

# “New Moon Day and Road Safety”: A Statistical Analysis of Accident Trends

Dr. Sanjeeva Kumar B.H<sup>1</sup>

<sup>1</sup> SLS Transport Training Institute and Consultancy

Email for correspondence, e.g. [sanjeev@tticblr.com](mailto:sanjeev@tticblr.com)

## 1 INTRODUCTION

Road traffic injuries are estimated to be the eighth leading cause of death globally and the leading cause of death for young people aged 15–29 years. Approximately 1.24 million people die every year on the world’s roads, and another 20 to 50 million sustain nonfatal injuries as a result of road traffic crashes. Half of the world’s road traffic deaths occur among motorcyclists (23%), pedestrians (22%) and cyclists (5%). Only 28 countries, representing 416 million people (7% of the world's population), have adequate laws that address all five behavioural risk factors (speed, drink-driving, helmets, seat-belts, and child restraints).

In India, the motor vehicle population is growing at a faster rate than the economic and population growth. The surge in motorization coupled with expansion of the road network has brought with it the challenge of addressing adverse factors such as the increase in road accidents. Between 1970 and 2011, the number of accidents increased 4.4 times accompanied with 9.8 times increase in fatalities and 7.3 times increase in the number of persons injured, against the backdrop of more than a 100-fold increase in the number of registered motor vehicles and close to a four-fold increase in the road network.

## 2 ROAD TRAFFIC IN BENGALURU CITY

Bengaluru, the capital city of Karnataka, is India's third most populous city and fifth-most populous urban agglomeration. Numerous public sectors, heavy industries, software companies, aerospace, telecommunications, and defence organisations are located in the city. Bangalore is known as the Silicon Valley of India because of its pre-eminent position as the nation's leading IT employer and exporter.

Bangalore is the fastest growing major metropolis in India, with the current population of 1.3 crores and vehicular population being 1.11 crores. Bengaluru's road network (around 14 ,000km) consists of ring roads, major roads (arterial, sub arterial) and residential streets.

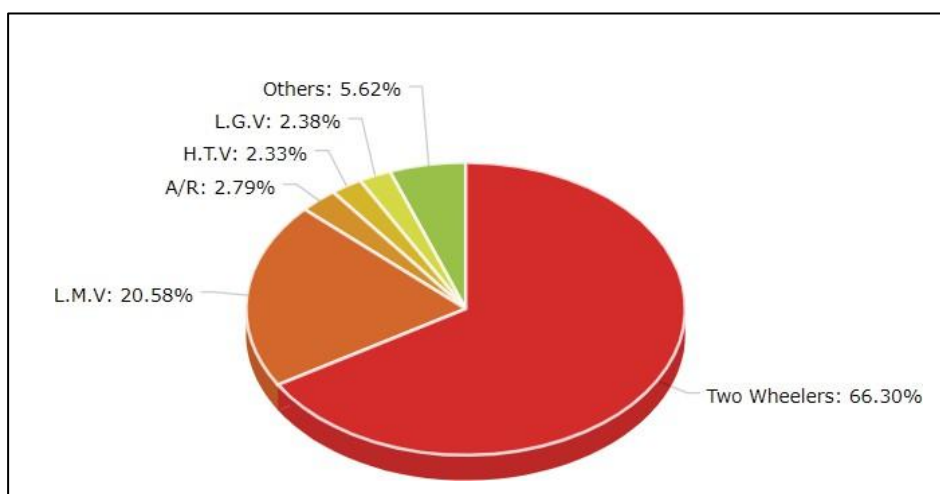


Figure 1. Composition of Vehicular Traffic in Bengaluru

3 ROAD ACCIDENTS IN BENGALURU CITY

Road accidents have become a major concern in Bengaluru City, impacting not only the administration and law enforcement departments but also the general public. The alarming rise in road accidents in recent years has highlighted the need for urgent attention and action.

