# UK Road Safety: Traffic Accidents & Vehicles


Fundamentals of Statistics – Group Project

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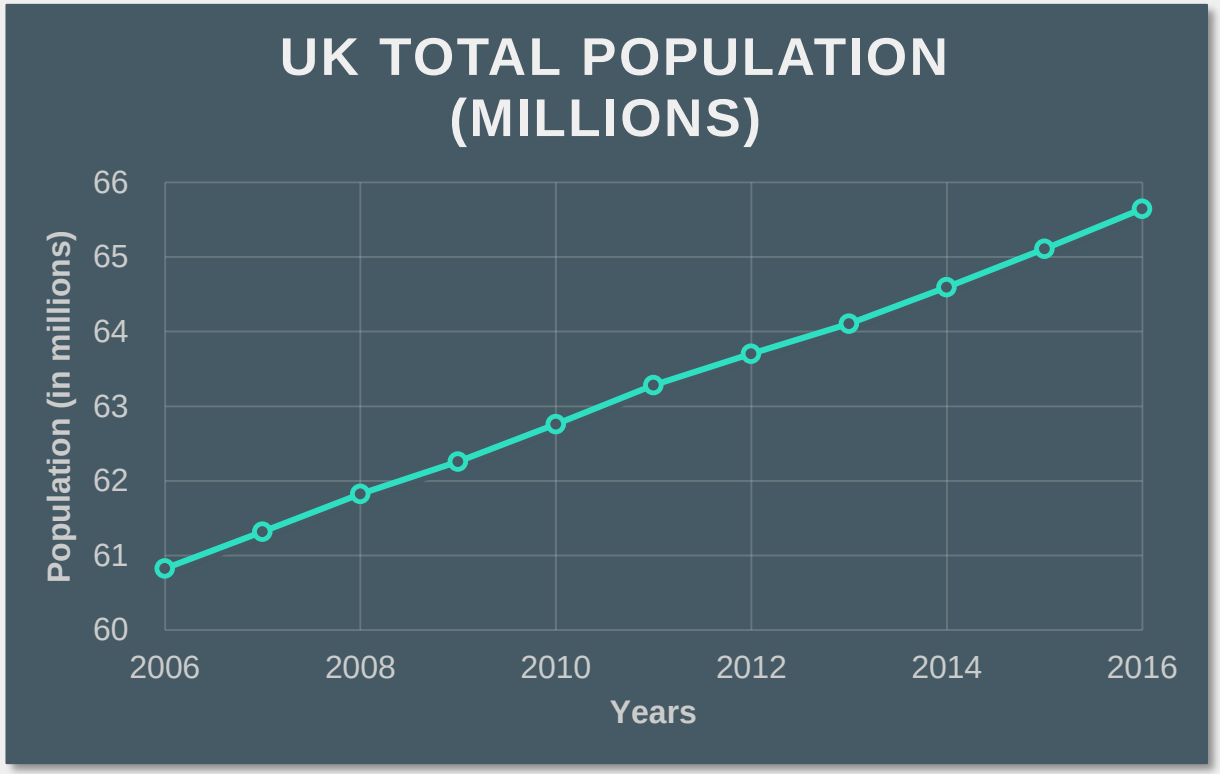
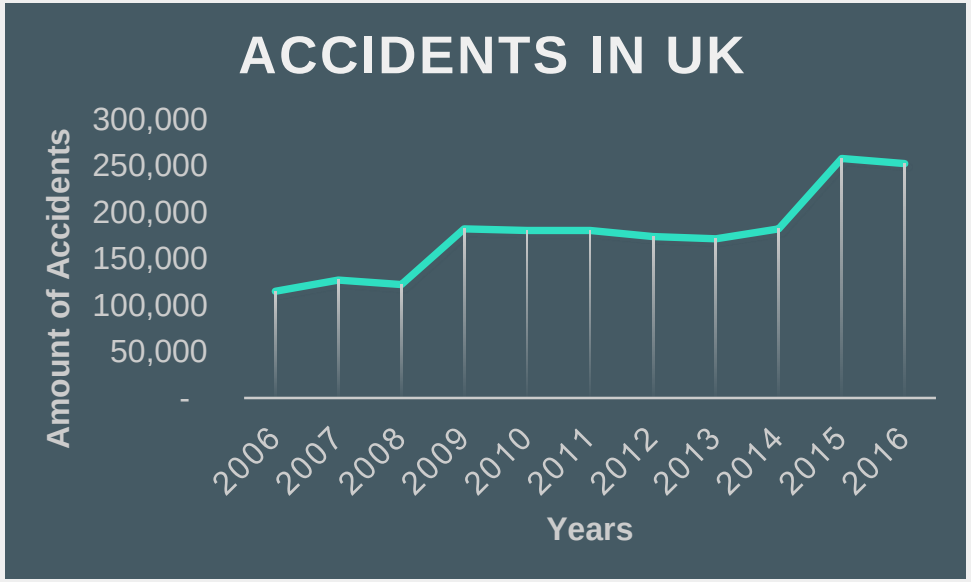
# Index

- Business Problem Identification
- Data Sources & Methodology
- Decision Maker
- Data Visualization
- Conclusions

# Business Problem Identification



# Data Sources & Methodology

## DATABASE

2 Open Databases published by the UK Government.
They include many parameters about the driver, the conditions of the accident, the causes, the number of people involved, the vehicle information

