



पुणे-ग्रामीण

PUNE-RURAL

ROAD SAFETY REPORT

2022-2023



PREFACE



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Globally, around 11.9 lakhs people lose their lives in road crashes each year, making road safety a critical public health issue. Unfortunately, Pune Rural considerably contributes to the total number of road crash deaths in Maharashtra and across the country. Recognizing this silent pandemic, the Pune Rural police are implementing an evidence-based systematic approach to reduce road crashes and deaths through interventions targeting risk factors.

Pune Rural accounted for 57% of the district's total fatal crashes in 2022 and 2023, in which primarily powered two-wheeler users and pedestrians lost their lives. Pune Rural's jurisdiction recorded a 5% increase in road crash deaths in 2023 as compared to the previous year, highlighting the urgent need for continued efforts to make roads safer for all users. Improving the road safety situation requires strategic planning and targeted interventions based on data. This report will play a pivotal role in guiding all stakeholders in designing effective enforcement measures and engineering solutions.

We are confident that through scientific, evidence-based, and planned measures, road crashes, deaths, and injuries can be prevented. We have collaborated with Bloomberg Philanthropies Initiative for Global Road Safety and its partner Vital Strategies to strengthen the surveillance data systems available at the department for their better usage in improving road safety.

I urge all government and private stakeholders to use this report in planning road safety measures to make the highways, city roads, and streets safer for all users. I congratulate all government stakeholders and Bloomberg Philanthropies Initiative for Global Road Safety for releasing the District Road Safety Report and look forward to seeing more progress from this partnership.


Sandeep Singh Gill, IPS

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Executive Summary

Over 1900 people died on the roads of Pune Rural between 2022 and 2023. In 2023, road crash deaths increased by 6% compared to the previous year. This overall trend in road crash deaths underscores a worrying road safety situation in Pune Rural.

Eight out of 10 victims were between 20 and 59 years of age. At least 8 out of 10 lives lost were those of vulnerable road users – 54% of victims were powered two-wheeler users while 29% were pedestrians. Most pedestrians were killed in fatal collisions with heavy vehicles (19%) and LMV (18%). The majority of the fatal crashes were recorded during the late afternoon to evening (39%, 697) (i.e., 5pm to 11 pm) and on Sundays (17%, 301).

There are 96 dangerous locations, or blackspots¹, in Pune Rural where road crashes claimed at least 5 fatal or serious injury road crashes over two consecutive calendar years in the aforementioned period. Seven corridors, or stretches of road, in various parts of Pune Rural were identified to be extremely dangerous for all road users.

This report presents these findings by visualizing road crash deaths data disaggregated in terms of road user groups, their gender and age groups, who-hit-whom matrices and heatmaps presenting the spatial distribution of fatal and serious injury crashes. Further, road crash deaths in the Pune Rural were mapped to enable the identification of high-risk corridors and blackspots in the region.

This report not only presents findings from the police data but also highlights key insights from a roadside observations study by the Johns Hopkins International Injury Research Unit (JH-IIRU) of the Johns Hopkins University (JHU) conducted in 2023. The roadside observations study focused on examining the prevalence of critical road safety risk factors, including speeding, non-use of helmets, and the lack of seatbelt and child-restraints use among road users.

The analyses presented aim to provide inputs to improve the safety of high-risk locations and corridors, strengthen surveillance data systems, and inform enforcement. The findings and recommendations of this report guide and empower key actors and stakeholders in Pune Rural to build safer roads for all road users.

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

INTRODUCTION

Road crashes are the leading cause of death worldwide for young people between 5 and 29 years of age. Road injury is the 12th leading cause of death for all ages².

A total number of 4,61,312 road crashes have been reported by Police Departments of States and Union Territories (UTs) in the country during the calendar year 2022, claiming 1,68,491 lives and causing injuries to 4,43,366 persons³. Maharashtra reported 15,224 road crash deaths in 2022, a 13% increase from 2021. The total number of fatal crashes, on the other hand, increased from 12,554 in 2021 to 14,058 in 2022, a 12% increase⁴.

The roads of the Pune Rural have witnessed at least 57% of all road crash deaths in the Pune district in 2022⁴, making them among the least safe in Pune district.

²WHO (2023) Global Status Report on Road Safety

³MoRTH (2022) Road Accidents in India

⁴Maharashtra Road Crash report 2022

METHODOLOGY

Data Collection & Collation	Data Entry	Data Cleaning & Analysis
1. Meetings with SP Pune Rural to request for FIRs. 2. The Pune Rural Traffic office compiled FIR soft copies Police station-wise and month-wise. 3. The BIGRS team reviewed copies to check for duplication.	1. Data entry of fatal and grievous injury crashes in Epi Info.	1. Data Cleaning: Resolved issues in data entry, checked data for duplication, correctness, and completeness. 2. Data Analysis: performed using Microsoft Excel to create tables & charts and QGIS to produce maps.

ROAD SAFETY SITUATION IN PUNE RURAL

3. Summary Statistics of Pune Rural

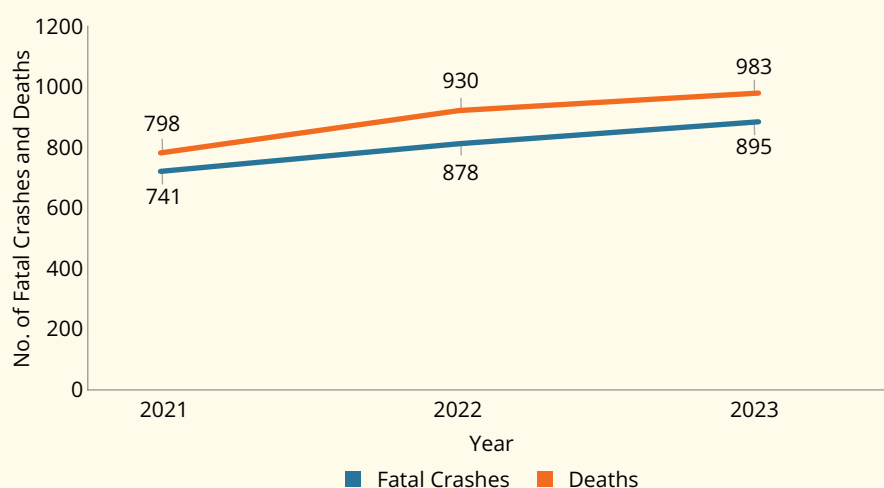
Table No.1: Road Crash Summary of Pune Rural from 2022-2023

	2022	2023	Total
Total Fatal Crashes	878	895	1773
Total SI Crashes	614	671	1285
Total Road Crash Deaths	930	983	1913
Total Seriously Injured	1383	1369	2752

- The number of fatal crashes increased by 2% in 2023 as compared to 2022.
- The number of serious injury crashes increased by 9% in 2023 as compared to 2022.

3.1 Overview of Fatal and Serious Injury Crashes in Pune Rural

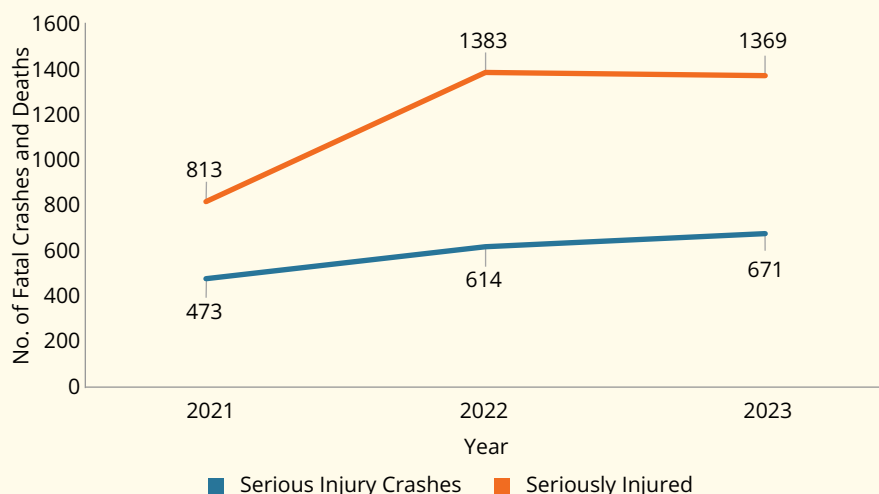
Figure 3.1.1: Fatal Crashes and Deaths in Pune Rural from 2021 to 2023



- A total of 2,514 fatal road crashes and 2,711 deaths were recorded between 2021 to 2023.
- An overall increasing trend of fatal crashes and deaths - deaths increased by 23% in 2023 as compared to 2021.

