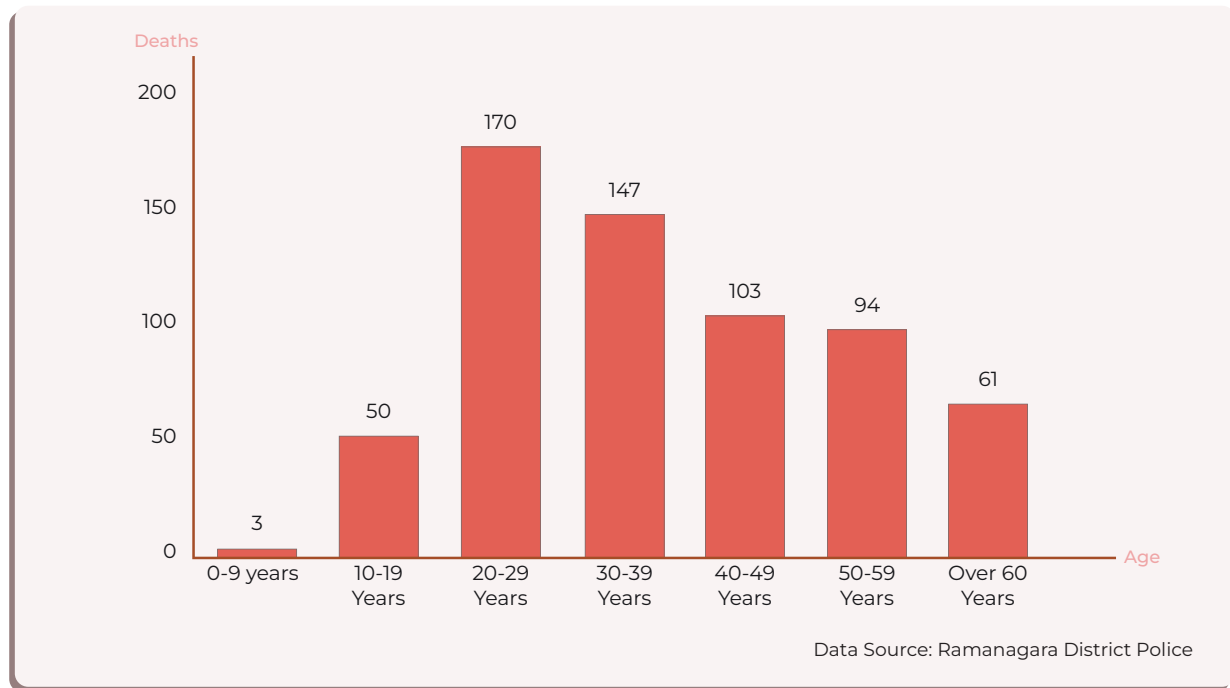
In fatal crashes recorded in Ramanagara district from 2019 to 2022, LMVs fatally crashed with motorcycles in 38% of cases, while other motorcycles and lorries were impacted in about 22% of cases each. The impacting vehicle was unknown in the 20 (4%) fatal crashes with motorcycle users.

Fig 11.3.3 Fatal crashes with motorcycle users - by Impacting Vehicle

Ramanagara District Police, 2019-22

Data Source: Ramanagara District Police
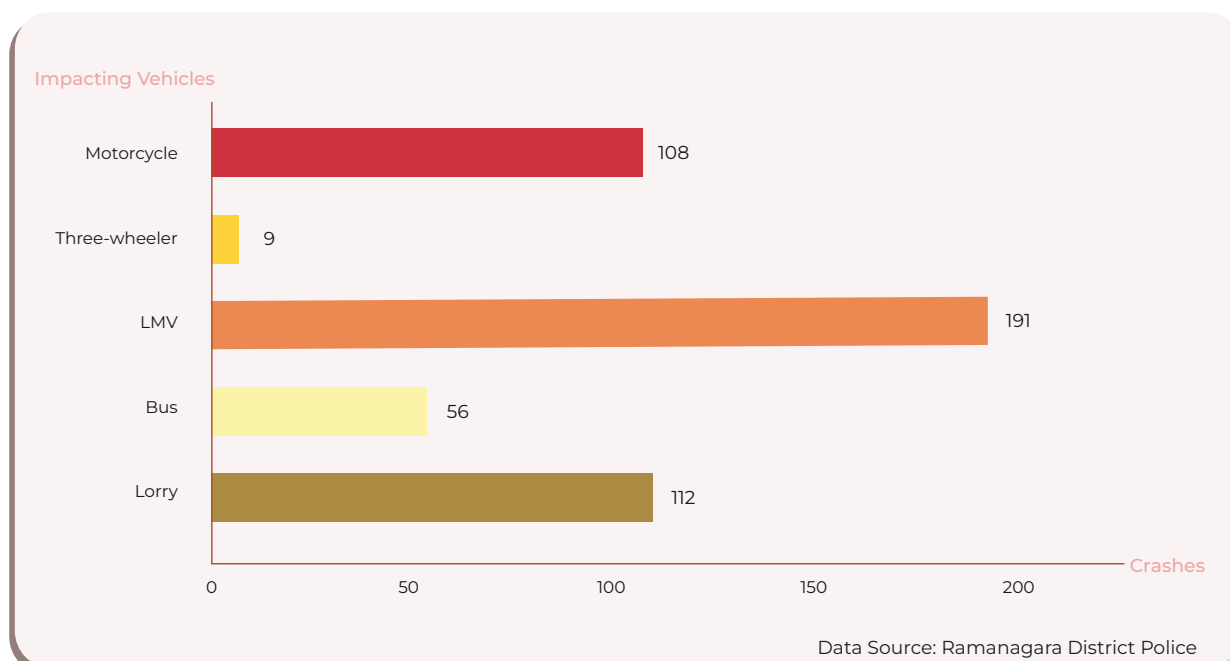
12.1 HEAT MAPS OF FATAL CRASHES

12.1.1 Bengaluru Urban

The map below indicates the density of road crash fatalities recorded by Bengaluru Traffic Police between 2019 and 2022. Darker colours reflect a higher density of fatalities. Road crash fatalities were concentrated along Hosur Road, Ballari Road, Tumkur Road and certain stretches of the Outer Ring Road, Old Madras Road and Mysore Road.

BENGALURU TRAFFIC POLICE
Road Crash Fatalities - Heatmap, 2019-22

Darker colours indicate more fatalities
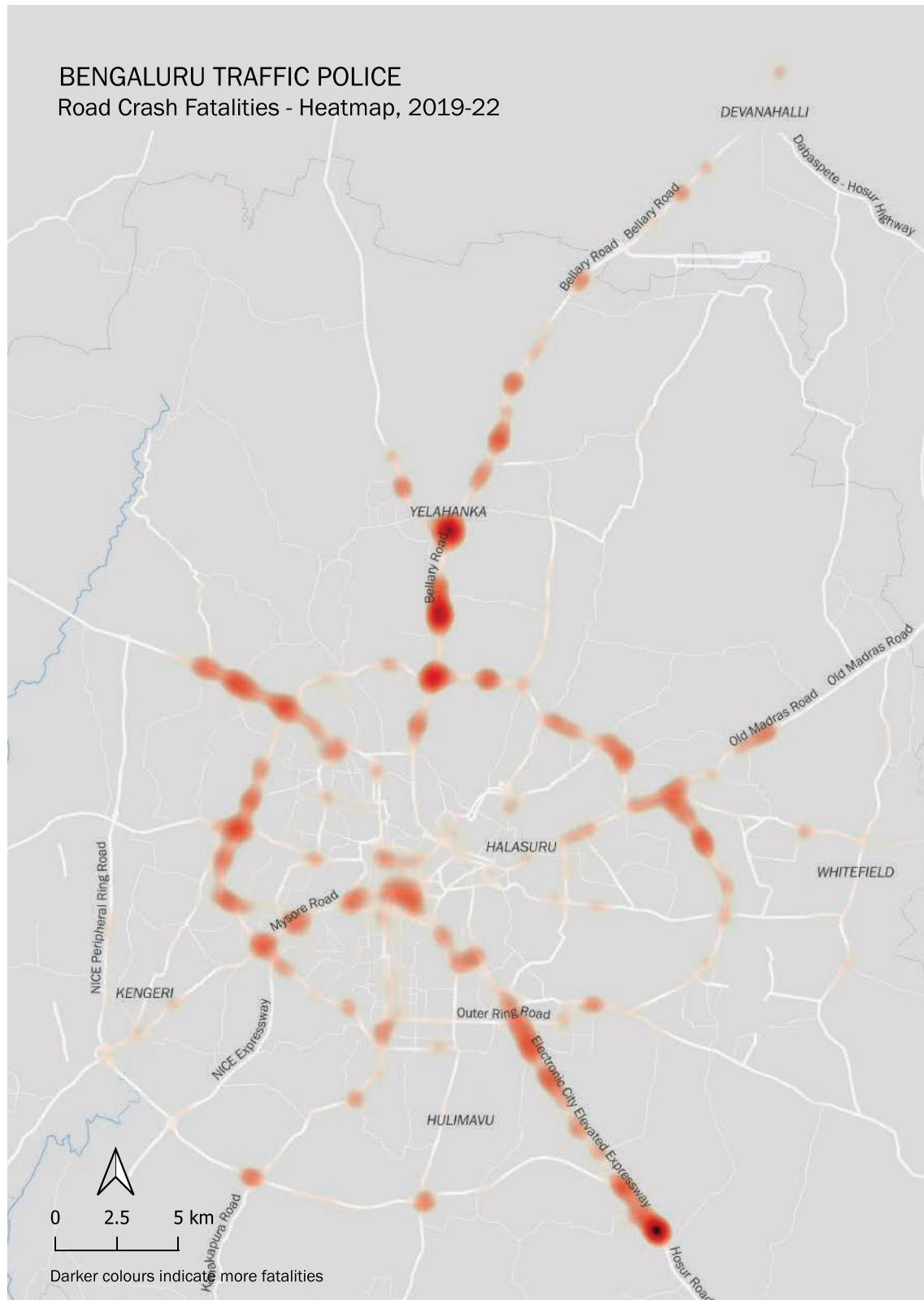
12.1.2 Bengaluru Rural