## TIME FRAME

Data range selected goes from 2006 to 2016


## NEW DATAFRAME

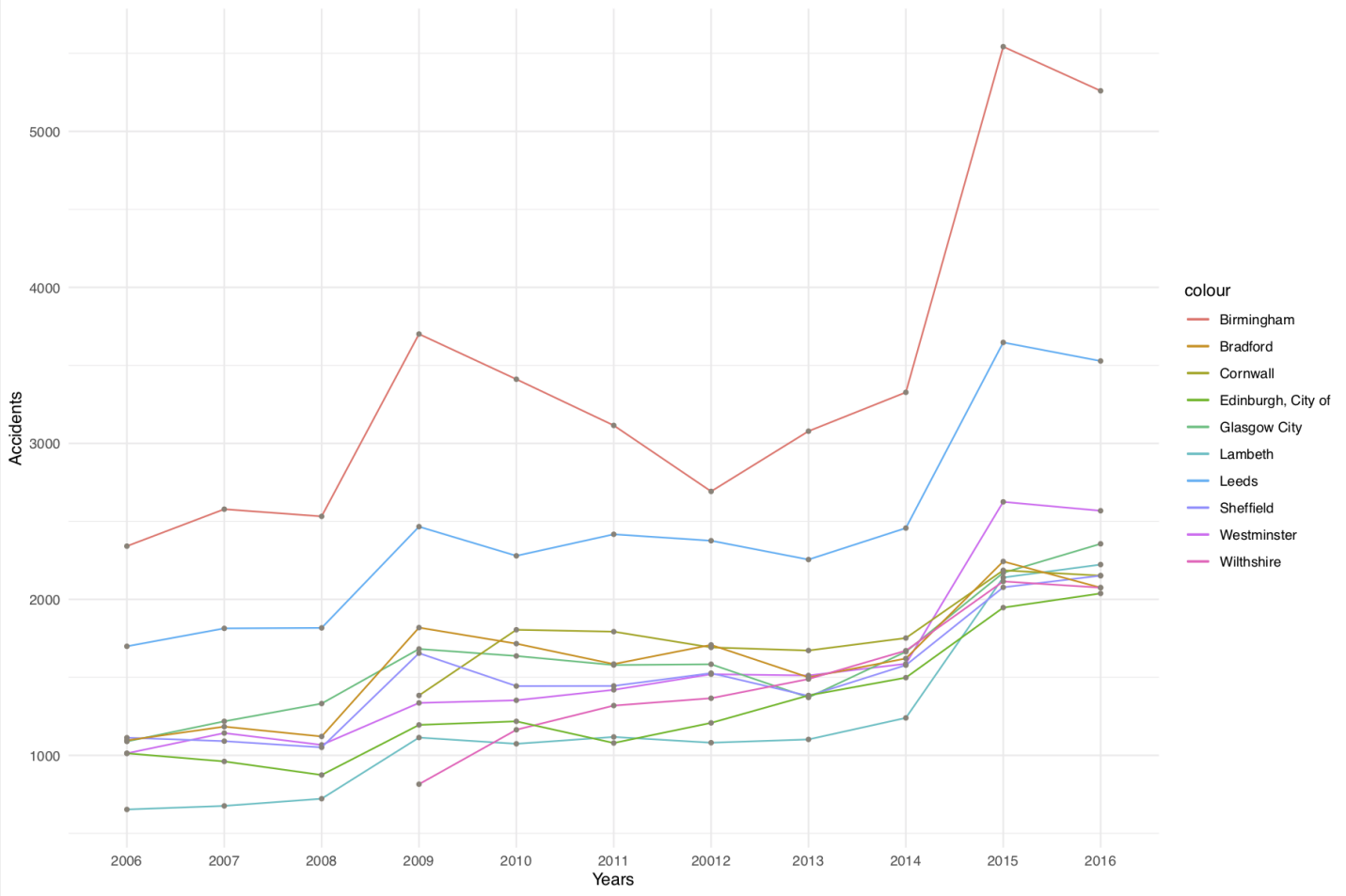
Merged the two databases into one to start our analysis.
New dimensions of the new set of data is:
1,946,120 observations of 27 variables

