**📝 Technical Report — Road Accident Analysis in the UK (2005–2015)**

**🔹 Introduction**

Road accidents are a major global issue that threaten both public safety and health. They result from various causes such as excessive speed, poor weather, unsafe road design, and driver behavior. Analyzing accident data is essential to detect high-risk patterns and develop targeted safety strategies.

**🔹 Problem Statement**

Road accidents in the UK pose threats to both lives and the economy, often driven by poor road conditions, weather, or traffic congestion. With no clear risk assessment system in place, data analysis is key to understanding causes and enhancing road safety.

**🔹 Target Audience**

* Ministries & Traffic Departments
* Drivers & Road Users
* Urban Planners & Civil Engineers

**🎯 Project Goals**

* Classify risks based on **severity** and **environmental conditions**
* Analyze the **impact of speed limits** on accident severity
* Identify **locations with the highest accident frequency**
* Detect **peak hours and days** for accidents
* Compare accident rates between **urban and rural** areas
* Assess if **pedestrian-involved** accidents tend to be more severe

**🧹 Data Cleaning Steps (Python Summary)**

**✅ Columns Removed**

* Accident\_Index, Location\_Easting\_OSGR, Location\_Northing\_OSGR → (non-informative or too granular)
* Junction\_Control, Did\_Police\_Officer\_Attend\_Scene\_of\_Accident, LSOA\_of\_Accident\_Location → (irrelevant to analysis goals)

**➕ Columns Added or Created**

* Hour extracted from Time column
* Day\_Type: categorized weekends vs weekdays
* Risk\_Level: custom label combining severity + weather conditions
* Area\_Type: transformed from urban/rural codes

**🔁 Columns Modified**

* Converted Date column to **datetime format**
* Standardized Weather\_Conditions, Light\_Conditions, and Road\_Surface\_Conditions into clear categories
* Filled null values in Speed\_limit, Weather\_Conditions, and Road\_Type with mode/most frequent value
* Recoded numerical categories to readable labels (e.g., 1 → "Fatal")