The image below is a map showing the density of road crash fatalities recorded by the Bengaluru District Police between 2019 and 2022. In this heatmap, darker colours indicate more fatalities.

Road crash fatalities were concentrated along five corridors labelled A to E in the map: Pune-Bengaluru Highway (NH-48), Tumkur Road (NH-48), Nelamangala-Chikkaballapura road, Old Madras Road (NH-75) and Hosur Road (NH-44).

BENGALURU DISTRICT POLICE

Road crash fatalities - Heatmap, 2019-22

A. Pune - Bengaluru Highway (NH48)
B. Tumkur Road (NH48)
C. Nelamangala - Chikkaballapura road
D. Old Madras Road (NH75)
E. Hosur Road (NH44)

Darker colours indicate more fatalities

0
10
20 km
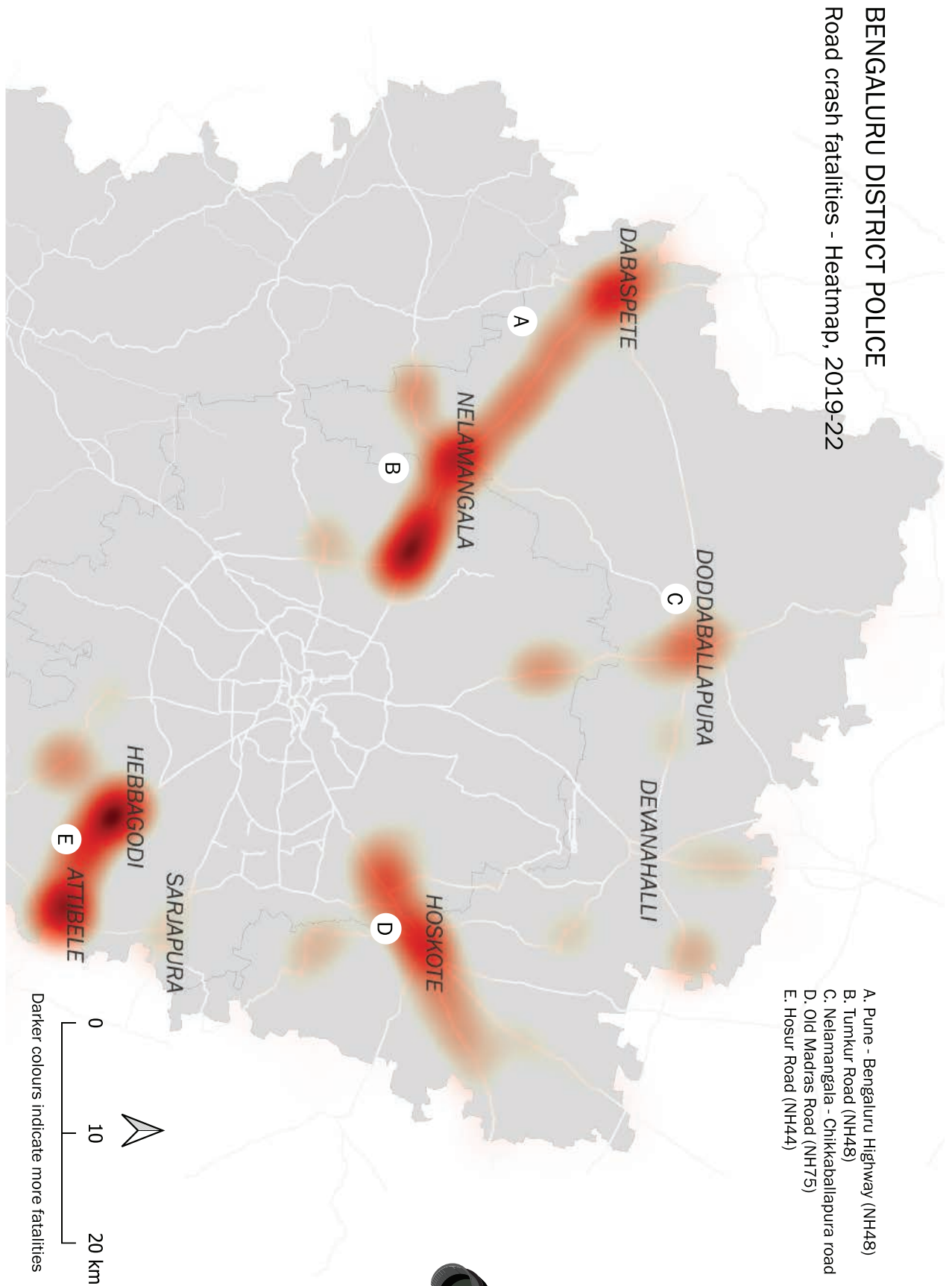
12.1.3 Ramanagara

Road crash fatalities recorded by Ramanagara District Police were concentrated mostly along Bengaluru-Mysuru Road, Kanakapura Road and Bengaluru-Mangalore Highway as shown in the heat map below. Darker colours indicate a higher concentration of fatalities in this heat map.

RAMANAGARA DISTRICT POLICE
Road crash fatalities - Heatmap, 2019-22

A. Bengaluru-Mangalore Highway
B. Bengaluru-Mysuru Road
C. Kanakapura Road

Darker colours indicate more fatalities

0   10   20 km
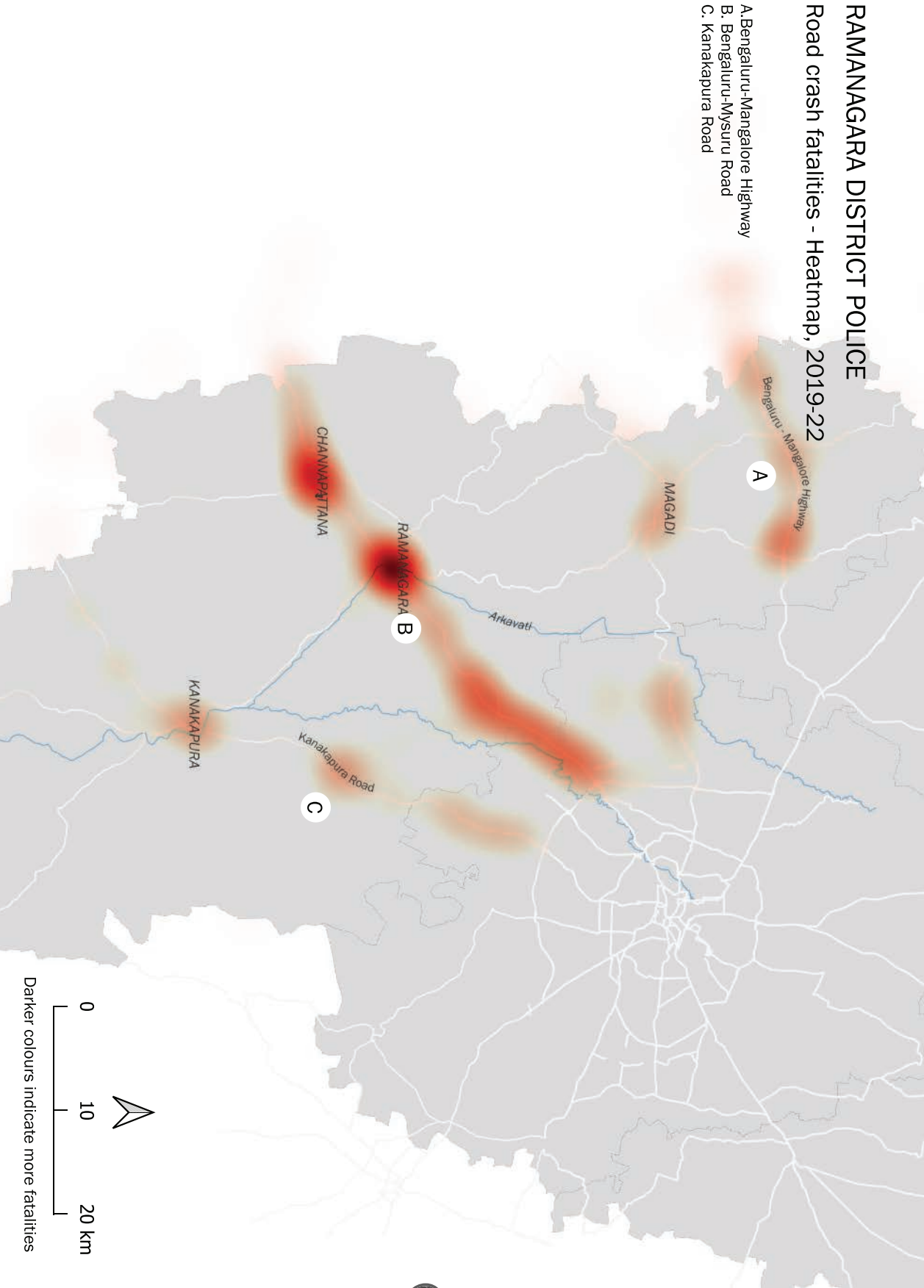
12.2 BLACKSPOTS AND HIGH-RISK ROADS

