Predicting traffic accidents in London

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PROBLEM

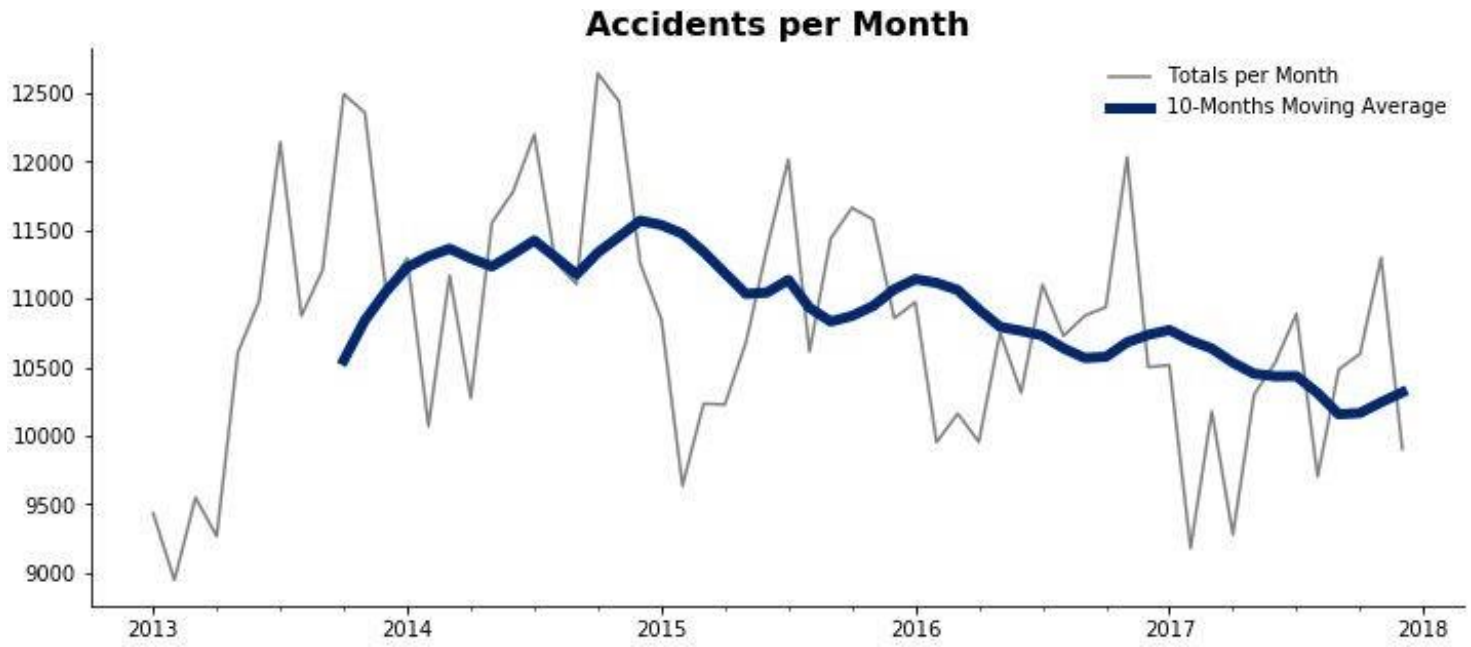
- Each year about 1.25 million people die in traffic accidents
- Hard to predict where these will occur, to take necessary action (e.g. avoiding these routes in routing software or for driverless cars)
- Also relevant for insurance companies and government

