

ROAD ACCIDENT ANALYSIS



By

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SUMMARY

This report presents a comprehensive analysis of road accident data, offering insights into the frequency, severity, and distribution of casualties across different parameters.

OBJECTIVE

This report provides a clear and interactive visual representation of road accident statistics, focusing on casualty counts, severity levels, vehicle involvement, and well as environmental factors. To monitor accident trends, identify high-risk categories, and support evidence based decision making for road safety improvements. The analysis also aims to help stakeholders pinpoint critical risk areas and implement targeted safety.

INTRODUCTION

This report provides a concise yet comprehensive analysis of national road accident data, offering insights into casualty trends, risk factors, and accident patterns. It has been designed to empower decision makers, traffic safety authorities, and policy planners with the information needed to implement targeted interventions, improve road safety, and reduce accident related fatalities and injuries. It presents a detailed analysis of Road accidents that occurred between 2021 and 2022. Using Power BI, the dataset was transformed and visualized to uncover trends, patterns, and key insights. The analysis aims to identify accident locations, understand the major causes, and provide actionable recommendations for improving road safety.

Purpose of the Report:

The primary purpose of this report is to monitor, evaluate, and communicate the scale and nature of road accidents over a defined period. By visualizing accident data in an accessible format, it enables stakeholders to quickly identify areas of concern, priorities safety measures, and track progress in reducing casualties. The report was created to analyze and visualize road accident data in order to identify trends, high risk factors, and patterns in casualty occurrences, and policy planners in designing targeted safety measures, allocating resources effectively, and reducing accident related fatalities and injuries.

Scope of Analysis:

- > **Timeframe:** Covers road accident data for the years (2021-2022)
- > **Geographic Coverage:** National level data across both urban and rural locations.
- > **Data Categories:**
 - *Accident Severity (fatal, serious, slight)
 - *Vehicle types involved
 - *Location type (urban/rural)
 - *Time of occurrence (day/night)
 - *Road surface conditions
 - *Weekly distribution of casualties
 - *Year-on-year casualty trends
 - *Road type casualties

Key Questions The Report Aims To Answer

- 1) What is the total number of casualties, and how are they distributed by severity?**
- 2) Which vehicle types are most frequently involved in accidents?**
- 3) Which road types and locations record the highest casualty numbers?**
- 4) What days of week have the most accidents?**
- 5) How do environmental conditions (e.g., road surface) influence accident frequency?**
- 6) How do casualty numbers in the current year (CY) compare to the previous year (PY).**

Charts and Their Explanations

1. Accidents by Vehicle Type (Column Chart)

- Shows the distribution of accidents based on the type of vehicle involved (e.g., cars, motorcycles, buses, trucks, agricultural vehicles)
- From the chart, we can identify the vehicle type most frequently involved in accidents, helping authorities target safety campaigns.

2. Casualties by Light Conditions (Donut Chart)

- Casualties by Light Conditions (Donut Chart)
- This helps determine whether day or night is a significant contributor to accident severity.

3. Accidents by Day of the Week (Column Chart)

- Highlights which days see the highest number of accidents
- Useful for scheduling traffic safety enforcement or awareness campaigns on high-risk days.

4. Accidents by Road Surface Condition (Treemap)

- Displays the part-to-whole of accidents occurring under different surface conditions (dry, wet, icy, etc.)
- Helps in understanding the role of weather and road maintenance in accidents.

5. Accident Locations (Donut Chart)

- Presents the proportion of accident location clearly and visually
- Allows identification of high-risk areas for road safety interventions.

6. Casualties by Road Type (Bar Chart)

- Viewers can quickly assess which road type has the highest or lowest casualties
- Each road type is represented by a bar, allowing you to easily compare the height (value) of each category

7. CY Casualties vs PY Casualties (Line Chart)

- It is ideal for visualizing trends over time and allows for intuitive side-by-side comparison
- This helps plot both years on the same axis and easily observe divergence, peaks, or patterns.