## DATA CLEAN

- Kept only relevant variables
- Excluded null and unknown values

# UK Car Accidents 2006 – 2016

**Accidents in top 10 cities by accident count 2006-2016**




**Cities with most accidents in 2016 in the UK:**

**01** Birmingham

**02** Leeds

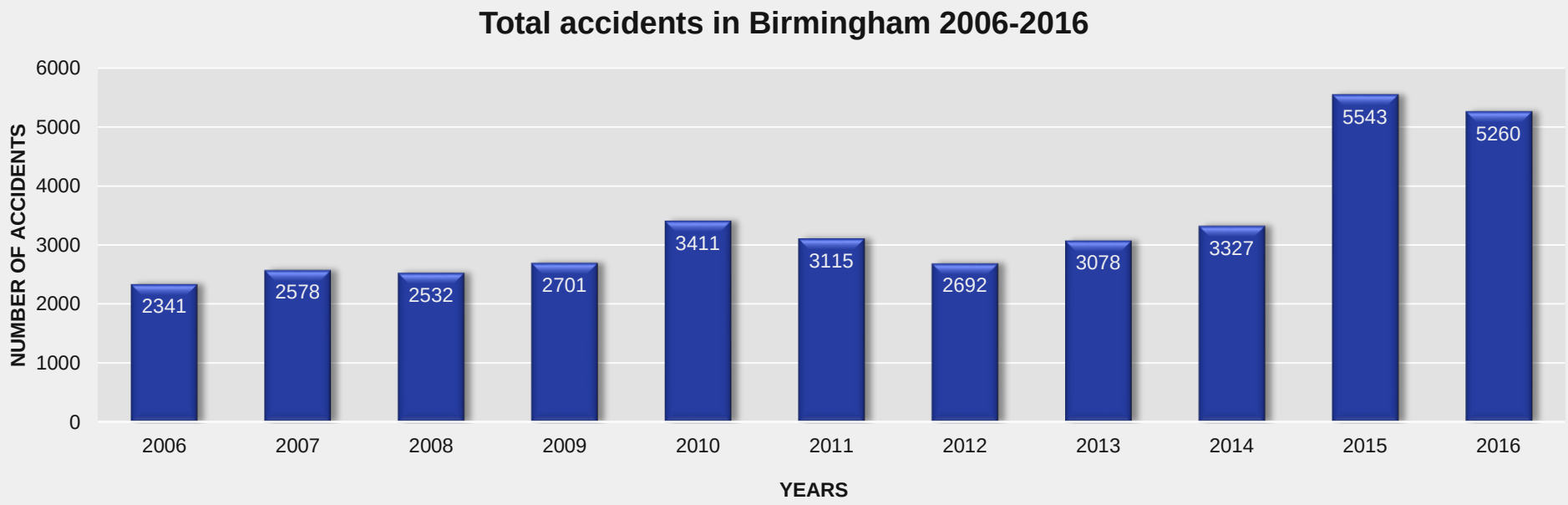
**03** Westminster

**04** City of Edinburg

**05** Lambeth

# Birmingham

- Focus on the city of **Bimingham** which reports the **highest number of road accidents** between 2006 and 2016
- Evaluate which variables cause the majority of the accidents



# Our Decision Maker

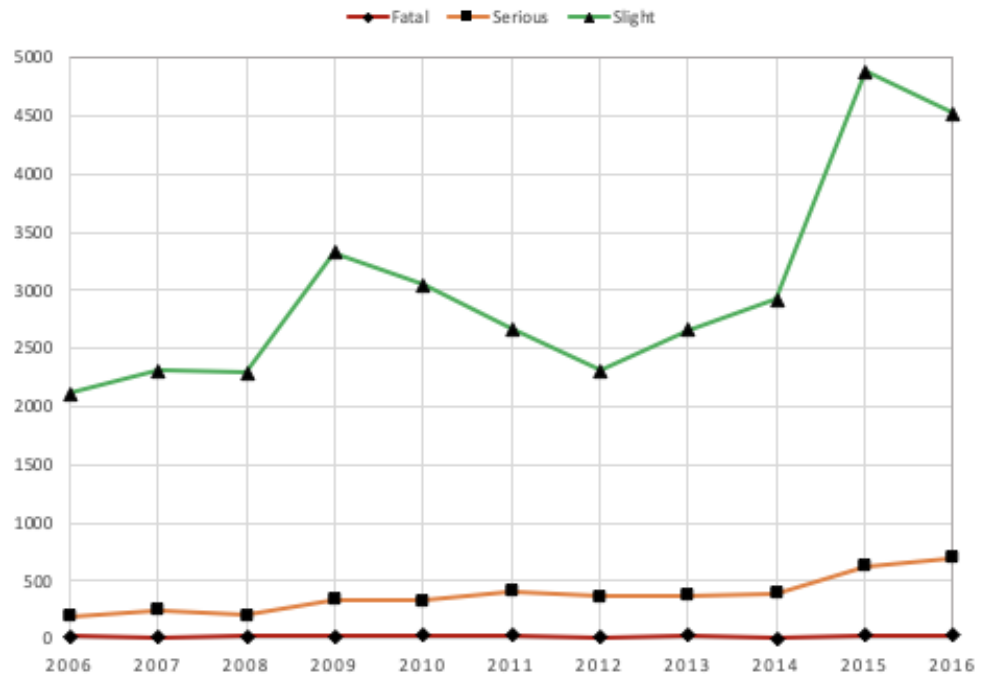
**Birmingham City Council**

- Carries out studies into the cause of accidents on roads in their area
- Takes appropriate measures to **prevent** such accidents
- Provides **road safety education**, training and publicity for all ages and types of road user, from pre-school to the elderly

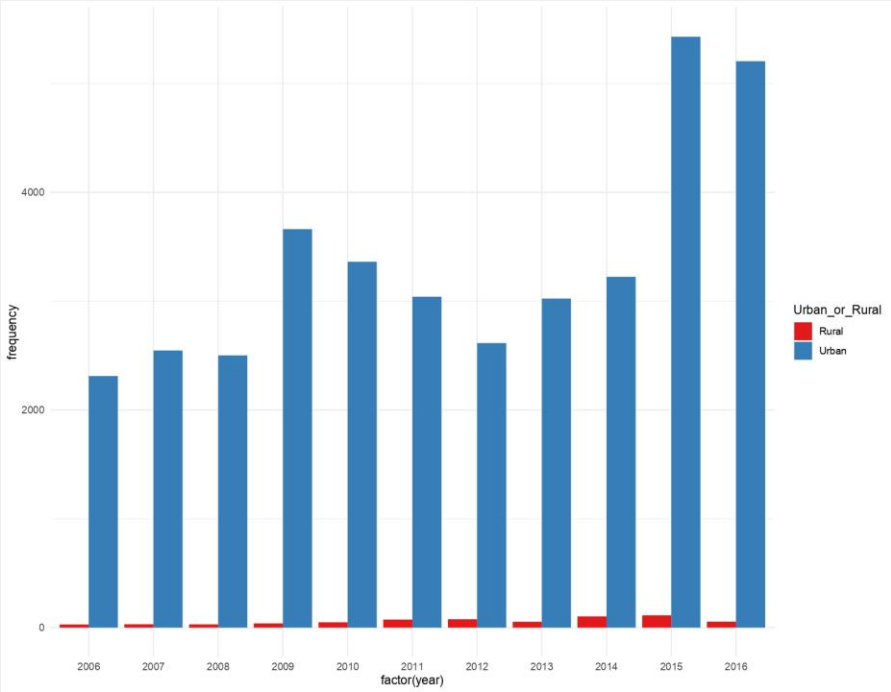
***«Which are the main causes of road accidents & how can the number be reduced? »***