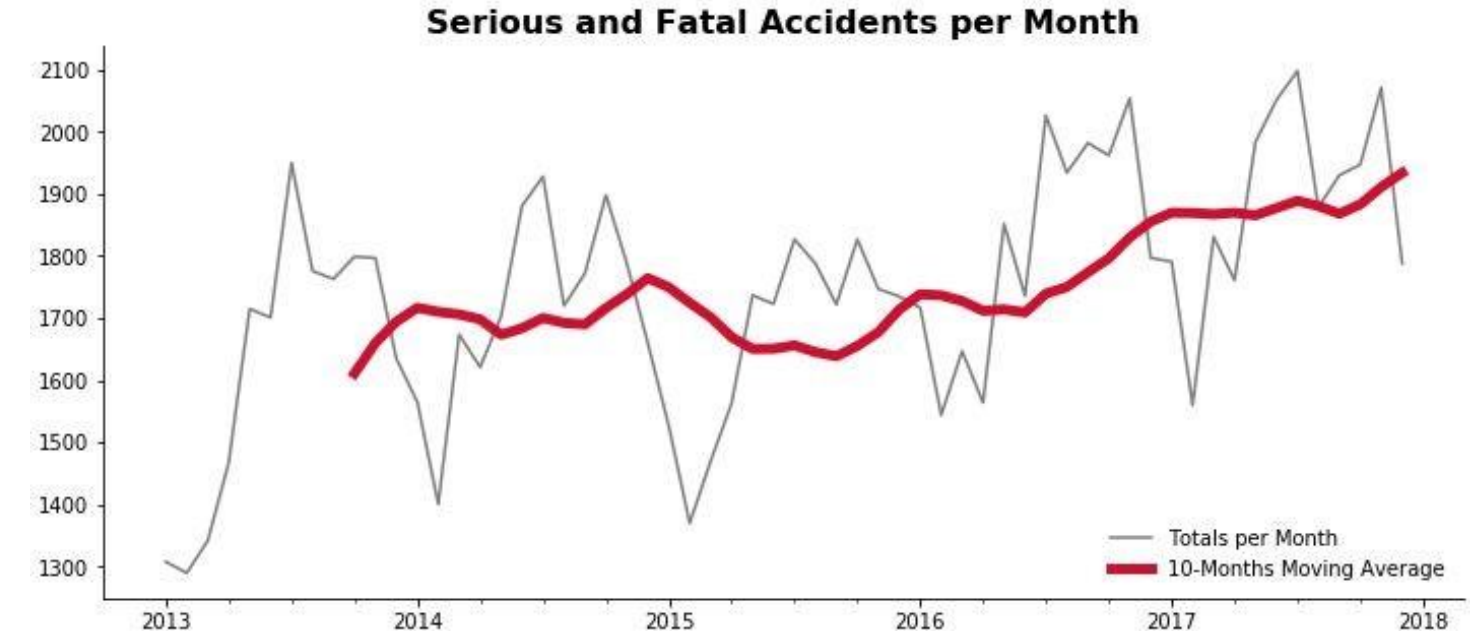
THE SOLUTION

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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