KPIs

**Current Year
Casualties**

195737

Fatal Casualties

7083

Serious Casualties

59312

**Previous Year
Casualties**

222146

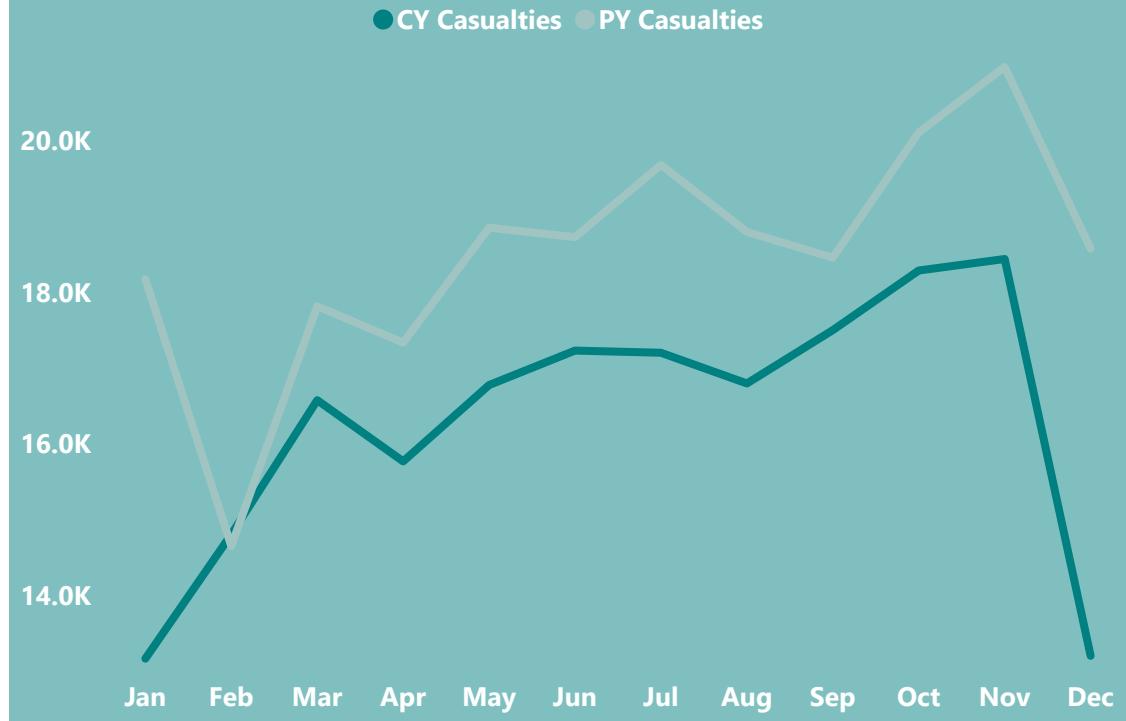
Slight Casualties

351436

Casualties by Car

333485

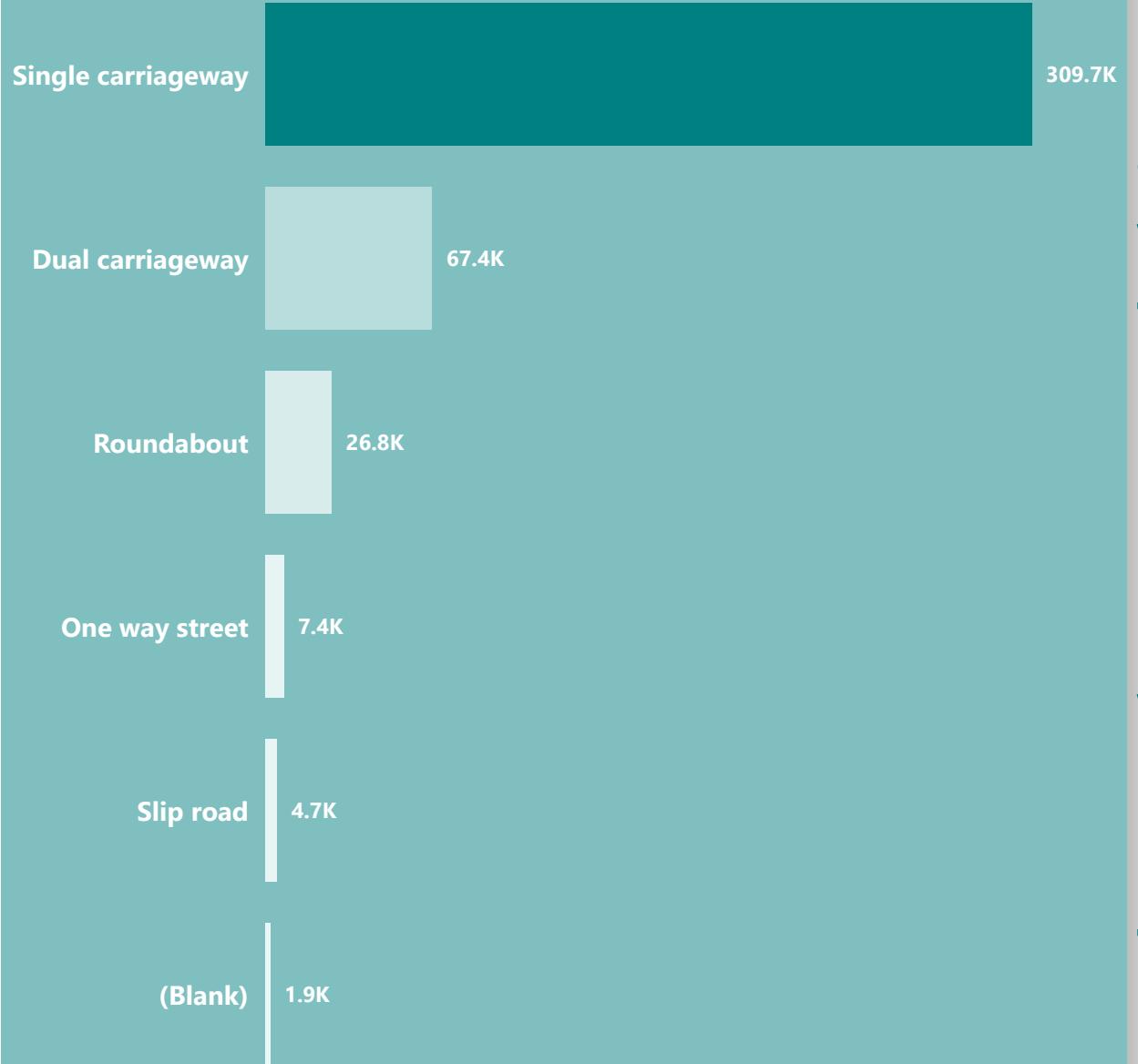
CY Casualties vs PY Casualties Monthly Trend



