

An aerial night photograph of London, showing the River Thames winding through the city. The city is illuminated with warm yellow and orange lights, contrasting with the deep blue twilight sky. A major railway line runs diagonally across the right side of the image. The text 'Predicting traffic accidents in London' is overlaid in large white letters on the left side.

Predicting traffic accidents in London

Stefano
Sanchioni

September
2020

PROBLEM



- ❖ Each year about 1.25 million people die in traffic accidents
- ❖ Hard to predict where these will occur, to take necessary action (e.g. avoiding these routes in routing software or for driverless cars)
- ❖ Also relevant for insurance companies and government

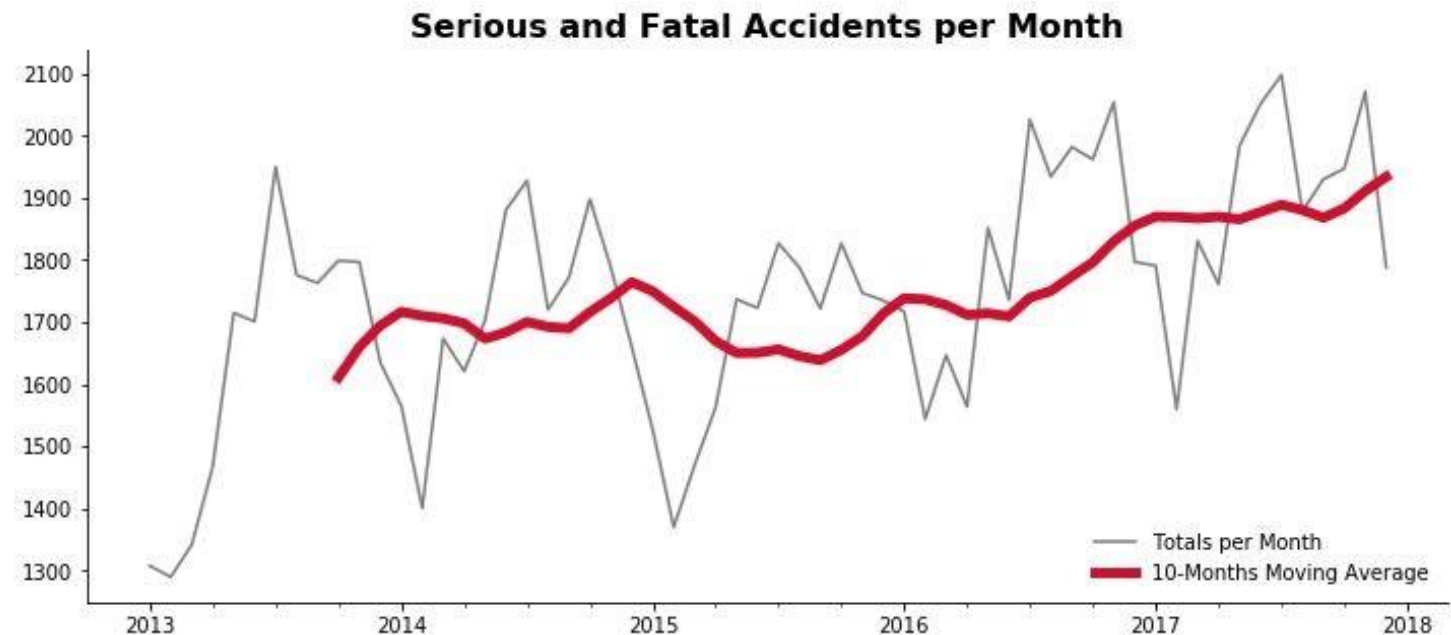
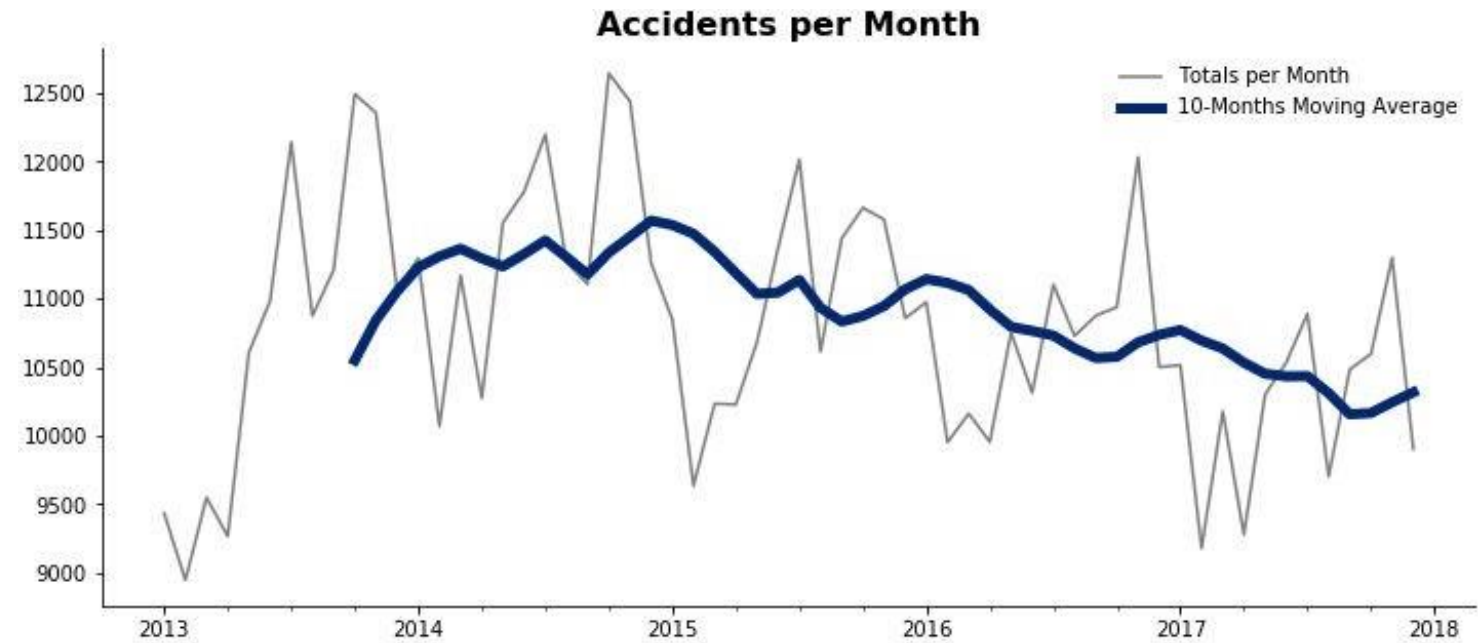
THE SOLUTION