12.2.1 Bengaluru Urban

Road crash blackspots are 500 metre stretches of road where at least 5 fatal crashes were recorded between 2019 and 2022. A total of 40 such blackspots were identified in the jurisdiction of BTP. Table-7 below ranks the Top 10 blackspots where the highest number of crash fatalities were recorded by BTP.

Table-7: TOP-10 BLACKSPOTS, BTP, 2019-22

SNO	RANK	LOCATION (Road)	FATALITIES WITHIN 250m RADIUS (2019-22)
1	1	Veerasandra Bus Stop (Hosur Road)	18
2	2	Electronic City Toll Plaza (Hosur Road)	17
3	3	Byatarayanapura Junction (Bellary Road)	15
4	4	Byatarayanapura Post Office (Bellary Road)	14
5	5	Hebbal Flyover (Bellary Road)	13
6	6	MVIT Cross (Bellary Road)	12
7	7	In front of Bagmane Tech Park (Outer Ring Road)	11
8	8	Electronic City Bus Stop (Hosur Road)	10
9	8	Singasandra Post Office (Hosur Road)	10
10	8	Garvebhavipalya Junction (Hosur Road)	10

Table-8 describes road corridors with the highest number of crash fatalities registered by Bengaluru Traffic Police between 2019 and 2022. These corridors have been identified by plotting fatalities on a map of Bengaluru Urban district using QGIS and have been ranked in the descending order of crash fatalities per kilometre.

Table-8: HIGH RISK CORRIDORS, BTP, 2019-22

CORRIDOR (Length)	ROAD NAME	FATALITIES (2019-22)	FATALITIES PER KM
1. Hebbal Flyover to Allalasandra Junction (4.4km)	Bellary Road	60	14
2. Silk Board Junction to Electronic City Toll (10.1km)	Hosur Road	104	10
3. Allalasandra Junction to MVIT Cross (8.4km)	Bellary Road	69	8
4. Hudson Circle to Nayandahalli Junction (7.2km)	Mysore Road	48	7
5. Marathahalli Junction to KR Puram Railway Station (5.9km)	Outer Ring Road	42	7
6. Cauvery Theatre Junction to Hebbal Flyover (4.5km)	Bellary Road	33	7
7. Trinity Circle to Medahalli Junction (12.7km)	Old Madras Road	77	6
8. Benniganahalli Flyover to Hebbal Flyover (11.2km)	Outer Ring Road	71	6
9. Nayandahalli Junction to CMTI Junction (11km)	Outer Ring Road	66	6
10. Yeshwantpur Police Station to Anchepalya Junction (10.4km)	Tumkur Road	64	6

BENGALURU URBAN
HIGH RISK CORRIDOR-1: BELLARY ROAD (NH44)
Hebbal Flyover to Allalasandra Junction (4.4km)
Road Crash Fatalities (2019-22): 60

Blackspot

Fatalities

ALLALASANDRA JUNCTION

JAKKUR

4. JAKKUR JUNCTION

Bellary Road

Jakkur Main Road

Jakkur Main Road

Bellary Road

3.BYATARAYANAPURA JUNCTION

Kodigehalli Main Road

Bellary Road

2.KEMPAPURA

Bellary Road

1.HEBBAL FLYOVER

Hebbal Flyover

Hebbal Flyover

Outer Ring Road

Yelahanka Road

0   250   500 m

SANJAY NAGARA

HEBBAL

Bellary Road Bellary Road

49

1. SILK BOARD
BUS STOP

2.BOMMANAHALLI
BUS STOP

HSR LAYOUT

3.GARVEBHAVIPALYA
JUNCTION

4.SINGASANDRA

5.HOSA ROAD
JUNCTION

6.KONAPPANA
AGRAHARA

7.ELECTRONIC CITY
BUS STOP

8.ELECTRONIC
CITY TOLL PLAZA

9.VEERASANDRA

Blackspot

Fatalities along corridor

Outer Ring Road

Sarjapura Road

Hosur Road

NICE Peripheral Ring Road

0   750   1,500 m

BENGALURU URBAN
HIGH RISK CORRIDOR-2: HOSUR ROAD (NH44)
Silk Board Junction to Electronic City Toll (10.1km)
Road Crash Fatalities (2019-22): 104

50

BENGALURU URBAN
HIGH RISK CORRIDOR-3: BELLARY ROAD (NH44)
Allalasandra Junction to MVIT Cross (8.4km)
Road Crash Fatalities (2019-22): 69

1. MVIT CROSS

HUNASAMARANAHALLI

Bellary Road

Bellary Road Bellary Road

Bagalur Road

BAGALUR CROSS

Doddaballapur Road Doddaballapur Road

Thanisandra Main Road

Thanisandra Main Road

YELAHANKA

YELAHANKA NEW TOWN

Yelahanka Road

Bellary Road

Yelahanka Road

Bellary Road

ALLALASANDRA JUNCTION

JAKKUR

Blackspot

Fatalities along corridor

0   500   1,000 m

BENGALURU URBAN
HIGH RISK CORRIDOR-4: MYSORE ROAD
Hudson Circle to Nayandahalli Junction (7.2km)
Road Crash Fatalities (2019-22): 48

■ Fatalities along corridor
▣ Metro Stations near the corridor

NAYANDAHALLI JUNCTION

Bangalore-Mysore Road

Vrishabhavati

NICE Expressway

Outer Ring Road

Outer Ring Road

Mysore Road

Mysore Road

Deepanjali Nagar

ATTIGUPPE

Attiguppe

Chord Road

Chord Road

Chord Road

Vrishabhavathi

Chord Road

Nagasandra Magadi Road

SATELLITE BUS STAND

Mysore Road

Mysore Road

Old Mysuru Road

SIRSI CIRCLE

CHAMARAJAPETE

5th Main Road

VINAYAKA THEATRE

Tank Bund Road

Tank Bund Road

Old Mysuru Road

Old Mysuru Road

CHIKKAPETE

Krishna Rajendra Road

Krishna Rajendra Market

Kondaji Basappa Road

JC Road

Chickpete

BGS Square

SJP Road

Dhanvanthari Road

Kempegowda Road

HUDSON CIRCLE

JC Road

Kalinga Rao Road

Nrupatunga Road

Sheshadri Road

Doctor B R Ambedkar Veedhi

Kasturba Road

Kengal Hanumanthaiah Road

Lalbagh Fort Road

Kanakapura Road

0
750
1,500 m

52

BENGALURU URBAN
HIGH RISK CORRIDOR-5: OUTER RING ROAD
Marathahalli Junction to KR Puram Railway Station (5.9km)
Road Crash Fatalities (2019-22): 42

Devasandra Main road

Whitefield Road Whitefield Road

Outer Ring Road Outer Ring Road

Tin Factory Flyover

Whitefield Road Whitefield Road

MAHADEVAPURA

Whitefield Road

Graphite India Road

Hoodi Main Road

Outer Ring Road

KAGGADASAPURA

2. BAGMANE BUS STOP

Kaggadasapura Main Road

Kundalahalli Main Road

2nd Road

Malleshpalya Main Road

Kundalahalli Main Road

Outer Ring Road

▢ Blackspot

▪ Fatalities along corridors

Outer Ring Road Outer Ring Road

Namjoshi Road

1.MARATHAHALLI JUNCTION

HAL Old Airport Road

Varthur Road Varthur Road

Varthur Road

Varthur Road

Outer Ring Road

0   250   500 m

BENGALURU URBAN
HIGH RISK CORRIDOR-6: BELLARY ROAD
Cauvery Theatre Junction to Hebbal Flyover (4.5km)
Road Crash Fatalities (2019-22): 33