Insights:

PY casualties are consistently higher than CY casualties in almost every month except February, suggesting an overall reduction in casualties in the CY. The largest gap between PY and CY occurs in the October-November period, where PY exceeds CY by approximately 2k casualties. In February, CY rises sharply while PY drops, indicating possible seasonal or event driven factors (e.g weather, holidays, road safety campaigns). The sharp decline in December for both years may be due to reduced travel activity, holidays, or road safety enforcement measures. Overall, the CY appears to have a positive safety trend with lower casualties, but certain months (especially October-November) still require attention for safety interventions.

Casualties by Road Type



Insights:

The graph "Casualties by Road Type" illustrates the number of casualties associated with different types of roads, with single carriageways accounting for the highest number of casualties at (309.7k). Dual carriageway follows with (67.4k), then roundabouts with (26.8k), one way streets with (7.4k), slip roads with (4.7k), and an unspecified category (blank) with (1.9k) casualties. This indicates that single carriageways are significantly more prone to casualties compared to other road types listed.

Casualties by Location

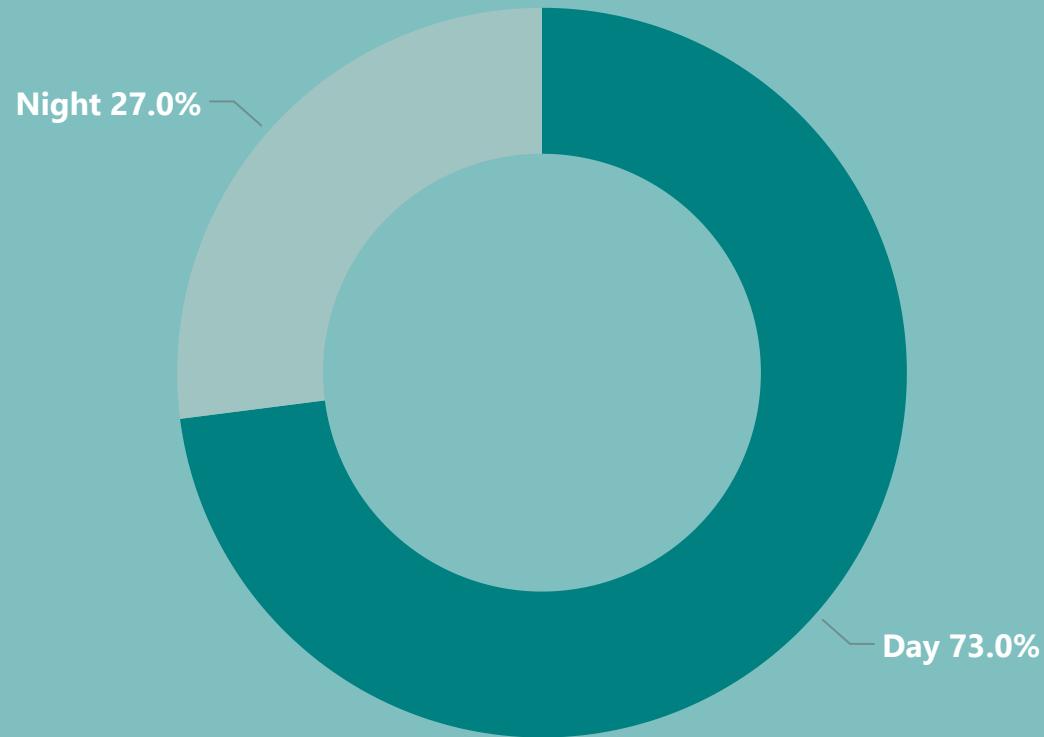
● Urban ● Rural



Insights:

This graph displayed is a Donut chart titled "Casualties by Location," illustrating the distribution of casualties between rural and urban areas. Urban areas with (61.2%) had the most occurring casualties by a larger segment of the donut chart. While Rural areas with (38.8%) had the least of casualties represented by the smaller segment of the donut chart. This graph visually represents that a significantly higher percentage of casualties are reported in urban areas compared to rural areas, based on the data presented.