(Source: Maharashtra road crash report, 2021 and FIRs received from Pune Rural Traffic Police from 2022-2023)

Figure 3.1.2: Serious Injury Crashes and Seriously Injured in Pune Rural from 2021 to 2023

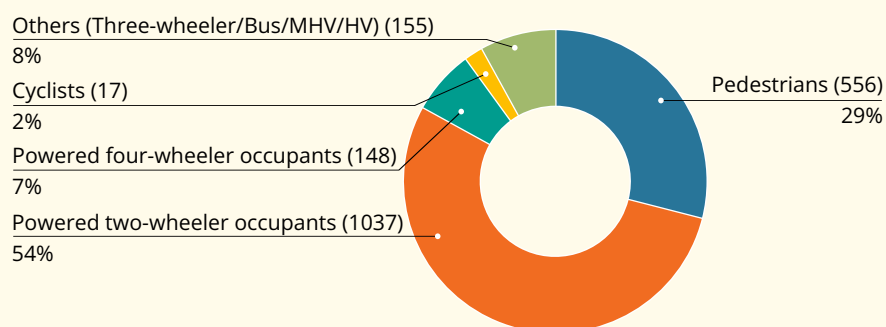


- A total of 1,758 serious injury road crashes and 3,565 serious injuries were recorded between 2021 to 2023.
- An overall increasing trend of serious injury crashes and injuries—seriously injured increased by 68% in 2023 as compared to 2021.

(Source: Maharashtra road crash report, 2021 and FIRs received from Pune Rural traffic office from 2022-2023)

3.2 Road Crash Deaths by Road User Categories in Pune Rural

Figure 3.2.1: Road Crash Deaths by Road User Type in Pune Rural, 2022-2023 (N=1913)

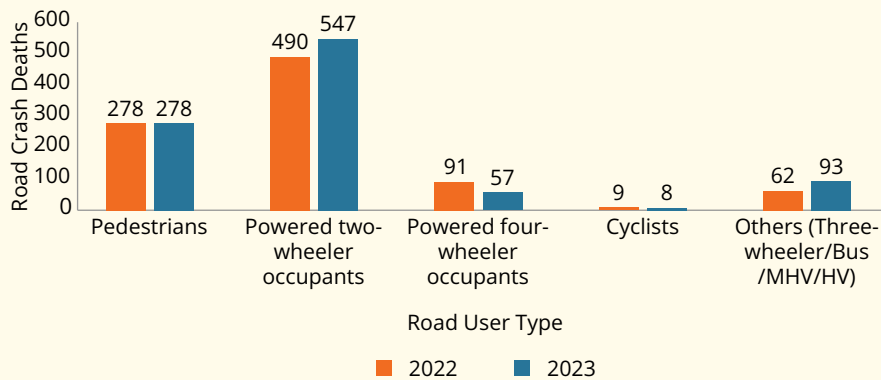


Most of deaths were among the powered two-wheeler occupants (54%) and pedestrians (29%).

Findings from the JH-IIRU's observational study:

- Powered two-wheelers had the highest prevalence of speeding (9%), compared to other vehicle types.
- The majority of the powered two-wheeler riders either did not wear helmets (82%) or wore them incorrectly (1%).

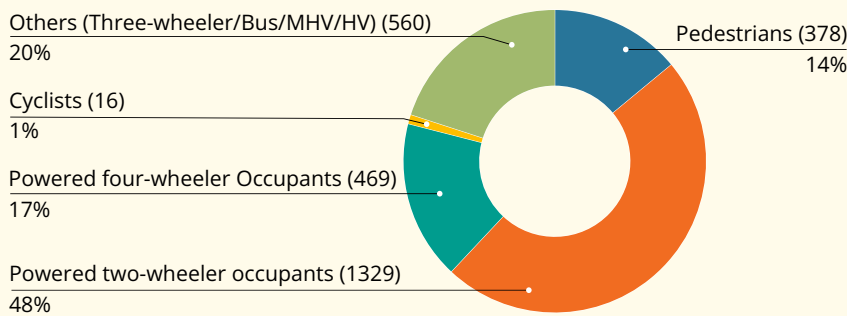
Figure 3.2.2: Comparison of Road Crash Deaths by Road User Types by Years in Pune Rural, 2022-2023



- The deaths increased by 12% among powered two-wheeler occupants in 2023, as compared to 2022.
- The number of pedestrian deaths stayed the same.

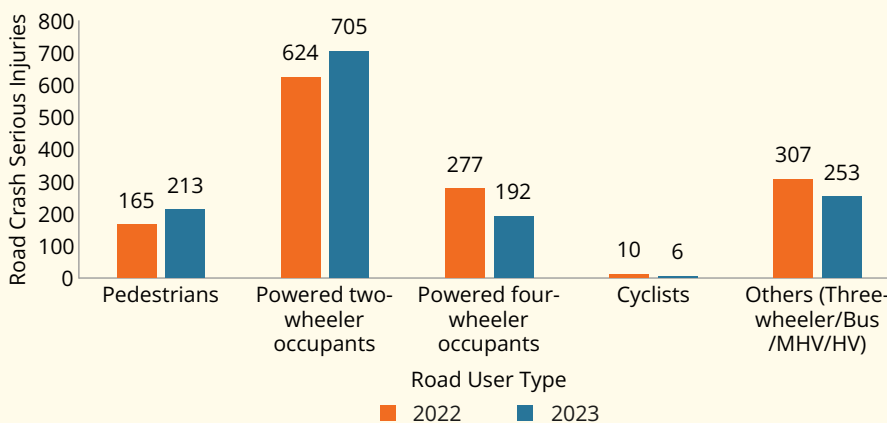
3.3 Road Crash Serious Injuries by Road User Categories in Pune Rural

Figure 3.3.1: Road Crash Serious Injuries by Road User Type in Pune Rural, 2022-2023 (N=2752)



- The majority of serious injuries were among the powered two-wheeler occupants (48%) and pedestrians (14%).

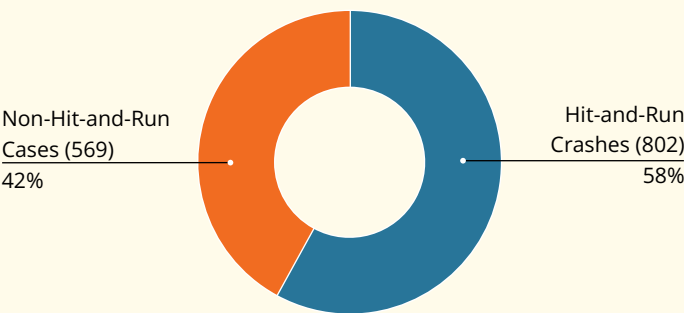
Figure 3.3.2: Comparison of Road Crash Serious Injuries by Road User Types by Years in Pune Rural, 2022-2023



- The serious injuries increased by 29% among pedestrians and by 13% among powered two-wheeler occupants in 2023 as compared to 2022.

3.4 Fatal Hit-and-Run Crashes in Pune Rural

Figure 3.4.1: Fatal Hit-and-Run Crashes, Pune Rural (2022-2023) (N=1371)

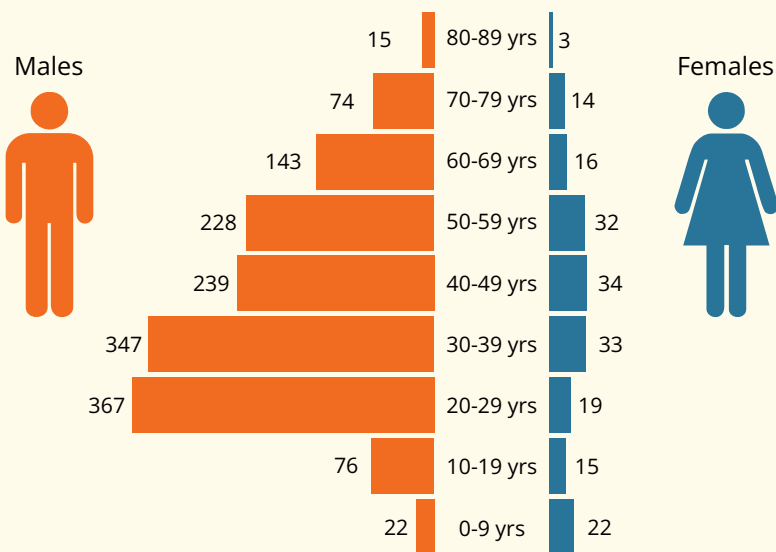


- Fifty-eight percent (802) of the total fatal crashes in 2022 and 2023 were hit-and-run crashes.
- The number of hit-and-run crashes slightly decreased by 3% in 2023 (394) as compared to 2022 (408).