Outer Ring Road

☐ Blackspot

■ Fatalities along corridor

SANJAY NAGARA

1. HEBBAL FLYOVER

Bellary Road

Hebbal Flyover

Outer Ring Road

Outer Ring Road

HEBBAL

Bellary Road   Bellary Road

R T NAGAR

New BEL Road New BEL Road

New BEL Road

Bellary Road

Mekhri Circle Underpass

Dr. CV Raman Road   Dr. CV Raman Road   Dr. CV Raman Road

CV Raman Road

Jayamahal Road

18th Cross Road

17th Cross Road

Margosa Road

Sampige Road

Sankey Tank Road   Sankey Tank Road

Ramana Maharshi Road

Nandi Durga Road   Nandi Durga Road

Jayamahal Road

Margosa Road

Sampige Road

MALLESWARAM

CAUVERY THEATRE
JUNCTION

0   250   500 m

54

BENGALURU URBAN
HIGH RISK CORRIDOR-7: OLD MADRAS ROAD (NH75)

Trinity Circle to Medahalli Junction (12.7km)

Road Crash Fatalities (2019-22): 77

Blackspot

Fatalities

6. KR PURAM RTO

5. BHATTARAHALLI

4. ITI GATE

3. TIN FACTORY BUS STOP

2. SURANJANDAS ROAD JUNCTION

1.BINNAMANGALA BUS STOP

Old Madras Road

HOODI

Whitefield Road

Hoodi Main Road

Kundalahalli Main Road

MAHADEVAPURA

Outer Ring Road

KAGGADASAPURA

Outer Ring Road

BANASWADI

Banaswadi Road

80 Feet Main Road

100 Feet Road

Swamy Vivekananda Road

Suranjandas Road

HAL Old Airport Road

HALASURU

Victoria Road

0   750   1,500 m

BENGALURU URBAN

HIGH RISK CORRIDOR-8: OUTER RING ROAD
Benniganahalli Flyover to Hebbal Flyover (11.2km)
Road Crash Fatalities (2019-22): 71

Legend:
- Fatalities along corridor
- Blackspot

Locations:
1. BABUSAPALYA BUS STOP
2. HENNUR JUNCTION
3. NAGAWARA JUNCTION
4. VEERANAPALYA BUS STOP
5. LUMBINI GARDEN

Roads labeled:
- Bellary Road
- HEBBAL
- HEBBAL FLYOVER
- Hebbal Flyover
- Outer Ring Road
- R T NAGAR
- T Chowdiah Road
- Netaji Road
- Haines Road
- Banaswadi Road
- 80 Feet Main Road
- 100 Feet Road
- BANASWADI
- Thanisandra Main Road
- Nagawara Flyover

Scale: 0 — 1 — 2 km

BENGALURU URBAN
HIGH RISK CORRIDOR-9: OUTER RING ROAD
Nayandahalli Junction to CMTI Junction (11km)
Road Crash Fatalities (2019-22): 66

Blackspot
Fatalities along corridor

Goraguntepalya Flyover

CMTI JUNCTION

Outer Ring Road

Tumkur Road

Tumkur Road Chord Road

Outer Ring Road

LAGGERE

NANDINI LAYOUT

Outer Ring Road

5. LAGGERE BRIDGE

Chord Road

Chord Road

Outer Ring Road

RAJAJINAGAR

Magadi Road

4. SUMMANAHALLI
JUNCTION

Summanahalli Flyover

Magadi Road

Chord Road

3. NEAR LITTLE
MILLENNIUM SCHOOL

Kengeri Main Road

Outer Ring Road

NAGARABHAVI

ATTIGUPPE

Chord Road

Vrishabavathi

Kengeri Main Road

2.NAGARABHAVI

Outer Ring Road

Chord Road

Mysore Road Mysore Road

Mysore Road

1.NAYANDAHALLI
JUNCTION

Outer Ring Road

0   750   1,500 m

57

BENGALURU URBAN

HIGH RISK CORRIDOR-10: TUMKUR ROAD

Yeshwantpur Police Station to Anchepalya Junction (10.4km)

Road Crash Fatalities (2019-22): 64

Blackspot

Fatalities along corridor

ANCHEPALYA
JUNCTION

NICE Peripheral Ring Road

Bangalore - Nelamangala Expressway

Tumkur Road

Tumkur Road

Hesaraghatta Main Road

1. JALAHALLI CROSS

Goraguntepalya Flyover

Goraguntepalya Flyover

LAGGERE

Outer Ring Road Outer Ring Road

Outer Ring Road

Outer Ring Road Outer Ring Road

NANDINI LAYOUT

Outer Ring Road Outer Ring Road

JALAHALLI

Chord Road

Tumkur Road

YESHWANTPUR
POLICE STATION

Tumkur Road Chord Road

Outer Ring Road

0   1   2 km

58

12.2.2 Bengaluru Rural

A total of 48 blackspots were identified among fatalities recorded by Bengaluru Rural District Police. Table-9 ranks the top 10 among those blackspots.

Table-9: TOP-10 BLACKSPOTS, BENGALURU DISTRICT POLICE, 2019-22

SNO	RANK	LOCATION (Road)	FATALITIES WITHIN 250m RADIUS (2019-22)
1	1	Hebbagodi Metro Station (NH-44)	28
2	2	Kithiganahalli Bus Stop (NH-44)	18
3	3	Dabaspet Junction (NH-48)	17
4	3	Attibele Junction (NH-44)	17
5	4	Attibele Toll Gate (NH-44)	15
6	4	Attibele Check Post (NH-44)	15
7	5	Budihal Gate (NH-48)	14
8	5	Edehalli Junction (NH-48)	14
9	6	Attivata Gate (NH-75)	13
10	7	Madanayakanahalli Junction (NH-48)	12

Table-10 below describes road corridors with the highest number of crash fatalities registered by Bengaluru District Police between 2019 and 2022. Corridors have been ranked in the descending order of crash fatalities per kilometre.

Table-10: HIGH RISK CORRIDORS, BENGALURU DISTRICT POLICE, 2019-22

CORRIDOR (Length)	ROAD NAME	FATALITIES (2019-22)	FATALITIES PER KM
1. Hebbagodi Metro Station to Chandapura Rail Bridge (4.3km)*	NH-44	97	23
2. Neraluru Bus Stop to Attibele Toll Gate (5.4km)*	NH-44	101	19
3. Anchepalya to Sondekoppa Junction (9.6km)*	NH-48	131	14
4. Junction of Hirandahalli road to Government Hospital, Hosakote (8km)*	NH-75	84	11
5. Kuluvanahalli to CISF 10th Reserve Junction (10.4km)	NH-48	108	10
6. Nelamangala Town to Thippagondanahalli (9.5km)	NH-48	89	9

The corridors marked with an asterisk (*) lie either completely or partially in Bengaluru Urban district but fall under the jurisdiction of Bengaluru Rural District Police.

The following maps show the fatalities along the corridors ranked in Table-10. Road crash blackspots along the corridors are also indicated in these maps.

BENGALURU RURAL DISTRICT

HIGH RISK CORRIDOR-1: HOSUR ROAD (NH44)

Hebbagodi Metro Station to Chandapura Rail Bridge (4.3 km)

Road Crash Fatalities (2019-22): 97

Blackspots

Fatalities along corridor

HEBBAGODI

BOMMASANDRA

CHANDAPURA

1.HEBBAGODI METRO STATION

2.BOMMASANDRA METRO STATION

3.NEAR BTL COLLEGE BUS STOP

4.NEAR KITHIGANAHALLI BUS STOP

5.CHANDAPURA CIRCLE

6.CHANDAPURA RAIL BRIDGE

0   500   1,000 m

60

BENGALURU RURAL DISTRICT
HIGH RISK CORRIDOR-2: HOSUR ROAD (NH44)
Neraluru Bus Stop to Attibele Toll Gate (5.4km)
Road Crash Fatalities (2019-22): 101

Blackspots
Fatalities along corridor

1. NERALURU BUS STOP
2.GUDDAHATTI GATE
3.SURYANAGAR BUS STOP
4.ATTIBELE CHECKPOST
5.ATTIBELE JUNCTION
6.ATTIBELE TOLL GATE

Hosur Road
Hosur Road Hosur Road Hosur Road
Hosur Road
Hosur Road
Attibele-Anekal Road

0
500
1,000 m

61

BENGALURU DISTRICT

HIGH RISK CORRIDOR-3: TUMKUR ROAD (NH48)
Anchepalya to Sondekoppa Junction (9.6km)
Road Crash Fatalities (2019-22): 131

Legend

Blackspots

■ Fatalities along corridor

Scale: 0 — 1 — 2 km

Junctions / Blackspots:

1. ANCHEPALYA
2. MADAVARA METRO STATION
3. MADANAYAKANAHALLI JUNCTION
4. MAKALI BUS STOP
5. ADAKAMARANAHALLI GATE
6. DASANAPURA POST OFFICE
7. ARASINAKUNTE JUNCTION
8. SONDEKOPPA JUNCTION