Casualties by Day/Night



Insights:

This graph displayed is a Donut chart titled "Casualties by Day/Night," illustrating the distribution of casualties between day and night time . Day time with (73.0%) had the most occurring casualties by a larger segment of the donut chart. While Night time with (27.0%) had the least of casualties represented by the smaller segment of the donut chart. This graph visually indicates that the majority of casualties occur during the day time hours.

Casualties by Road Surface • Dry • Wet or damp • Frost or ice • Snow • Flood over 3cm. deep • (Blank)

Dry

Wet or damp

115K

Frost or ice

16K

Snow

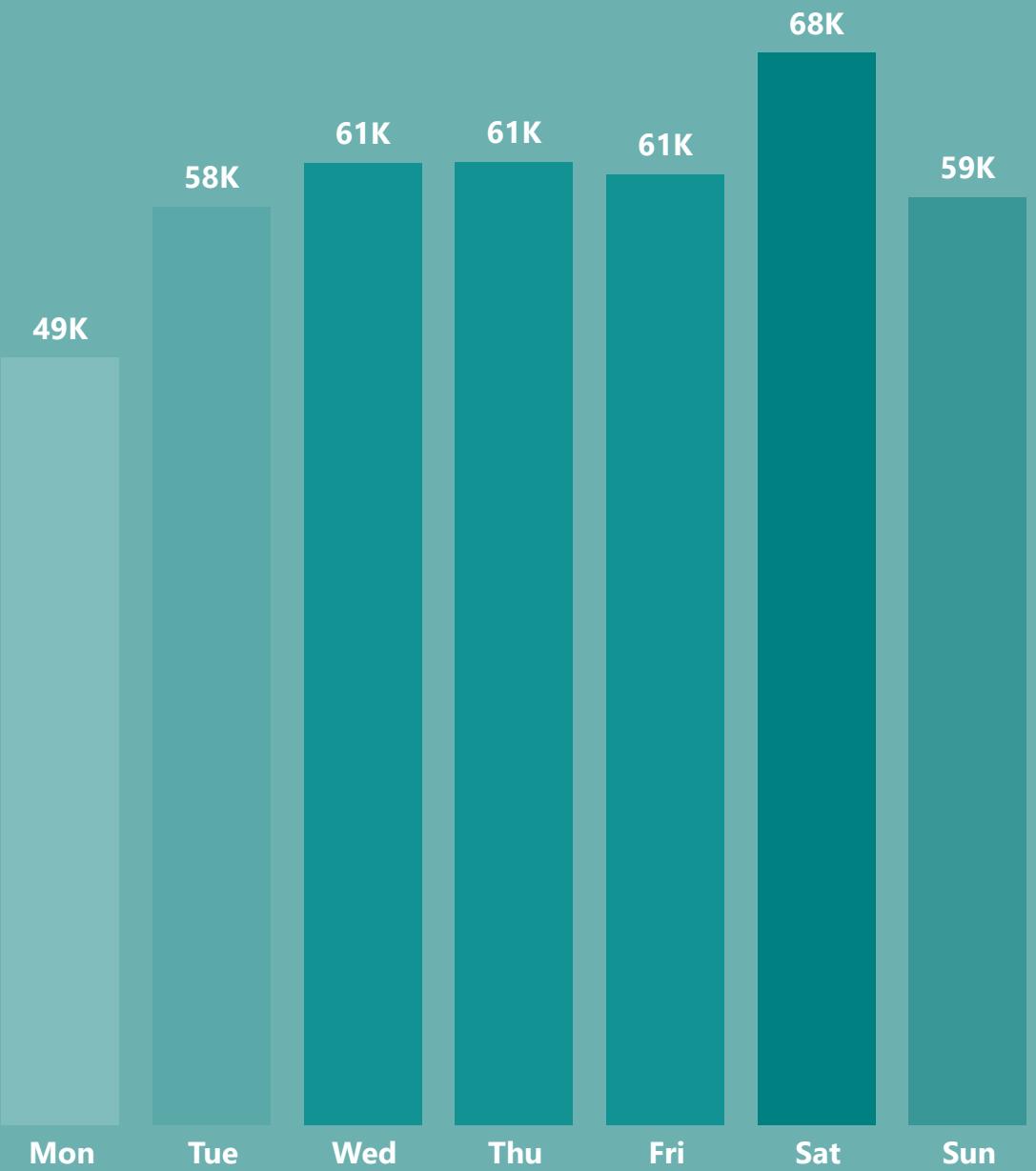
6K

279K

Insight:

The graph displayed is a Treemap visualizing "Casualties by Road surface", categorizing incidents based on the condition of the road surface. The graph is showing that Dry has the highest number of casualties with (279k), followed by Wet or damp (115k), Frost or ice (16k), Snow (6k), Flood over 3cm deep and Blank with having the lowest casualties.