* Fatal crashes excluded for which hit-and-run status was unknown

3.5 Road Crash Deaths by Age and Gender of Victims

Figure 3.5.1: Road Crash Deaths by Age and Gender of Victims in Pune Rural, 2022-2023 (N=1699)



- Most road crash deaths among males occurred in the age group of 20 to 39 years, (56%) while those among females occurred in the age group of 30 to 59 years (53%).

- The number of deaths increased among males by 21% in the 30-39 years age group and among females by 116% in the 20-29 years age group, in 2023 compared to 2022.

3.5.2 Comparison of Road Crash Deaths by Age and Gender of Victims by Years in Pune Rural (2022-2023)

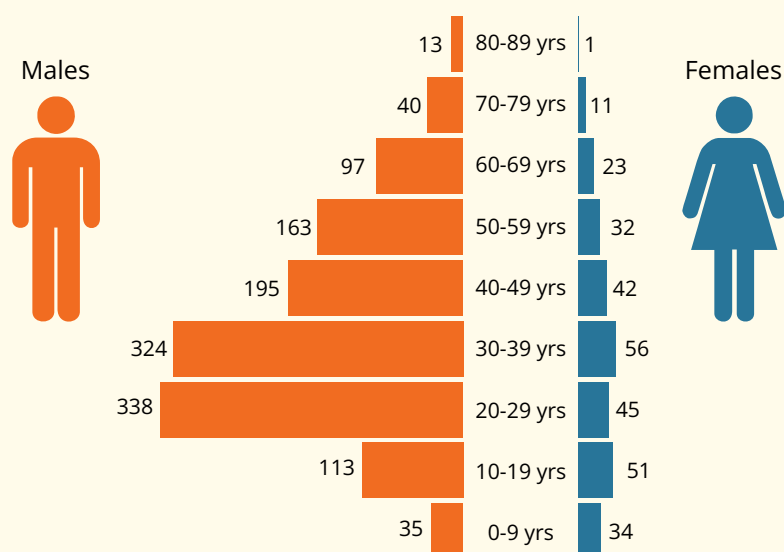
Table No.2: Comparison of Road Crash Deaths by Age and Gender of Victims by Years in Pune Rural (2022-2023)

	Male		Female	
Age Group	2022	2023	2022	2023
0-9	8	14	10	12
10-19	38	38	7	8
20-29	179	188	6	13
30-39	157	190	19	14
40-49	116	123	14	20
50-59	114	114	14	18
60-69	78	65	6	10
70-79	35	39	7	7
80-89	8	7	2	1
Total	733	778	85	103

- The number of deaths increased among males by 21% in the 30-39 years age group
- Deaths among women increased slightly among many age groups.

3.6 Road Crash Serious Injuries by Age and Gender of Victims

Figure 3.6.1: Road Crash Serious Injuries by Age and Gender of Victims in Pune Rural, 2022-2023 (N=1613)



- Half of road crash serious injuries among males occurred in the age group of 20 to 39 years and 52% of female deaths occurred in the age group of 10 to 39 years.

3.6.2 Comparison of Road Crash Serious Injuries by Age and Gender of Victims by Years in Pune Rural, 2022-2023

Table No.3: Comparison of Road Crash Serious Injuries by Age and Gender of Victims by Years in Pune Rural (2022-2023)

	Male		Female	
Age Group	2022	2023	2022	2023
0-9	16	19	18	16
10-19	46	67	33	18
20-29	163	175	24	21
30-39	173	151	27	29
40-49	99	96	19	23
50-59	80	83	17	15
60-69	42	55	13	10
70-79	16	24	4	7
80-89	7	6	1	0
Total	642	676	156	139

- The number of serious injuries increased among males by 46% in the 10-19 years age group and by 36% in the 60-79 years age group, in 2023 as compared to 2022. This emphasizes the need for targeted safety measures for elderly and younger age groups.

3.7 Road User Interaction Matrix

Table No.4: Fatal Crash Victims and Impacting Vehicles in Pune Rural, 2022-2023

Victim Road User	Impacting Vehicle								
	LMV	Powered two-wheeler	Bus	Heavy Vehicle	Bicycle	Single Vehicle Crash	Other	Missing	Total
Pedestrians	100	92	22	104	0	0	2	236	556
Cyclists	4	6	0	3	0	0	0	4	17
Powered two-wheeler	145	222	43	299	0	217	0	137	1063
Vehicle Occupants	51	0	17	156	0	44	0	6	274
Others	0	0	0	2	0	0	0	1	3
Missing	0	0	0	0	0	0	0	0	0
Total	300	320	82	564	0	261	2	384	1913

Heavy vehicle: Heavy Vehicles includes Tempo, Truck, Tractor, Lorry, JCB-Joseph Cyril Bamford, Construction Truck, Mixer

LMV: Light Motor Vehicle (Car/Jeep/Taxi/Van/SUV)

Powered two-wheeler: Geared motorbike, Gearless motorbike, Auto-Rickshaw Occupants, Pillion rider.

Vehicle Occupants: Road Users in Bus, Car/Jeep/Taxi/Van/SUV, Truck, Tempo, Tractor, Lorry

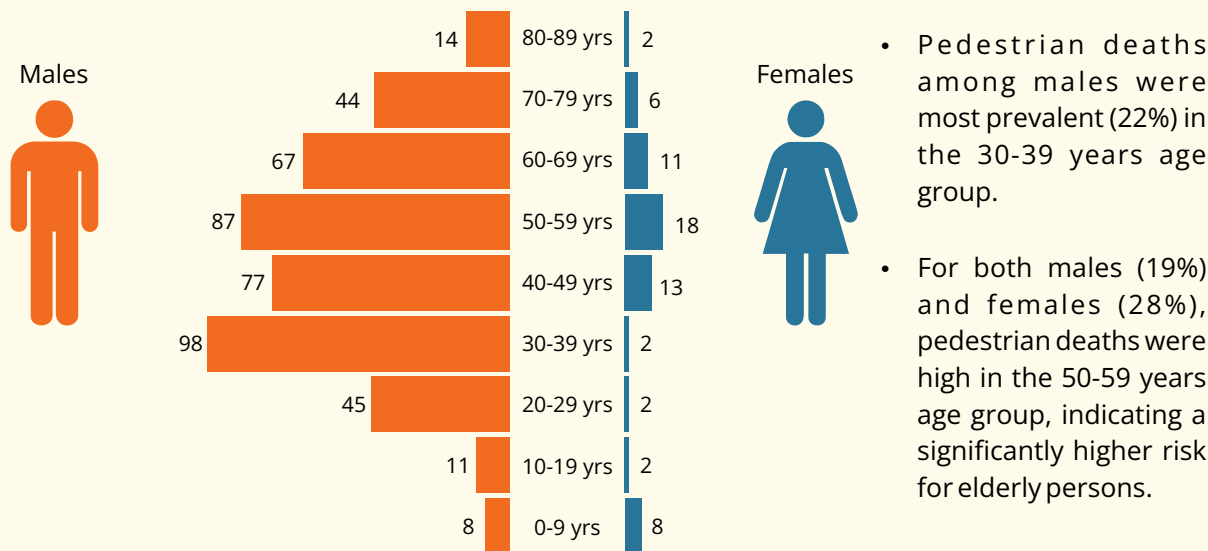
- This table presents the details of victim road users organized by the vehicles that impacted them (with impacting vehicles in columns and victim road users in rows).
- Many road crash victims were powered two-wheelers (1,063) and pedestrians (556). Many were hit by heavy vehicles (powered two-wheelers-28%, pedestrians-19%), light motor vehicles (Car/Jeep/Taxi/Van/SUV) (powered two-wheelers-14%, pedestrians-18%), and powered two-wheelers (powered two-wheelers-21%, pedestrians-17%). Additionally, 57% of the four-wheeler occupants were impacted by the heavy vehicles.
- Eighty three percent of single vehicle crash deaths were among powered two-wheelers.
- Majority (99%) of the impacting drivers were males and 64% of them belonged to the 20-39 years age group.

