

# Exploring London's Vehicular Accident Rate in 2019: A Visual Journey

Group Project Presentation

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# Introduction

- Goal: Visualize London's vehicular accidents and extract meaningful insights that can inform safety measures, urban planning, and policy decisions in the future
- Understanding of accident landscape, exploring factors such as severity, location, population, and casualty mode
- The significance of road safety and potential to contribute to the well being of community drove out team to choose this topic



# Technologies Used

Python (to clean and export data)

MongoDB (to store our data)

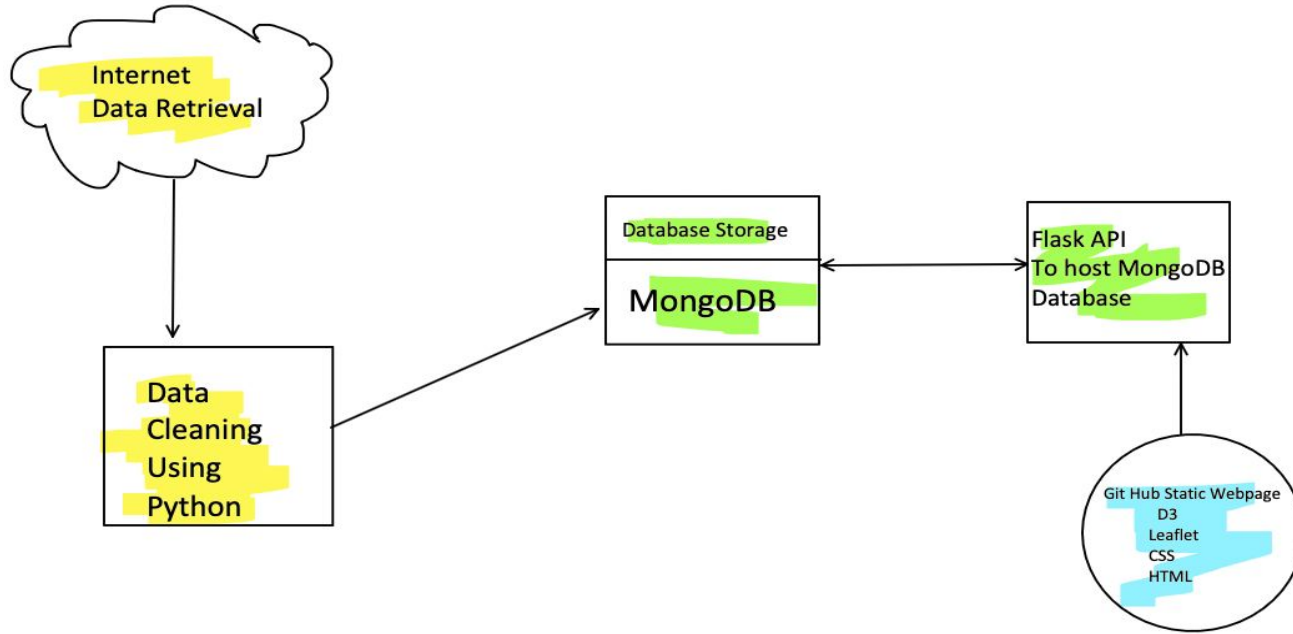
Flask (to create framework for API's)

JavaScript & Chart.js (to visualize data)

HTML & CSS ( as basic skeleton of webpage)