Using satellite imagery combined with traffic accident and local area data to predict the location of traffic accidents



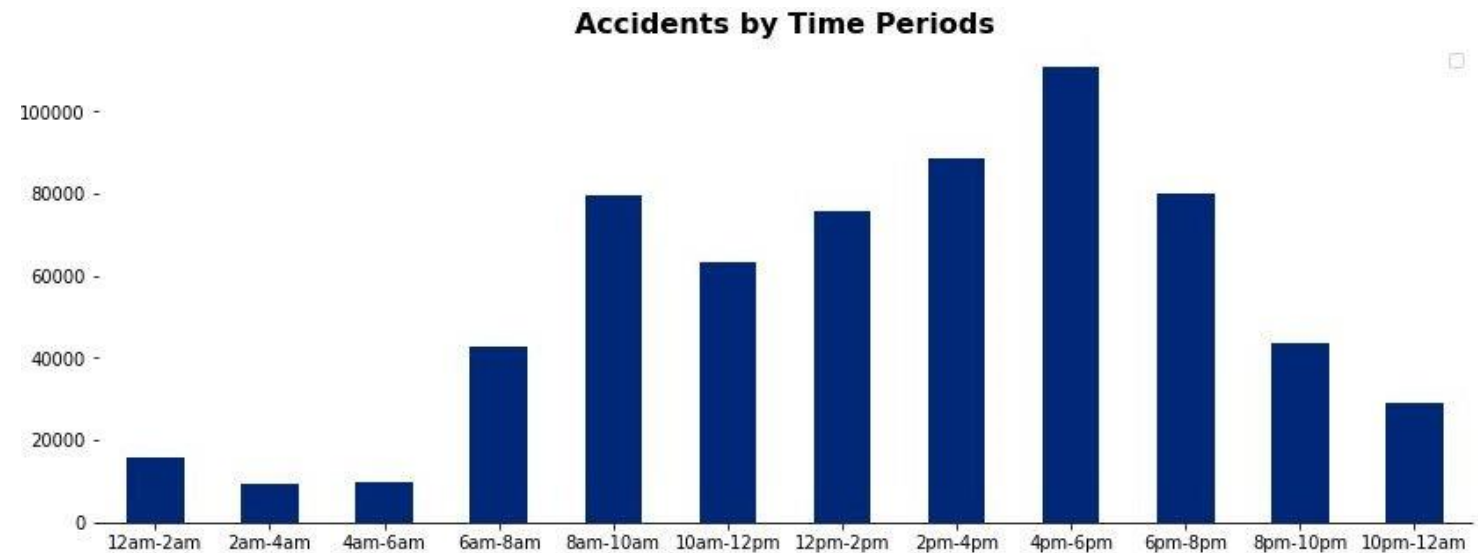
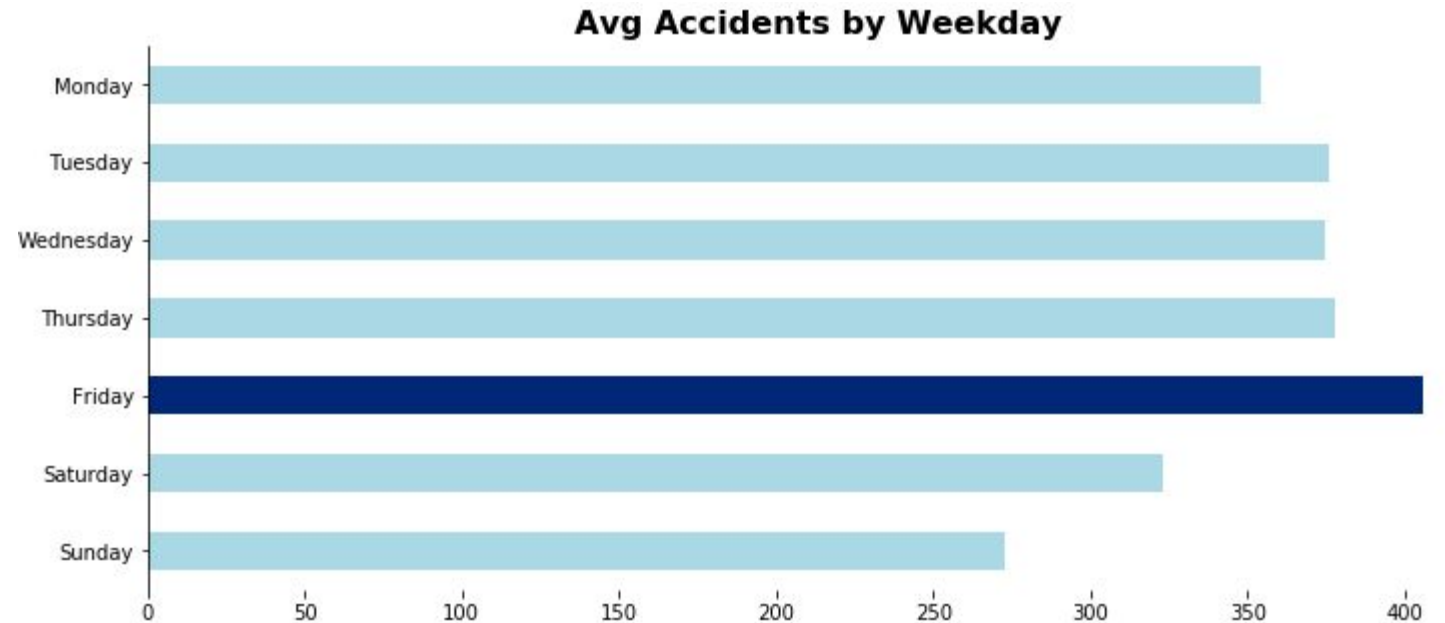
Accident trends

- ❖ Month: November & July
- ❖ Day: Friday
- ❖ Time: 4PM-6PM
- ❖ Age: 26-35 years old