Bengaluru has witnessed a concerning increase in road accidents over the years. The proportion of fatal accidents has shown a consistent rise from 12.6% in 2011 to 19.6% in 2022. This trend is indicative of not just an increase in the number of accidents, but also in the severity of these incidents.

In 2023 alone, by the end of November, Bengaluru recorded a total of 4,499 accidents. Out of these, 794 were fatal crashes resulting in 823 deaths. The non-fatal accidents numbered 3,705, with 3,802 people sustaining injuries. These figures underline the critical situation on the city's roads, necessitating immediate measures to enhance road safety.

Fatal & Non-Fatal Accidents in Bengaluru City over the years			
Year	Fatal	Non-Fatal	Total
2014	711	4293	5004
2015	714	4114	4828
2016	754	6752	7506
2017	608	4457	5065
2018	663	3948	4611
2019	744	3944	4688
2020	622	2614	3236
2021	618	2593	3211
2022	751	3072	3823
2023	882	4092	4974

Table 1. Accident Statistics of Bengaluru

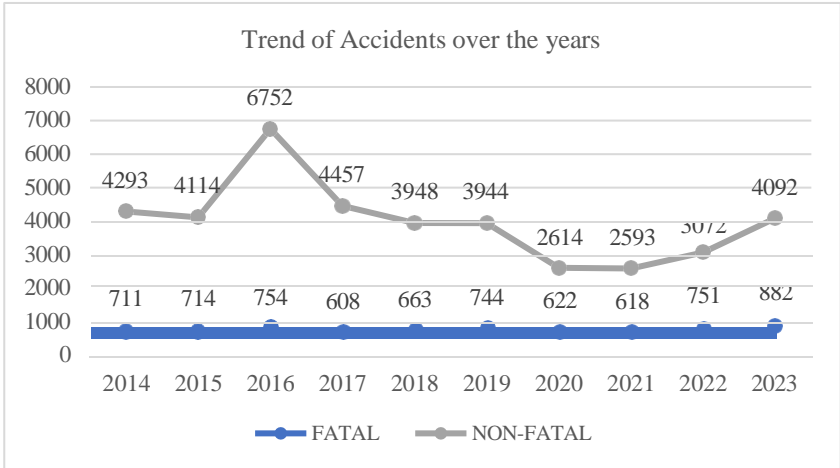


Figure 2. Graph indicating Trend of Accidents over the years

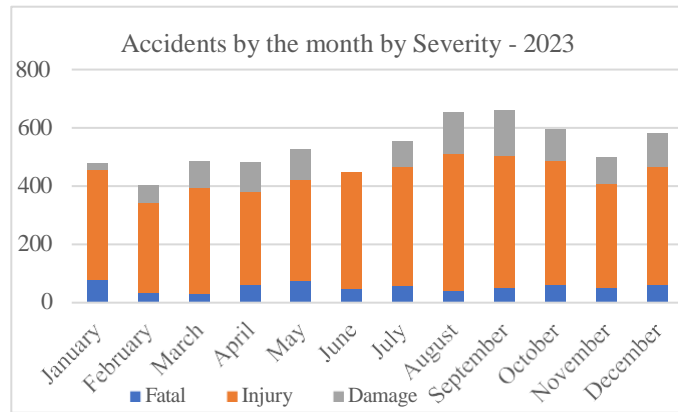


Figure 3. Graph indicating Accidents by the month by Severity for the year 2023

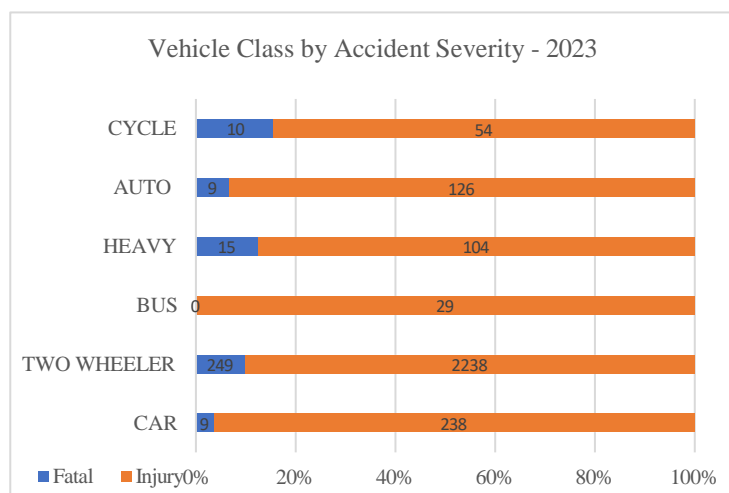


Figure 4. Graph indicating Accidents by Vehicle Class by Severity for the year 2023

A significant concern is the high fatality rate among Vulnerable Road Users (VRUs). VRUs include pedestrians, cyclists, and motorcyclists who share the same road space with larger, motorized vehicles. Their increased susceptibility to accidents is due to their limited protection compared to occupants of cars and other larger vehicles. The statistics reveal a dire need to improve safety measures for VRUs to reduce their risk of accidents.

The vehicular traffic flows vary for different days of the week and hence there are variations in crashes, thus necessitating a study of the daily variation of accidents. Distribution of crashes in Bangalore city over the days of week as aggregated for the year 2023 may be seen in the following tables and figures.

Accidents by the Day of Week - 2023							
Severity	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Fatal	108	108	80	97	75	88	92
Injury	703	644	627	617	657	696	699
Damage	140	164	144	169	175	165	180
Total	951	916	851	883	907	949	971

Table 2. Accidents by the day of week for the year 2023