# Project Architecture



# Data Sources

- Accidents API api route: /api/v1.0/accidents

```
[{"lat": 51.511963, "lon": -0.028211, "location": "On Commercial Road Near The Junction With Burdett Road", "date": "2019-01-03T01:20:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.371636, "lon": -0.117621, "location": "On Purley Way 20 metres north of The Junction With Waddon Road", "date": "2019-01-02T22:45:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.514951, "lon": -0.072747, "location": "On Whitechapel High Street Near The Junction With Old Castle Street", "date": "2019-01-02T18:45:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.519173, "lon": -0.262356, "location": "On western Avenue 10 metres south of The Junction With Leamington", "date": "2019-01-03T08:41:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.565743, "lon": -0.136308, "location": "On Macdonald Road 30 metres south of The Junction With Highgate Hill", "date": "2019-01-03T08:37:00Z", 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"Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.506781, "lon": -0.128527, "location": "On The Mall 50 metres west of The Junction With Spring Gardens", "date": "2019-01-03T10:45:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.50048, "lon": -0.158812, "location": "On Lowndes Square 30 metres north of The Junction With Harriet Street", "date": "2019-01-03T10:40:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.536686, "lon": 0.050838, "location": "On Ron Leighton Way 100 metres west of The Junction With High Street", "date": "2019-01-03T13:10:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.495119, "lon": -0.179456, "location": "On Kensington Gore Near The Junction With Queensgate", "date": "2019-01-03T16:01:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.523469, "lon": -0.164818, "location": "On Harewood Avenue Near The Junction With Blandford Square", 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Whalebone Lane south", "date": "2019-01-02T17:21:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.413656, "lon": -0.204524, "location": "On Kingston Road London SW19 Near The Junction With Church Lane", "date": "2019-01-03T18:30:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.498485, "lon": -0.264411, "location": "On Acton Lane Near The Junction With Evelyn Road", "date": "2019-01-03T18:45:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.417659, "lon": -0.073764, "location": "On Anerley Hill Near The Junction With Crystal Palace Station Road", "date": "2019-01-03T19:30:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.421329, "lon": -0.252852, "location": "On Kingston Bypass 200 metres north of The Junction With Coombe Lane", "date": "2019-01-03T20:19:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.521242, "lon": -0.161989, "location": 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"location": "On Down Street Near The Junction With Brick Street", "date": "2019-01-04T00:15:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.584185, "lon": -0.265824, "location": "On Kinsbury Road Near The Junction With Slough Lane", "date": "2019-01-03T22:43:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.445033, "lon": -0.095033, "location": "On Pymers Mead Near The Junction With Croxted Road", "date": "2019-01-04T01:30:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.605589, "lon": -0.420841, "location": "On Rickmansworth Road 50 metres south of The Junction With New Farm", "date": "2019-01-03T22:45:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}, {"lat": 51.395812, "lon": -0.108363, "location": "On Brigstock Road Near The Junction With Colliers Water Lane", "date": "2019-01-04T00:25:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"}]
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# Data Sources

- [London Borough GeoJSON](#) Api Route: /api/v1.0/boroughs

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{
  "type": "FeatureCollection",
  "name": "file23f9e20d355f2",
  "features": [
    {
      "type": "Feature",
      "properties": {
        "id": 1,
        "name": "Kingston upon Thames",
        "code": "E09000021",
        "area_hectares": 3726.117,
        "inner_statistical": false
      },
      "geometry": {
        "type": "MultiPolygon",
        "coordinates": [
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              [-0.330679021892208, 51.3290110042255],
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      }
    }
  ]
}
```

# Data Sources

- [London Population and Area](#) api route: /api/v1.0/population

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[{"Borough_Name": "City of London",  
  "Population": 7953,  
  "Square_km": 2.9,  
  "Population_per_square_kilometer": 2738.7},  
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  "Population": 214858,  
  "Square_km": 36.1,  
  "Population_per_square_kilometer": 5950.5},  
 {"Borough_Name": "Barnet",  
  "Population": 402363,  
  "Square_km": 86.7,  
  "Population_per_square_kilometer": 4638.3},  
 {"Borough_Name": "Bexley",  
  "Population": 252885,  
  "Square_km": 60.6,  
  "Population_per_square_kilometer": 4174.4},  
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# Dashboard Views