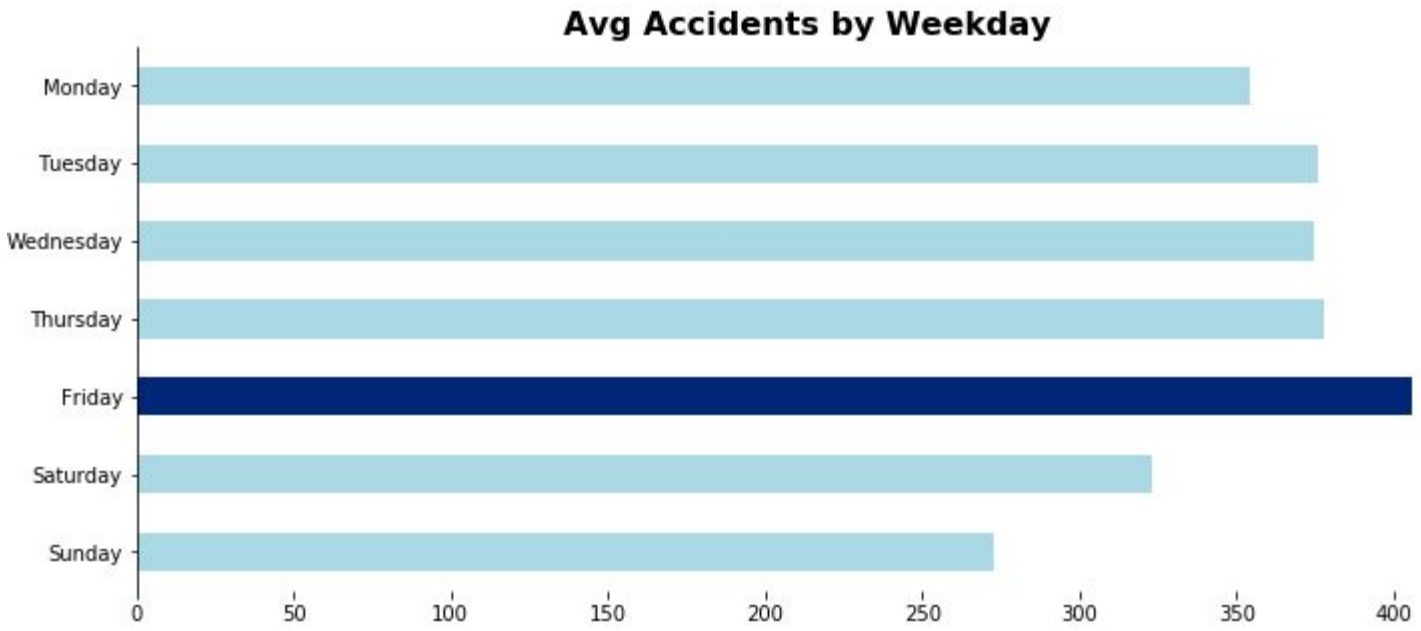
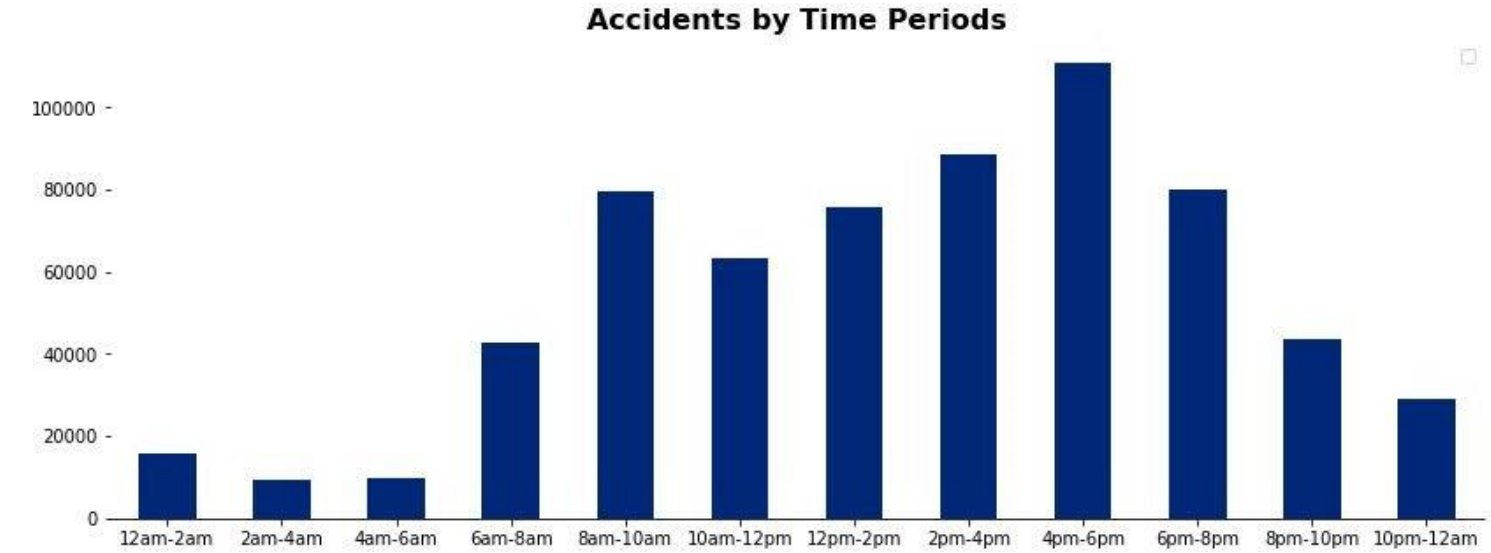
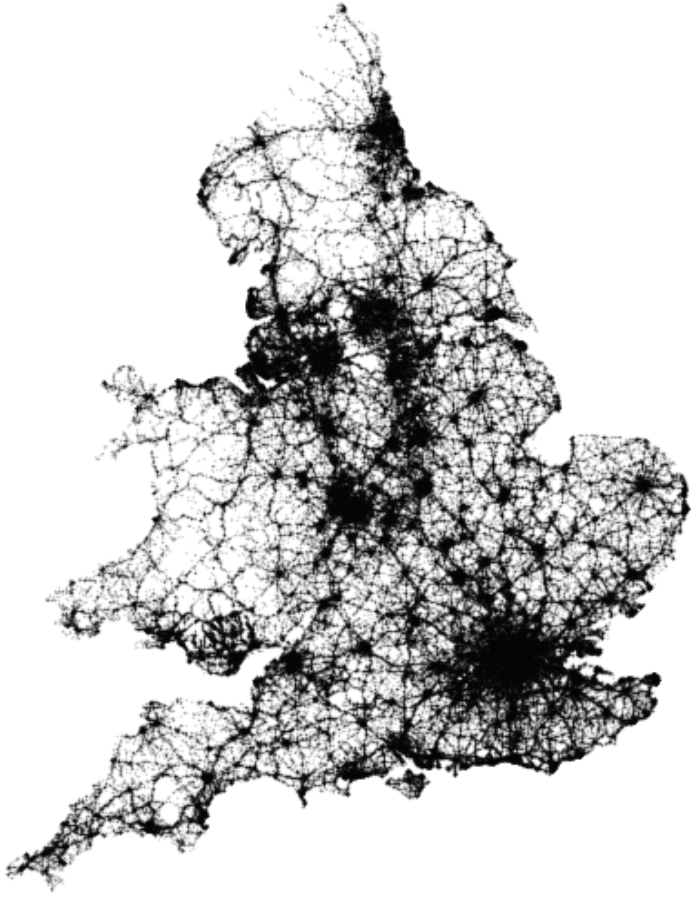




