Road Accident Analysis

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सड़क परिवहन
एवं राजमार्ग मंत्रालय
MINISTRY OF
**ROAD TRANSPORT
AND HIGHWAYS**
सत्यमेव जयते

Introduction

- **Objective:** Analyze road accident data to understand casualty trends and factors contributing to accidents.

- **Tool Used:** SQL for querying and analyzing accident data.

- **Focus Areas:**
  - Type and severity of casualties
  - Patterns and contributing factors

- **Outcome:** Insights to improve road safety measures and inform policy decisions.
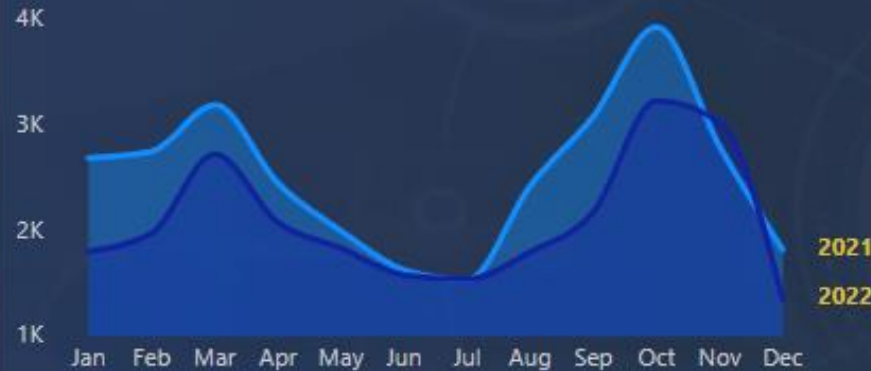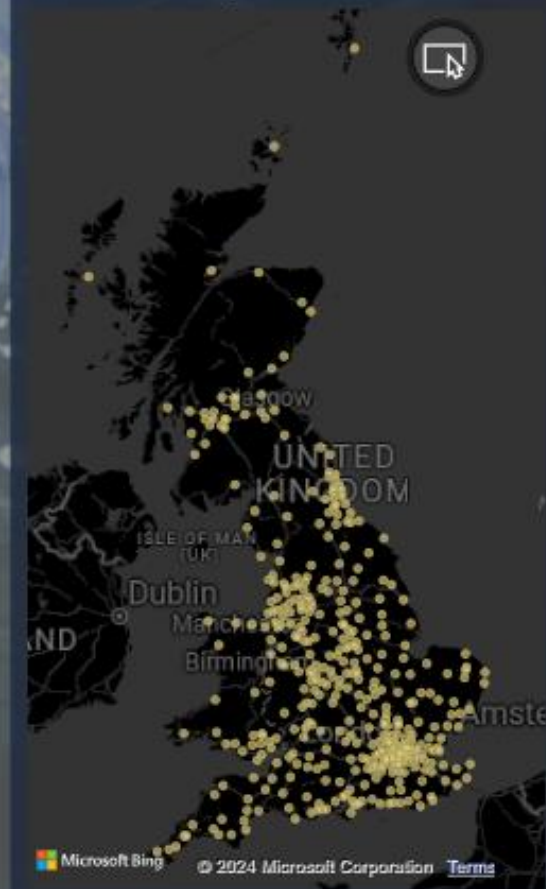
Top Causes of Accidents

Code

```
SELECT cause_of_accident, COUNT(*) AS accident_count
FROM road_accident
GROUP BY cause_of_accident
ORDER BY accident_count DESC;
```

Result Grid | Filter Rows: | Export

cause_of_accident	accident_count
No priority to vehicle	1207
Moving Backward	1137
No priority to pedestrian	721
Other	456
Overtaking	430
Driving under the influence of drugs	340
Driving to the left	284
Getting off the vehicle improperly	197
Driving at high speed	174

Accidents by Day of the Week

Code

```sql
SELECT day_of_week, COUNT(*) AS accident_count
FROM road_accident
GROUP BY day_of_week
ORDER BY accident_count DESC;
```

day_of_week	accident_count
Friday	2041
Thursday	1851
Wednesday	1840
Tuesday	1770
Monday	1467
Saturday	
Sunday	1467

