


Road Safety in the Greater London Area

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
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Technologies Used

Python (to clean and export data)

MongoDB (to store our data)

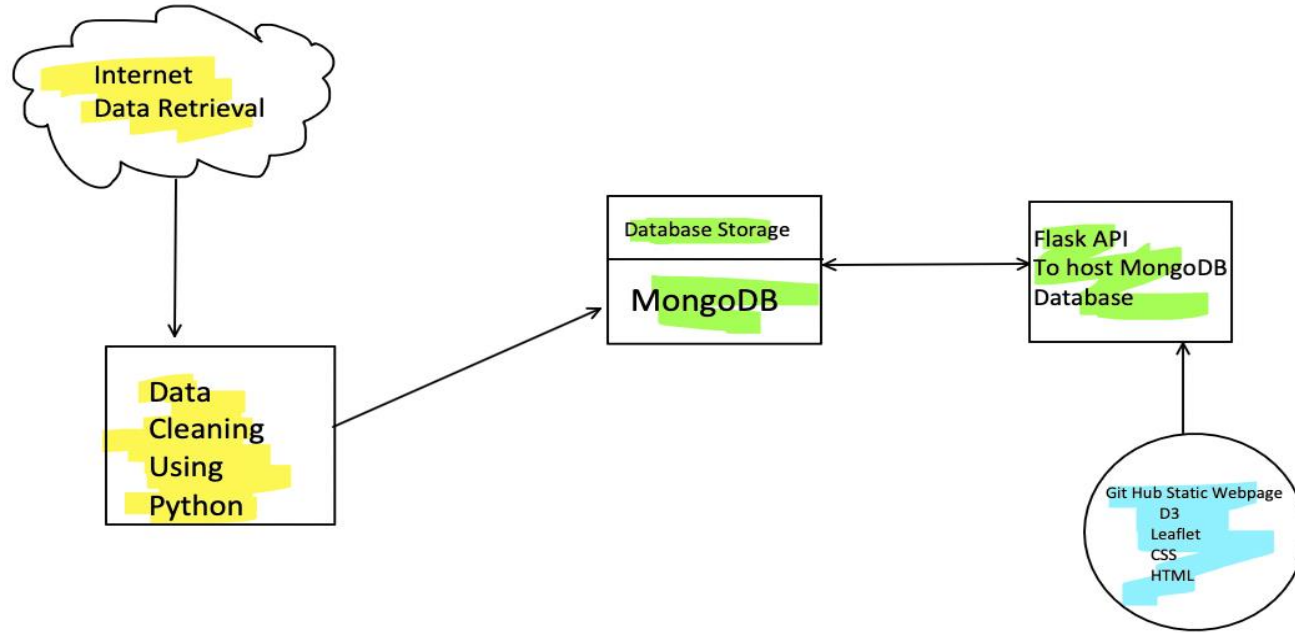
Flask (to create framework for API's)

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

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{
  "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"
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{
  "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"
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{
  "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"
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{
  "lat": 51.551805, "lon": 0.130436, "location": "On Valence Avenue Near The Junction With Wood Lane", "date": "2019-01-02T18:10:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"