Findings from the JH-IIRU's observational study:

- Nine percent of powered two-wheelers were observed exceeding speed limits followed by three-wheelers at 3%.
- The majority of the powered two-wheeler riders either did not wear helmets (82%) or wore them incorrectly (1%).

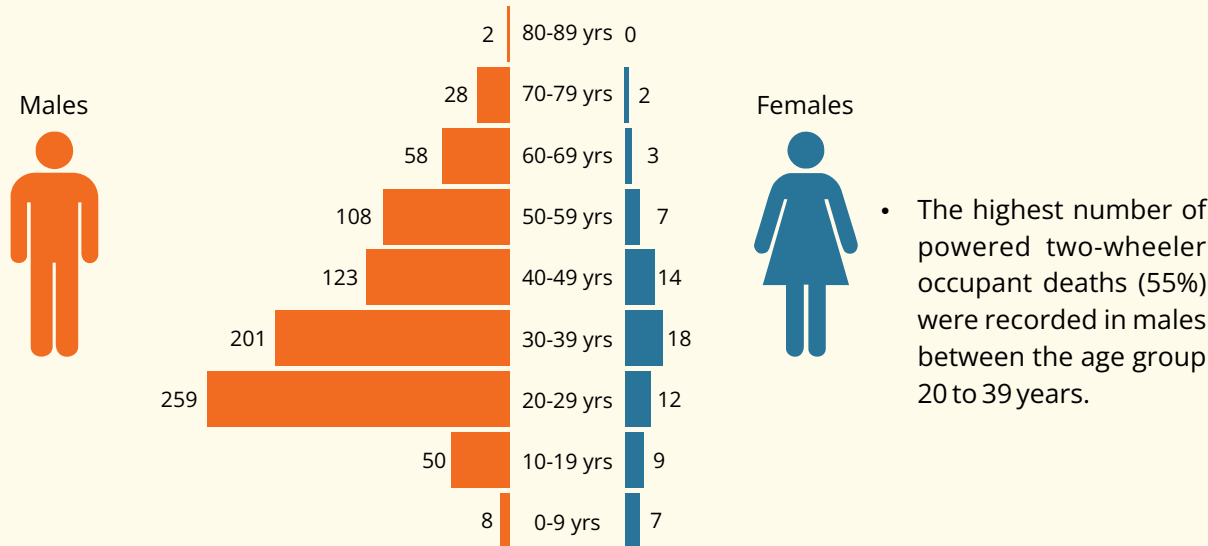
3.8 Pedestrian Deaths

Figure 3.8.1: Pedestrian Deaths by Age and Gender in Pune Rural, 2022-2023 (N=515)



3.9 Powered Two-Wheeler Occupant Deaths

Figure 3.9.1: Powered Two-Wheeler Occupant Deaths by Age and Gender in Pune Rural, 2022-2023 (N=909)

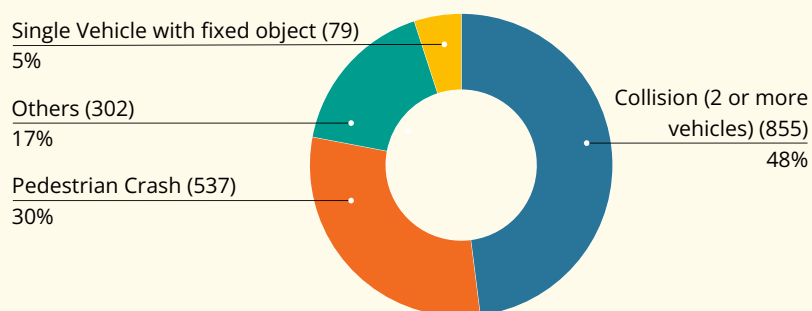


Findings from the JH-IIRU's observational study:

- No or incorrect helmet use was observed in 83% of powered two-wheeler riders.
- More than three-fourths of both male as well as female two-wheeler drivers either did not wear helmets or wore them incorrectly.

3.10 Fatal Road Crashes by Crash Type

Figure 3.10.1: Fatal Road Crashes by Crash Type in Pune Rural, 2022-2023 (N=1773)



- The majority (48%) of the fatal crashes occurred due to collisions of two or more vehicles.
- Thirty percent of fatal crashes involved collision of vehicles with pedestrians.

3.11 Fatal Road Crashes by Time-of-Day and Days-of-Week

Table No.5: Distribution of Fatal Crashes in Pune Rural by Time-of-Day and Days-of-Week, 2022-2023

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Grand Total
00:00-00:59	6	7	7	5	4	6	7	42
01:00-01:59	11	5	11	10	3	8	9	57
02:00-02:59	3	6	4	7	6	6	4	36
03:00-03:59	7	8	5	5	6	6	8	45
04:00-04:59	4	6	7	4	2	5	5	33
05:00-05:59	10	5	12	5	10	5	4	51
06:00-06:59	7	7	8	6	9	8	15	60
07:00-07:59	6	11	10	8	4	5	12	56
08:00-08:59	10	6	10	12	12	14	12	76
09:00-09:59	12	7	10	12	13	10	14	78
10:00-10:59	10	13	6	8	8	12	12	69
11:00-11:59	12	12	7	6	10	16	19	82
12:00-12:59	10	9	14	4	10	13	11	71
13:00-13:59	5	6	9	9	7	15	6	57
14:00-14:59	5	7	4	8	8	8	8	48
15:00-15:59	13	13	15	8	8	4	19	80
16:00-16:59	8	9	8	11	10	11	12	69
17:00-17:59	11	11	17	11	16	11	16	93
18:00-18:59	13	9	16	14	12	22	16	102
19:00-19:59	17	26	26	19	23	24	35	170

(Contd.)

Table No.5: Distribution of Fatal Crashes in Pune Rural by Time-of-Day and Days-of-Week, 2022-2023

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Grand Total
20:00-20:59	19	24	24	17	22	21	21	148
21:00-21:59	19	15	9	16	13	13	10	95
22:00-22:59	14	10	14	16	10	11	14	89
23:00-23:59	4	10	7	14	9	10	12	66
Total	236	242	260	235	235	264	301	1773

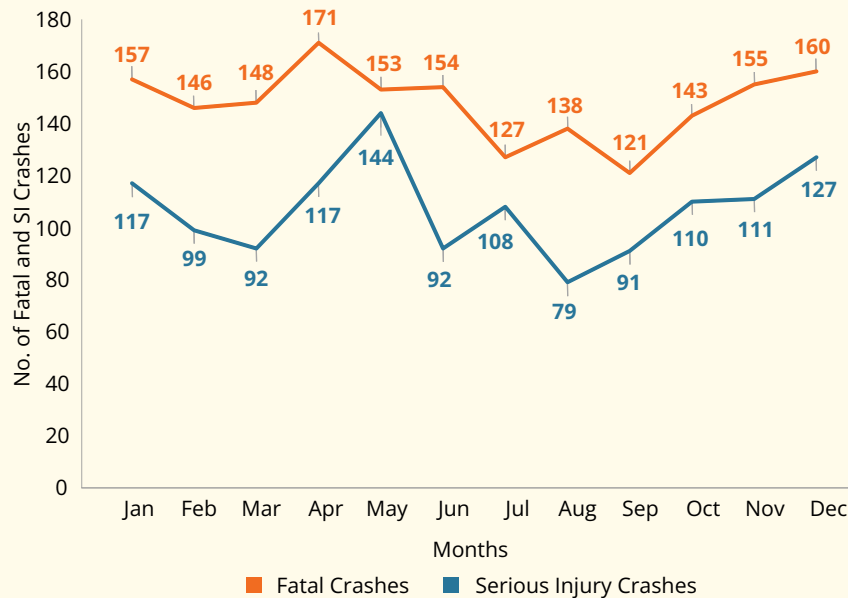
- The majority of the fatal crashes were recorded during the late evening (39%, 697) (i.e., 5pm to 11 pm) and on Sundays (17%, 301).

Findings from the JH-IIRU's observational study:

- While overall speeding prevalence was low (3%) with an average speed of 49 km/h, vehicles in free-flow conditions exhibited much higher speeds (70 km/h), particularly in the late afternoon and evening, with an average free-flow speed of 70 km/h, and the 85th percentile speed reaching 78 km/h.
- Incorrect helmet use was also more prevalent in the evening (81%) compared to the morning (79%), suggesting a decline in compliance as the day progresses.