Tumkur Road NH48

DASANAPURA
ADAKAMARANAHALLI
MAKALI
NELAMANGALA
Bazaar Street
Nelamangala Main Road
Unnamed road
Huskur Road
Arkavati
Lakshmipura Main Road
Kuduregere Main Road

62

BENGALURU RURAL DISTRICT
HIGH RISK CORRIDOR-4: OLD MADRAS ROAD (NH75)

Avalahalli Bus Stop to Hosakote Government Hospital(8 km)

Road Crash Fatalities (2019-22): 84

Blackspots

■ **Fatalities along corridor**

1. JUNCTION OF NH75 & HIRANDAHALLI MAIN ROAD

2. JUNCTION OF NH75 & BUDIGERE ROAD

3. HOSAKOTE GOVERNMENT HOSPITAL JUNCTION

Hirandahalli Main Road

Cheemasandra Road

Old Madras Road

BOMMENAHALLI

Budigere Road

Dabaspete - Hosur Highway

Dabaspete - Hosur Highway

HOSAKOTE

HOSAKOTE

Old Madras Road

Old Madras Road

0   1   2 km

63

BENGALURU RURAL DISTRICT

HIGH RISK CORRIDOR-5: PUNE-BENGALURU HIGHWAY (NH48)

Kuluvanahalli to CISF Reserve Junction (10.4 km)

Road Crash Fatalities (2019-22): 108

Blackspots

Fatalities along corridor

0 1 2 Km

State Highway 3

SH3

HONNENAHALLI

MACHANAHALLI

BILLANAKOTE

Pune - Bangalore Highway (NH48)

Pune - Bangalore Highway (NH48)

State Highway 3

Dabaspete - Hosur Highway

DABASPET

DABASPET

THYAMAGONDLU

KULUVANAHALLI

7. JUNCTION OF NH48 & CISF RESERVE ROAD

6.DABASPET JUNCTION

5.EDEHALLI JUNCTION

4.JUNCTION OF NH48 & ROAD NUMBER 4

3.BILLANAKOTE SCHOOL JUNCTION

2.JUNCTION OF NH48 & ALADAHALLI ROAD

1.KULUVANAHALLI JUNCTION

DABASPETE

64

BENGALURU RURAL DISTRICT

HIGH RISK CORRIDOR-6: PUNE-BENGALURU HIGHWAY (NH48)

Nelamangala Town to Thippagondanahalli (9.5 km)

Road Crash Fatalities (2019-22): 89

Blackspots

Fatalities along corridor

1. JUNCTION OF NH48 & NH75
2. JUNCTION OF NH48 & NELAMANGALA MAIN ROAD
3. KULUMEPALYA TOLL BOOTH
4. OPPOSITE UNITED BREWERIES
5. BUDIHAL GATE
6. T BEGUR
7. THIPPAGONDANAHALLI JUNCTION

Pune - Bangalore Highway (NH48)

Bangalore - Mangalore Highway

Nelamangala Main Road

Agasarhalli Road

Unnamed road

KEMPAHALLI

KEMPOHALLI

NELAMANGALA

BUDIHAL

T BEGUR

THIPPAGONDANAHALLI

0 1 2 km

65

A total of 24 blackspots were identified among the fatalities recorded by Ramanagara District Police. Table-11 ranks the top 10 among those blackspots.

Table-11 BLACKSPOTS, RAMANAGARA DISTRICT POLICE, 2019-22

SNO	RANK	LOCATION (Road)	FATALITIES WITHIN 250m RADIUS (2019-22)
1	1	Near Judicial Layout (NH-275)	10
2	1	Ijoor Circle (NH-275)	10
3	1	Belekere Gate (NH-275)	10
4	1	Solur Bus Stand (NH-75)	10
5	2	Kanakapura Circle (NH-275)	9
6	2	Gandhi Bhavan Public Library (NH-275)	9
7	3	Harohalli Bus Stand, Kanakapura Road	8
8	4	Manchanayakanahalli Bus Stop (NH-275)	7
9	4	Kallugopahalli (NH-275)	7
10	4	Kaniminike Colony (NH-275)	7

Table-12 below describes road corridors with the highest number of crash fatalities registered by Ramanagara District Police between 2019 and 2022. Corridors have been ranked in the descending order of crash fatalities per kilometre.

Table-12: HIGH RISK CORRIDORS, RAMANAGARA DISTRICT POLICE, 2019-22

CORRIDOR (Length)	ROAD NAME	FATALITIES (2019-22)	FATALITIES PER KM
1. Bengaluru - Mysuru Road: Zilla Panchayat Bhavan to Kanakapura Circle (5km)	NH-275	59	12
2. Bengaluru - Mangalore Highway: Solur Bus Stand to Gudemaranahalli Handpost (2.7km)	NH-75	26	10
3. Bengaluru - Mysuru Road: Kaniminike Colony to Manchanayakanahalli Bus Stop (4.7km)	NH-275	41	9
4. Bengaluru - Mysuru Road: Billakempanahalli Gate to Kallugopahalli (6.3km)	NH-275	44	7
5. Bengaluru - Mysuru Road: Kunnirkatte to Belekere Gate (10.1km)	NH-275	63	6

