SQL Query Document – Road Accident Analysis

Project Overview

This document presents SQL queries and insights used to create the 'Road Accident Analysis' Power BI dashboard. The dashboard analyzes UK road accident data across dimensions like vehicle type, road type, light conditions, location, and casualty severity.

Query 1: Total CY Casualties

Business Question:

What are the Total number of casualties in the current year?

SQL Code:

```
SELECT SUM(number_of_casualties) AS CY_casualties

FROM road_accident

WHERE EXTRACT(YEAR FROM accident_date) = 2022;
```

Result (Table):

Row	CY_casualties
1	195737

Explanation:

This query helps identify the overall trend in casualties. A year-over-year comparison is used in the KPI cards

Query 2: Total CY Accidents

Business Question:

What are the Total number of Accidents in the current year?

SQL Code:

```
SELECT COUNT(DISTINCT accident_index) AS CY_accidents

FROM road_accident

WHERE EXTRACT(YEAR FROM accident_date) = 2022;
```

Result (Table):

Row	CY_accidents
1	144419

Explanation:

This query helps identify the Total number of UNIQUE accidents in the Year 2022. Helping Stakeholders Measure the current Year's accident count for KPI tracking and trend analysis.

Query 3: Total CY Fatal Casualties

Business Question:

How many fatal casualties occurred in the year 2022?

SQL Code:

```
SELECT SUM(number_of_casualties) AS CY_Fatal_casualties

from road_accident

WHERE EXTRACT (YEAR FROM accident_date) = 2022 AND accident_severity =
'Fatal';
```

Result (Table):

Row	CY_Fatal_casualties
1	2855

Explanation:

This query provides the total number of fatal casualties in 2022, supporting the business case for tracking High-severity incidents and prioritizing road safety interventions.

Query 4: Total CY Serious Casualties

Business Question:

How many Serious casualties occurred in the year 2022?

SQL Code:

```
SELECT SUM(number_of_casualties) AS CY_serious_casualties

FROM road_accident

WHERE EXTRACT (YEAR FROM accident_date) = 2022 AND accident_severity =
'Serious';
```

Result (Table):

Row	CY_serious_casualties
1	27045

Explanation:

This query provides the total number of Serious casualties in 2022, providing insights into the severity of accidents during year.

Query 5: Total CY Slight Casualties

Business Question:

How many Slight casualties occurred in the year 2022?

SQL Code:

```
SELECT SUM(number_of_casualties) AS CY_slight_casualties

FROM road_accident

WHERE EXTRACT (YEAR FROM accident_date) = 2022 AND accident_severity = 'Slight';
```

Result (Table):

Row	CY_slight_casualties
1	165837

Explanation:

This query provides the total number of Slight casualties in 2022, providing insights into the Frequency of Less sever accidents during year.

Query 6: Casualties by Vehicle type

Business Question:

Which broad vehicle categories are most frequently involved in road accident?

SQL Code:

```
SELECT CASE

WHEN vehicle_type IN ('Agricultural vehicle') THEN 'Agricultural'

WHEN vehicle_type IN ('Car', 'Taxi/Private hire car') THEN 'cars'

WHEN vehicle_type IN ('Motorcycle 125cc and under', 'Motorcycle 50cc and
under', 'Motorcycle over 125cc and up to 500cc', 'Motorcycle over 500cc',
'Pedal cycle') THEN 'Bike'

WHEN vehicle_type IN ('Bus or coach (17 or more pass seats)', 'Minibus(8-16
passenger seats)') THEN 'Bus'

WHEN vehicle_type IN ('Goods 7.5 tonnes mgw and over', 'Goods over 3.5t.
and under 7.5t', 'Van / Goods 3.5 tonnes mgw or under') THEN 'Van'

ELSE 'Other'

END AS vehicle_group,

SUM(number_of_casualties) AS CY_casualties

FROM road_accident

WHERE EXTRACT(YEAR FROM accident_date)= '2022'

GROUP BY

CASE

WHEN vehicle_type IN ('Agricultural vehicle') THEN 'Agricultural'

WHEN vehicle_type IN ('Car', 'Taxi/Private hire car') THEN 'cars'

WHEN vehicle_type IN ('Motorcycle 125cc and under', 'Motorcycle 50cc and
under', 'Motorcycle over 125cc and up to 500cc', 'Motorcycle over 500cc',
'Pedal cycle') THEN 'Bike'

WHEN vehicle_type IN ('Bus or coach (17 or more pass seats)', 'Minibus(8-16
passenger seats)') THEN 'Bus'

WHEN vehicle_type IN ('Goods 7.5 tonnes mgw and over', 'Goods over 3.5t.
and under 7.5t', 'Van / Goods 3.5 tonnes mgw or under') THEN 'Van'
```

```
ELSE 'Other'

END
```

Result (Table):

Row	vehicle_group	CY_casualties
1	Agricultural	399
2	Bike	15610
3	Bus	6573
4	cars	155804
5	Others	1446
6	Van	15905

Explanation:

This categorization simplifies vehicle type data, enabling better analysis of accident trends by grouping vehicles into broader categories like Agricultura, cars, bikes, bus, and vans, aiding in targeted safety measure and policy development.