3.12 Distribution of Fatal and Serious Injury Crashes by Month in Pune Rural, 2022-2023

Figure 3.12: Distribution of Fatal and Serious Injury Crashes by Month in Pune Rural, 2022-2023



- Ten percent of the fatal crashes occurred in the month of April and similarly, 11% of the serious injury crashes occurred in the month of May (holiday season).
- The average number of fatal crashes per month was comparatively higher in January, April, May, June, November and December (158) than the remaining months (137) (potentially due to holidays and festive seasons).
- The average number of serious injury crashes per month was comparatively higher in January, April, May, July, October, November and December (119) than the remaining months (90) (potentially due to holidays and festive seasons).

3.13 Death Rate by Age Group

Figure 3.13.1: Death Rate by Age Group in Pune Rural, 2022 (N=818)

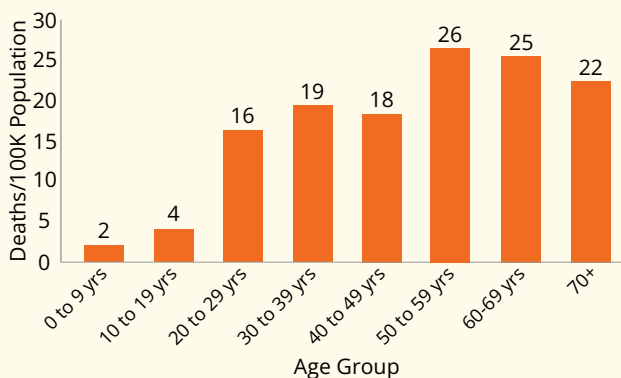
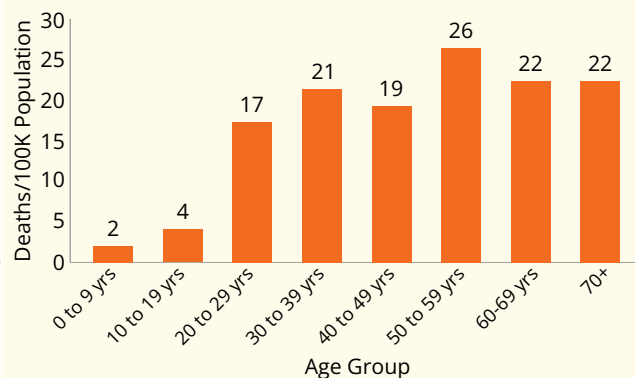


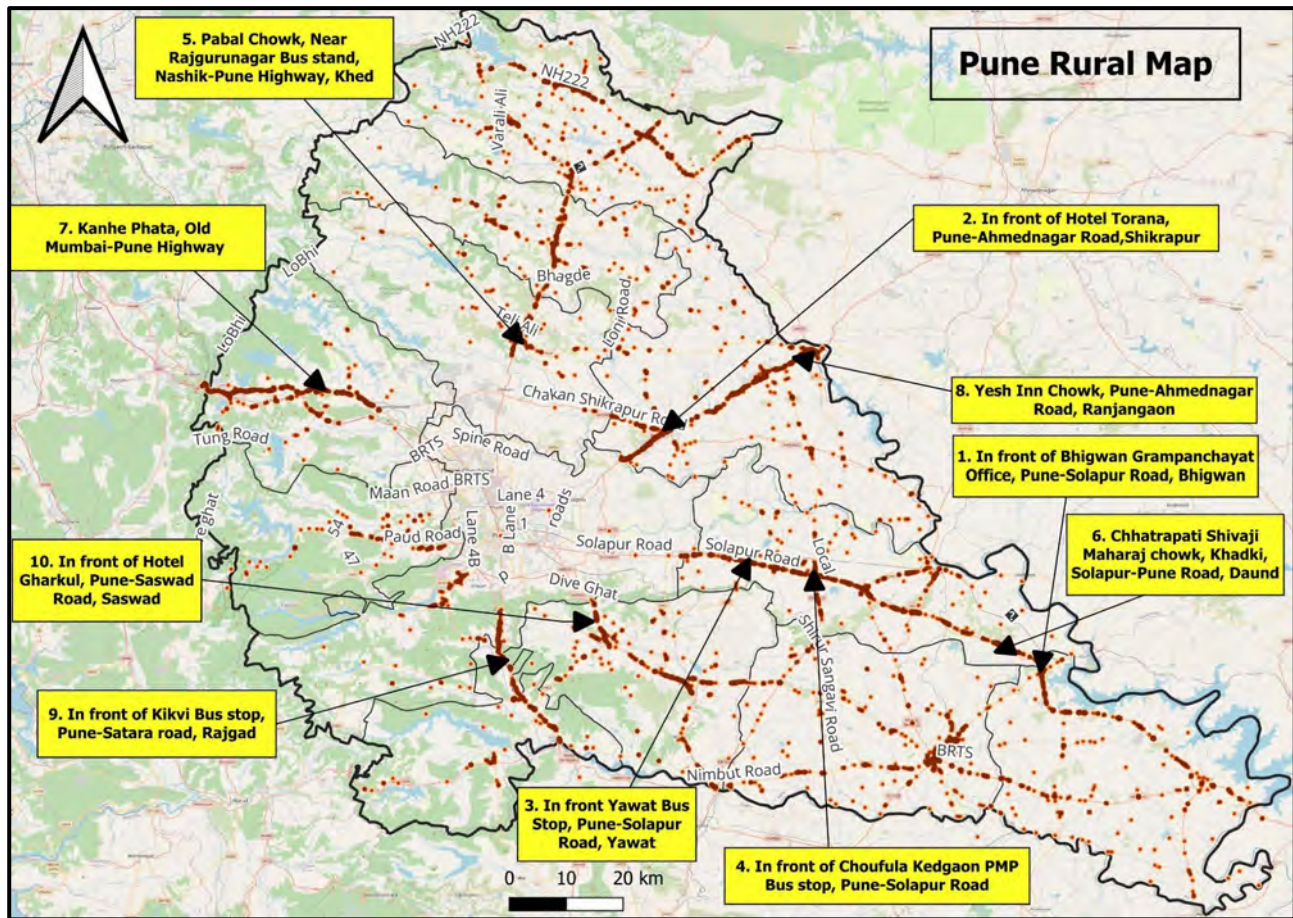
Figure 3.13.2: Death Rate by Age Group in Pune Rural, 2023 (N=881)



- Road crash deaths rate (i.e., deaths per 1 lakh population) increased among the 20-49 years and it decreased among 60-69 years age groups in 2023 as compared to 2022.

3.14. Spatial Distribution of Road Crashes

Figure 3.14.1: Heat Maps of Fatal and Serious Injury Crashes, Pune Rural



The heatmap above gives a visual picture of high risk locations throughout Pune rural district. In this map, the crash density is reflected in the “heat” or color ranging from light red (lower density of fatal and serious injury crashes) to dark red (higher density of fatal and serious injury crashes). Most road crashes were concentrated along Pune-Solapur highway, Pune-Ahmednagar road, and Pune-Bangalore highway.