Map of London

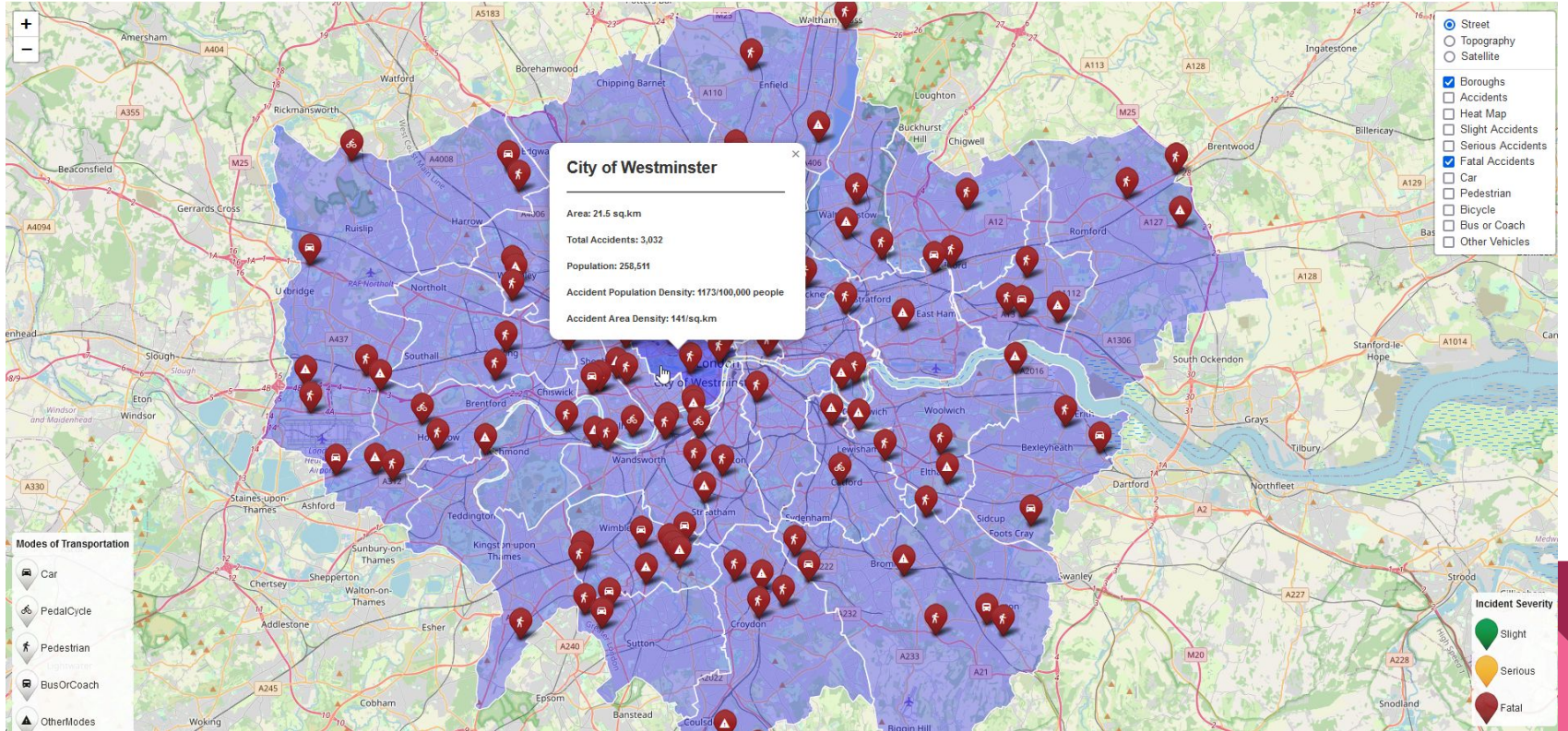
Total Accidents Bar Graph by Borough

Casualties Pie Chart by Types



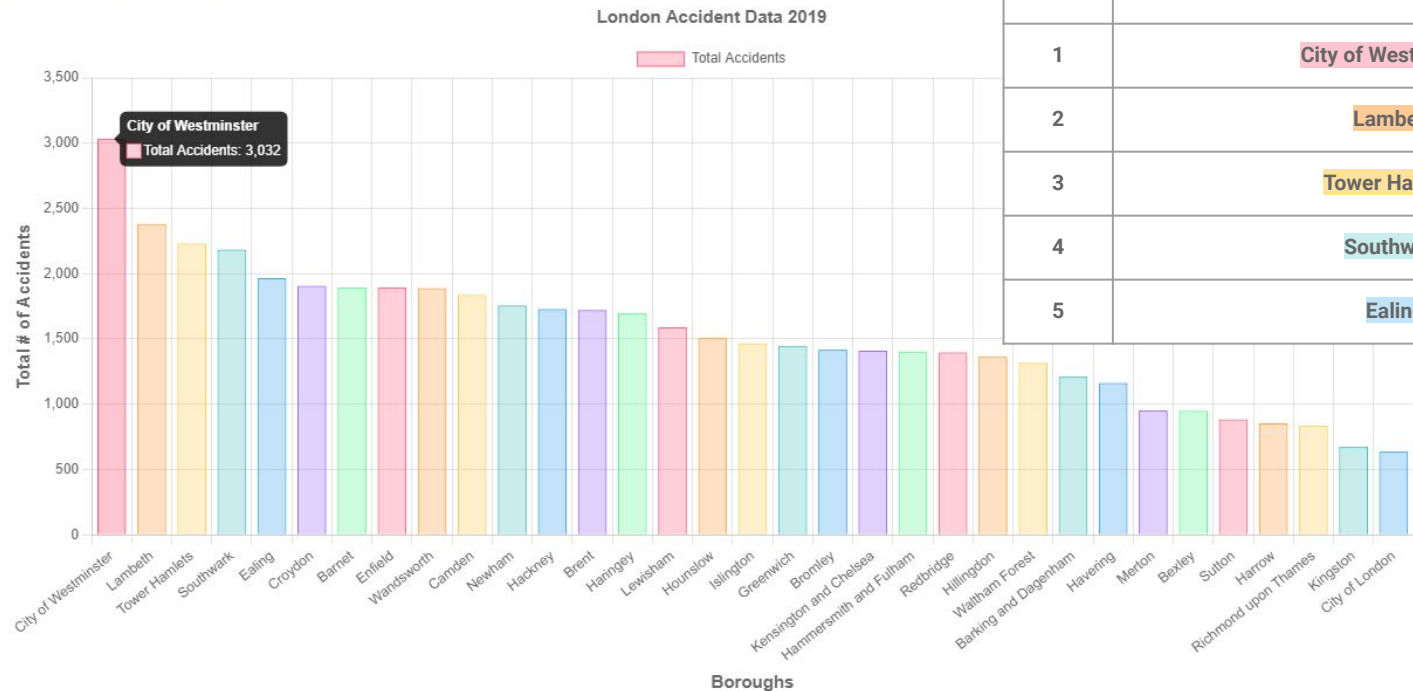