The accident data reveals several key trends. Saturday has the highest total number of accidents, with 971 cases reported, and also records the most significant damages. Sunday follows with a high number of both fatal and non-fatal accidents: 108 fatal cases and 703 non-fatal cases, totaling 951 accidents. Monday also shows a significant number of accidents, with 108 fatal cases and 644 non-fatal cases, bringing the total to 916 accidents. In summary, while Saturday experiences the highest overall number of accidents, Sunday and Monday see the highest numbers of fatal and non-fatal accidents.

#### 4 ACCIDENT SEVERITY ON NEW MOON DAYS

Amāvāsyā (अमावासी) refers to “new-moon” day. The next day marks the start of the counting of tithis (lunar day), which at fifteen days reaches purṇimā (full-moon), after which the counting of tithis starts again for another fifteen days where it ends with amāvāsyā again.

The moon goes around the earth once in every 29.5 days. The moon cannot glow on its own and it just reflects the sun rays falling on it. During its various positions around the earth, it is exposed to varying amount of sun rays as the earth occurs in between. Therefore, moon appears to grow and reduce in its size. When the earth completely blocks the moon from the sun, it is Amavasya and when the moon is completely exposed to the sun, it is Purnima.

According to Vedic Astrology, moon is considered an important planet which is not visible on the night of Amavasya.

People avoid travelling during this time as Amavasya (No Moon night) can invite problems. Since, Moon provides light and if it is not there, then darkness can cause problems during journey. In this context, an analysis is made as to how many number of accidents have happened on Amavasya days of each month in the year 2023.

Accidents by the Day of Week - 2023		
	New Moon Day	Avg. of Other Days
Fatal	60	20
Injury	76	83
Damaged	12	10

Table 3. Accidents by the Day of Week on New Moon Day and average of other days for the year 2023

A total of 173 accidents have happened on New Moon days with 26 accidents occurring in the month of October and December 2023. Out of 173 accidents, 23 have turned out to be fatal and injuries were 122, mostly involving two-wheelers and cars.

The total number of injuries was almost the same compared to New Moon day and overall data with 76 cases on New Moon day and 83 cases on Avg of other days for the year 2023. Fatal cases were seen more on New Moon Days with 60 cases respectively.