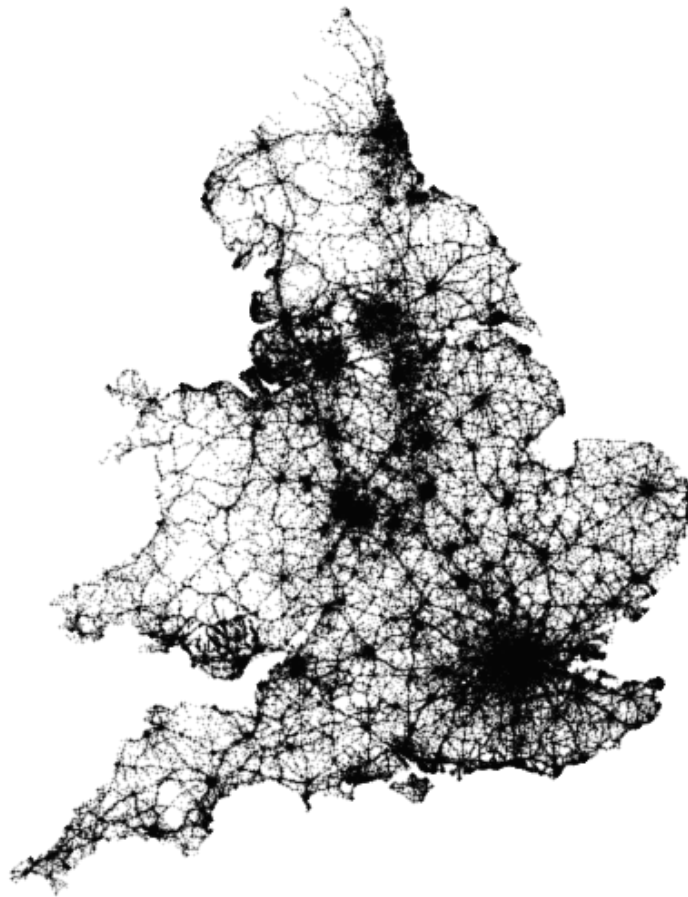
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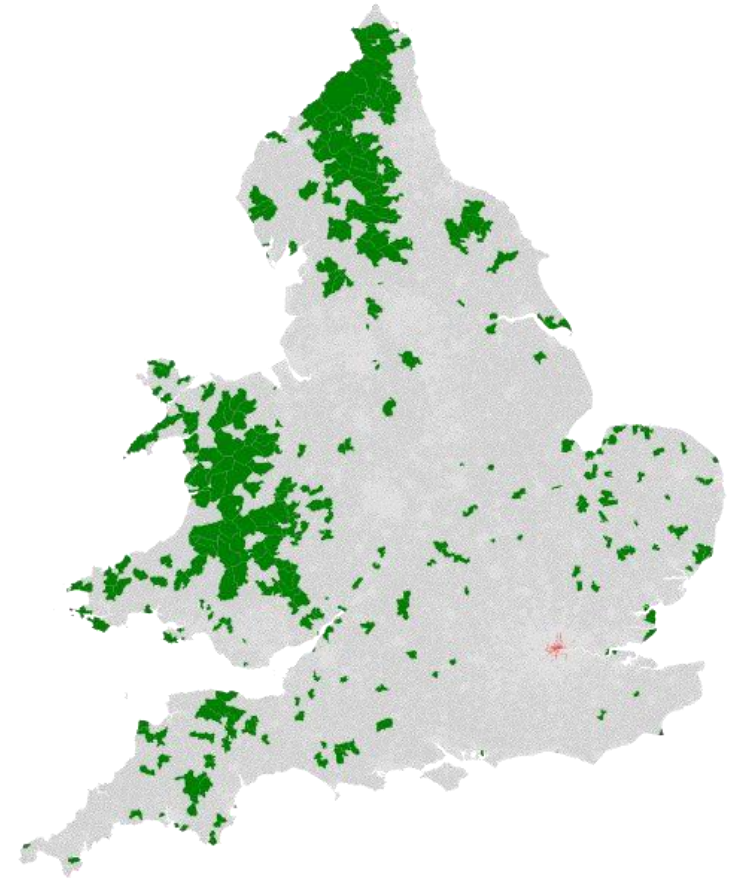