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  "lat": 51.427047, "lon": -0.166814, "location": "On Mitcham Road Near The Junction With Tooting High Street", "date": "2019-01-02T17:20:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"
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  "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"
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},
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  "lat": 51.54266, "lon": 0.251211, "location": "On Corbets Tey Road Near The Junction With Harwood Hall Lane", "date": "2019-01-03T17:30:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"
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  "lat": 51.566434, "lon": 0.145376, "location": "On Stanley Avenue Near The Junction With Whalebone Lane south", "date": "2019-01-02T17:21:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"
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  "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"
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  "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"
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  "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"
},
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  "lat": 51.521242, "lon": -0.161989, "location": "On Marylebone Road Near The Junction With Great Central Street", "date": "2019-01-03T19:10:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"
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{
  "lat": 51.556862, "lon": 0.084724, "location": "On Park Road Near The Junction With Winchester Road", "date": "2019-01-03T17:10:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"
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  "lat": 51.426704, "lon": -0.155306, "location": "On Church Lane Near The Junction With Derinton Road", "date": "2019-01-03T21:36:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"
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  "lat": 51.466859, "lon": -0.047764, "location": "Drakefell Road 100 metres east of Kitto Road", "date": "2019-01-03T21:00:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"
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{
  "lat": 51.456756, "lon": -0.192728, "location": "On Wandsworth High Street Near The Junction With Garratt Lane/Ram", "date": "2019-01-03T03:00:00Z", "severity": "Slight", "borough": "Croydon", "mode": "Power"
},
{
  "lat": 51.505163, "lon": -0.148363, "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": 51.445038, "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"
}
```

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},  