# Birmingham Geographic Area & Accidents Severity

**Accidents severity in Birmingham 2006-2016**



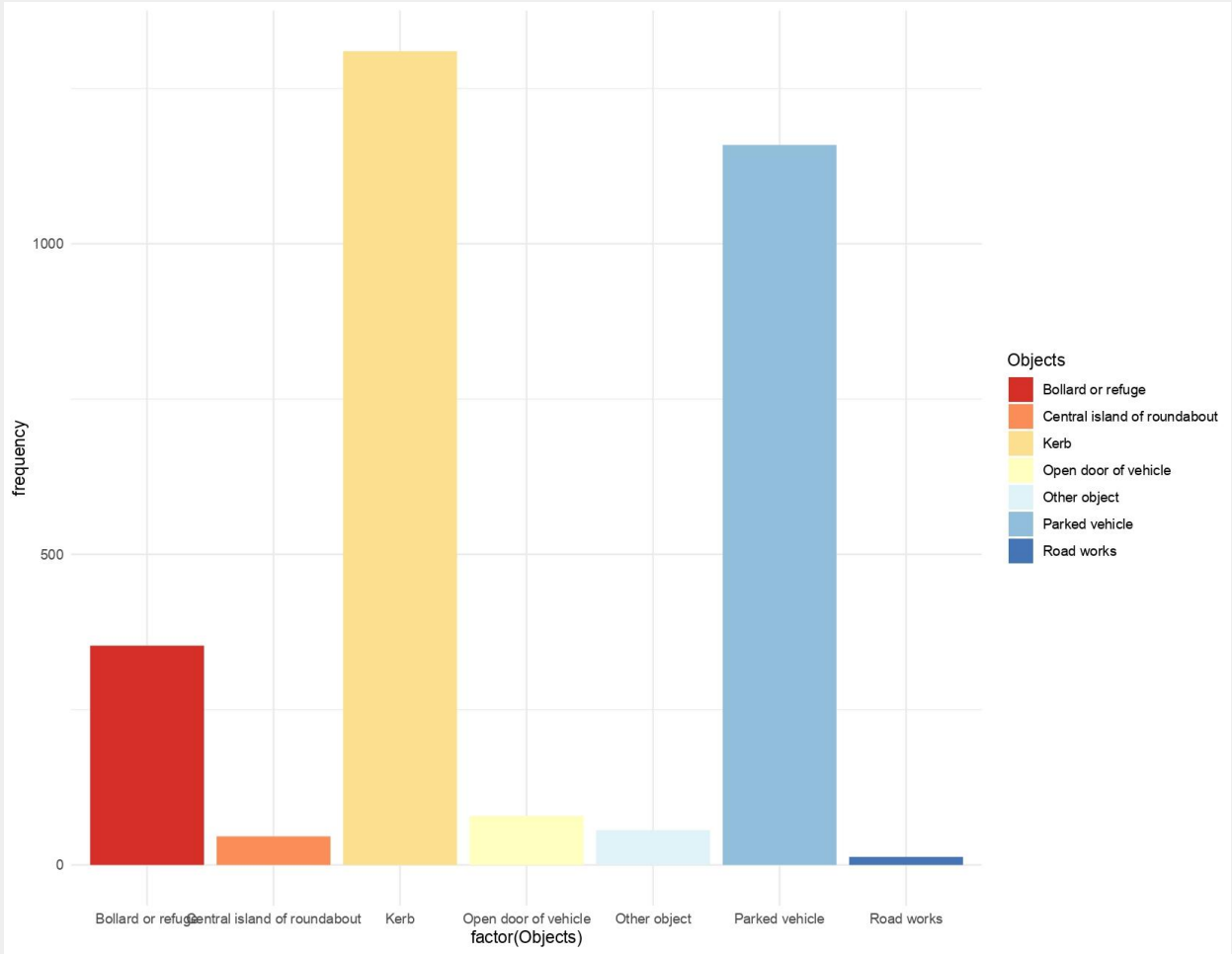

**Accidents in Birmingham Rural vs. Urban areas 2006-2016**



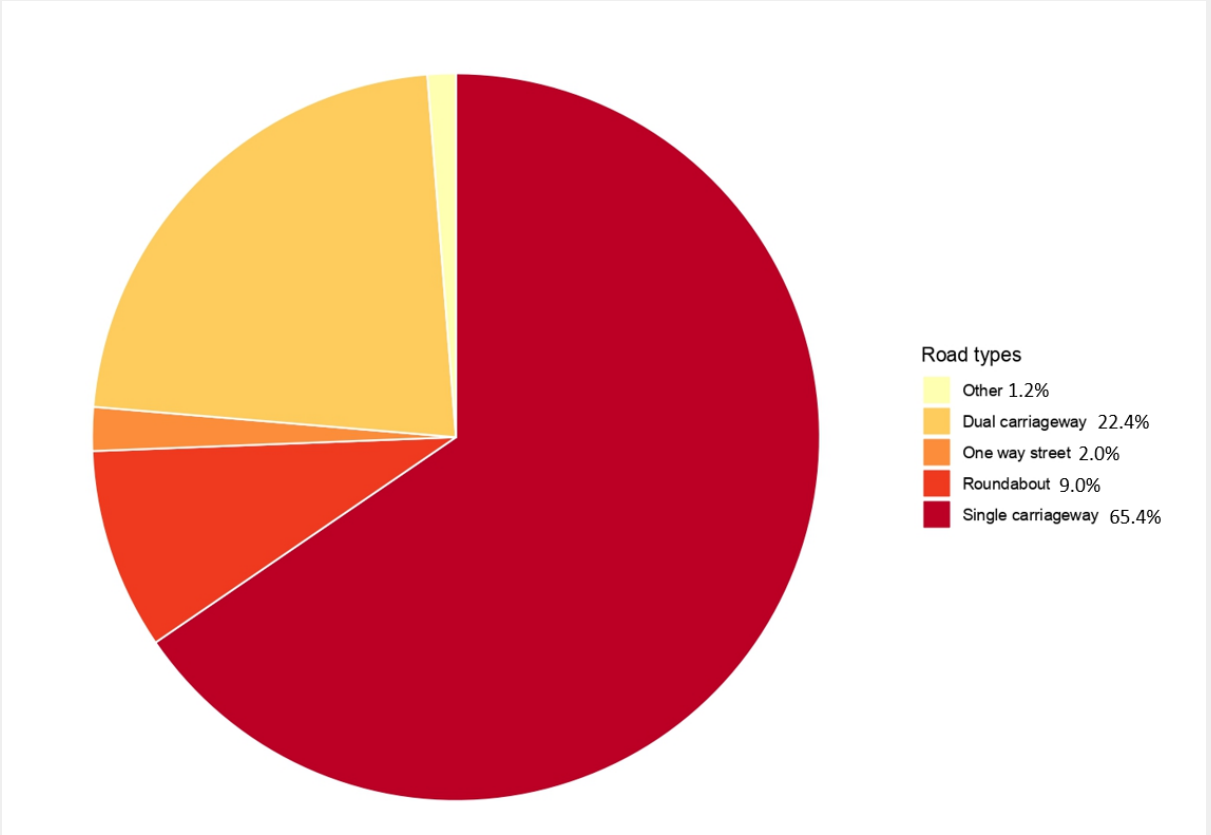

- Number of **Slight** Accidents → 33,051 (88%)
- Number of **Serious** Accidents → 4,214 (11%)
- Number of **Fatal** Accidents → 313 (1%)