# Map of London Demo



# London Accident Data by Borough Demo

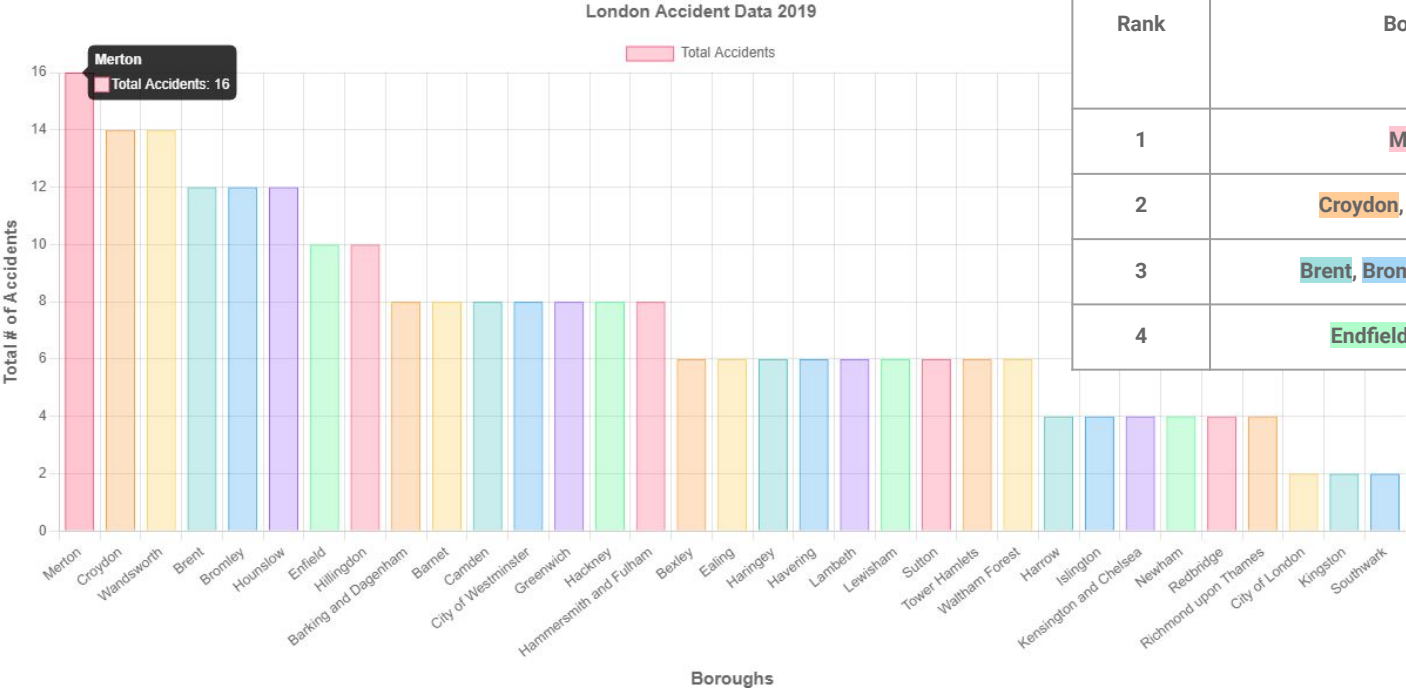
Severity:  Sort:



Top 5 Boroughs with Highest Total # of Accidents		
Rank	Borough	Total # of Accidents
1	City of Westminster	3032
2	Lambeth	2382
3	Tower Hamlets	2232
4	Southwark	2186
5	Ealing	1966