3.14.2 Black Spots in Pune Rural

Table No.6: Black Spots in Pune Rural, 2022-2023

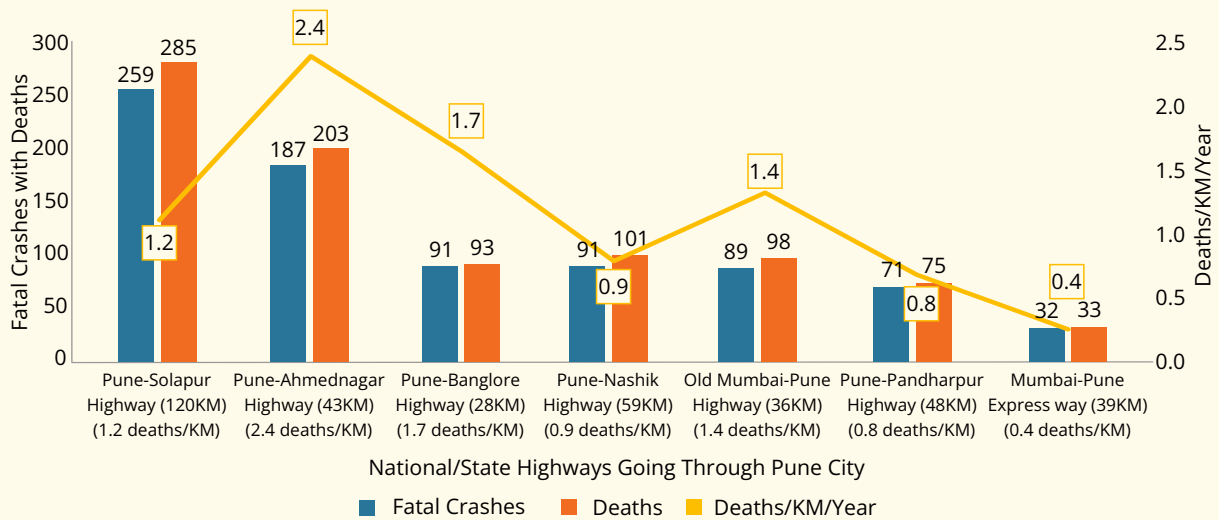
Sr. No	Rank	Name of Location	Latitude	Longitude	Number of Fatal Crashes	Number of Serious Injury Crashes	Total Fatal and SI Crashes (2022-2023)	Number of People died	Number of People Seriously Injured
1	1	In front of Bhigwan Grampanchayat Office, Pune-Solapur road, Bhigwan	18.29853	74.753019	8	5	13	8	11
2	2	In front of Hotel Torana, Pune-Ahmednagar road, Shikrapur	18.68826	74.12504	10	2	12	11	18
3	2	In front of Yawat Bus Stop, Pune-Solapur road, Yawat	18.47558	74.272044	9	3	12	9	12
4	2	In front of Choufula Kedgaon PMP Bus stop, Pune-Solapur Road, Yawat	18.4538	74.37856	7	5	12	7	11
5	2	Pabal Chowk, Near Rajgurunagar Bus stand, Nashik-Pune Highway, Khed	18.85343	73.887778	3	9	12	3	11
6	3	Chhatrapati Shivaji Maharaj chowk, Khadki, Solapur-Pune Road, Daund	18.34169	74.681524	9	2	11	9	5
7	3	Kanhe Phata, Old Mumbai-Pune Highway	18.75712	73.594095	6	5	11	6	9
8	4	Yesh Inn Chowk, Pune-Ahmednagar Road, Ranjangaon	18.77968	74.288282	8	2	10	12	6
9	4	In front of Kikvi Bus stop, Pune-Satara road, Rajgad	18.20267	73.944797	7	3	10	9	8
10	4	In front of Hotel Gharkul, Pune-Saswad Road, Saswad	18.38463	74.015359	7	3	10	7	7
11	4	Sahajpur Phata, Solapur-Pune Highway, Yawat	18.48841	74.177612	7	3	10	7	5
12	4	In front of Shivare Bus stop, Satara-Pune Road, Rajgad	18.3174	73.85998	6	4	10	6	10
13	5	In front Of Ranjangaon Astavinayak Ganpati, Pune-Ahmednagar road, Ranjangaon	18.75434	74.241642	8	1	9	8	2

(Contd.)

Sr. No	Rank	Name of Location	Latitude	Longitude	Number of Fatal Crashes	Number of Serious Injury Crashes	Total Fatal and SI Crashes (2022-2023)	Number of People died	Number of People Seriously Injured
14	5	In front of Kanifnath Temple, Nhavare Phata, Pune-Ahmednagar road, Shirur	18.80575	74.33939	7	2	9	8	5
15	5	In front of Hotel Fouji, Pune-Solapur Highway, Daund	18.39354	74.544128	6	3	9	7	14
16	5	In front of Hotel Jai Malhar, Old Mumbai-Pune Highway	18.75826	73.550643	5	4	9	6	6
17	5	Bhuleshwar Phata, Solapur-Pune Highway, Yawat	18.47759	74.262931	6	3	9	6	4
18	5	In front of Waghjai temple, towards Pune, before flyover, Shindewadi, Rajgad, Satara-Pune Road	18.37594	73.855463	6	3	9	5	6
19	5	Near Kapurhol, Narayanpur Phata, Rajgad	18.23226	73.912742	5	4	9	5	4
20	5	Pencil Chowk, Baramati-Bhigwan Road, Baramati Taluka	18.1792	74.607769	1	8	9	2	9

Using the Ministry of Road Transport and Highways (MoRTH) definition of black spot, we identified top 20 black spots where 5 or more fatal and serious injury crashes had occurred within 500 meters' stretch of each junction and mid-block during 2022 and 2023. Spots such as in front of Bhigwan Grampanchayat Office, Hotel Torana and Yawat Bus Stop recorded the most fatal and serious injury crashes with deaths and injuries from 2022 to 2023.

Figure 3.14.3: High Risk Corridors in Pune Rural, 2022-2023



The highest number of fatal crashes (259) and road crash deaths (285) were registered on Pune-Solapur highway (120KM); however, Pune-Ahmednagar highway recorded the highest death rate (2.4 deaths/km/year). These corridors, when treated, can drastically bring down the total number of crashes, deaths, and injuries in the city.

3.15 Summary of Key Findings:

- **Trend of crashes**

- Fatal crashes increased by 8% while deaths increased by 6% in 2023 compared to 2022.
- Serious injury crashes increased by 9% in 2023 compared to 2022.
-

- **Vulnerable road users**

- Powered two-wheeler occupants, and pedestrians contributed to 83% of road crash deaths and 62% of road crash serious injuries.

- **Vulnerable age groups**

- Men aged between 20-39 years contributed to 47% of road crash deaths and 50% of road crash injuries.
- The death rate was high among those aged 50 years and above.

- **Hit-and-run crashes**

- Fifty-eight percent of fatal crashes were hit-and-run crashes.
- The number of hit-and-run crashes increased by 3% in 2023 as compared to 2022.

- **Crashes by day and time**

- Thirty-nine percent of fatal crashes occurred during late afternoon hours through midnight (5pm to 11pm).

- **High risk corridors**
 - Fifteen percent of fatal road crashes occurred on Pune-Solapur highway whereas 11% occurred on Pune-Ahmednagar highway.
 - However, Pune-Ahmednagar highway recorded the highest death rate (2.4 deaths/km/year) compared to other highways.
- **Top blackspots**
 - Areas such as 'Bhigwan Grampanchayat Office, Hotel Torana and Yawat Bus Stop' recorded the highest number of fatal and serious injury crashes during 2022 and 2023.
- **Speeding, helmet use, and seat-belt/child restraint use:**
 - Powered two-wheelers had the highest prevalence of speeding (9%), compared to other vehicle types.
 - The majority of the powered two-wheeler riders either did not wear helmets (82%) or wore them incorrectly (1%).
 - No or incorrect helmet use was observed in 83% of the powered two-wheeler occupants on both arterial roads and expressways.

3.16 Recommendations:

Recommendation 1: Prioritize high-risk locations and corridors

Given constraints in resources, prioritizing high-risk locations is cost-effective and can drastically reduce crash deaths and serious injuries. The immediate next step after the publication of this report should be conducting further investigations in the identified high-risk locations to conduct road safety inspections, understand specific issues, and to design targeted interventions.

Recommendation 2: Reduce speeding through infrastructure interventions

Speeding is a primary cause of road crash deaths in powered two-wheelers and pedestrians. Powered two-wheelers had the highest prevalence of speeding (9%), compared to other vehicle types. Speed calming measures can effectively and significantly reduce road crash deaths. These measures may include the construction of raised intersections, installation of roundabouts, and implementation of speed humps and rumble strips.

Recommendation 3: Strict enforcement of speed limit laws

Speed limit compliance should also be the priority of the police. Alongside enhanced enforcement, it is recommended to use media to inform the public about the penalties and ongoing enforcement activities related to speeding. In the future, mandatory installation of speed limiters especially for impacting vehicles such as heavy vehicles should also be explored.

Recommendation 4: Strictly enforce and implement helmet-clasping law to reduce powered two-wheeler deaths.

Helmet-clasping can drastically reduce the risk of a powered two-wheeler death by 28% to 73% (Johns Hopkins School of Public Health). Given that 54% of the total deaths were powered two-wheelers in 2022 and 2023, with 82% of riders either not wearing helmets or wearing them incorrectly (1%), it is crucial to strictly enforce the helmet-clasping law.

Recommendation 5: Improve pedestrian safety and accessibility especially of the elderly (sidewalks, raised crossings, other pedestrian infrastructure).