# Birmingham Road Conditions

**Objects hit in Car Accidents in 2016**

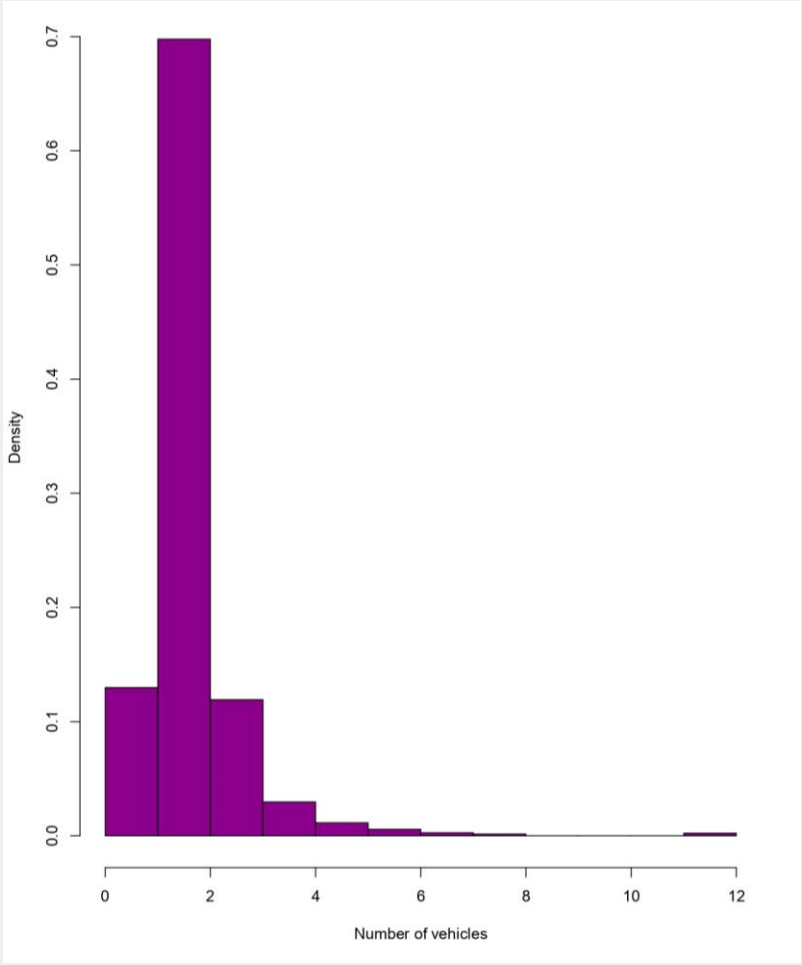



**Accidents in Birmingham in 2016 – Pie chart of road conditions**

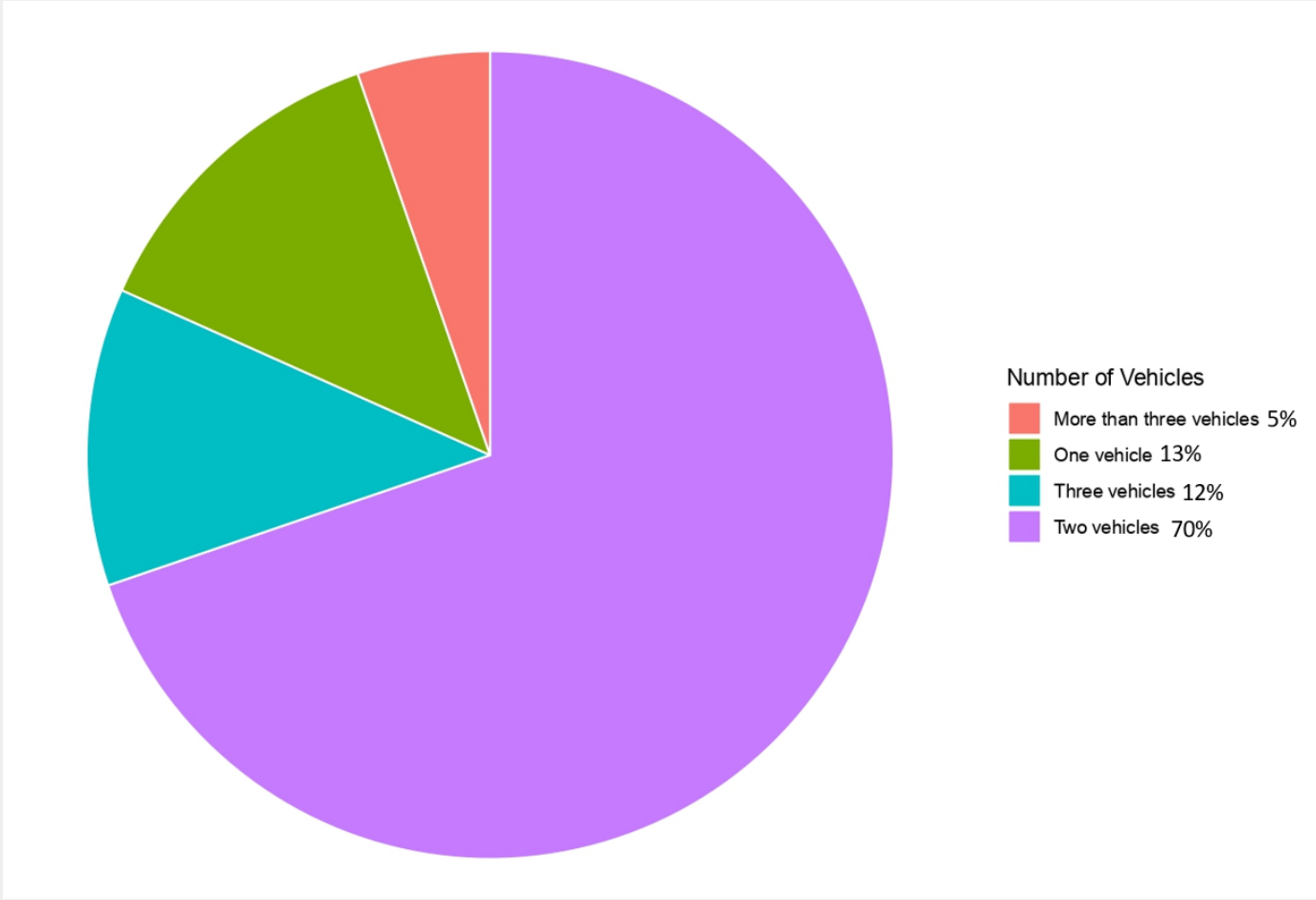


# Birmingham Number of Vehicles Involved

**Accidents in Birmingham in 2016 –
Histogram of number of vehicles involved**

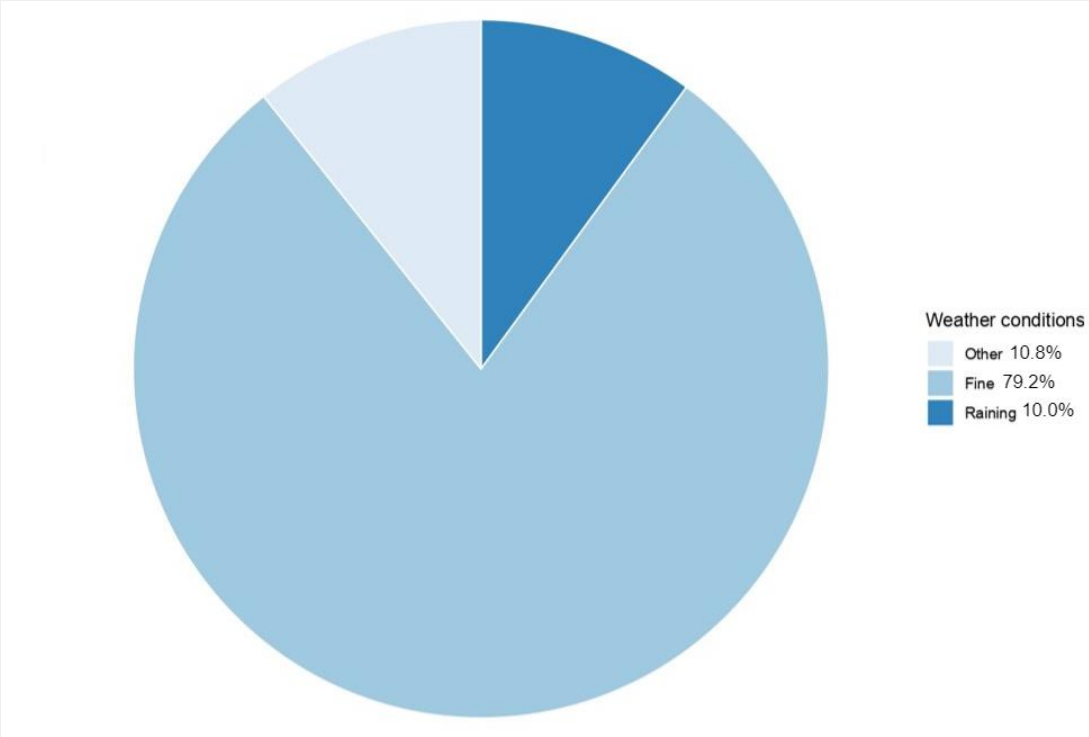



**Accidents in Birmingham in 2016 –
Pie chart of number of vehicles involved (grouped)**