Casualties by Week Name



Insights

The bar chart illustrates the total number of casualties throughout the week, showing a clear variation in numbers across different days. The highest casualties is on Saturday with (68k) followed by Wednesday, Thursday and Friday each having (61k) casualties, Sunday (59k), Tuesday (58k) and Monday having been the lowest day with (49K) of casualties.

Casualties by Vehicle Type

	Agricultural	1032
	Bike	33672
	Car	333485
	Van	33472
	Bus	12798
	Others	3424

Insight:

Cars dominate casualties by a huge margin (333485), followed distantly by bikes (33672) and vans (33472). Bikes and vans are nearly equal in casualty count, highlighting similar levels of road risk, Bus with (12798) and Agricultural vehicles (1032) and Others (3424) have the lowest casualty numbers, possibly due to infrequent road use. The large gap between cars and all other types suggests that interventions to improve car related road safety could have the biggest impact.

ROAD ACCIDENT DASHBOARD

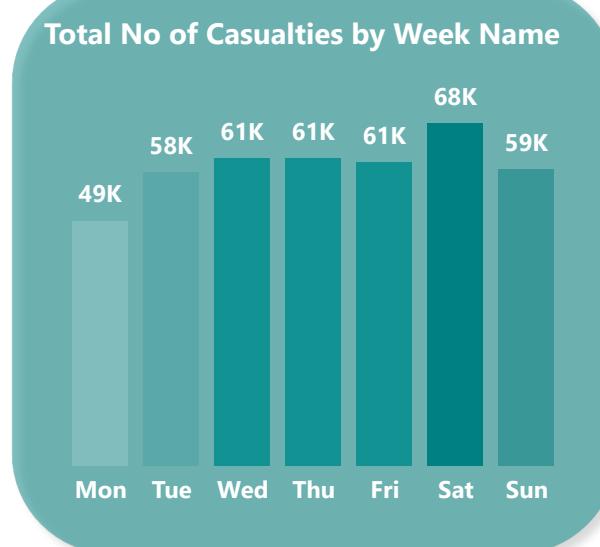
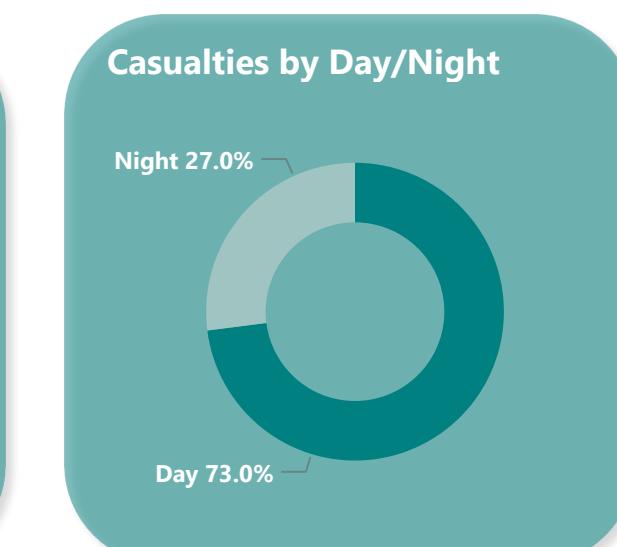
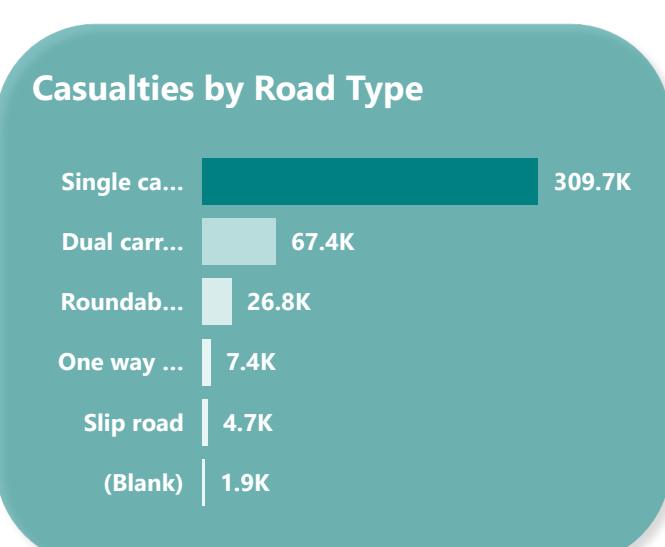
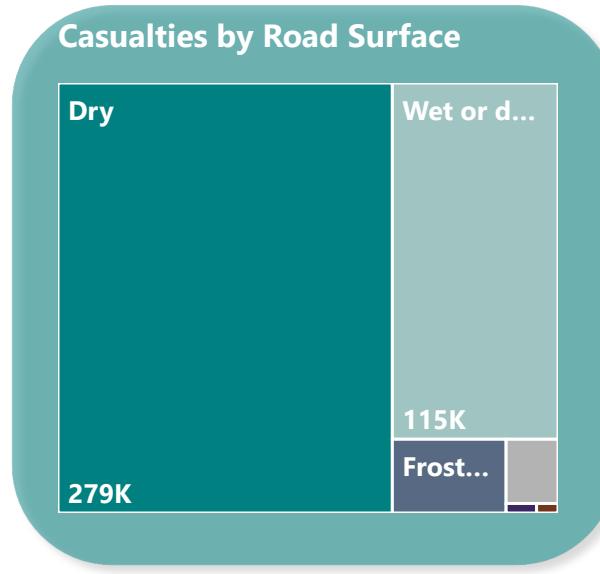
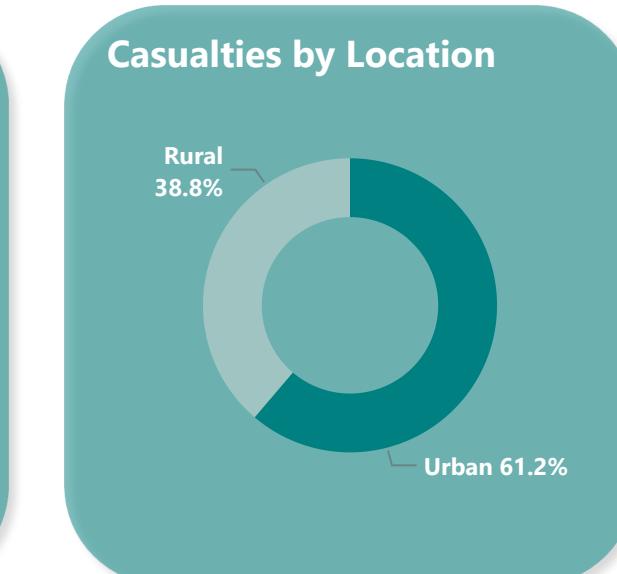
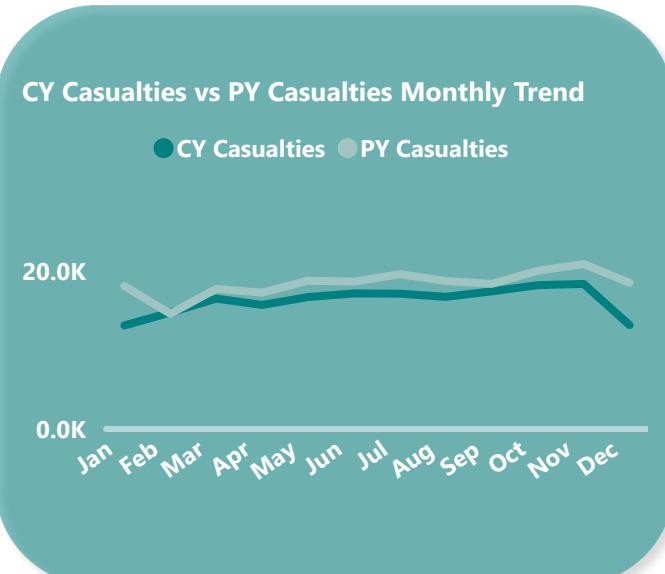
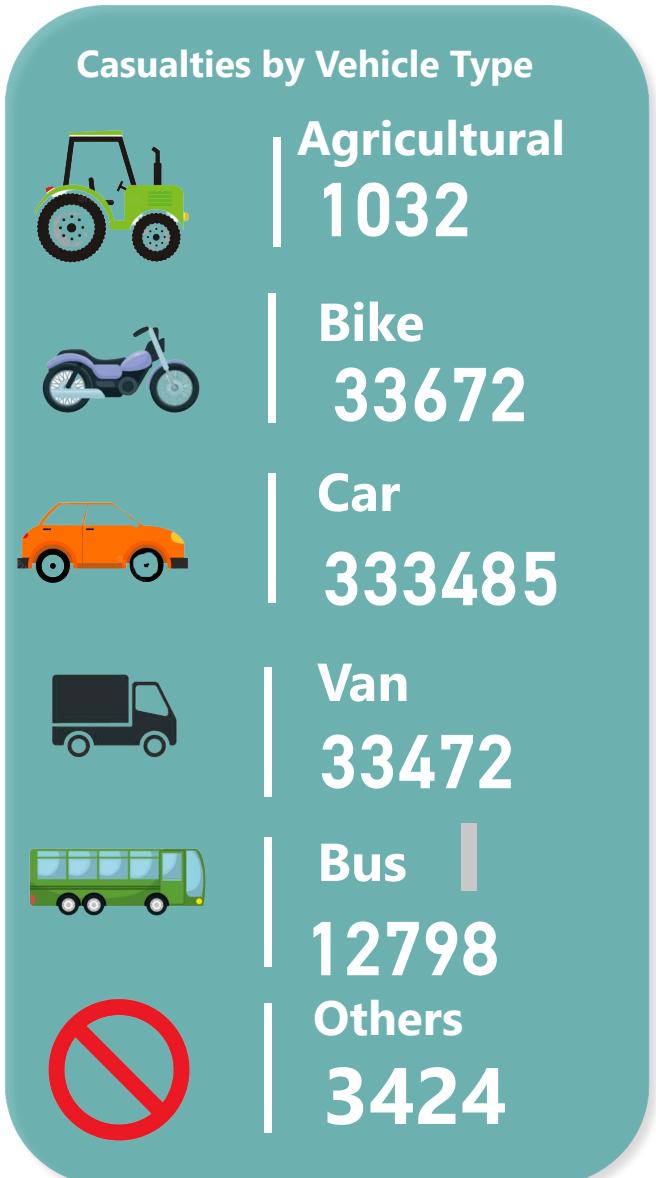
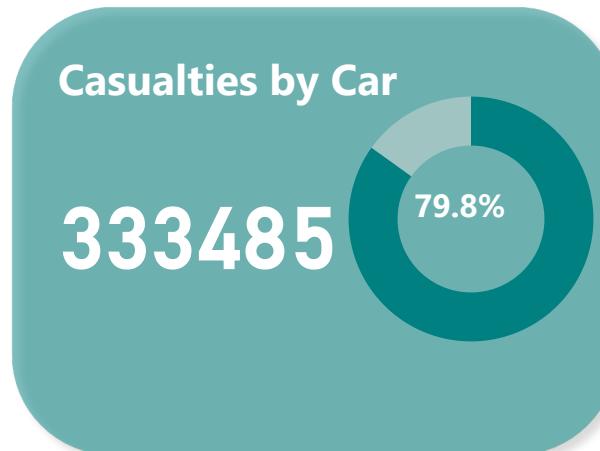
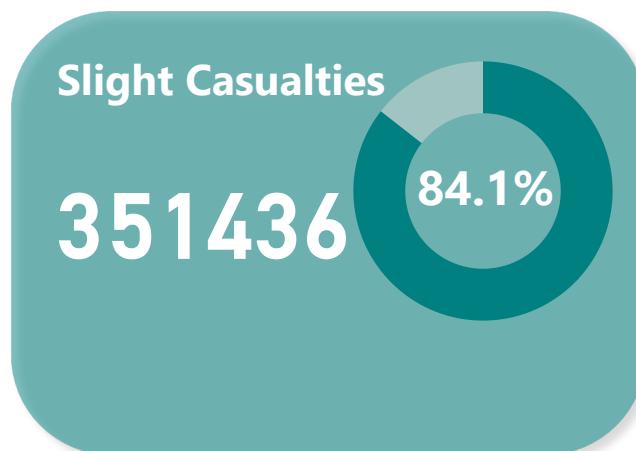
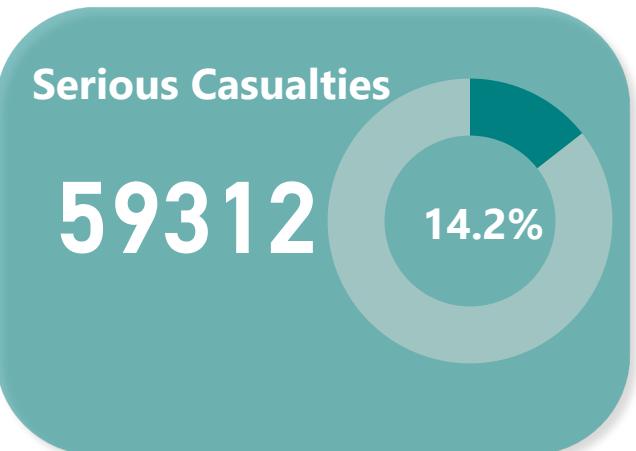
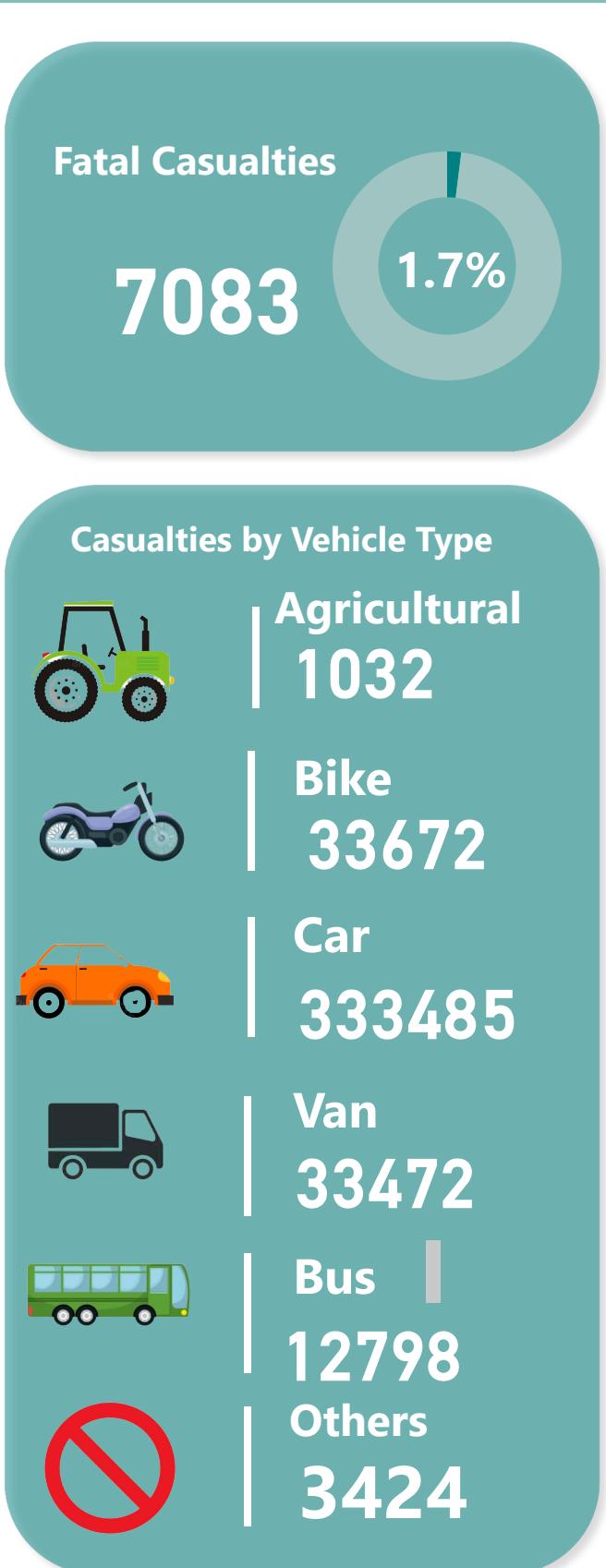
Total Casualties **417883**