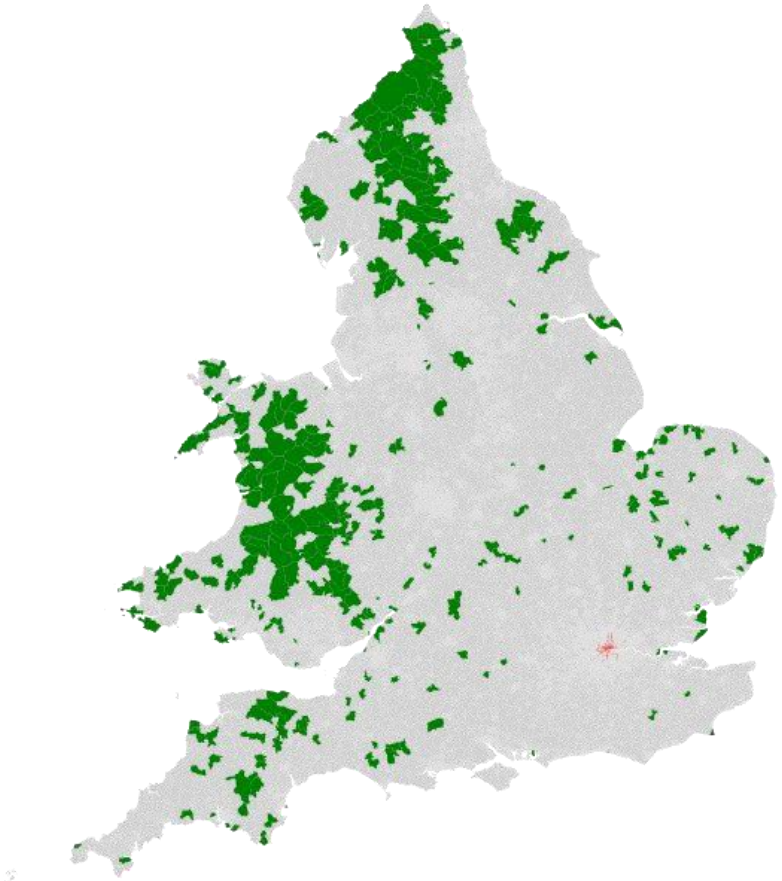
Accident hot-spots

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

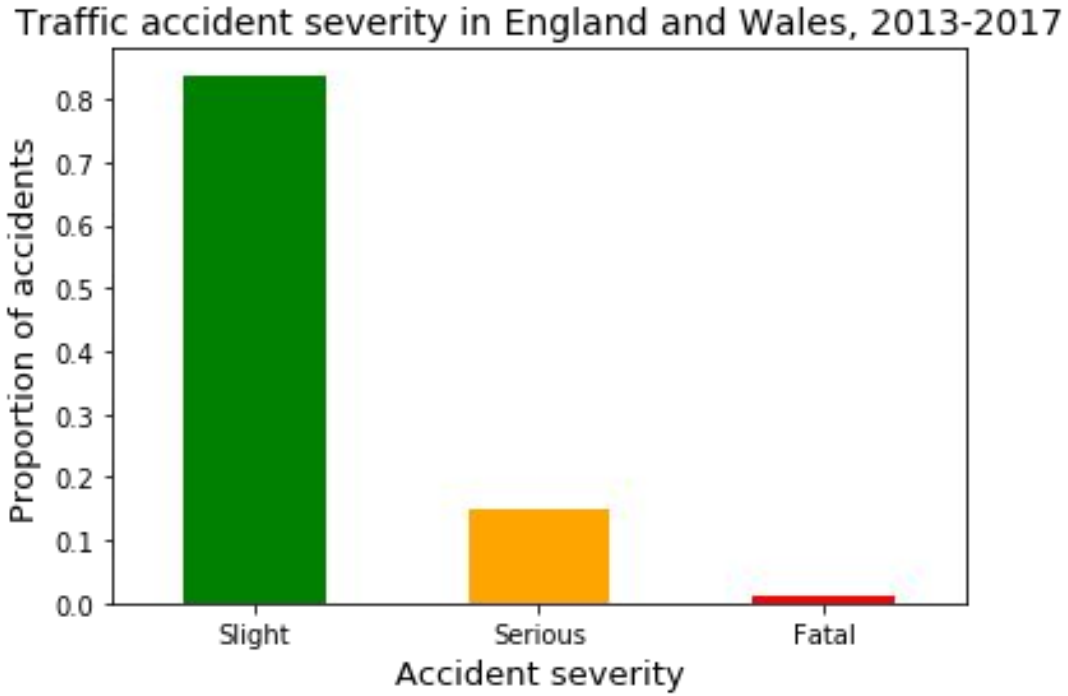
Road traffic accidents in England and Wales, 2013-2017



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



