

Response Brief: Road Accident Trend Analysis (2023)

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Role: Junior Data Analyst

Project Title: Nationwide Road Accident Trend Analysis — 2023

Summary

In response to the Department of Road Safety's request, I conducted an in-depth analysis of the 2023 road accident dataset to uncover critical trends by time-period, road type, and surface condition. Using Excel, I cleaned the dataset, built visual dashboards, and created KPI summaries that present a clear picture of nationwide road safety performance over the year.

Analysis Process

Data Preparation

- Cleaned the raw dataset by replacing missing values and ensuring consistency across categorical columns (e.g., road type, surface condition).
- Extracted and standardized date and time components for temporal trend analysis.
- Created helper columns for month, quarter, and time range to improve analytical depth.

Exploratory Analysis

- Analyzed monthly accident trends to identify peak periods.
- Grouped data by road type and road surface condition to evaluate their relationship to accident frequency.
- Created summary tables to track key variables such as accident volume, frequency by category, and seasonal patterns.

Dashboard Design & Visuals

Built a multi-sheet Excel workbook with the following key sheets:

- **Monthly Trend:** A line chart visualizing spikes in accidents across the year.
 - **Road Type Trend:** A bar chart comparing accident volume across different road types.
 - **Surface Condition Sheet:** A breakdown of accidents by road surface (dry, wet, muddy, etc.).
 - **Donut Charts:** Visualizing categorical proportions (e.g., surface types, time ranges).
 - **KPI:** Key metrics like total number of accidents, highest accident month, and most frequent surface condition.
 - **Dashboard Sheet:** An interactive summary page using slicers for region, road type, and time-period.
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Key Insights

- July recorded the highest number of accidents, with a noticeable spike between May and August.
 - Dry road surfaces were involved in the majority of accidents, suggesting high traffic periods or overconfidence in driving conditions.
 - Major roads and highways had the highest accident frequencies, pointing to possible infrastructure or enforcement gaps.
 - Afternoon and evening hours were the most accident-prone time windows, especially on weekdays.
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Recommendations

- Increase traffic law enforcement during peak mid-year months, particularly in July.
- Implement targeted awareness campaigns about safe driving on dry surfaces, especially on major roads.

- Explore infrastructure upgrades or speed limit controls on roads with the highest accident density.
 - Consider real-time public safety alerts during high-risk time periods (afternoons/evenings).
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Final Deliverables

- Cleaned and structured dataset (internal workbook)
- Interactive Excel dashboard with visuals across trend sheets
- KPI summary for high-level stakeholder review
- Written insights for reporting and presentation