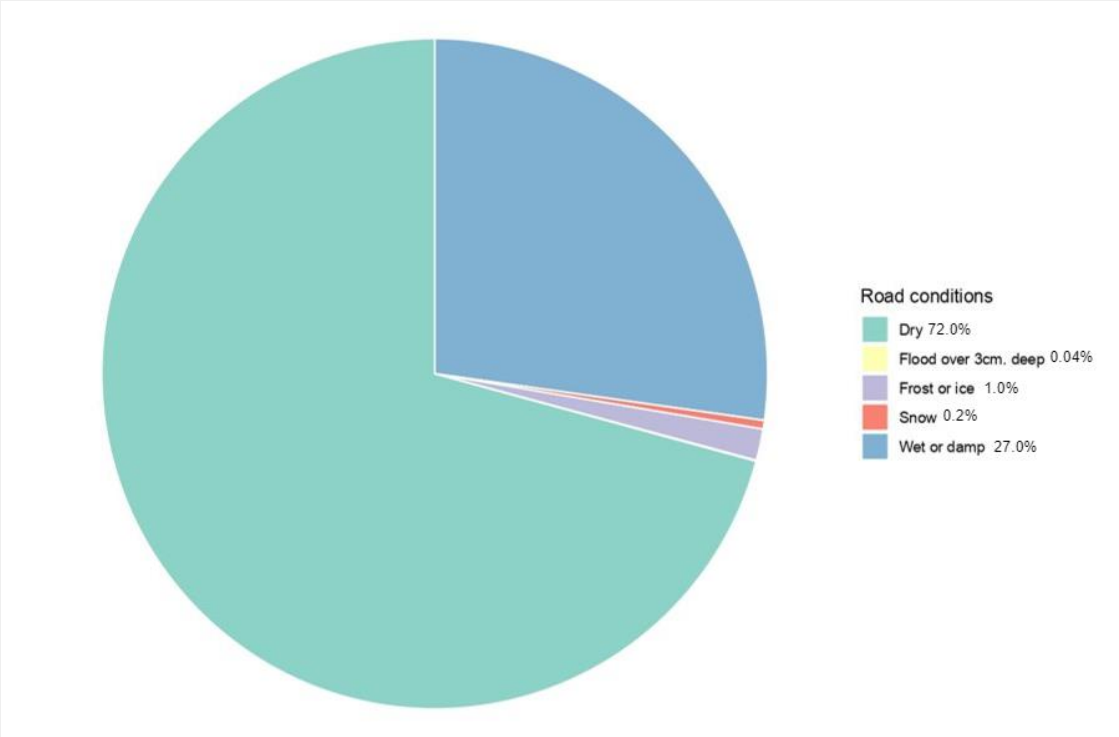


# Birmingham Road and Weather Conditions

**Accidents in Birmingham in 2016 – Pie chart Weather Condition**




**Accidents in Birmingham in 2016 – Pie chart of Road Conditions**




*Note:
- The **wetter season** lasts **8.5 months**, with a greater than ***28%*** chance of a given day being a wet day
- The **drier season** lasts **3.5 months**, and the smallest chance of a wet day is ***22%*** on ***July 13***

