

# **ROAD ACCIDENTS DATA ANALYSIS**

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# Project Description

**AIM:** We are given a dataset about road accidents, including various attributes such as accident date, severity, weather conditions, etc. Our task is to create a Power BI dashboard for analysing this data. We are required to explore this dataset, identify key performance indicators (KPIs), and present insightful visualizations through a well-designed dashboard.

**TASKS:** We are required to perform following tasks:

## 1. Data Preparation:

- Import the provided dataset into Power BI.
- Clean the data by handling missing values, outliers, and any inconsistencies.
- Perform necessary data transformations to prepare it for analysis.

## 2. Exploratory Data Analysis:

- Explore the dataset to understand the distribution and characteristics of variables.
- Identify trends, patterns, and correlations within the data.
- Select relevant KPIs based on your analysis (e.g., Accident Severity Distribution, Number of Accidents Over Time, Distribution of Accidents by Day of the Week, Top Junction Controls Contributing to Accidents etc )

## 3. Dashboard Design:

- Design an interactive dashboard with multiple visualizations to effectively communicate insights from the data.
- Include a variety of charts and graphs such as bar charts, line charts, maps, etc.
- The dashboard layout should be intuitive and user-friendly.

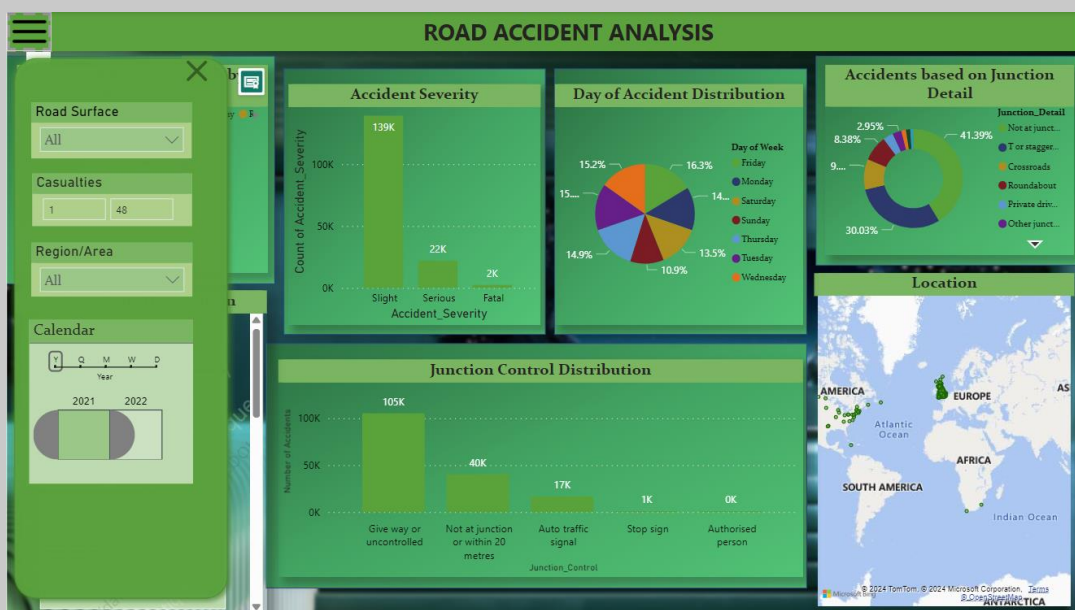
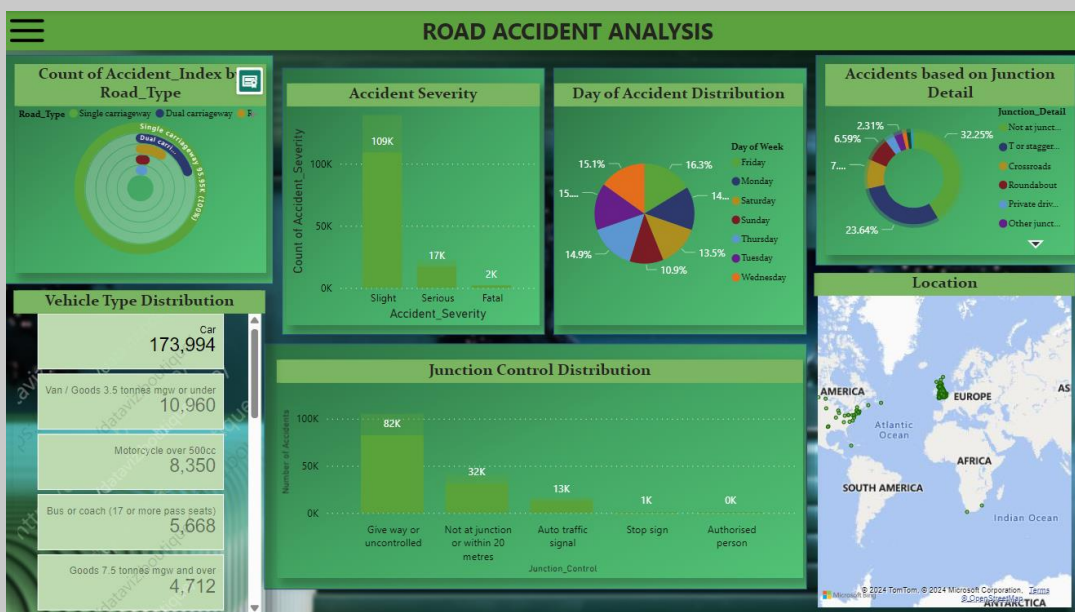
# **KEY PERFORMANCE INDICATORS**

