Data Analytics Brainstation

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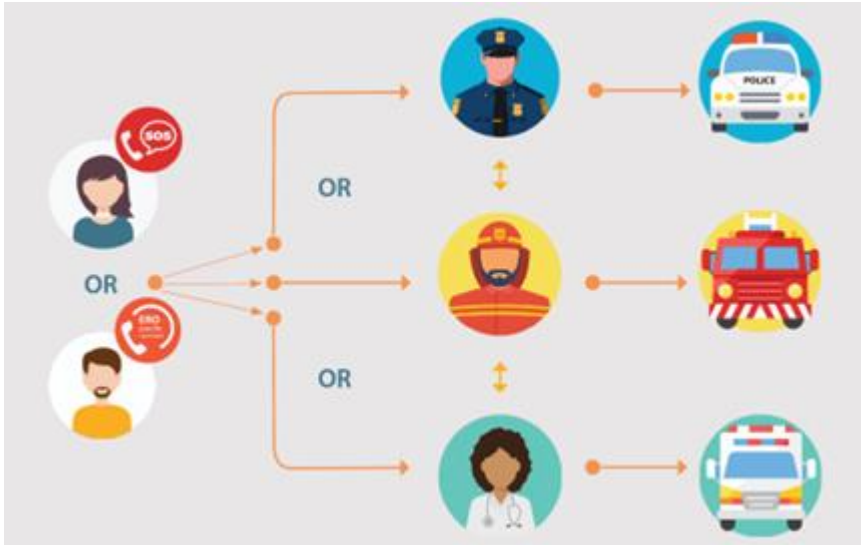
Hypothesis

The number of incidents and the response time are higher in urban areas compared to rural areas in the UK.



Data

- Annual incident data
  - ✓ Year: between 2010-2011 and 2023-2024
  - ✓ Fire type: Primary, Dwellings, Other buildings, Road vehicles, Other outdoors
  - ✓ Location:44 FRS location, Annual urban/rural category, Metropolitan/Non-metropolitan category and England
  - ✓ Number of incidents
  - ✓ Total response time
  - ✓ Call handling
  - ✓ Crew turnout time
  - ✓ Drive time
- Fire and Rescue Service (FRS)
  - ✓ 46 FRS (2 FRS record not included in incident data)
  - ✓ FRS name
  - ✓ Urban/ Rural Category: Predominantly Urban, Significantly Rural, Predominantly Rural
  - ✓ Metropolitan/Non-metropolitan category: Metropoliatan, Non-metropolitan

Predominantly rural: 50% or more of their area is 'rural‘
Significantly rural: less than 74% of their area is 'urban' and 26% or more of their area is 'rural‘
Predominantly urban: 74% or more of their area is 'urban'

Table Creation

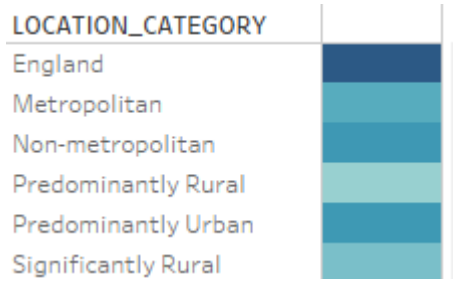
```sql
CREATE SCHEMA uk_fire_database;
USE uk_fire_database;
CREATE TABLE data_annual(
year_ending_quarter text DEFAULT NULL,
fire_type text DEFAULT NULL,
location_category text DEFAULT NULL,
incidents_included double DEFAULT NULL,
total_response_time float DEFAULT NULL,
call_handling_time float DEFAULT NULL,
crew_turnout_time float DEFAULT NULL,
drive_time float DEFAULT NULL,
PRIMARY KEY (location_category)
);
```

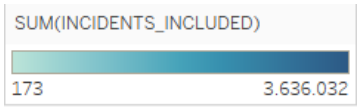
```sql

CREATE TABLE `uk_fire_database`.`frs` (
    frs_name text ,
    urban_rural_category text DEFAULT NULL,
    met_nonmet_category text DEFAULT NULL,
    PRIMARY KEY (frs_name(255))
);
```