The following maps show the fatalities along the corridors ranked in Table-12. Road crash blackspots along the corridors are also indicated in these maps.
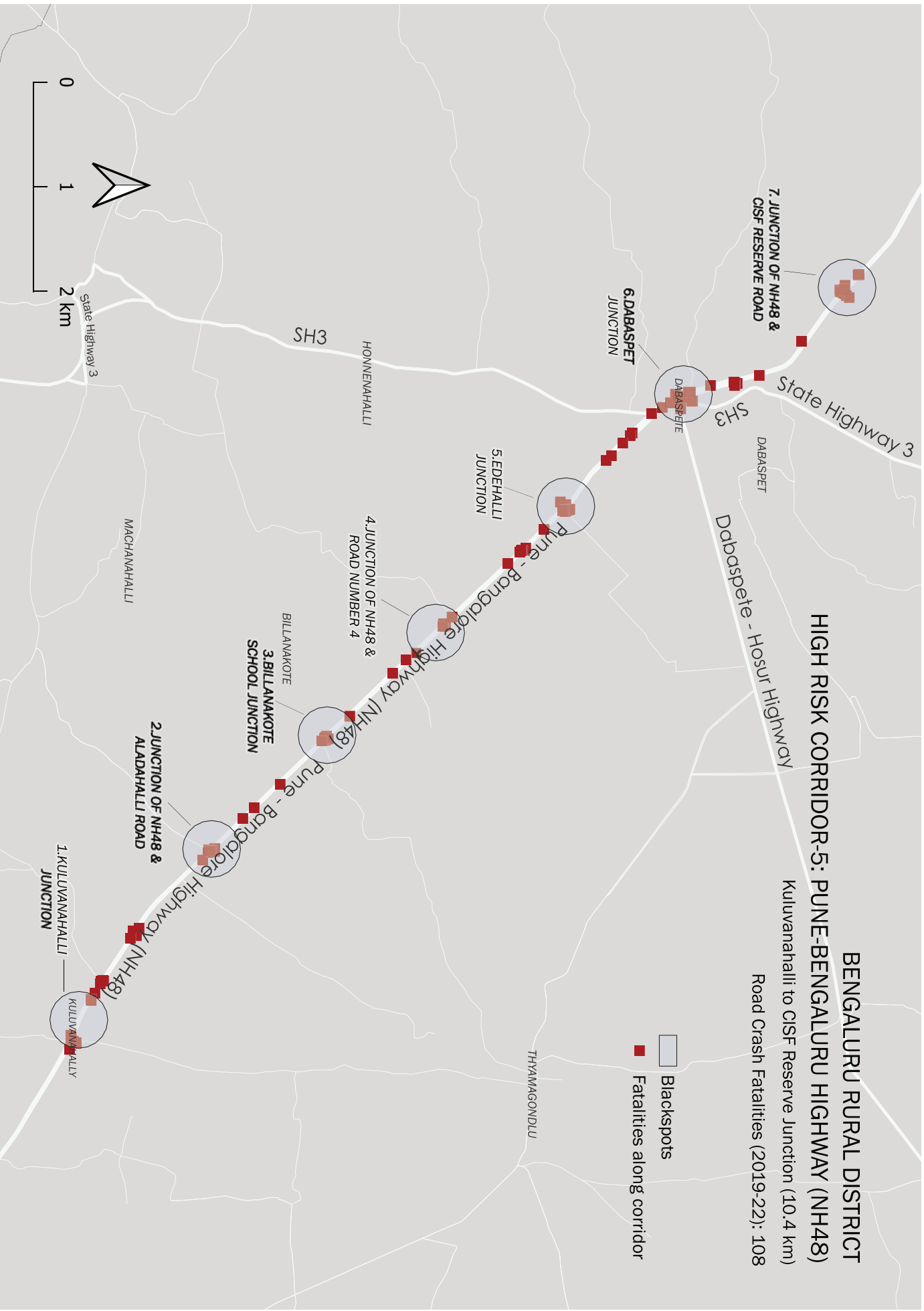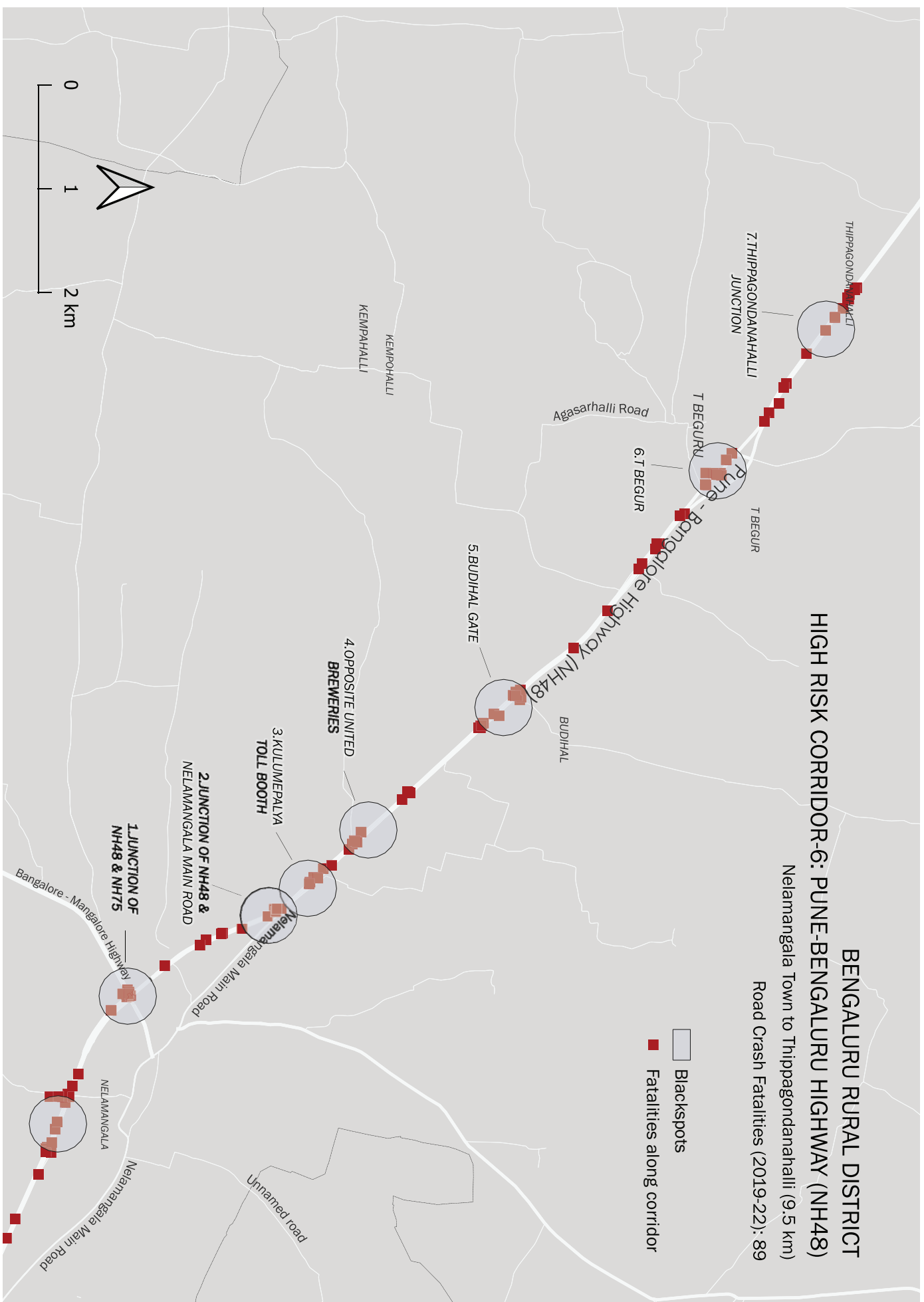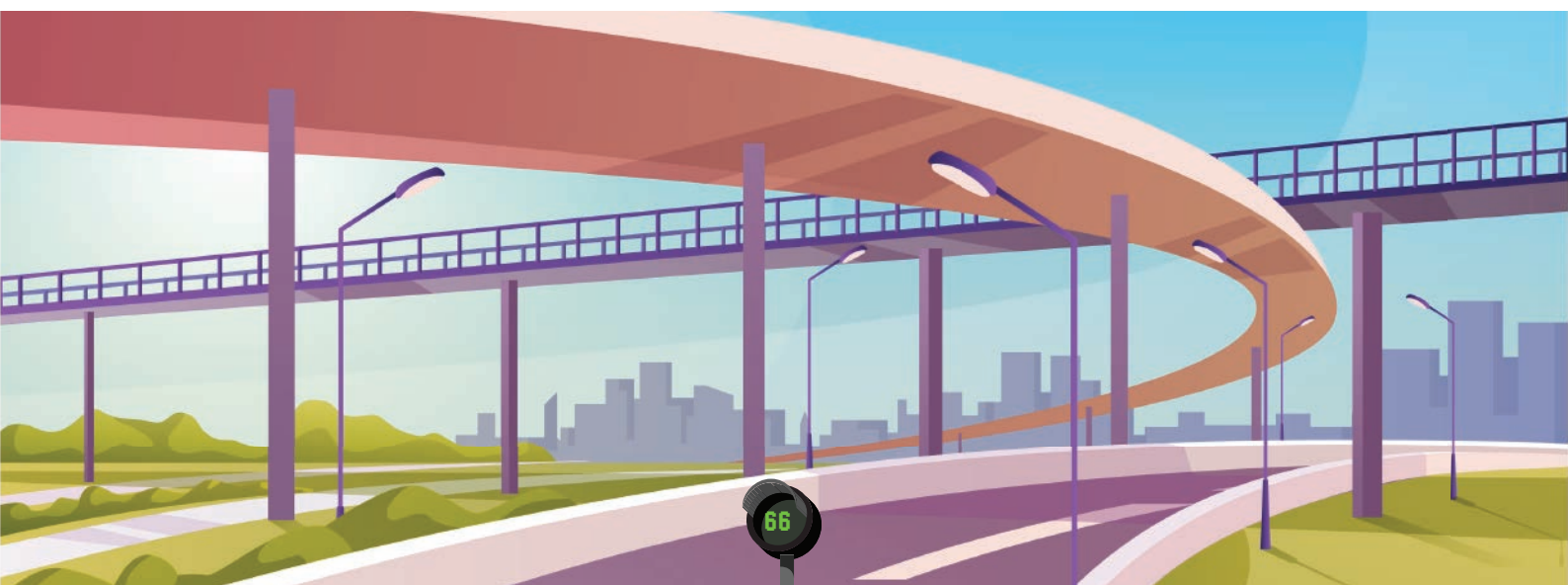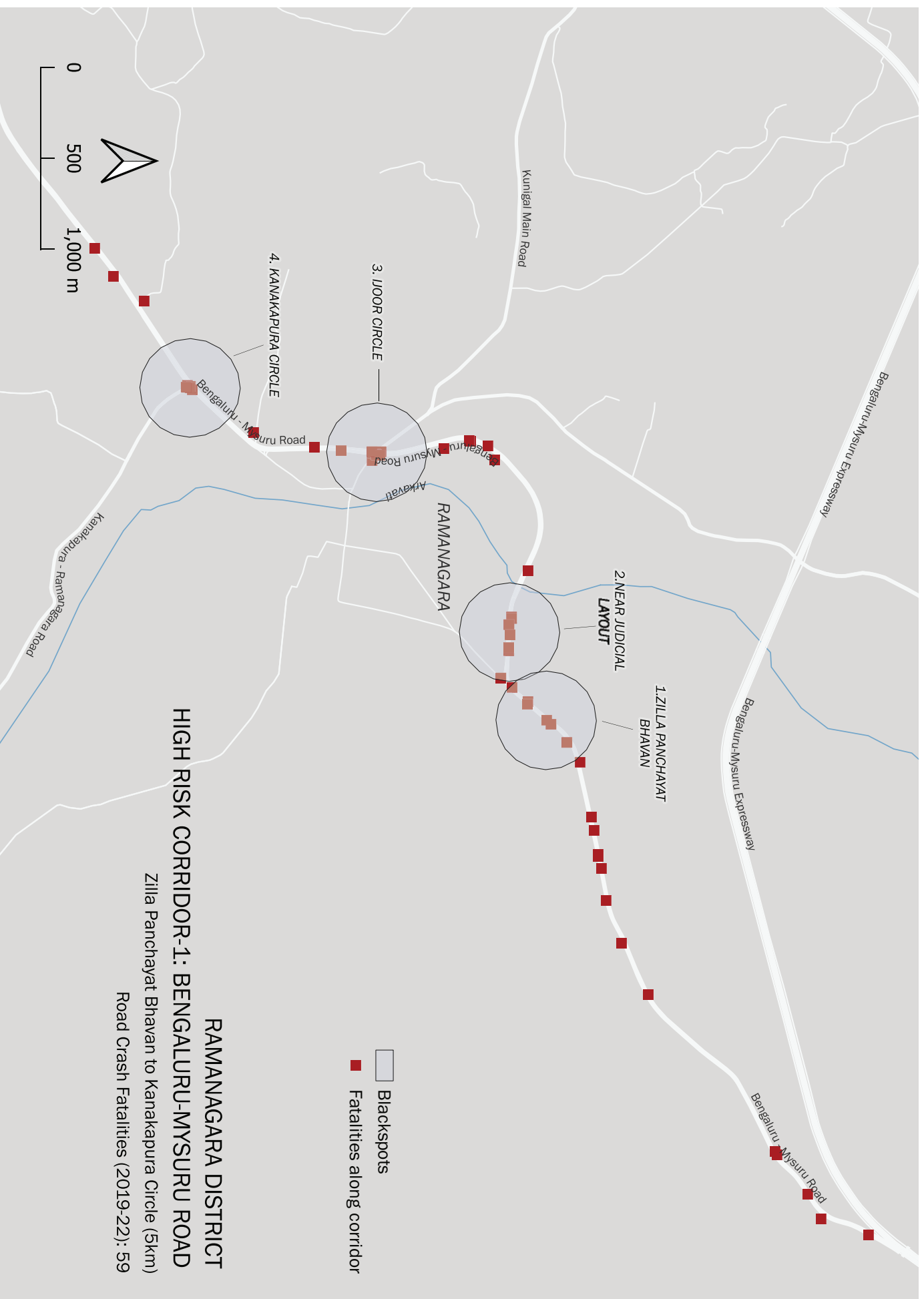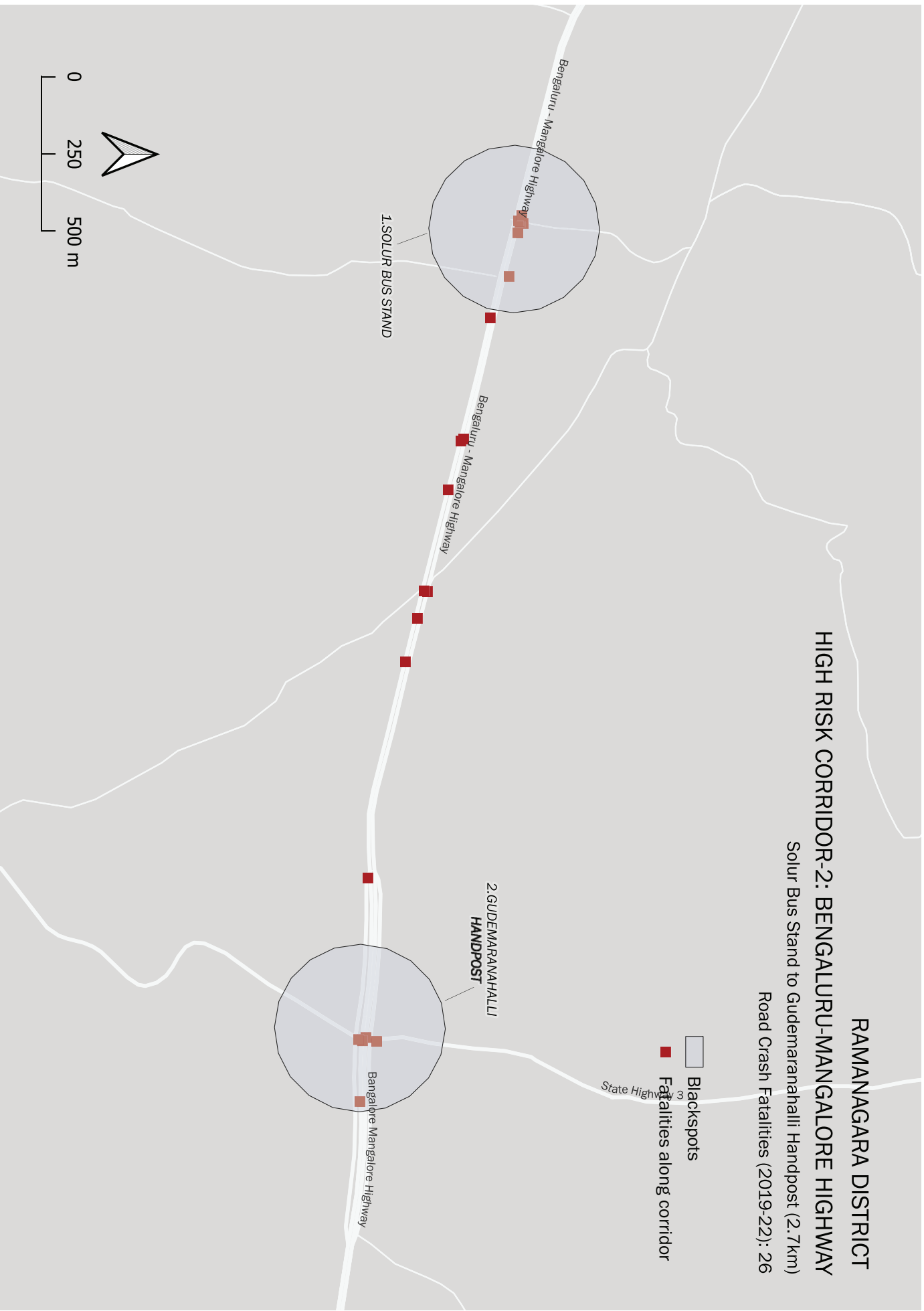
RAMANAGARA DISTRICT