Query 7: Casualties by Vehicle type

Business Question:

In which months did the highest number of road accident casualties occur in 2022?

SQL Code:

```
SELECT TO_CHAR(accident_date, 'Month') AS Month_Name,

SUM(number_of_casualties) AS CY_casualties

FROM road_accident

WHERE EXTRACT(YEAR FROM accident_date) = 2022

GROUP BY TO_CHAR(accident_date, 'Month');
```

Result (Table):

Row	Month_Name	CY_casualties
1	April	15767
2	August	16796
3	December	13200
4	February	14804
5	January	13163
6	July	17201
7	June	17230
8	March	16575
9	May	16775
10	November	18439
11	October	18287
12	September	17500

Explanation:

This query reveals the monthly distribution of casualties from road accidents in 2022, helping identify peak months for accidents.

Query 8: Casualties by Road type

Business Question:

Which types of roads had the highest number of accident casualties in 2022?

SQL Code:

```
SELECT road_type, SUM(number_of_casualties) AS CY_casualties

FROM road_accident
```

```
WHERE EXTRACT(YEAR FROM accident_date)= 2022

GROUP BY road_type;
```

Result (Table):

Row	road_type	CY_casualties
1	Dual carriageway	31912
2	One way street	3499
3	Roundabout	12683
4	Single carriageway	144653
5	Slip road	2990

Explanation:

This query shows how the number of casualties varies by road type in 2022, helping identify which road types are most prone to accidents.

Query 9: Casualties by Urban/Rural Area

Business Question:

Were there more road accident casualties in urban or rural areas in 2022?

SQL Code:

```
SELECT urban_or_rural_area,

 CAST(SUM(number_of_casualties) AS DECIMAL(10,2)) * 100 /

 (SELECT CAST(SUM(number_of_casualties) AS DECIMAL(10,2))

 FROM road_accident

 WHERE EXTRACT(YEAR FROM accident_date)= 2022) AS
casualty_percentage

FROM road_accident
```

```
WHERE EXTRACT(YEAR FROM accident_date) = 2022

GROUP BY urban_or_rural_area;
```

Result (Table):

Row	urban_or_rural_area	Casualty_percentage
1	Rural	38.0541236455039160
2	Urban	61.9458763544960840

Explanation:

This query compares total accident casualties between urban and rural areas in 2022, highlighting where accidents were more severe or frequent.

Query 10: Casualties by Light condition

Business Question:

What percentage of road accident casualties in 2022 occurred during daylight vs. dark conditions?

SQL Code:

```
SELECT

  CASE

    WHEN light_conditions = 'Daylight' THEN 'Day'

    WHEN light_conditions IN (

      'Darkness - lighting unknown',

      'Darkness - lights lit',

      'Darkness - lights unlit',

      'Darkness - no lighting'

    ) THEN 'Dark'
```

```
    END AS light_condition_group,

    CAST(
      CAST(SUM(number_of_casualties) AS DECIMAL(10,2)) * 100 /
      (SELECT CAST(SUM(number_of_casualties) AS DECIMAL(10,2))
       FROM road_accident
       WHERE EXTRACT(YEAR FROM accident_date) = 2022)
    AS DECIMAL(10,2)) AS CY_casualties_pct

  FROM road_accident
  WHERE EXTRACT(YEAR FROM accident_date) = 2022
  GROUP BY
    CASE
      WHEN light_conditions = 'Daylight' THEN 'Day'
      WHEN light_conditions IN (
        'Darkness - lighting unknown',
        'Darkness - lights lit',
        'Darkness - lights unlit',
        'Darkness - no lighting'
      ) THEN 'Dark'
END;
```

Result (Table):

Row	light_conditions_group	CY_casualties_PCT
1	Dark	26.16
2	Day	73.84

Explanation:

This query highlights how lighting conditions (day vs. dark) impacted the percentage of total casualties in 2022, helping assess the need for improved road visibility or lighting infrastructure.

Query 10: Top 10 Locations by casualties

Business Question:

Which top 10 local authorities had the highest number of road accident casualties?

SQL Code:

```
SELECT local_authority, SUM(number_of_casualties) AS total_casualties

FROM road_accident

GROUP BY local_authority

ORDER BY SUM(number_of_casualties) DESC LIMIT 10;
```

Result (Table):

Row	local_authority	Total_casualties
1	Birmingham	8611
2	Leeds	5821
3	Bradford	4431

4	Manchester	4366
5	Liverpool	4052
6	Cornwall	3820
7	Sheffield	3737
8	Kirklees	3312
9	County Durham	3295
10	Westminster	3169

Explanation:

The top 10 local authorities with the most casualties highlight high-risk areas, helping prioritize regions for road safety improvements and targeted interventions.