 {"Borough_Name": "Barking and Dagenham",  
  "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",  
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  "Square_km": 60.6,  
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Dashboard Views

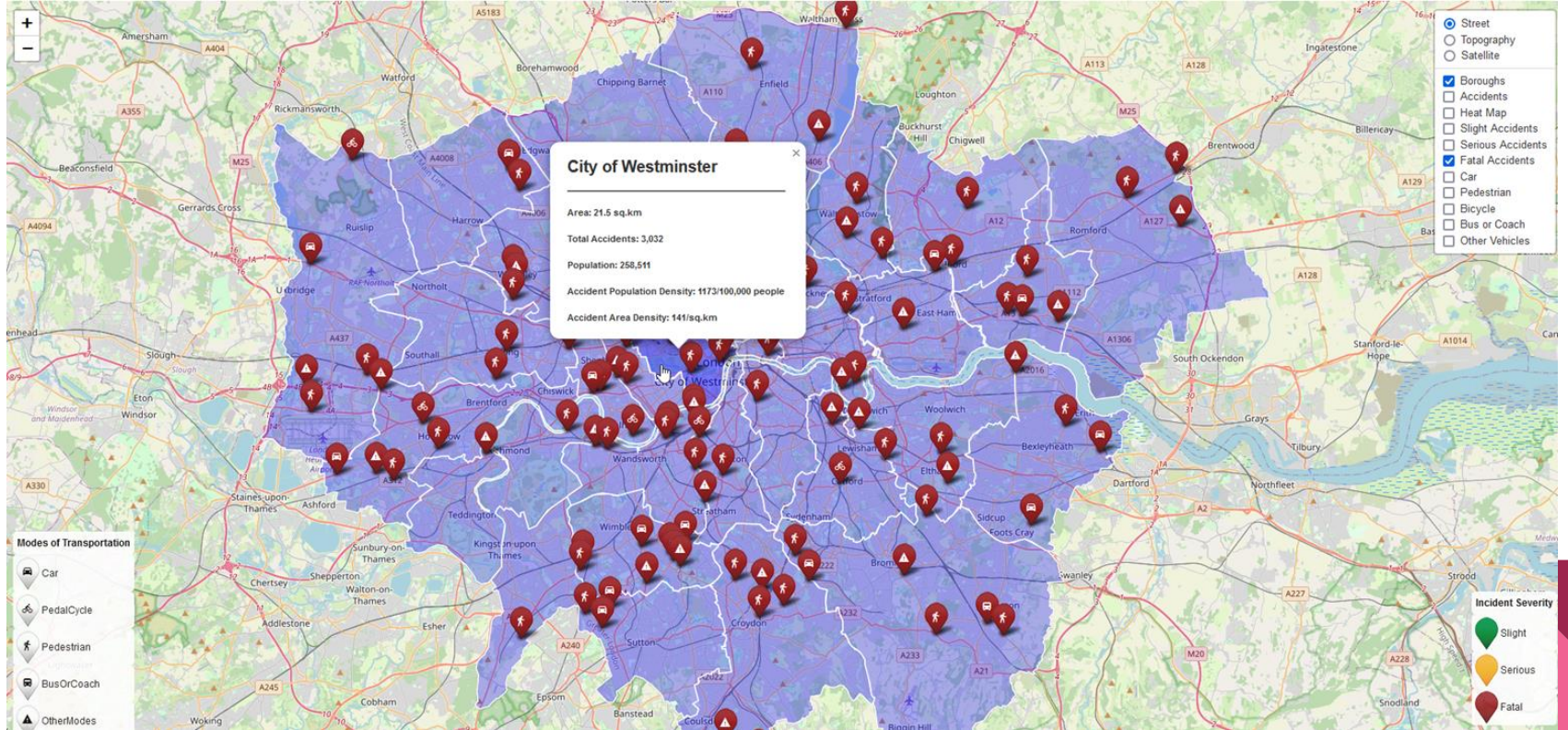
Map of London

Total Accidents Bar Graph by Borough

Casualties Pie Chart by Types

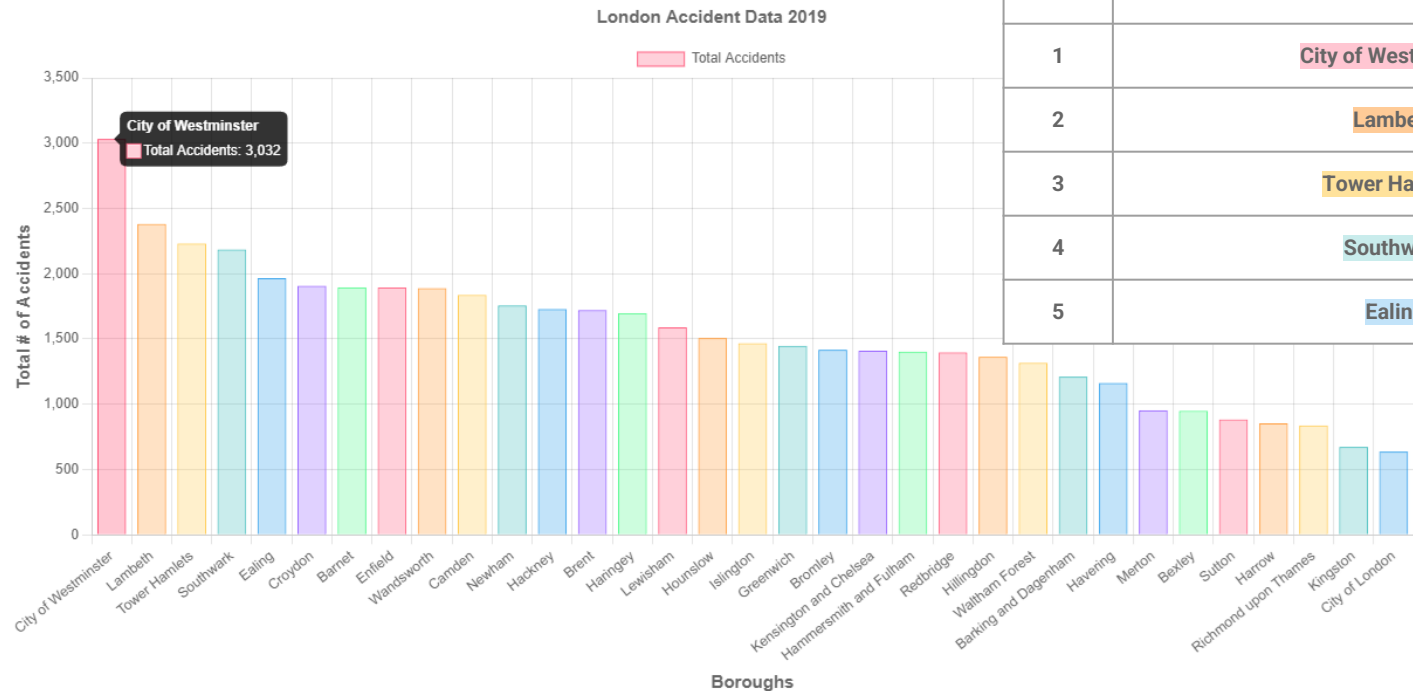


Map of London Demo



London Accident Data by Borough Demo

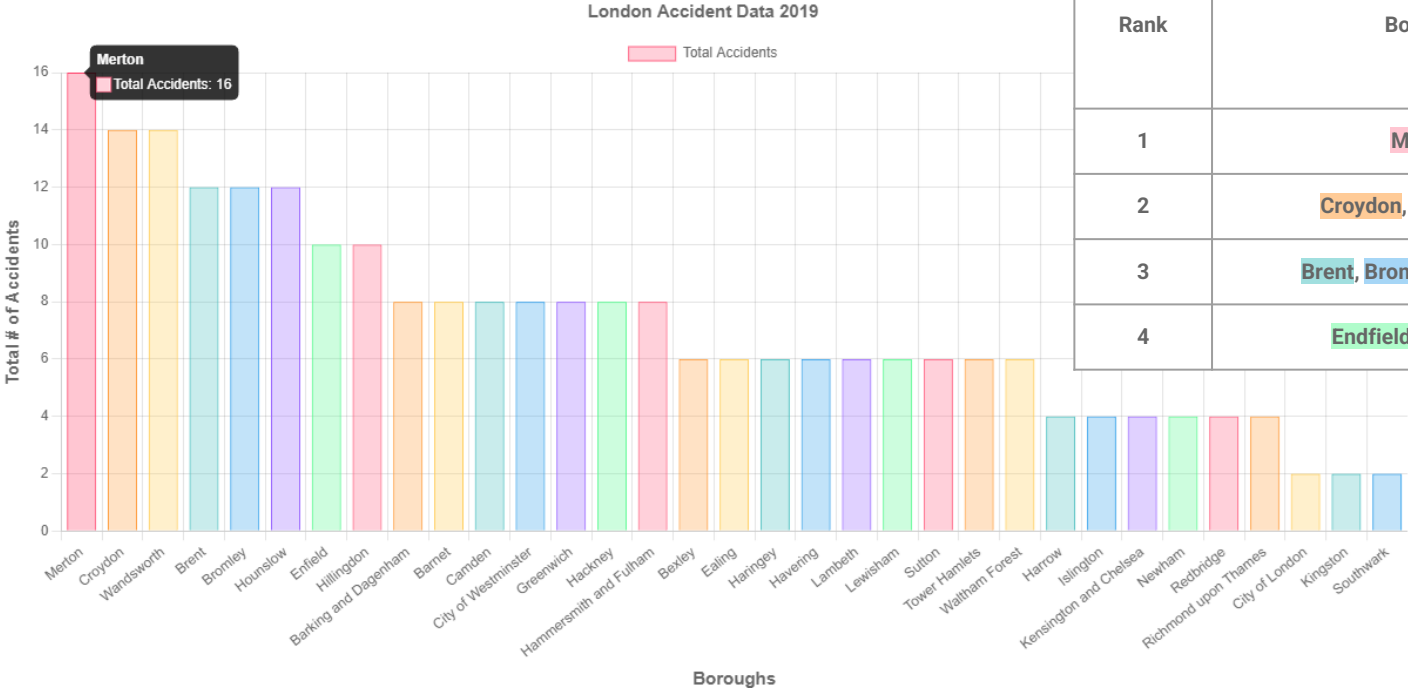
Severity: Sort:



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

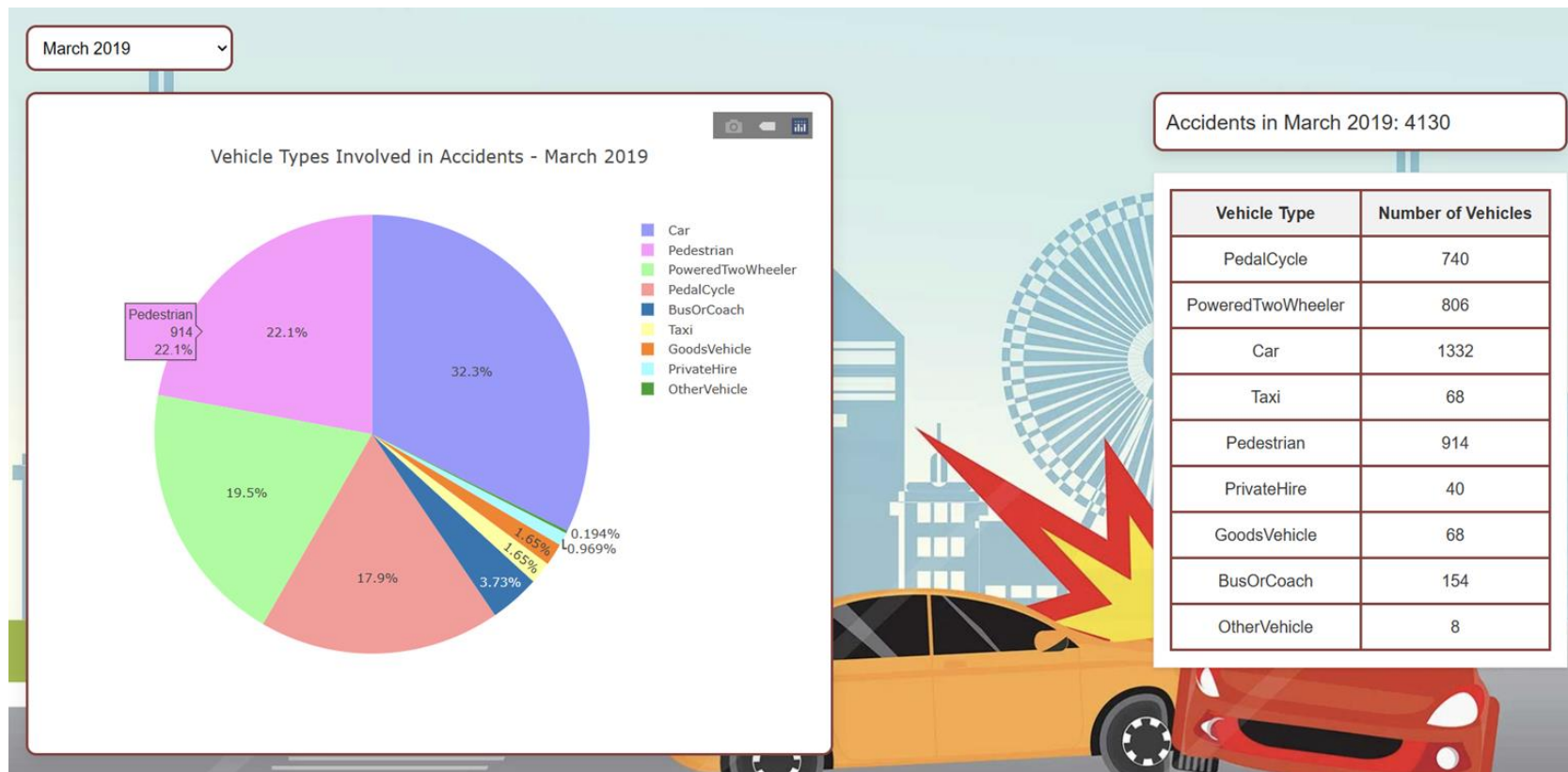
Severity: Fatal Sort: Descending



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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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	Endfield, Hillingdon	10

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.