Initial Analysis

```sql
SELECT SUM(INCIDENTS_INCLUDED)
FROM uk_fire_database.kitap1
WHERE LOCATION_CATEGORY NOT IN ("England","Predominantly Rural","Significantly Rural","Predominantly Urban");

SELECT SUM(INCIDENTS_INCLUDED)
FROM uk_fire_database.kitap1
WHERE LOCATION_CATEGORY ="England";

SELECT SUM(INCIDENTS_INCLUDED)
FROM uk_fire_database.kitap1
WHERE LOCATION_CATEGORY IN ("Cambridgeshire","Cornwall","Cumbria", "Devon and Somerset", "Durham","Isles Of Scilly",
"Lincolnshire","Norfolk","North Yorkshire","Norfolk","North Yorkshire","Northumberland","Oxfordshire","Shropshire",
"Suffolk") ;

SELECT SUM(INCIDENTS_INCLUDED)
FROM uk_fire_database.kitap1
WHERE LOCATION_CATEGORY ="Predominantly Rural";

SELECT COUNT(DISTINCT LOCATION_CATEGORY)
FROM uk_fire_database.kitap1;
```

Incidents

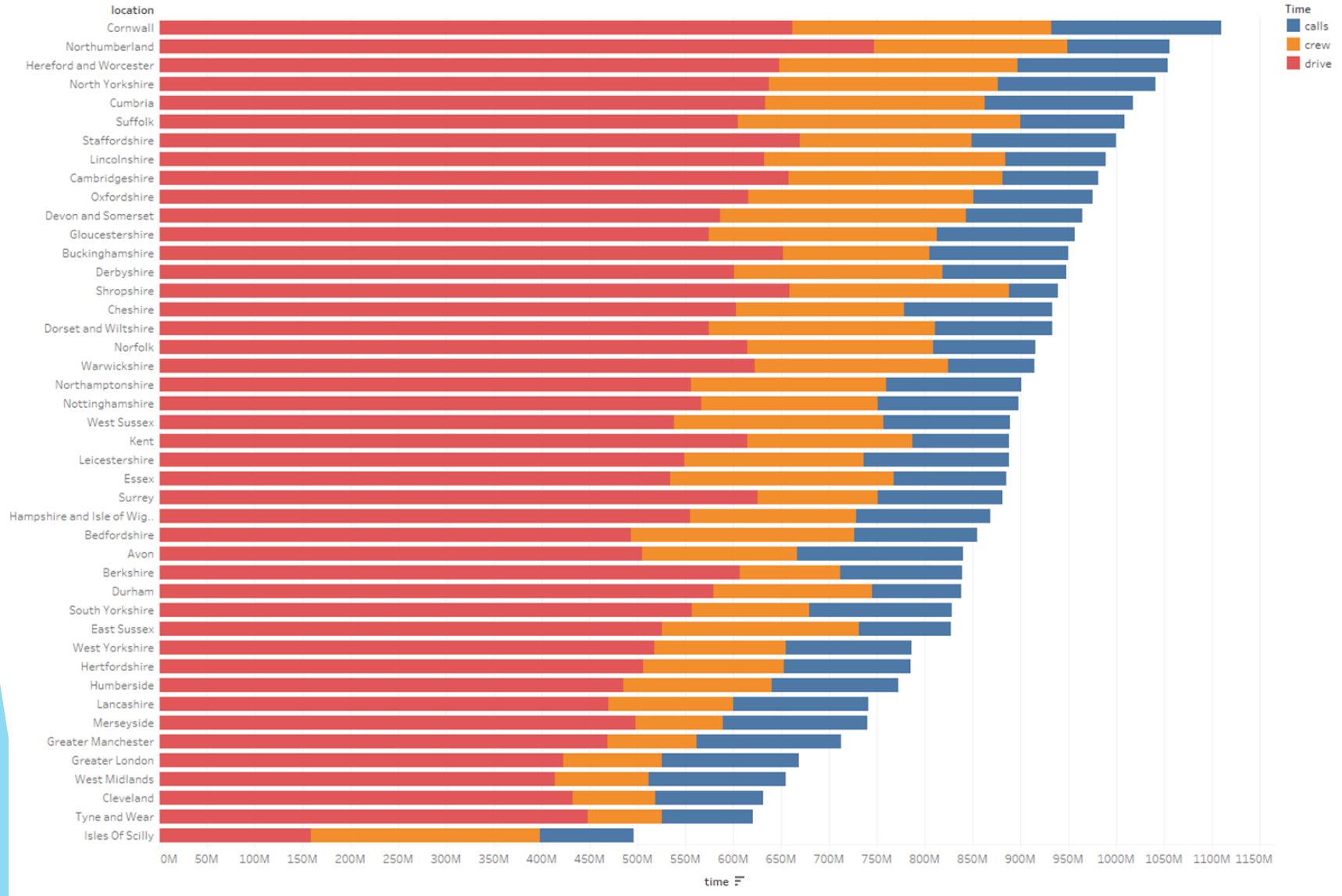




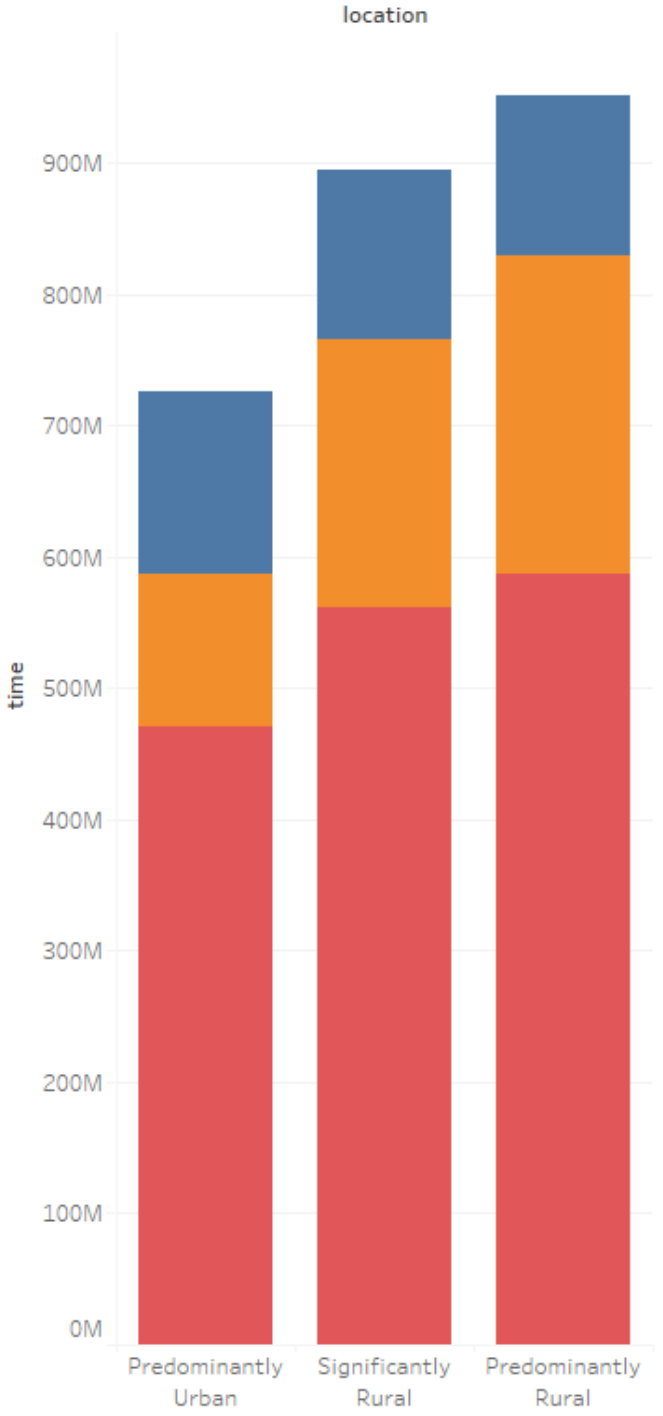
- Number of incidents ≠ Urban/Rural
- Number of incidents = Metropolitan/Non-metropolitan