The road crash deaths are constant among pedestrians in 2023, compared to 2022 and the elderly contributed to 28% in the total pedestrian deaths. This underscores the importance of specific interventions for pedestrian safety such as having safe, accessible pedestrian facilities, including wide, obstruction-free footpaths, raised crossings, and safely designed pedestrian and school zones. The focus should be on high-risk areas, especially near schools, railway stations, and commercial and residential zones.

Recommendation 6: Build safe, reliable, and accessible walking and cycling amenities as well as safe public transportation infrastructure.

Building safe walking and cycling facilities as well as well-connected and integrated public transportation options will enable people to shift from private vehicles to public transport which effectively reduces exposure on the road. This shift will not only reduce the number of deaths and injuries but will also have multiple benefits to the city's economy, environment, and overall quality of life.

Recommendation 7: Improve data quality (inclusion of key indicators in the FIRs, establishment of a crash analysis team, scale-up of eDAR).

Explore the inclusion of additional details and indicators such as age and gender, and incomplete details regarding the circumstances that led to the crash. A crash analysis team who can gather and digitize FIRs as well as produce routine road safety reports should also be established within the police. The police should also work with the NIC to scale-up the use of eDAR in the city and gain access to line list data from eDAR so it can be used for analysis.

Recommendation 8: Organize and follow-up on collection of fines

Aside from the enforcement of laws, it would be important to ensure that fines are strictly collected. This would involve establishing mechanisms to adequately process violations, follow-up on fines, and integration of licensing, vehicle registration, and law violations datasets. The implementation of the law without the collection of fines, enables road users to disobey the law as it has no effect.

ANNEXURE

**PUNE RURAL
BLACK SPOTS**

Annexure-3 List of Black Spots of Pune Rural (2022-2023)

Sr. No	Rank	Name of Location	Latitude	Longitude	Number of Fatal Crashes	Number of Serious Injury Crashes	Total Fatal and SI Crashes	Number of People died	Number of People Seriously Injured
1	1	In front of Bhigwan Grampanchayat Office, Pune- Solapur road, Bhigwan	18.298526	74.753019	8	5	13	8	11
2	2	In front of Hotel Torana, Pune-Ahmednagar road, Shikrapur	18.688262	74.12504	10	2	12	11	18
3	2	In front of Yawat Bus Stop, Pune-Solapur road, Yawat	18.475579	74.272044	9	3	12	9	12
4	2	In front of Choufula Kedgaon PMP Bus stop, Pune- Solapur Road, Yawat	18.453797	74.37856	7	5	12	7	11
5	2	Pabal Chowk, Near Rajgurunagar Bus stand, Nashik- Pune Highway, Khed	18.853434	73.887778	3	9	12	3	11
6	3	Chhatrapati Shivaji Maharaj chowk, Khadki, Solapur- Pune Road, Daund	18.341688	74.681524	9	2	11	9	5
7	3	Kanhe Phata, Old Mumbai-Pune Highway	18.757122	73.594095	6	5	11	6	9
8	4	Yesh Inn Chowk, Pune-Ahmednagar Road, Ranjangaon	18.779684	74.288282	8	2	10	12	6
9	4	In front of Kikvi Bus stop, Pune-Satara road, Rajgad	18.202667	73.944797	7	3	10	9	8
10	4	In front of Hotel Gharkul, Pune-Saswad Road, Saswad	18.38463	74.015359	7	3	10	7	7
11	4	Sahajpur Phata, Solapur-Pune Highway, Yawat	18.488414	74.177612	7	3	10	7	5
12	4	In front of Shivare Bus stop, Satara-Pune Road, Rajgad	18.317398	73.85998	6	4	10	6	10
13	5	Infront Of Ranjangaon Astavinayak Ganpati, Pune-Ahmednagar road, Ranjangaon	18.754342	74.241642	8	1	9	8	2
14	5	In front of Kanifnath Temple, Nhavare Phata, Pune-Ahmednagar road, Shirur	18.805753	74.33939	7	2	9	8	5
15	5	In front of Hotel Fouji, Pune-Solapur Highway, Daund	18.393544	74.544128	6	3	9	7	14

(Contd.)

Sr. No	Rank	Name of Location	Latitude	Longitude	Number of Fatal Crashes	Number of Serious Injury Crashes	Total Fatal and SI Crashes	Number of People died	Number of People Seriously Injured
16	5	In front of Hotel Jai Malhar, Old Mumbai-Pune Highway	18.758255	73.550643	5	4	9	6	6
17	5	Bhuleshwar Phata, Solapur-Pune Highway, Yawat	18.47759	74.262931	6	3	9	6	4
18	5	In front of Waghjai temple, towards Pune, before flyover, Shindewadi, Rajgad, Satara-Pune Road	18.37594	73.855463	6	3	9	5	6
19	5	Near Kapurhol, Narayanpur Phata, Rajgad	18.232257	73.912742	5	4	9	5	4
20	5	Pencil Chowk, Baramati-Bhigwan Road, Baramati Taluka	18.179199	74.607769	1	8	9	2	9
21	6	In front of Matoshri Hospital, Vadgaon, Mumbai-Pune Highway	18.737206	73.638951	5	3	8	6	9
22	6	Wireless Phata, Daund-Patas Road, Daund	18.457925	74.531661	5	3	8	6	4
23	6	Chakan chowk, Pune-Ahmednagar road, Shikrapur	18.69239	74.132285	5	3	8	5	3
24	6	In front of Whirlpool of India Ltd, Pune-Ahmednagar Road, Ranjangaon	18.775858	74.27982	5	3	8	5	9
25	6	Varkute Pati, Pune Solapur Road, Indapur	18.184172	74.9401	3	5	8	3	8
26	6	In front of Darshan Dhaba, Khamshet, Old Mumbai-Pune Highway	18.76177	73.539159	2	6	8	2	7
27	6	Bhigwan Chowk, Baramati City	18.150023	74.575184	1	7	8	1	7
28	7	In front of Dalaj Traffic Police Station, Pune-Solapur Road, Bhigwan	18.226865	74.816869	6	1	7	9	6
29	7	In front of Hotel Darbar, Pune-Solapur road, Yawat	18.420586	74.46971	6	1	7	8	15
30	7	In front of Hotel Shivprasad, Pandharewadi, Pune- Solapur Road, Daund	18.392227	74.549593	5	2	7	7	10
31	7	In front of Hotel Sandip, Pune-Solapur Road, Yawat	18.453486	74.385038	4	3	7	7	15

(Contd.)

Sr. No	Rank	Name of Location	Latitude	Longitude	Number of Fatal Crashes	Number of Serious Injury Crashes	Total Fatal and SI Crashes	Number of People died	Number of People Seriously Injured
32	7	In front of Kalyani Forge Company, Pune-Ahmednagar road, Shikrapur	18.663203	74.091824	6	1	7	7	2
33	7	In front of Sujata Petrol Pump, Pune-Solapur Road, Bhigwan	18.226515	74.824788	6	1	7	6	2
34	7	In front of Jio/Reliance petroleum, Pune-Ahmednagar Road, Shikrapur	18.694619	74.13693	5	2	7	5	3
35	7	In front of Phalkemala, Pune-Ahmednagar road, Ranjangaon	18.795441	74.312316	5	2	7	5	5
36	7	Near MSRTC Bus stop Palasdev, Solapur-Pune Highway, Indapur	18.217489	74.88319	3	4	7	3	7
37	7	In front Saswad ST bus stand, Saswad	18.350113	74.028803	2	5	7	2	7
38	7	Near Jejuri MIDC Office, Pune-Pandharpur Road, Jejuri	18.261133	74.172842	2	5	7	2	7
39	7	In front of HP Petrol pump, near Hotel Tiranga, Pune-Ahmednagar Road, Shikrapur	18.66884	74.098633	2	5	7	2	7
40	7	Jambhul Phata, Old Mumbai-Pune Highway	18.74858	73.622383	1	6	7	1	11
41	7	In front of Hotel Zopadi, Pune-Solapur road, Yawat	18.466984	74.314494	1	6	7	1	16
42	8	In front of Hotel Royal blue, Pune-Satara road, Rajgad	18.337016	73.853119	5	1	6	5	1
43	8	In front of Hotel Aaisaheb, Pune-Solapur Road, Daund	18.395378	74.524447	4	2	6	5	10
44	8	In front of Hotel Nisarg, Pune-Solapur Road, Yawat	18.440958	74.43521	5	1	6	5	5
45	8	Near Digambar Bharat Petrol Pump, Kondhapuri, Pune-Ahmednagar road, Shikrapur	18.724913	74.209592	5	1	6	5	3
46	8	Karegaon Karde road chowk, Ahmednagar-Pune Highway, Ranjangaon	18.783387	74.296668	5	1	6	5	5
47	8	In front of Sheetal Dhaba, Old Mumbai-Pune highway	18.760615	73.458572	4	2	6	4	3

(Contd.)