- 1) ACCIDENT SEVERITY DISTRIBUTION**
- 2) NUMBER OF ACCIDENTS OVER TIME**
- 3) DISTRIBUTION OF ACCIDENTS BY DAY OF THE WEEK**
- 4) TOP JUNCTION CONTROLS CONTRIBUTING TO ACCIDENTS**
- 5) WEATHER CONDITIONS VS. ACCIDENT SEVERITY**
- 6) AND ROAD SURFACE CONDITIONS VS. ACCIDENT SEVERITY**

# DASHBOARD FEATURES

## Our dashboard stands unique in terms of following:

- 1) A drop-down menu to select the slicer of your choice to visualise data in different dimensions.
- 2) A world map using heat map to visualise the distribution of accidents over different parts of world.
- 3) A unique Calendar that allows users to analyse data on daily, weekly, monthly, quarterly and annually.
- 4) A huge variety of visuals like column charts, donut chart, pie chart, activity gauge, KPI card etc to unlock valuable insights at every turn.



# SUMMARY

## I. DATA PREPARATION:

Data provided to us is nearly cleaned and formatted except for some minute changes.

- **DUPLICATE VALUES:** After importing the data file in power query, we selected all data and removed all duplicate rows.  
**No. of duplicates found = 0**
- **MISSING VALUES:** Using filter option, we found attributes **carriageway\_hazards** and **time** have missing values. So, we removed those rows containing missing values.
- **OUTLIERS:** we checked through z-score and quartiles that there were no outliers in entire dataset.
- **INCONSISTENCIES:** we removed typing mistake by replacing 'fetal' to 'fatal' in accident\_severity attribute. In attribute Junction control 'unknown' values are changed to other values on the basis of frequency distribution.
- All attributes are relevant in analysis and data types are pre-formatted as well.

## II. EXPLORATORY DATA ANALYSIS:

Let's discuss Primary KPIs first.

### 1) Accident Severity distribution –

**On basis of time-**

From our dashboard, we can see following changes in accident severity from 2021 to 2022:

Slight- 0.20%

Serious- 0.15%

Fatal – 0%

So, no. of accidents and casualties didn't change much in a year showing the effects of control measures to be very less.