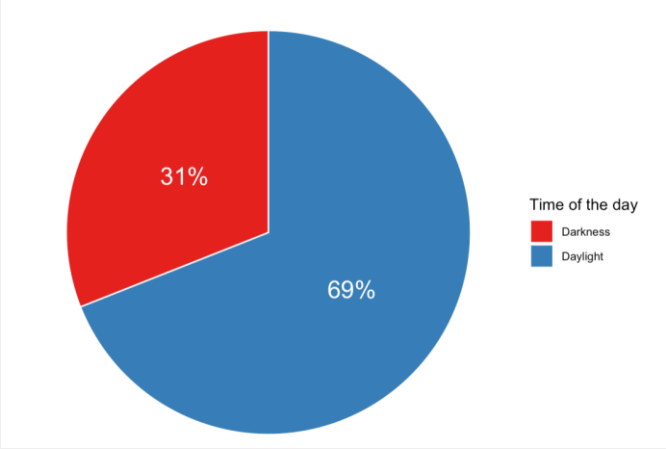
# Accidents behaviour by time

**Heat Map of accidents in Birmingham in 2016 - by Months and Days of the Week**

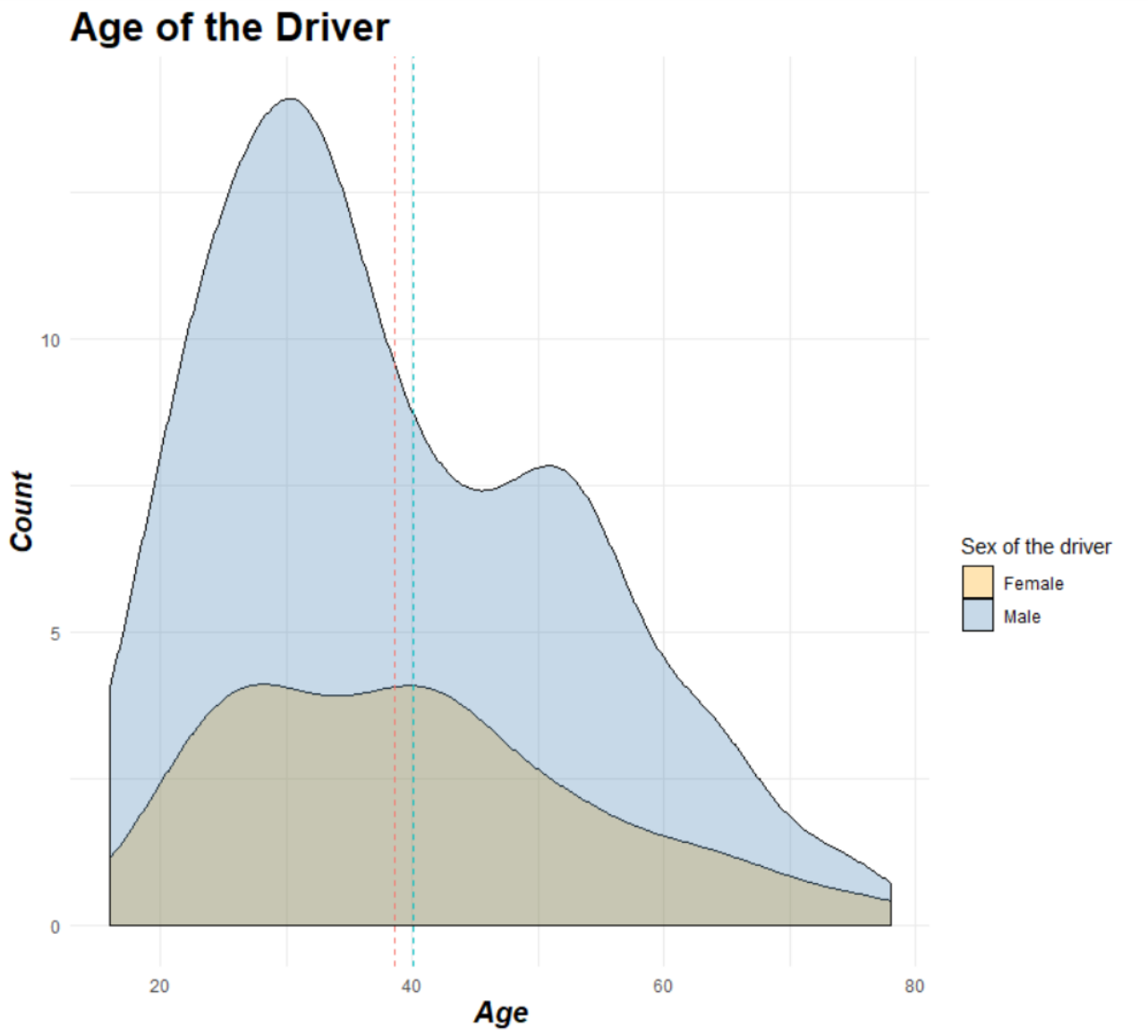
| | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday | Totals |
|---|---|---|---|---|---|---|---|---|
| January | 425 | 448 | 507 | 420 | 478 | 407 | 307 | 2992 |
| February | 417 | 525 | 463 | 456 | 544 | 321 | 302 | 3028 |
| March | 402 | 492 | 527 | 544 | 581 | 377 | 301 | 3224 |
| April | 372 | 403 | 399 | 435 | 463 | 434 | 311 | 2817 |
| May | 514 | 529 | 490 | 417 | 500 | 386 | 335 | 3171 |
| June | 430 | 416 | 553 | 520 | 521 | 408 | 342 | 3190 |
| July | 483 | 476 | 458 | 436 | 569 | 480 | 427 | 3329 |
| August | 389 | 499 | 561 | 448 | 503 | 370 | 323 | 3093 |
| September | 425 | 460 | 405 | 462 | 656 | 461 | 327 | 3196 |
| October | 458 | 469 | 415 | 349 | 454 | 357 | 312 | 2814 |
| November | 402 | 470 | 566 | 516 | 502 | 361 | 247 | 3064 |
| December | 398 | 412 | 420 | 456 | 550 | 408 | 258 | 2902 |
| Totals | 5115 | 5599 | 5764 | 5459 | 6321 | 4770 | 3792 | |

Lower — Higher

**Pie chart of accidents in Birmingham in 2016 - during dark vs. light**



# Drivers' Characteristics




Graph depicts the age **distribution of drivers involved in the accidents**

- Younger drivers engage in a greater number of accidents unsafe traffic safety compared to older drivers

# Conclusions

## ROAD CONDITIONS

Improve road conditions to reduce ‘slippery’

For example: usage of porous concrete that allows rainwater to flow though it