Response Time

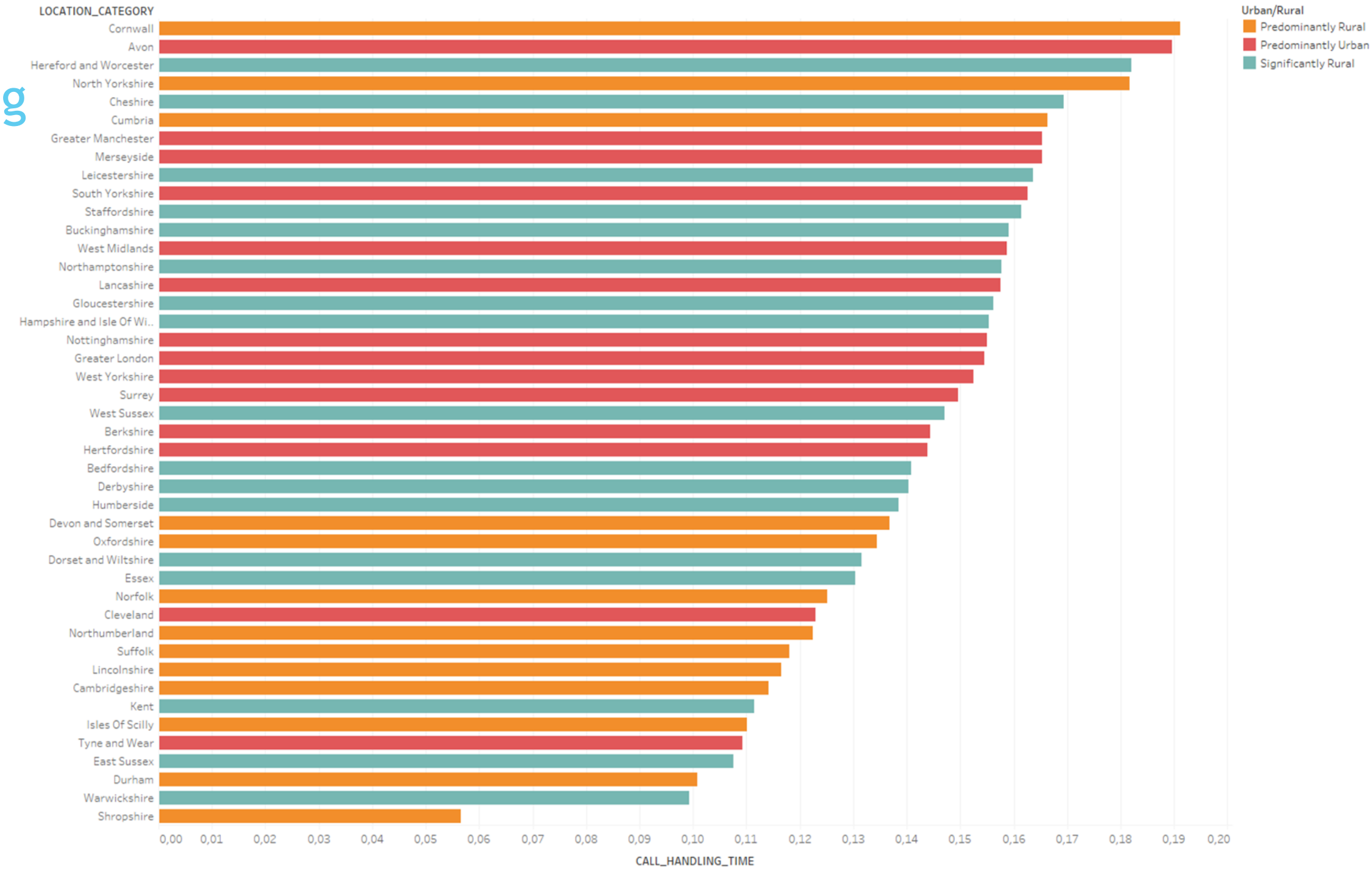
<Response Time Over Year Based On Location>