HIGH RISK CORRIDOR-2: BENGALURU-MANGALORE HIGHWAY

Solur Bus Stand to Gudemaranahalli Handpost (2.7km)

Road Crash Fatalities (2019-22): 26

Blackspots

Fatalities along corridor

1.SOLUR BUS STAND

2.GUDEMARANAHALLI HANDPOST

Bengaluru - Mangalore Highway

Bangalore Mangalore Highway

State Highway 3

0   250   500 m

68

RAMANAGARA DISTRICT
HIGH RISK CORRIDOR-3: BENGALURU-MYSURU ROAD
Kaniminike Colony to Manchanayakanahalli Bus Stop (4.7km)
Road Crash Fatalities (2019-22): 41

0
500
1,000 m

1.KANIMINIKE COLONY

2.SHESHAGIRIHALLI BUS STOP

3.WONDERLA GATE

4.MANCHANAYAKANAHALLI BUS STOP

Bengaluru-Mysuru Expressway

Bengaluru-Mysuru Expressway

Vrishabhavati

Blackspot

Fatalities along corridor

69

RAMANAGARA DISTRICT
HIGH RISK CORRIDOR-4: BENGALURU-MYSURU ROAD
Biilakempanahalli Gate to Kallugopahalli (6.3km)
Road Crash Fatalities (2019-22): 44

Blackspots
Fatalities along corridor

1.BILLAKEMPANAHALLI
GATE

2.BIDADI RAILWAY
STATION

3.BIDADI BUS STAND

4.KALLUGOPAHALLI

Bengaluru-Mysuru Expressway
Bengaluru-Mysuru Expressway
Bengaluru - Mysuru Road
Bengaluru - Mysuru Road
Bengaluru - Mysuru Road

0   500   1,000 m

70

RAMANAGARA DISTRICT
HIGH RISK CORRIDOR-5: BENGALURU-MYSURU ROAD
Kunnirkatte to Belekere Gate (10.1km)
Road Crash Fatalities (2019-22): 63