Accidents by Collision Type on New Moon Day and Avg. of Other Days - 2023		
Collision Type	New Moon Day	Avg. of Other Days
Nose To Tail (NT)	116	814
Side Swipe (SW)	45	219
Head On (HO)	46	252
Pedestrian (PE)	127	557
Obstacle (OB)	57	219
Nose To Side (NS)	0	0
Passenger (PS)	25	203
Tail To Nose (TN)	0	0

Table 4. Accidents by the Day of Week on New Moon Day and average of other days for the year 2023

On New Moon days, the types of collisions involving pedestrians and nose-to-tail incidents are higher compared to other types of collisions. Most accidents on these days involve two-wheelers and pedestrians, as the darkness makes it difficult for vehicles to see pedestrians clearly. Consequently, pedestrian accident cases are higher on New Moon days than on other days.

Severity of Accidents by Time for New Moon Day and Avg. of Other Days			
	Day (7am to 7pm)	Night (8pm to 6am)	Total
Fatal - Amavasya	11	13	24
Fatal - Other Days	354	120	474
Injury - Amavasya	17	50	67
Injury - Other Days	3872	1011	4883
Damage - Amavasya	5	16	21
Damage - Other Days	603	150	753

Table 5. Accidents by Severity by Time on New Moon Day and average of other days for the year 2023

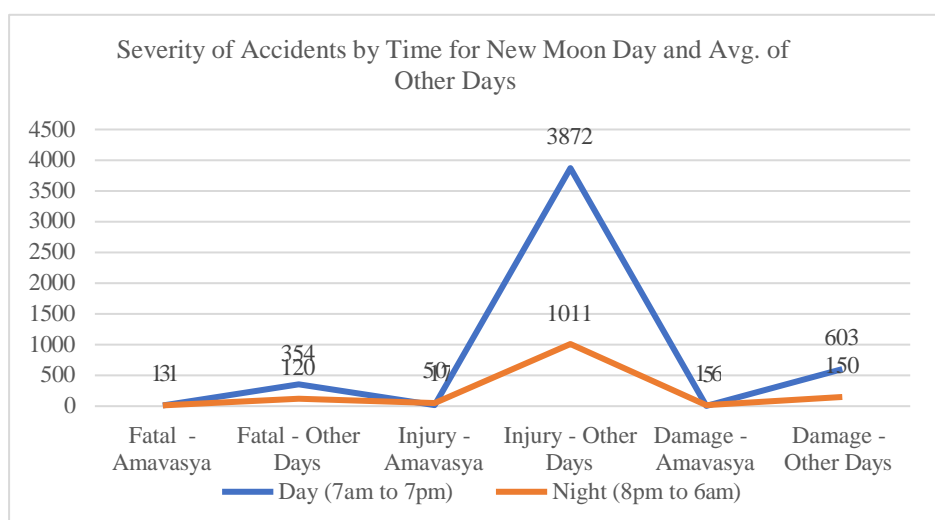


Figure 5. Graph indicating Accidents by Severity by Time for New Moon Day and Average of other days for the year 2023

Comparing daytime and nighttime on New Moon Days, it is evident that more accidents occur during the night. There are 11 fatal cases during the day and 13 fatal cases at night. Similarly, there are 17 injury cases during the day and 50 injury cases at night. In contrast, on other days, daytime accidents are higher for both fatal and non-fatal cases.

## 5 CONCLUSION

A total of 148 accidents have happened on New Moon Days in the year 2023, as against 113 accidents happening on average of other days. Out of 148 accidents, 60 have turned to be fatal, mostly involving two-wheelers and cars. Most number of accidents (116) have occurred by nose to tail type collision and accidents involving pedestrians are 127 in number and time of occurrence is almost equally distributed through the day.

This analysis suggests that there is a higher number of accidents on New Moon Days, implying a possible increase in accident frequency on these days compared to the average on other days.

This finding highlights the necessity for increased awareness and targeted road safety measures, particularly on New Moon Days, to mitigate the elevated risk of accidents. Addressing these issues comprehensively can help reduce the overall incidence and severity of road accidents in Bengaluru, ultimately enhancing the safety and well-being of all road users.