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# ROAD ACCIDENT ANALYSIS





# OBJECTIVE

- This report presents a comprehensive analysis of the Road Accident data to identify patterns, risk factors and high risk conditions that lead to accidents. The goal is to identify the areas of improvement and support data-driven efforts to enhance road safety.





# DATASET OVERVIEW

The analysis is based on a comprehensive road accident dataset spanning the years **2001 and 2002**, comprising a total of **307,974 records** and **21 features**. This dataset captures detailed information about each reported road accident incident, covering aspects such as accident timing, location, severity, road conditions, weather, and involved vehicles.

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# KEY FEATURES INCLUDED IN THE DATASET

- **Accident Details:** Accident Index, Accident Date, Time, Day of Week
  - **Location Attributes:** Latitude, Longitude, Urban or Rural Area, Local Authority (District), Junction Control, Junction Detail
  - **Road and Traffic Conditions:** Road Type, Speed Limit, Road Surface Conditions, Carriage\_way Hazards, Light Conditions, Weather Conditions
  - **Impact and Severity:** Accident Severity, Number of Vehicles, Number of Casualties
  - **Other Identifiers:** Police Force, Vehicle Type
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# KEY INSIGHTS

## Time-Based Insights

- **November** recorded the **highest number of accidents**, indicating possible seasonal or environmental impacts.
  - Accident rates in **2022 decreased** compared to 2021, suggesting improved road safety or reduced traffic.
  - **Afternoon hours** saw the **highest casualties**, possibly due to high road activity or fatigue.
  - **Nighttime** recorded the **fewest casualties**, likely due to lower traffic volume.
  - **Most accidents occurred during daytime**, highlighting risks during peak traffic hours.
  - **Friday** saw the **highest accident rate**, possibly due to end-of-week rush.
  - **Sunday** had the **lowest accident rate**, likely reflecting lower commuting traffic.
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## Location-Based Insights

- **Urban areas** experienced significantly **more accidents and casualties** than rural areas, likely due to high traffic density and pedestrian movement.
  - **Junctions** had **more accidents** than non-junction areas, suggesting higher risk from complex traffic interactions.
  - Emphasizes the need for **better control measures** like traffic signals, signage, and public awareness at intersections.
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## Severity & Road Type

- Most accidents were of **slight severity**; fatal accidents were least frequent.
  - Indicates effectiveness of **emergency response, safety measures**, and vehicle improvements.
  - **Single carriageway roads** saw the **most casualties**, possibly due to narrow lanes and lack of separation.
  - **Slip roads** had the **fewest casualties**, reflecting lower traffic or safer design.
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## Weather-Related Insights

- Majority of accidents occurred in **fine weather with no high winds**, indicating that good weather doesn't ensure safety.
- Second highest occurred during **rain without wind**, suggesting visibility and road slipperiness play a role.





## Recommendations

- Increase **awareness during peak daytime hours**.
  - Strengthen **intersection control** in urban areas.
  - Promote **safe driving habits regardless of weather**.
  - Consider infrastructure improvements on **single carriageway roads**.
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# CONCLUSION

- The analysis highlights **clear patterns** in road accident data across **time, location, weather, and road types**.
- **Peak accident periods** include **daytime hours**, especially **afternoons and Fridays**, signaling a need for targeted safety measures.
- **Urban areas and junctions** emerge as critical hotspots, requiring **improved infrastructure and traffic control systems**.
- Despite favorable weather, accidents remain high—indicating the importance of **driver awareness and behavior**.
- While most accidents are of **slight severity**, focused efforts can further reduce **fatalities and serious injuries**.
- Strategic interventions such as **public awareness, urban planning, and enforcement of traffic rules** can significantly enhance road safety.