**On basis of region/area-**

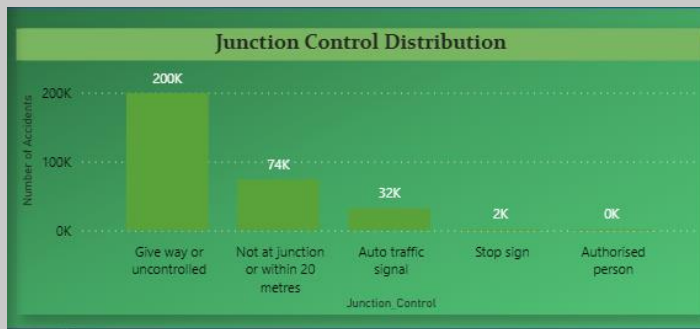
Accidents in Urban area holds 65% of total no. of accidents while remaining 35% took place in rural area.



## 2) Number of accidents over time-

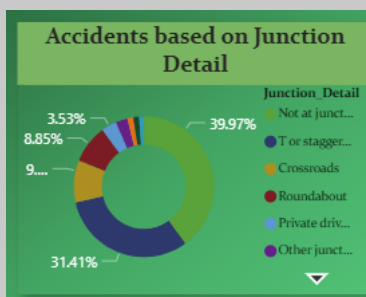
### Based on Junction control:

Most of the accidents (about 200k) took place in uncontrolled junctions which is a matter to discuss as control measures as completely lacking in these areas resulting into huge no. of accidents.



#### Based on Junction detail:

Most of the accidents took place (about 70% of total no. of accidents) at T or staggered junction or not at any junction.

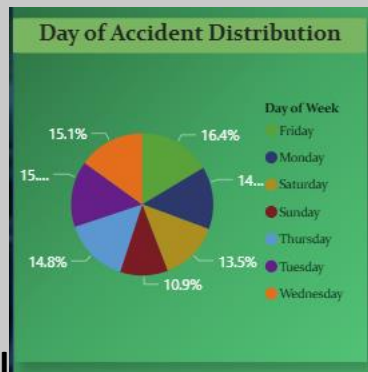


**Based on Location:** Highest no. of accidents took place in near districts of London like Westminster, Kensington and Chelsea, Ealing etc since this area is high density metropolitan area leading to more casualties and accidents.



### 3) Distribution of accidents by day of week-

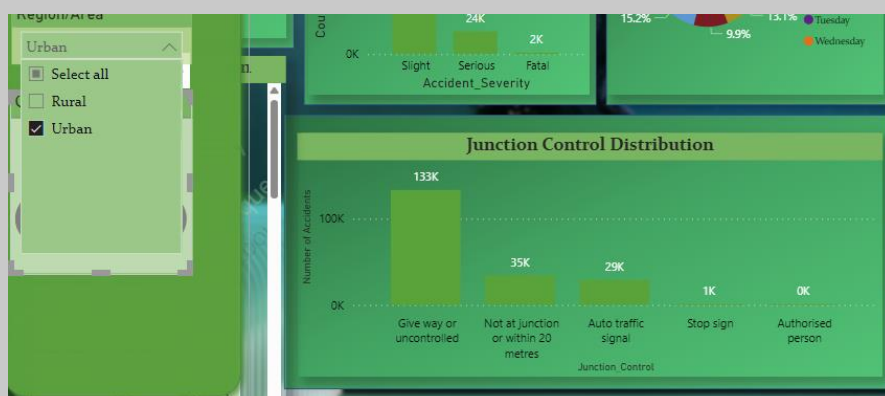
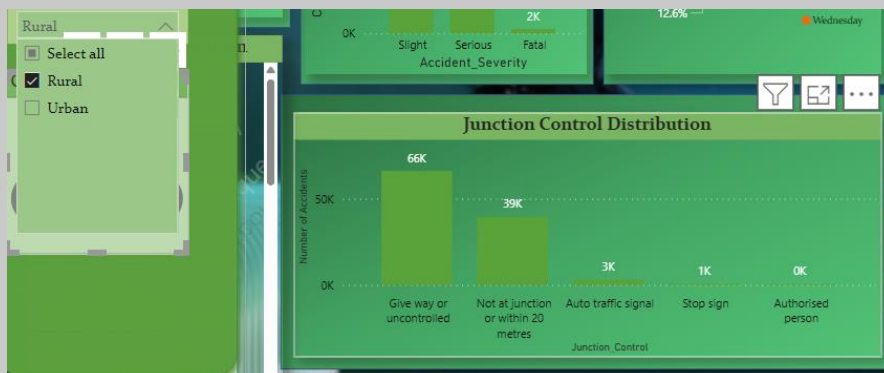




Accidents are usually less on Saturday and Sundays as these are non-working days where people tend to stay indoors.