Accident severity



Fatal accidents are more likely to be:

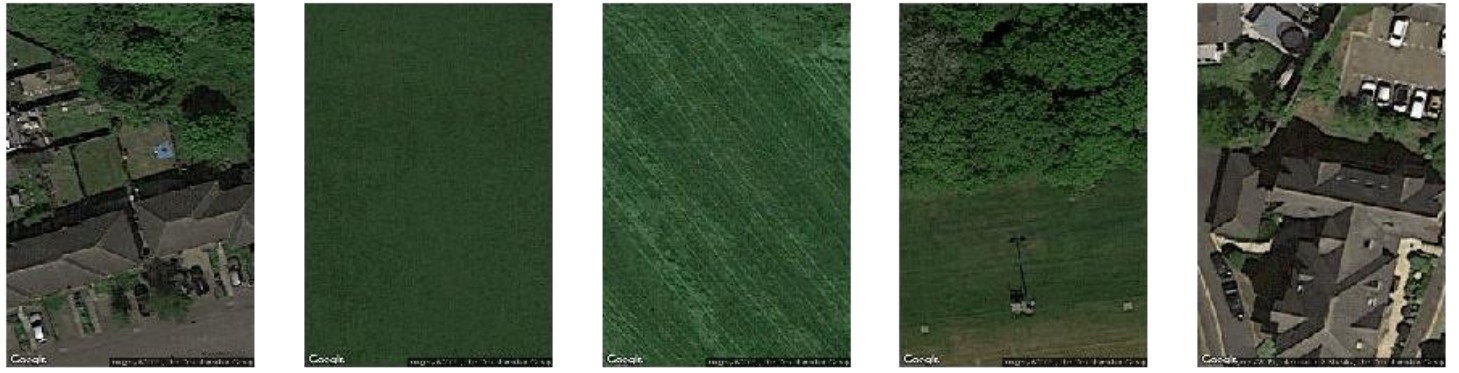
- On larger roads with higher speed limits
- On straight sections of road (not junctions)
- At night
- In rural areas