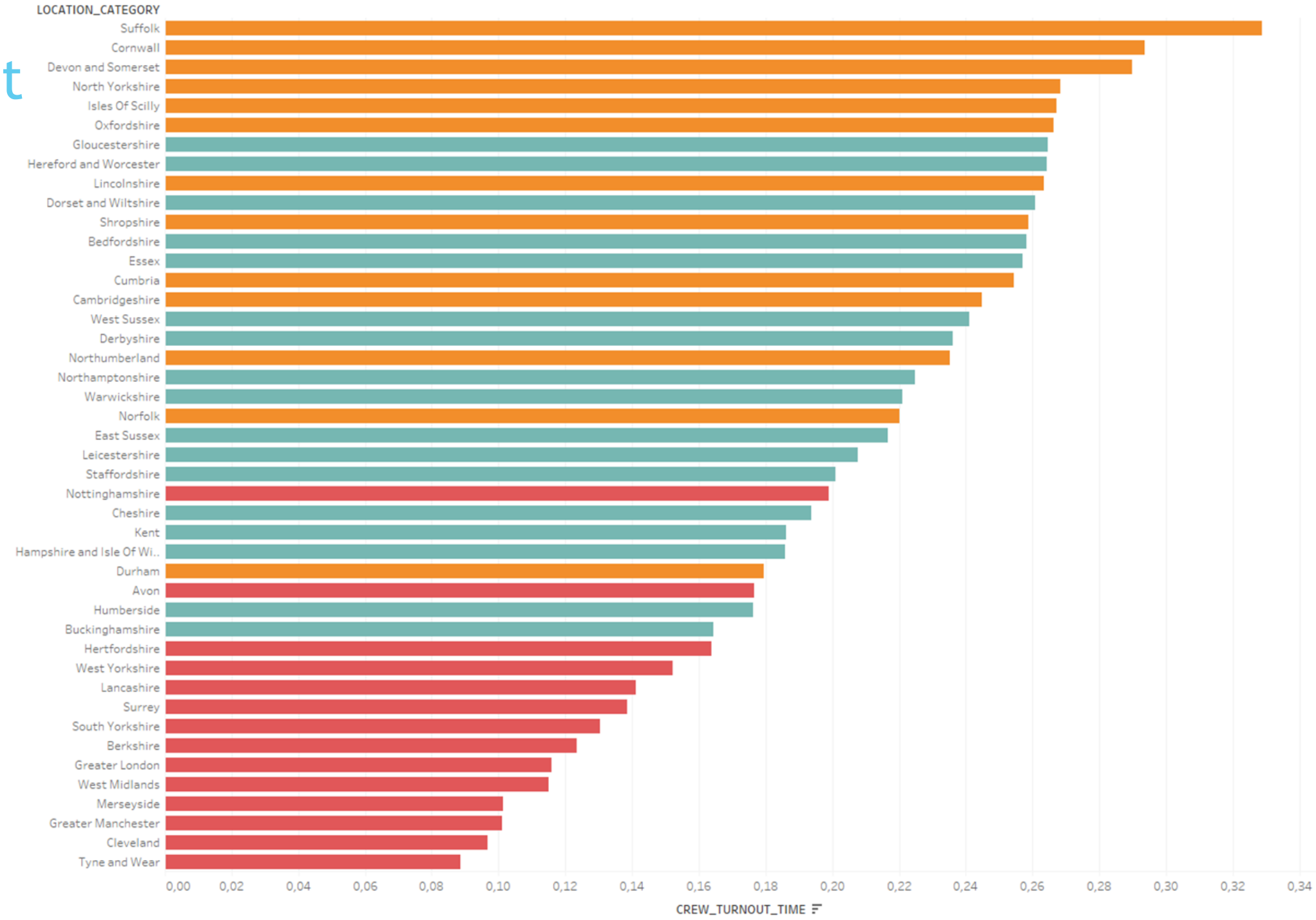
Sum of time for each location. Color shows details about flag. The view is filtered on location, which keeps 44 of 50 members.