Year
All

Accident Severity
All

Weather Condition
All



RECOMMENDATIONS

- 1) Target High-Risk Road Types: Implement stricter enforcement and safety measures on single carriageways, as they account for the majority of casualties.**
- 2) Focus on Vehicle-Specific Interventions: Since cars contributes nearly 80% of all casualties, targeted awareness campaigns and stricter compliance checks for car drivers could significantly reduce numbers.**
- 3) Weekend Safety Campaigns: Deploy enhanced road safety enforcement and public education during weekends especially Saturdays which record the highest casualties.**
- 4) Motorcyclist Protection Measures: Promote helmet use, rider training, and stricter licensing to address the high casualty rates among bike users.**
- 5) Urban Road Safety Improvements: Increase pedestrian crossings, improve road lighting, and enhance traffic calming in urban areas where accident concentration is high.**
- 6) Data Driven Enforcement: Use hotspot mapping to direct police patrols and speed control to areas with historically high accident rates.**

LIMITATIONS

- 1) Data Coverage:** The dataset covers only the years (2021-2022), limiting long-term trend analysis.
- 2) Data Accuracy:** Potential underreporting or misclassification of accidents may affect the reliability of findings.
- 3) Lack of Behavioral Data:** The dataset does not include information on driver behavior (e.g., speeding, distraction, intoxication), which could provide deeper insights.
- 4) No Cost Impact Analysis:** The financial and economic impact of accidents is not covered, restricting the scope for cost benefit evaluation of interventions.

CONCLUSION

The analysis reveals that road safety challenges remain significant, with over 417,000 casualties recorded during the review period. Cars dominate casualty figures, followed by bikes and vans, while single carriageways and urban roads present the highest risk. Time-based patterns show that weekends particularly Saturdays are the most dangerous, and dry road surfaces feature in most incidents, pointing toward human error rather than environmental causes.

By implementing targeted interventions focused on high-risk road types, weekends, and specific vehicle categories, and by strengthening urban road safety measures, substantial reductions in casualties can be achieved. Continuous monitoring, expanded datasets, and deeper behavioral analysis will further enhance the effectiveness of road safety strategies.

THANK YOU!