## ONE-WAY

Construct roads to divert traffic from congested area.

For example: Increase the number of one - way roads

## MAINTENANCE

Implement road maintenance by better signaling bollards and kerbs

## CONTROL

From the day-month heatmap, we can suggest to increase response time during rush-days

## REPORTING

Citizens can report odd situations (for example broken, dirty, damaged or dumped streets, and need fixing, cleaning or clearing. Also potholes or streetlights that don't work) by using the *FixMyStreet* app

Note: The weather conditions, road conditions & collision objects provide useful insights for policy makers to understand how accidents happen and provide solutions to limit the cause

# Conclusions

**Our Recommendations:**

- **Develop roads conditions** in order to make them less slippery. For ex: usage of porous concrete that allows rainwater to flow though it
- Construct roads to divert traffic from congested area. For ex: **Increase the number of one - way roads**
- **Implement road maintenance** by better signaling bollards and kerbs
- From the day-month heatmap, we can suggest to **increase response time during rush-days**
- The weather conditions, road conditions & frequency of type of collision objects, these insights are useful for policy makers to understand how accidents happen and provide solutions to limit the cause
- Citizens can **report things** which are broken or dirty or damaged or dumped, and need fixing, cleaning or clearing, potholes or streetlights that don't work in **FixMyStreet** app

# THANK YOU