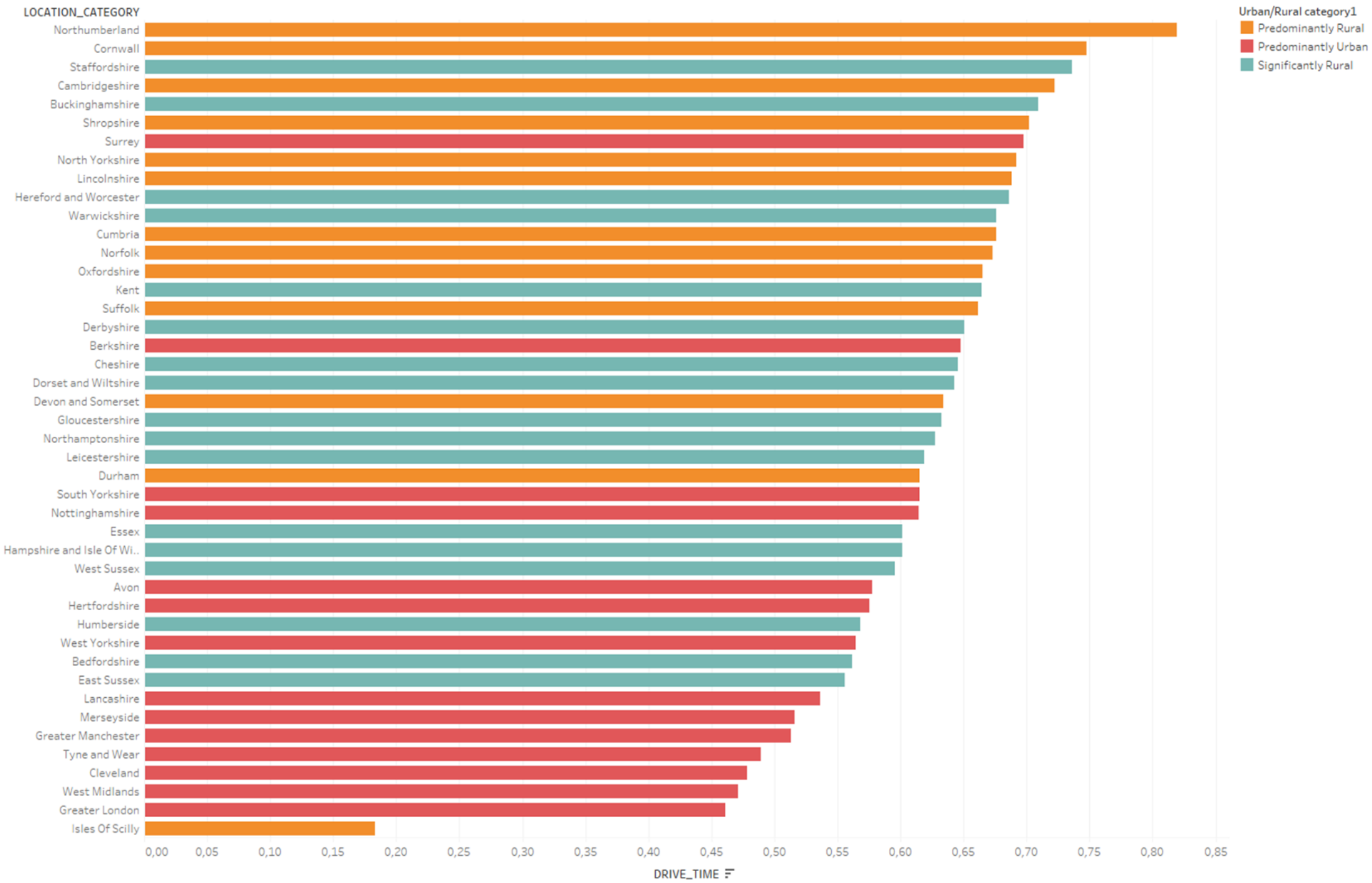
Call Handling Time



Crew Turnout Time



Drive Time


LOCATION_CATEGORY
Northumberland
Cornwall
Staffordshire
Cambridgeshire
Buckinghamshire
Shropshire
Surrey
North Yorkshire
Lincolnshire
Hereford and Worcester
Warwickshire
Cumbria
Norfolk
Oxfordshire
Kent
Suffolk
Derbyshire
Berkshire
Cheshire
Dorset and Wiltshire
Devon and Somerset
Gloucestershire
Northamptonshire
Leicestershire
Durham
South Yorkshire
Nottinghamshire
Essex
Hampshire and Isle Of Wi..
West Sussex
Avon
Hertfordshire
Humberside
West Yorkshire
Bedfordshire
East Sussex
Lancashire
Merseyside
Greater Manchester
Tyne and Wear
Cleveland
West Midlands
Greater London
Isles Of Scilly
0,00
0,05
0,10
0,15
0,20
0,25
0,30
0,35
0,40
0,45
0,50
0,55
0,60
0,65
0,70
0,75
0,80
0,85
DRIVE_TIME
Urban/Rural category1
Predominantly Rural
Predominantly Urban
Significantly Rural

SQL Codes

```sql

with calls as (
SELECT  FINANCIAL_YEAR,FIRE_TYPE,LOCATION_CATEGORY,INCIDENTS_INCLUDED, CALL_HANDLING_TIME AS time, "calls" as flag
FROM  uk_fire_database.kitap1)
,crew as(
SELECT  FINANCIAL_YEAR,FIRE_TYPE,LOCATION_CATEGORY,INCIDENTS_INCLUDED, CREW_TURNOUT_TIME AS time, "crew" as flag
 FROM  uk_fire_database.kitap1)
 ,drive as(
SELECT  FINANCIAL_YEAR,FIRE_TYPE,LOCATION_CATEGORY,INCIDENTS_INCLUDED, DRIVE_TIME AS time, "drive" as flag
 FROM  uk_fire_database.kitap1)


 SELECT  * FROM calls UNION
 SELECT * FROM drive UNION
 SELECT * FROM crew


```

```sql
 SELECT k.*
 FROM `kitap1` k
 INNER JOIN `uk_fire_database`.`frs` f ON k.`LOCATION_CATEGORY` = f.`frs_name`;
```

References

- 1 Rural Urban classifications of Fire and Rescue Service as defined by Department for Environment, Food and Rural Affairs (DEFRA):
- https://eena.org/
- https://www.gov.uk/government/statistical-data-sets/fire-statistics-data-tables#response-times