Methodology

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

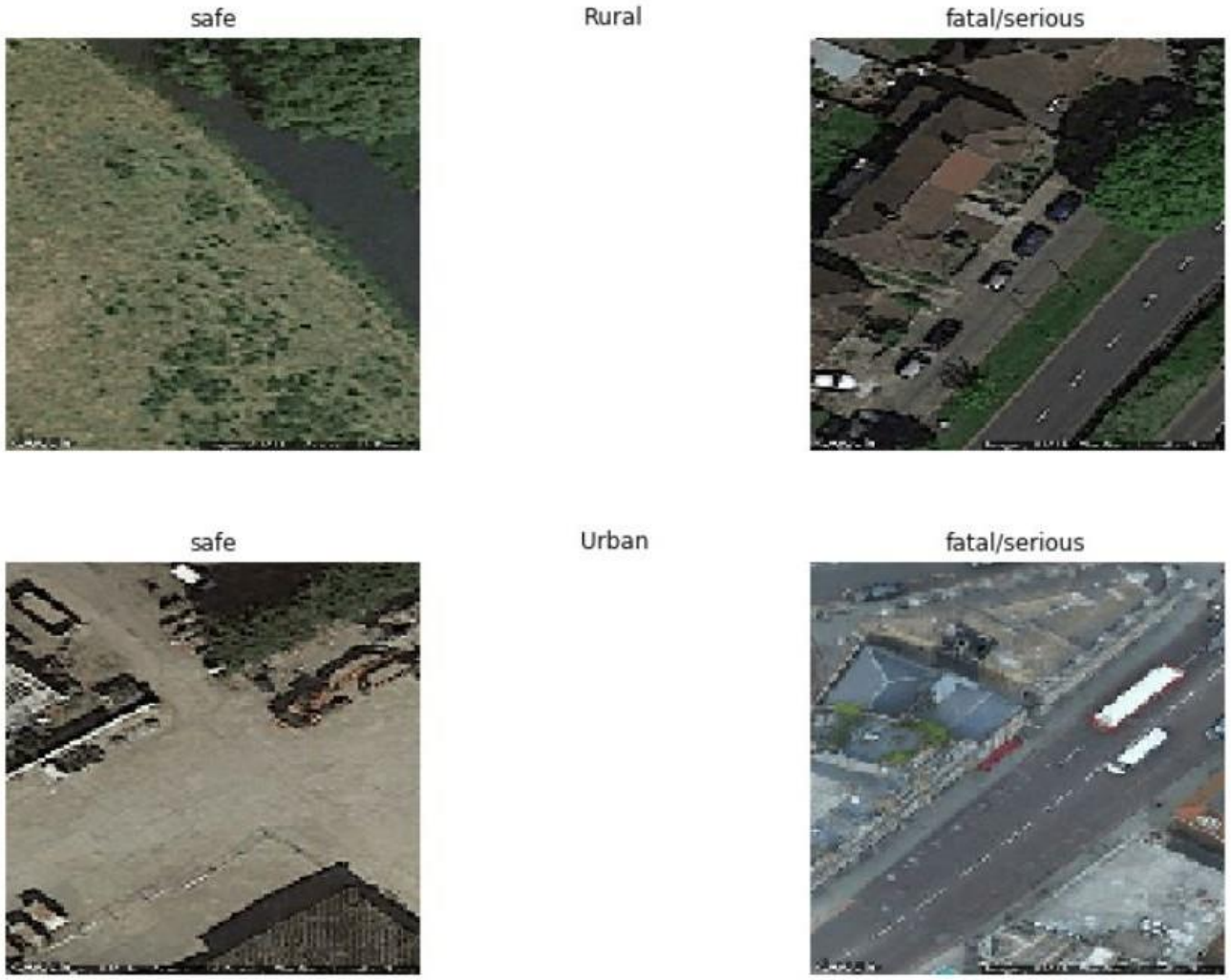
Examples of traffic accident areas

Examples of areas without traffic accidents