Sr. No	Rank	Name of Location	Latitude	Longitude	Number of Fatal Crashes	Number of Serious Injury Crashes	Total Fatal and SI Crashes	Number of People died	Number of People Seriously Injured
48	8	In front of Saibaba Temple Sevadham, Old Mumbai-Pune Highway	18.757216	73.586218	4	2	6	4	2
49	8	In front of Rameshwar Indian Oil Petrol Pump, Mumbai-Banglore Highway, Rajgad	18.182129	73.953692	4	2	6	4	3
50	8	In front of A1 Chikki, Old Mumbai-Pune highway	18.754132	73.405687	3	3	6	3	4
51	8	Karla/Ekvara Phata, Old Mumbai-Pune Highway	18.762442	73.480273	3	3	6	3	3
52	8	Talegaon Dabhade Phata, Old Mumbai-Pune Highway	18.728104	73.654175	3	3	6	3	3
53	8	Near Tiranga Hotek. BhavaniNagar, Indapur Road, Walchandnagar	18.117524	74.688087	3	3	6	3	6
54	8	In front of Deshpande Hotel, Near Mahatma Phule chowk, Pune Solapur, Indapur	18.105163	75.039359	3	3	6	3	5
55	8	Near Hotel Daulat, Pune-Solapur Road, Bhigwan	18.254915	74.760017	3	3	6	3	14
56	8	In front of Katraj Dairy, Sinhgad road, Pune	18.445263	73.788132	3	3	6	2	5
57	8	Near Velu Phata, Towards Pune, Satara-Pune Road, Rajgad	18.364607	73.853541	2	4	6	2	14
58	8	Wadgaon Phata, Ahmendar-Pune Road, Shikrapur	18.650251	74.072245	2	4	6	2	13
59	8	Malthan Phata, Pune-Ahmednagar road, Shikrapur	18.701355	74.148879	2	4	6	2	7
60	8	In front of Hotel Abhishek, Near Morgaon Bus stand, Morgaon-Supa Road, Supa	18.277016	74.320445	1	5	6	1	10
61	8	Pimpalgaon phata, Pune Nashik highway, Manchar	19.004703	73.946816	1	5	6	1	10
62	8	Near Laxmi Temple, Mhetre vasti, Pune-Solapur road, Yawat	18.486697	74.165363	0	6	6	0	10

(Contd.)

Sr. No	Rank	Name of Location	Latitude	Longitude	Number of Fatal Crashes	Number of Serious Injury Crashes	Total Fatal and SI Crashes	Number of People died	Number of People Seriously Injured
63	9	Near Dingore bus stop, Dingore gaon, Ahmednagar- Kalyan road, Otur	19.273746	73.928571	5	0	5	14	1
64	9	Shilatane Phata, Old Mumbai-Pune Highway	18.765855	73.495321	3	2	5	8	4
65	9	Near Akshara Milk collection dairy, Vatkhole Gaon, Ahmendagar-Kalyan road, Otur	19.294896	73.84003	4	1	5	7	16
66	9	In front of Jadhav Construction, Malad gaon, Solapur-Pune Road, Daund	18.373648	74.599613	4	1	5	6	3
67	9	In front of Surve's Veg Non-Veg Hotel, Pune Satara Road, Rajgad	18.35649	73.853262	4	1	5	5	3
68	9	Kondhanpur Phata, Pune-Banglore Highway	18.348551	73.851651	5	0	5	5	2
69	9	In front of Hotel Neelkamal, Pune-Satara Road, Rajgad	18.301147	73.872946	4	1	5	5	3
70	9	Infront Of Krishnaleela Garden Mangal Karyalaya, Pune-Ahmednagar road, Shikrapur	18.679939	74.110743	5	0	5	5	1
71	9	Mundhaware Phata, Old Mumbai-Pune Highway	18.758108	73.518662	4	1	5	4	6
72	9	Jejuri Railway Bridge, Jejuri-Morgaon Road, Jejuri	18.283391	74.175945	4	1	5	4	1
73	9	Infront Of Mavdi Kadepathar Bus Stop, Jejuri-Morgaon-Baramati Road	18.276139	74.245393	4	1	5	4	1
74	9	Near Anuradha Palace, Kurkumbh, Pune-Solapur Road, Daund	18.399837	74.511979	4	1	5	4	3
75	9	In front of Hotel Annapurna, Near Mula Mutha River, Pune-Solapur Road, Yawat	18.474355	74.278226	4	1	5	4	1
76	9	In front of Bappa Misal, Pune-Solapur Road, Yawat	18.484876	74.226123	4	1	5	4	1
77	9	Near Nhavara Bus Stand, Shrigonda-Nhavare road, Shirur	18.663049	74.37337	4	1	5	4	2

(Contd.)

Sr. No	Rank	Name of Location	Latitude	Longitude	Number of Fatal Crashes	Number of Serious Injury Crashes	Total Fatal and SI Crashes	Number of People died	Number of People Seriously Injured
78	9	In front of Hotel Archana, Ahmednagar-Pune Road, Shikrapur	18.716598	74.182076	5		5	4	3
79	9	Rajmudra Chowk, Ahmednagar-Pune Road, Ranjangaon	18.765769	74.260879	4	1	5	4	1
80	9	In front of Hotel Akash, Pune-Nashik Highway, Khed	18.901586	73.913675	4	1	5	4	1
81	9	Near Shri Ramdas baba Mandir, Wadgaon Anandgaon, Ahmednagar-Kalyan road, Alephata	19.188702	74.082211	2	3	5	4	4
82	9	In front of Spot on Hotel Abhijeet, Ahemednagar-Kalyan road, Otur	19.246094	74.009514	4	1	5	4	3
83	9	In front of Rangat Restaurant, Kusgaon Budruk, Old Mumbai-Pune Highway	18.760816	73.444815	3	2	5	3	7
84	9	Near Gorakshnath Math,Bhivadi, Saswad-Kapurhol-Bhor Road, Saswad	18.319533	73.994997	3	2	5	3	5
85	9	Dalaj No-2, Chowk, Near Hotel Visava, Pune-Solapur Road, Bhigwan	18.227511	74.79399	3	2	5	3	3
86	9	In front of Hotel Surya, Pune-Solapur Road, Bhigwan	18.230158	74.774074	3	2	5	3	3
87	9	Near Shirur bypass, Pune-Ahmednagar road, Shirur	18.8204	74.355512	3	2	5	3	3
88	9	Near Manshakti Research Centre, Old Mumbai-Pune highway	18.758794	73.433201	2	3	5	2	5
89	9	In front of Shree Vitthal Dhaba, Saswad Road, Jejuri	18.284956	74.141518	2	3	5	2	6
90	9	Near Hotel Sahyadri, Pune-Solapur road, Yawat	18.458171	74.353353	2	3	5	2	4
91	9	In front of More Petrol Pump, Pune-Solapur road, Yawat	18.471327	74.291972	2	3	5	2	7
92	9	Koregaon Bhima PMT Bus stop, Pune-Ahmednagar road, Ranjangaon	18.645843	74.060163	2	3	5	2	9

(Contd.)

Sr. No	Rank	Name of Location	Latitude	Longitude	Number of Fatal Crashes	Number of Serious Injury Crashes	Total Fatal and SI Crashes	Number of People died	Number of People Seriously Injured
93	9	In front of Morya lawns, Pune-Ahmednagar road, Ranjangaon	18.756482	74.249461	2	3	5	2	3
94	9	Near Dabhade Sarkar Bridge, Brahmanwadi, Towards Pune, Mumbai-Pune Expressway	18.710364	73.568191	1	4	5	1	4
95	9	In front of Hotel Shivsagar, Mulshi Road, Paud	18.500891	73.514532	1	4	5	1	4
96	9	Saswad Veer Phata, Pune-Jejuri Road, Saswad	18.336546	74.036641	1	4	5	1	6