Legend:
- Blackspots
- Fatalities along corridor

0   1   2 Km

2.BELEKERE GATE

Bengaluru-Mysuru Expressway

Bengaluru - Mysuru Road

Bengaluru-Mysuru Road

Bengaluru-Mysuru Expressway

1.GANDHI BHAVAN
PUBLIC LIBRARY

CHANNAPATTANA

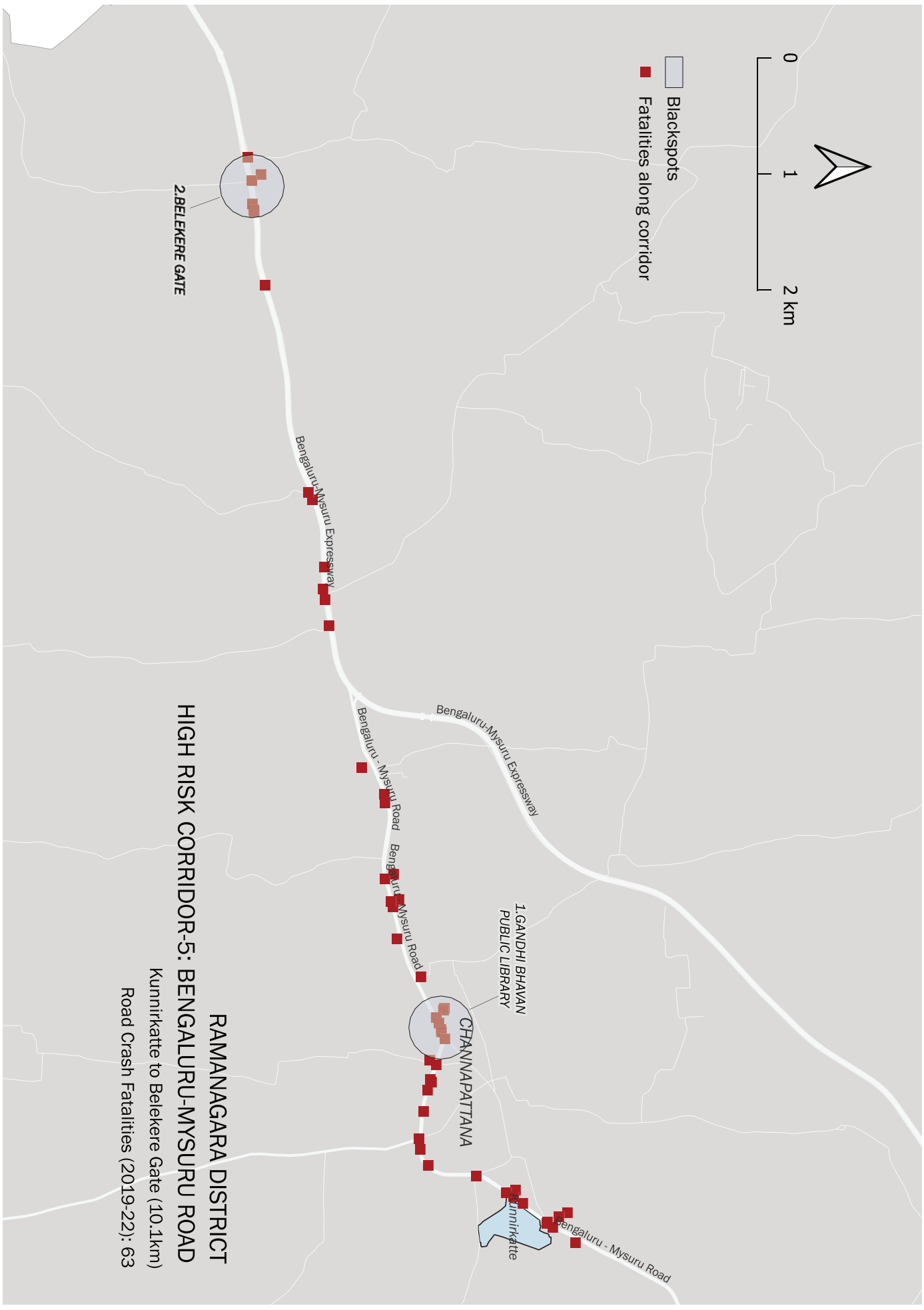Kunnirkatte

Bengaluru - Mysuru Road

13. RECOMMENDATIONS

This report enables the development of evidence-based programs and interventions in road safety in BMR. The statistics and high-risk locations can inform where detailed investigation and resources are most needed. The following summarises the most pressing road safety issues in BMR and provides broad recommendations on next steps.

In the whole of BMR as well as the three jurisdictions under it, motorcyclists had the highest share of fatalities out of all the road user groups. Motorcyclists are inherently vulnerable because of their size and weight. Other road users such as heavy vehicles cause many motorcyclist fatalities. They often fail to see motorcyclists on the road and this can lead to risky situations. At the same time, coupled with the vulnerability of motorcyclists is their tendency for higher speeds, acceleration, and weaving which creates risks on the road. This can be attributed largely to the urban environment which enables all road users to speed and forces vulnerable road users to mix with heavy vehicles. It also does not help that junctions are not designed in a way that slows down vehicles. The mobility restrictions during the pandemic influenced more motorcycle use as public transportation options were not easily available. This resulted in an increase in exposure and risk when the mobility restrictions were lifted. Without addressing these issues now, crash fatalities would most likely continue to increase from 2022 onwards.

After motorcyclists, pedestrians are the second most affected by road crash fatalities in the whole of BMR and in each of the jurisdictions under it. Pedestrians are mostly victimised by heavy motor vehicles, light motor vehicles, and motorcyclists. The high-risk locations and corridors are often located in high-speed, multi-lane roads cutting through pedestrian-heavy areas. Most of these roads often prioritise vehicular traffic over the accessibility and safety of pedestrians. These result in multiple conflicts between vehicles and pedestrians which then equate to fatalities and serious injuries.

Given these two most pressing issues in road safety in BMR, there are a lot of interventions and programs that the government can implement to save lives on the road. The following is a list of recommendations:

Recommendation 1: Address Data Quality Issues in Police IT System including Completion of Missing Fields

Firstly, there is an urgency to improve the collection of road crash data in the BMR. Given the alarming number of road crash fatalities, it is important that the stakeholders understand the road safety situation and design effective, evidence-based interventions. This can be done through addressing data quality issues.

The state should be able to improve the data collection and quality in the Police IT System of the State Crime Records Bureau (SCRB). The Police IT System is a major resource of the Karnataka state which allows the government to produce state-wide reports. The review of this system indicates that the level of reporting of crashes needs to be further improved. In addition, some of the details needed for designing effective road safety interventions are not available. Some of these are missing such as reliable Georeferencing or Location details, Hit and Run, Main Cause, Type of Violation, Alcohol/Drugs, Type of License, Passenger Position, among others. The form and the indicators need to be improved such as the inclusion of pedestrian and cyclist fields. There are also non-standard inputs to the fields in the database systems such as in Collision Types and data on risk factors such as helmet and seatbelt-wearing. The integration in eDAR would need to be completed and this would entail not just technological solutions but also alignment in terms of definitions of indicators and standard operating procedures.

Recommendation 2: Provide Clear Instruction on Helmet-Wearing Law through Police Memorandum

While data is being improved, specific interventions for motorcyclists should also be implemented. One of the immediate activities that the government can do is to strictly enforce the helmet-clasping law, Section 129 of the Motor Vehicles Act, which is currently not widely followed by motorcyclists.Periodic circular/guidelines/instructions on helmet laws should be implemented strictly, enforced and enforcement data should be analysed.

Recommendation 3: Organise and Follow-up on Collection of Fines

The implementation of the law by collection of fines immediately, enables the government to improve deterrence and compliance towards road safety laws.

Recommendation 4: Reduce Speeding through Construction of Speed Calming Measures, Designation of School Zones, Installation of Speed Cameras

Speeding is a primary cause of motorcyclist and pedestrian fatalities and just by reducing speed by five percent, it already equates to a thirty percent reduction of fatalities. Speed calming measures can therefore also effectively and significantly bring down fatalities. These include the construction of roundabouts, raised crossings and intersections, gateway treatments, implementation of lower speed limits, designation of pedestrian and school zones, and installation of speed cameras. In terms of focus, infrastructure interventions to regulate speed can start in high-risk corridors and locations.

Recommendation 5: Construct Adequate, Accessible, and Safe Pedestrian Footpaths, Crossings, and Facilities

The huge number of pedestrians dying on BMR's roads warrant specific interventions on pedestrian safety. Ensuring that there are adequate, accessible, and safe pedestrian facilities in the whole of BMR is crucial. This would include ensuring that there are continuous and wide pedestrian footpaths without obstructions, raised pedestrian crossings (not footbridges) to also support traffic calming, among others. Given limited resources, it is sensible to focus on interventions on high-risk locations and particular typographies, such as school zones, metro stations, commercial and residential zones.

Recommendation 6: Improve Reliability, Accessibility, and Safety of Sustainable Transport

Next, there has been a lot of proven research to reduce motorcyclist deaths. The most effective of which is to promote the use of public transportation among motorcyclists. This can be done through improving the reliability, accessibility, quality, and safety of public transportation. When other, reliable modes of transportation are made available, road users will be encouraged to shift from motorcycles to such modes, reducing the risk of motorcyclist deaths on the road. The road network should be made more efficient by providing public transportation options and at the same time, prioritizing road safety.

Recommendation 7: Scale-up Use of eDAR through Creation of Task Force

The eDAR can also be a rich source of data in the BMR. It is important to complete the integration between the Police IT system and eDAR to avoid duplication of work by the police. As a start, the creation of a technical working group made up of representatives from KSRSA, SCRB, NIC is suggested. This will allow the government to discuss outstanding issues on eDAR implementation and to ensure that agencies working on data are all aligned.

Recommendation 8: Routine Production of Road Safety Reports by Institutionalising Data Collection and Analysis Process, Data Sharing, and Identification and Establishment of Lead Agency for Data

This report shows how crucial data is in developing interventions in road safety. Producing this report though requires institutionalisation of data collection, cleaning, collation, and analysis processes among different stakeholders. There needs to be a lead agency that will collate all data from Bengaluru Urban, Bengaluru Rural, and Ramanagara. This lead agency will then ensure that data is complete and is prepared for analysis and for the production of reports. This will require data sharing agreements among agencies and capacity to collect and analyse data.

Thank you