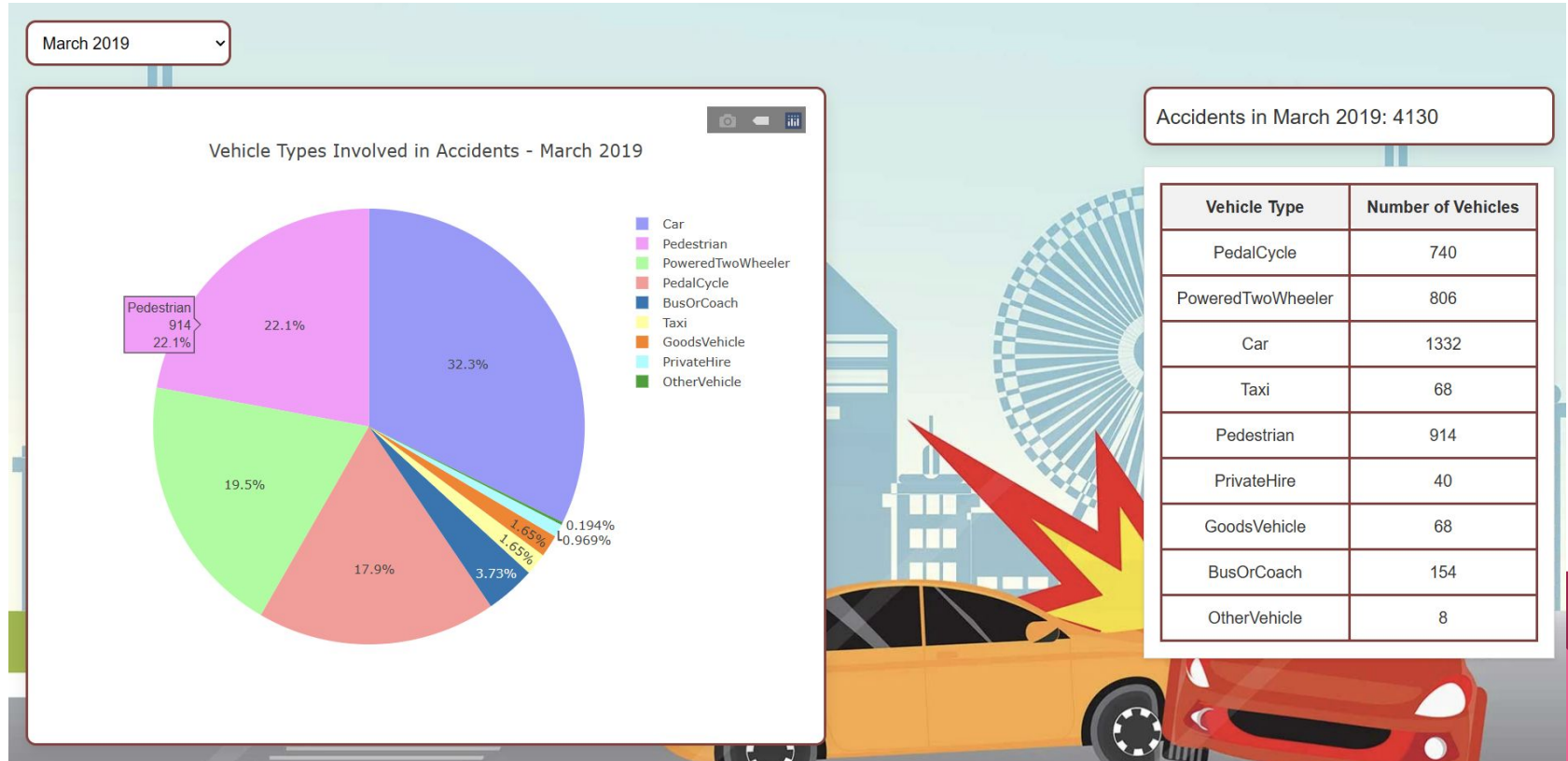
# London Accident Data by Borough Demo

Severity: Fatal Sort: Descending



Top 5 Boroughs with Highest Total # of Fatal Accidents		
Rank	Borough	Total # of Accidents
1	Merton	16
2	Croydon, Wandsworth	14
3	Brent, Bromley, Hounslow	12
4	Enfield, Hillingdon	10

# London Accident Data by Casualty type Demo



# Data Analysis

- Bromley has the **lowest accidents/sq.km of 9**. Bromley - **150 sq.km**
- City of London has the **highest with 220 accidents/sq.km**. City of London - **2.9 sq.km**
- City of Westminster has **highest accidents per 100,000 people - 1173**
- Harrow has **lowest accidents per 100,000 people - 330**



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# Data Analysis

- **Peak Accidents:** Most in November (4,694), October (4,594), and June (4,544)
- **Fewest Accidents:** April (3,760), February (3,782), January (3,790)
- **Vehicle Involvement:** Dominated by cars (16,450 accidents), followed by pedestrians (10,472), powered two-wheelers (10,370), and cyclists (9,088). Lesser involvement of buses and goods vehicles.





# Conclusion

- Inconclusive evidence to relate months with accidents
  - a. Other factors could include road maintenance
  - b. Weather
- More car safety measures as cars are involved with nearly 50% of the accidents as well as safety measures for pedestrians as they are constantly exposed to the road
- However, most accidents are only slight accidents, with an 86% of the accidents being only slight accidents
- Accident density increases closer to the centre of the city





# Q&A

Open floor for question and discussions.