Accident hot-spots

Road traffic accidents in England and Wales, 2013-2017



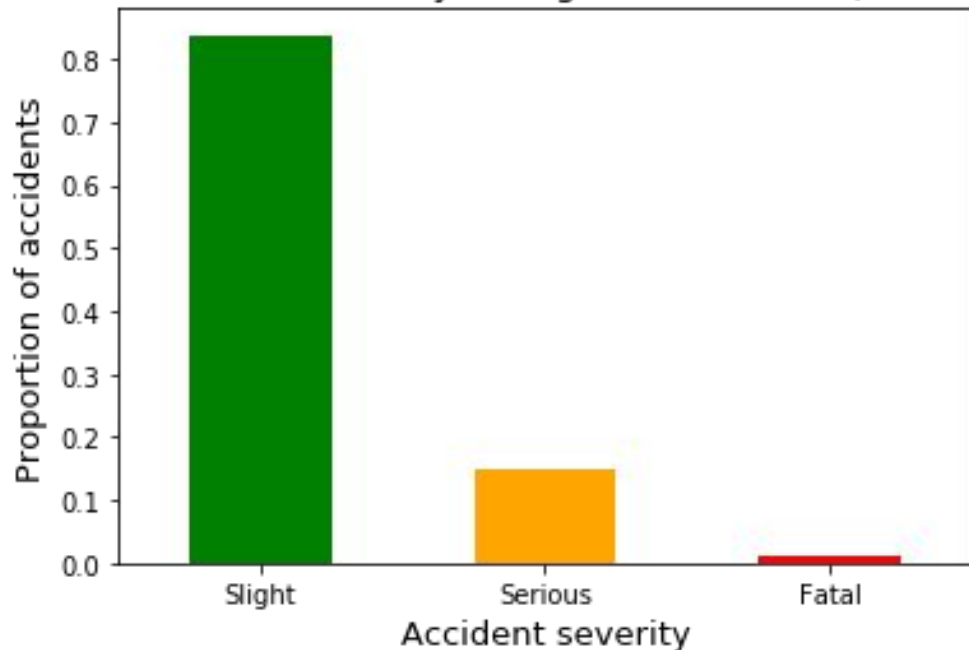
LSOAs in England and Wales with the highest (red) and lowest (green) density of traffic accidents 2013-2017



- ❖ Big cities have the most traffic accidents
- ❖ London contains 95% of the 300 worst areas of traffic accident density

Accident severity

Traffic accident severity in England and Wales, 2013-2017



Fatal accidents are more likely to be:

- ❖ On larger roads with higher speed limits
- ❖ On straight sections of road (not junctions)
- ❖ At night
- ❖ In rural areas

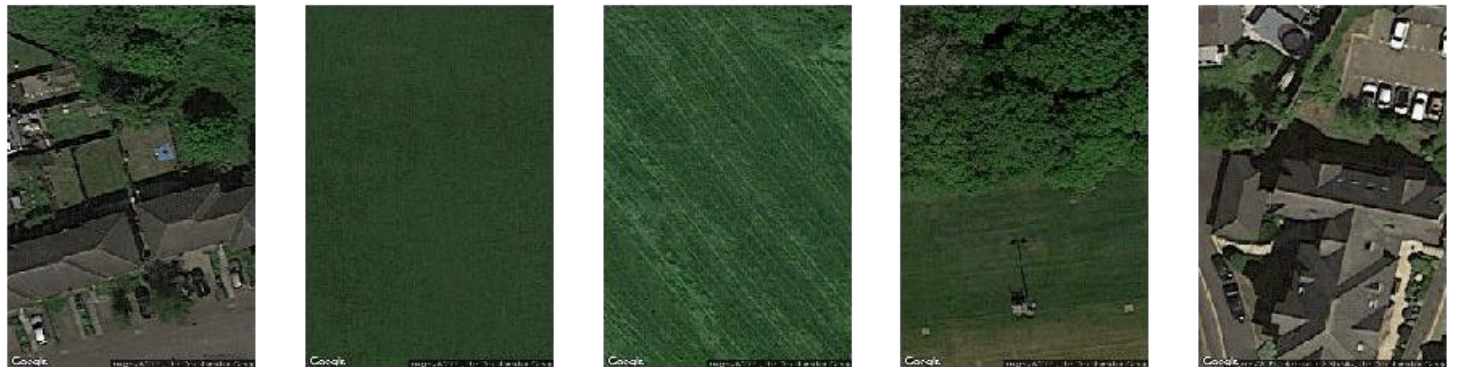
Methodology

- ❖ Three models - only satellite images, only other data, and combined
- ❖ Combined model performed the best (80% accuracy), with opportunities for further improvement

