Road Accident Data Analysis

1. Analysis Approach

The primary goal of this analysis is to identify key trends, high-risk conditions, and safety-critical factors in road accidents. The Power BI dashboard uses various interactive visuals, filters, and KPIs to analyze patterns based on accident severity, weather conditions, day of the week, vehicle types, road surface conditions, and location.

2. Key KPIs and Metrics

- **Total Road Accidents:** 3904
- **Total Casualties Reported**: 7218
- **Average Vehicles Involved per Accident:** 1.76
- **Most Common Weather During Accidents:** Fine, no high winds
- **Accident Goal vs Actual (Shown on Trend Line Chart):** Goal = 5000, Actual = 23 (-99.54%)

3. Key Visual Insights

- **Accident Severity Distribution:** Majority of accidents are categorized as 'Slight' (84.73%), followed by 'Serious' (13.68%). Fatal cases are the lowest.
- **Weather Conditions vs Severity:** Most accidents occurred under 'Fine, no high winds' with 31K slight injuries and 5K serious/fatal.
- **Accidents by Day of the Week:** Friday has the highest accident frequency (6K), followed by Tuesday and Wednesday.
- **Top Junction Controls Contributing to Accidents:** Dual carriageways and roundabouts show higher accident frequency.
- **Road Surface Condition vs Severity:** Wet or damp roads are significantly associated with higher accident counts.
- **Vehicle Type Analysis:** Accident severity is evenly distributed among all vehicle types including cars, motorcycles, and goods vehicles.
- **Geospatial Map:** Shows accident density across locations in the UK region – concentrated primarily in urban centers.

4. Accident Trend Over Time

A timeline chart reveals periodic spikes in accident count around early 2021 and mid-2022. These patterns could correlate with seasonal or traffic changes (e.g., holiday seasons, weather changes).

5. Recommendations

- Prioritize road safety measures on Fridays and during fine weather.
- Improve signage and visibility at dual carriageways and roundabouts.
- Introduce awareness and control mechanisms during high-risk periods (e.g., monsoon).
- Maintain road surface quality to reduce wet/damp conditions.
- Use this data to improve emergency preparedness at accident hotspots.