Accident Severity Distribution

Code

```sql
SELECT
    accident_severity,
    COUNT(*) AS count_of_injuries,
    (COUNT(*) * 100.0 / (SELECT COUNT(*) FROM road_accident)) AS percentage_of_injuries
FROM road_accident
GROUP BY accident_severity
ORDER BY percentage_of_injuries DESC;
```

accident_severity	count_of_injuries	percentage_of_injuries
Slight Injury	10415	84.56479
Serious Injury	1743	14.15232
Fatal injury	158	1.28288

Accidents by Age Band of Driver

Code

```sql
SELECT age_band_of_driver, COUNT(*) AS accident_count
FROM road_accident
GROUP BY age_band_of_driver
ORDER BY accident_count DESC;
```

	age_band_of_driver	accident_count
▶	18-30	4271
	31-50	4087
	Over 51	1585
	Unknown	1548
	Under 18	825

Accidents by Type of Vehicle:
Identify which types of vehicles are involved in the most accidents

Code

```sql
SELECT type_of_vehicle, COUNT(*) AS accident_count
FROM road_accident
GROUP BY type_of_vehicle
ORDER BY accident_count DESC;
```

type_of_vehicle	accident_count
Automobile	3205
Lorry	2727
Public	1647
Other	1208
Unknown	950
Pick up	811
Stationwagen	687
Long lorry	383
Taxi	265

Accidents by Driver's Driving Experience: Check how driving experience affects the number of accidents

Code

```sql
SELECT driving_experience, COUNT(*) AS accident_count
FROM road_accident
GROUP BY driving_experience
ORDER BY accident_count DESC;
```

driving_experience	accident_count
5-10yr	3363
2-5yr	2613
Above 10yr	2262
1-2yr	1756
Below 1yr	1342
unknown	862
No Licence	118

Accident by type of vehicle involved

Code

```sql
SELECT type_of_vehicle, COUNT(*) AS total_accidents
FROM road_accident
GROUP BY type_of_vehicle
ORDER BY total_accidents DESC;
```

type_of_vehicle	total_accidents
Unknown	950
Pick up	811
Stationwagen	687
Long lorry	383
Taxi	265
Motorcycle	177
Special vehicle	84
Ridden horse	76
Turbo	46
Bajaj	29
Bicycle	21

Total no. of accidents by type of collision

Code

```sql
SELECT type_of_collision, COUNT(*) AS total_accidents
FROM road_accident
GROUP BY type_of_collision
ORDER BY total_accidents DESC;
```

type_of_collision	total_accidents
Vehicle with vehicle collision	8774
Collision with roadside objects	1786
Collision with pedestrians	896
Rollover	397
Collision with animals	171
Unknown	169
Collision with roadside-parked vehicles	54
Fall from vehicles	34
Other	26
With Train	9

Total no. of accidents by lightning conditions

Code

```sql
SELECT light_conditions, COUNT(*) AS total_accidents
FROM road_accident
GROUP BY light_conditions
ORDER BY total_accidents DESC;
```

	light_conditions	total_accidents
▶	Daylight	8798
	Darkness - lights lit	3286
	Darkness - no lighting	192
	Darkness - lights unlit	40

Total no. of accidents by weather conditions

Code

```
SELECT weather_conditions, COUNT(*) AS total_accidents

FROM road_accident

GROUP BY weather_conditions

ORDER BY total_accidents DESC;
```

weather_conditions	total_accidents
Normal	10063
Raining	1331
Other	296
Unknown	292
Cloudy	125
Windy	98
Snow	61
Raining and Windy	40
Fog or mist	10

Accidents by vehicle movement at the time of the accident

Code

```sql
SELECT vehicle_movement, COUNT(*) AS total_accidents
FROM road_accident
GROUP BY vehicle_movement
ORDER BY total_accidents DESC;
```

vehicle_movement	total_accidents
Going straight	8158
Moving Backward	985
Other	937
Reversing	563
Turnover	489
Unknown	396
Getting off	339
Entering a junction	193
Overtaking	96
Stopping	61
U-Turn	50

Accidents by service year of vehicle:

Code

```sql
SELECT service_year_of_vehicle, COUNT(*) AS total_accidents
FROM road_accident
GROUP BY service_year_of_vehicle
ORDER BY total_accidents DESC;
```

service_year_of_vehicle	total_accidents
Unknown	6811
2-5yrs	1792
Above 10yr	1324
5-10yrs	1280
1-2yr	827
Below 1yr	282

Accident involvement of male and female

Code

```sql
SELECT sex_of_driver, COUNT(*) AS total_accidents
FROM road_accident
GROUP BY sex_of_driver
ORDER BY total_accidents DESC;
```

sex_of_driver	total_accidents
Male	11437
Female	701
Unknown	178

Accident by educational level of driver

Code

```sql
SELECT educational_level, COUNT(*) AS total_accidents
FROM road_accident
GROUP BY educational_level
ORDER BY total_accidents DESC;
```

educational_level	total_accidents
Junior high school	7619
Elementary school	2163
High school	1110
Unknown	841
Above high school	362
Writing & reading	176
Illiterate	45

Accident by educational level of driver

Code

```
SELECT educational_level, COUNT(*) AS total_accidents
FROM road_accident
GROUP BY educational_level
ORDER BY total_accidents DESC;
```

educational_level	total_accidents
Junior high school	7619
Elementary school	2163
High school	1110
Unknown	841
Above high school	362
Writing & reading	176
Illiterate	45

Average driver experience of total accident involvement

Code

```sql
SELECT AVG(CASE
        WHEN driving_experience = 'Below 1yr' THEN 0.5
        WHEN driving_experience = '1-2yr' THEN 1.5
        WHEN driving_experience = '2-5yr' THEN 3.5
        WHEN driving_experience = 'Above 10yr' THEN 12
        ELSE 0
    END) AS avg_driving_experience
FROM road_accident;
```

avg_driving_experience
3.21488

Percentage of accidents caused by male and female

Code

```sql
SELECT sex_of_driver,
       COUNT(*) * 100.0 / (SELECT COUNT(*) FROM road_accident) AS percentage_of_accidents
FROM road_accident
GROUP BY sex_of_driver;
```

sex_of_driver	percentage_of_accidents
Male	92.86294
Female	5.69178
Unknown	1.44527

No. of accidents happened by overtaking

Code

```
SELECT cause_of_accident, COUNT(*) AS accidents_count
FROM road_accident
WHERE cause_of_accident = 'Overtaking';
```

cause_of_accident	accidents_count
Overtaking	430

Weighted severity by days

Code

```sql
SELECT day_of_week,
       avg(CASE
           WHEN accident_severity = 'Slight Injury' THEN 1
           WHEN accident_severity = 'Serious Injury' THEN 2
           WHEN accident_severity = 'fatal injury' THEN 3
           ELSE 0
       END) AS Average_severity_day_of_week
FROM road_accident
GROUP BY day_of_week
ORDER BY Average_severity_day_of_week  DESC;
```

day_of_week	Average_severity_day_of_week
Saturday	1.1915
Sunday	1.1772
Thursday	1.1707
Friday	1.1690
Tuesday	1.1644
Wednesday	1.1630
Monday	1.1356

Average no. of vehicles involved by road surface conditions

Code

```sql
select road_surface_conditions, avg(number_of_vehicles_involved) as average_no_of_vehicles_involved
from road_accident
group by  road_surface_conditions
order by average_no_of_vehicles_involved desc;
```

road_surface_conditions	average_no_of_vehicles_involved
Snow	2.6429
Dry	2.0483
Wet or damp	2.0017
Flood over 3cm. deep	2.0000

Average number of people involved by type of vehicles

Code

```sql
select type_of_collision, avg(number_of_casualties) as average_no_of_people_involved
from road_accident
group by type_of_collision
order by average_no_of_people_involved desc;
```

type_of_collision	average_no_of_people_involved
Other	1.9231
Collision with animals	1.7135
Rollover	1.6272
Fall from vehicles	1.5882
Collision with roadside objects	1.5834
Collision with pedestrians	1.5525
Vehicle with vehicle collision	1.5390
Collision with roadside-parked vehicles	1.4444
With Train	1.3333
Unknown	1.2544