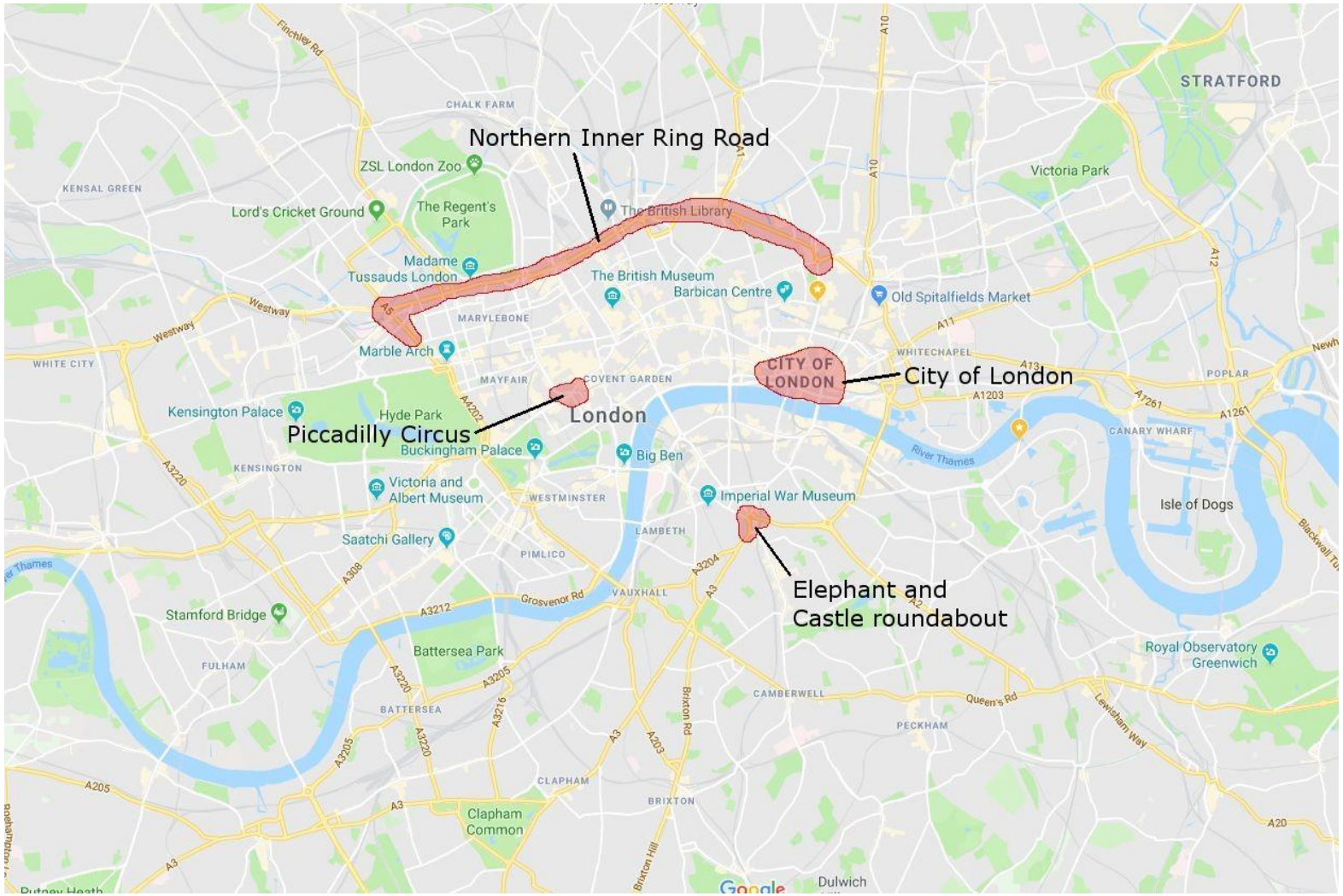


Predicting the location of traffic accidents

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



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