

We started our analysis looking at how the different types of junctions affected the number of car accidents that took place. Using the bar graphs created with Junction Type and Junction Detail, you can see that the majority of car accidents take place where there is no junction (some kind of highway) and at T-intersections. Because of the drastic difference in car accidents at these types of junctions compared to others, we decided to look deeper. Next we did a t-test to compare the number of casualties at T-intersections compared to Roundabouts. The t-test gave a p-value of  $7.8e-11$  which is much smaller than our level of significance 0.05. This means there is significant evidence to prove that accidents that occur at T-intersections have a higher number of casualties than accidents that occur in roundabouts, not to mention that there are three times more accidents as well. With this being said one possible solution to make the roads safer for drivers would be to turn some of the T-intersections into roundabouts.

For our analysis of whether or not geographic location, along with road type, impacts the number of accidents that occur we used a series of bar graphs and histograms to depict the differences between the two areas. A bar graph was used to show the overall number of casualties that occurred between urban and rural areas with the difference being 86,187 fewer casualties in the rural area. A histogram was used to show the different road types and how many accidents occurred between the two locations with the data indicating that single carriageways had the most number of accidents in both locations. Interestingly, slip road accidents were more common in rural areas than in urban areas and there were also an almost even amount of dual carriageway accidents between urban and rural areas. A Geoapify API was used to give a visualization of the Kensington and Chelsea area and the different road type accidents that occurred.

Based on the data analysis performed between the urban and rural areas it can be determined that more improvement needs to be made to single carriageway roads. Urban areas were expected to have a higher number of accidents as they are usually more populated giving

way to more cars being on the road. A number of solutions to reduce the amount of accidents that occur in these urban areas might include promoting public transport, carpooling, improving traffic light optimization, or eliminating street parking to name a few.

We began our analysis by trying to determine what is the most dangerous speed limit that had the most accidents on a road. After finding this data we were able to see that 30 MPH and 60 MPH zones were the most dangerous for drivers. This outcome was very peculiar because you would think a 30 MPH zone is relatively safe. So we decided to focus on the road type and see if there was a correlation between the high number of accidents and the 30 MPH speed limit. From here we filtered the data to see the number of accidents on a road type in a 30 MPH zone and it showed that single carriageways were clearly the most dangerous and had far more accidents than the other roads. We also decided to do the same thing for 60 MPH roads and it was the same outcome. 60 MPH zones also had many accidents on single carriageways and far more than the other roads. We also ran a T-test to compare single carriageways to dual carriageways in a 30MPH zone. Our results gave us a P value of  $1.3866744692368699e-15$ , this result shows that the data has a statistical significance that dual carriageways are safer than single carriageways. So based on the data we can determine that speed limit does not have a factor in crashes but the road type does and the only way to mitigate the number of accidents on a road is to turn single carriageways into dual carriageway roads. By updating single carriageways we can decrease the number of accidents significantly.