Examples of traffic accident areas



Examples of areas without traffic accidents



Predicting the location of traffic accidents

- ❖ Predicting locations of serious or fatal accidents
- ❖ Able to predict the worst locations for traffic accidents with 82% accuracy

safe



Rural

fatal/serious



safe

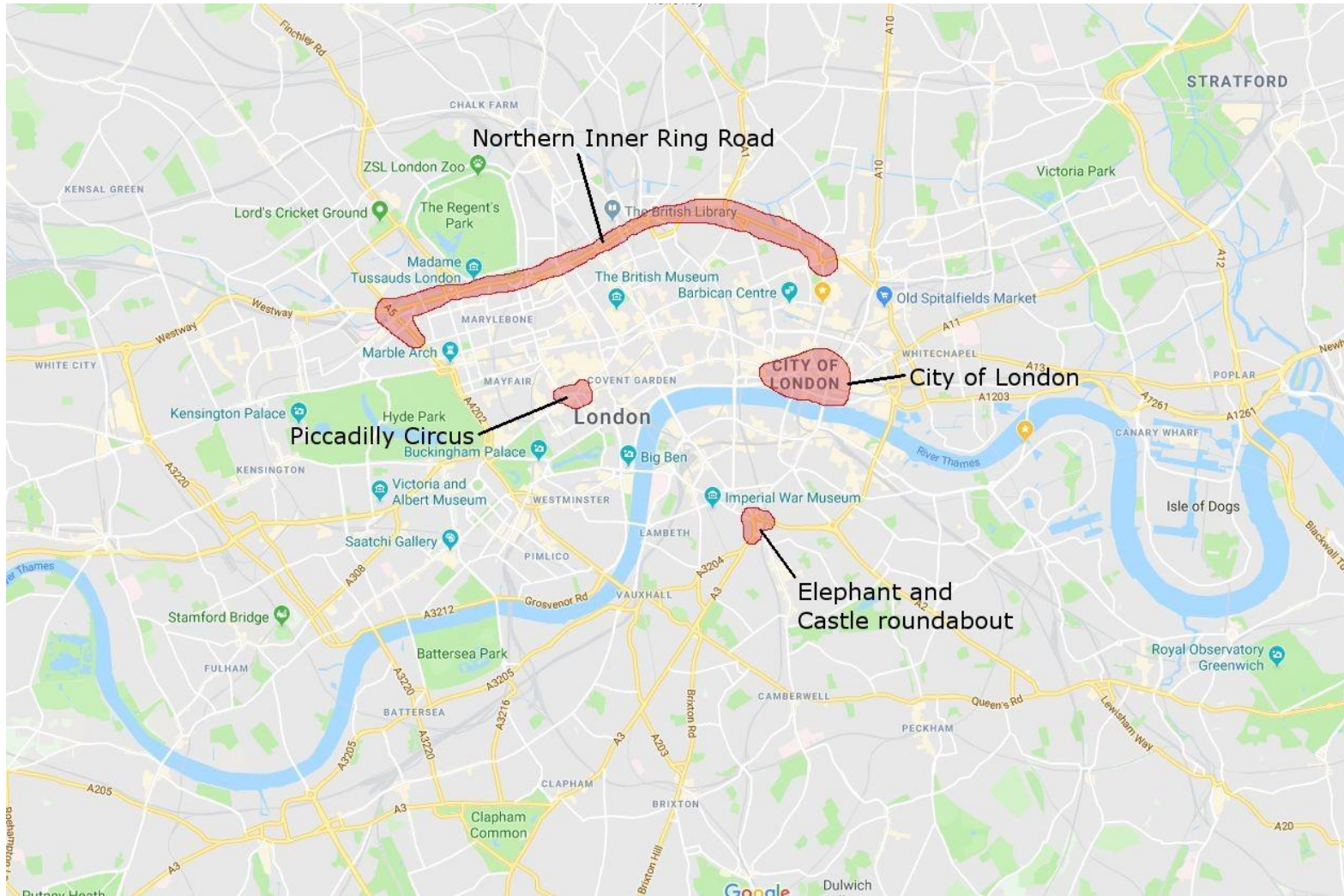


Urban

fatal/serious



Rural and urban danger zones



Conclusions & future work

- ❖ Being able to predict the location of road traffic accidents could have many beneficial uses
- ❖ Promising results from combining satellite images and other data
- ❖ Future work could include:
 - Expanding to other cities and countries
 - Adding other data sources
 - Adding more images to learn from