#### 4) Top Junction Controls Contributing to Accidents-

It can be seen that major contributor in accidents is uncontrolled junctions in urban area while In rural areas , most of the accidents did not take place at any junction or uncontrolled junction.



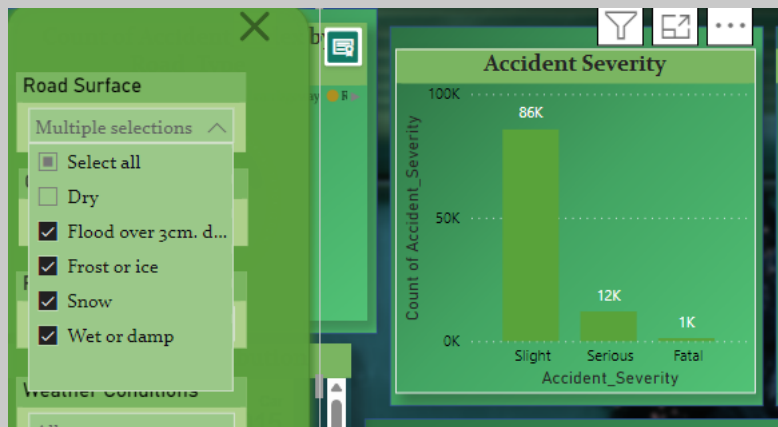
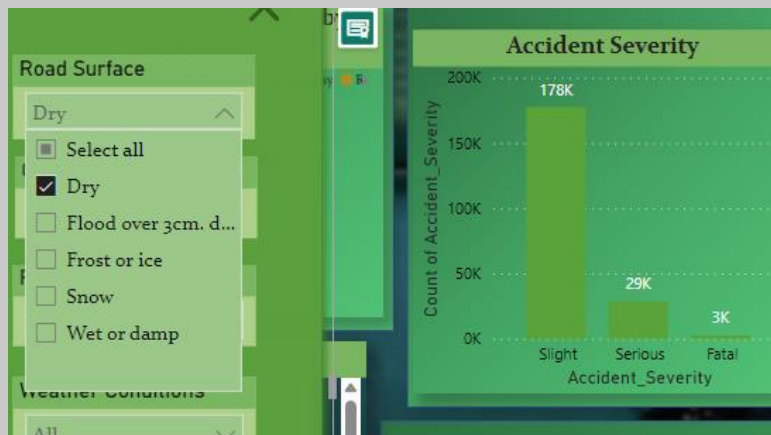
## 5) Weather Conditions vs. Accident Severity-

It can be seen as accident severity 16% of accidents are serious and 82% are slight in fine weather. Also, 75% of fatal accidents took place in fine weather among all weather conditions. 36k thousand accidents which alone account for 13% of total accidents are during rainy weather because of less visibility, slippery roads etc.



## 6) Road Surface Conditions vs. Accident Severity-

Almost 100k accidents took place in bad road surface conditions which accounts for probably 35% of total accidents which should be quite concerning for the government and the people. with 25% of total accidents being fatal , the condition become serious and should not be overlooked.



## CONCLUSION

The prevalence of accidents on poorly maintained roads, particularly during bad weather, highlights a critical public safety issue. This concern is further amplified by the fact that metropolitan areas, with their higher traffic density, see the most accidents. The stubbornly slow decline in accident rates suggests a worrying lack of progress. This inefficiency points to a two-pronged problem: on one hand, a potential lack of sufficient government investment in road maintenance, leading to hazardous driving conditions. On the other hand, it could indicate a need for improved driver education and awareness campaigns, focusing on safe driving practices in adverse weather and on roads with compromised surfaces. Until both aspects are addressed comprehensively, a significant reduction in accidents is likely to remain elusive, putting countless lives at risk.