CAR ACCIDENT SEVERITY

INTRODUCTION

Road accidents are fatal all over the world. Not only do they claim lives, they also leave serious injuries behind or may be an unforgettable scar. These accidents are increasing year by year claiming more lives than ever and leaving so many wounded or paralysed.

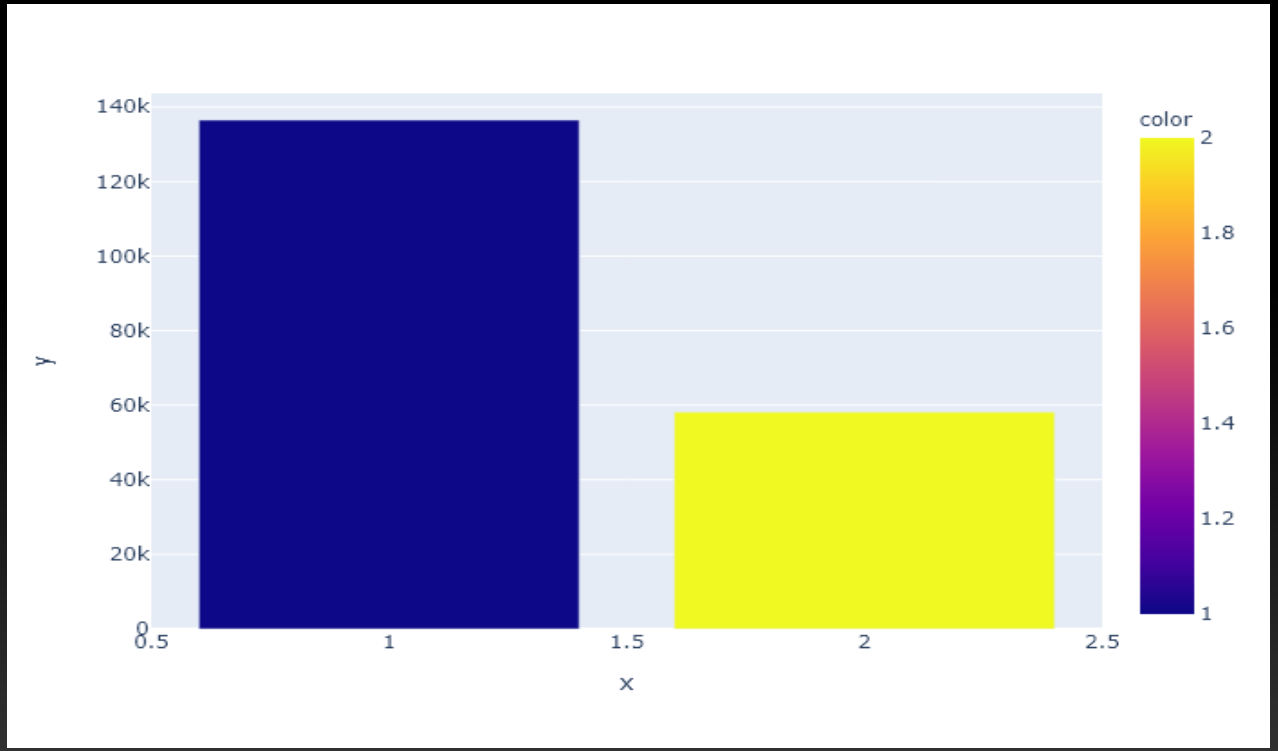
My project works on various Machine Learning Algorithms to predict and thereby avoid/reduce future accidents.

Again, this is just a humble attempt to try and figure out measures to make commute safer especially in rough environmental and road conditions.

SEVERITY COUNT OF LEVEL 1 & LEVEL 2

As the level of severity increases, chances of casualty also increases. The figure shows the count of each severity.

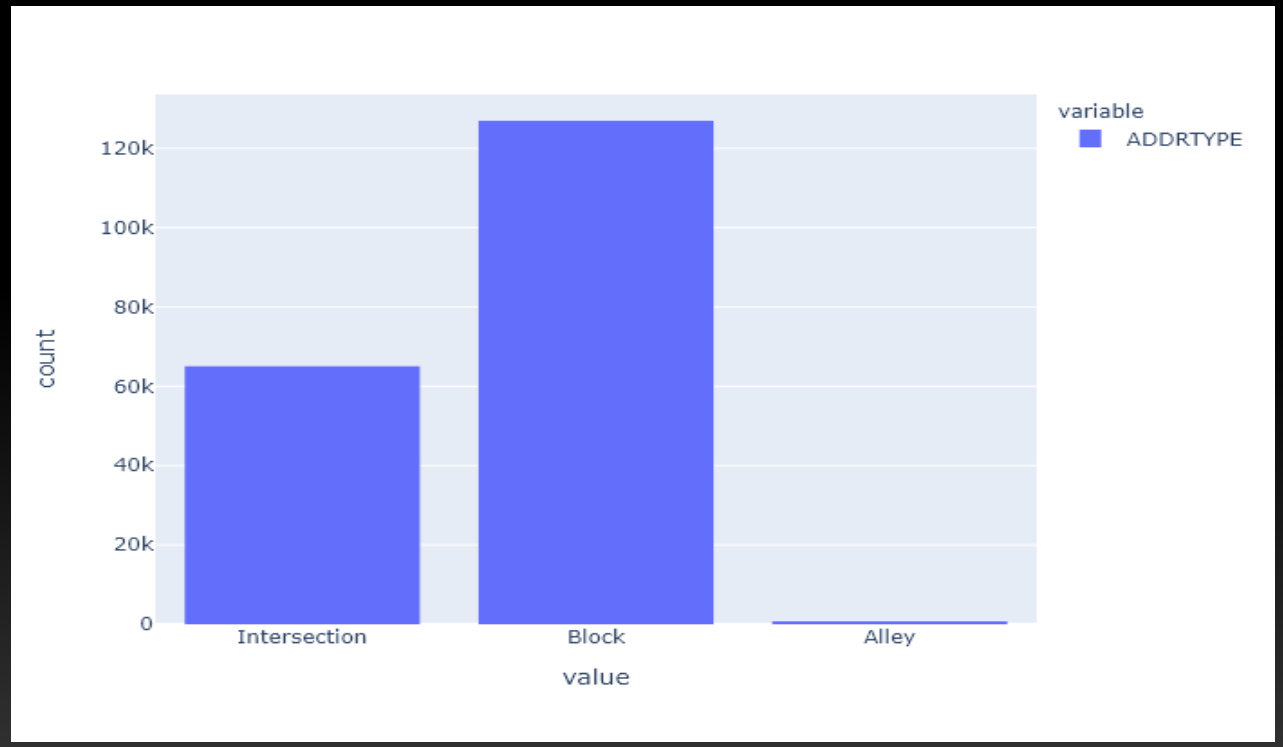
From the figure, it can be concluded that most of the accidents have occurred with a severity level of 1.



ACCIDENT LOCATION COUNT

This will help us figure location(s) are a hotspot for accidents.

From the figure, it can be concluded that most of the accidents occur at blocks followed by intersections. This is because people on these roads must be in a rush and are driving so fast that they fail to notice another vehicle coming right at them.

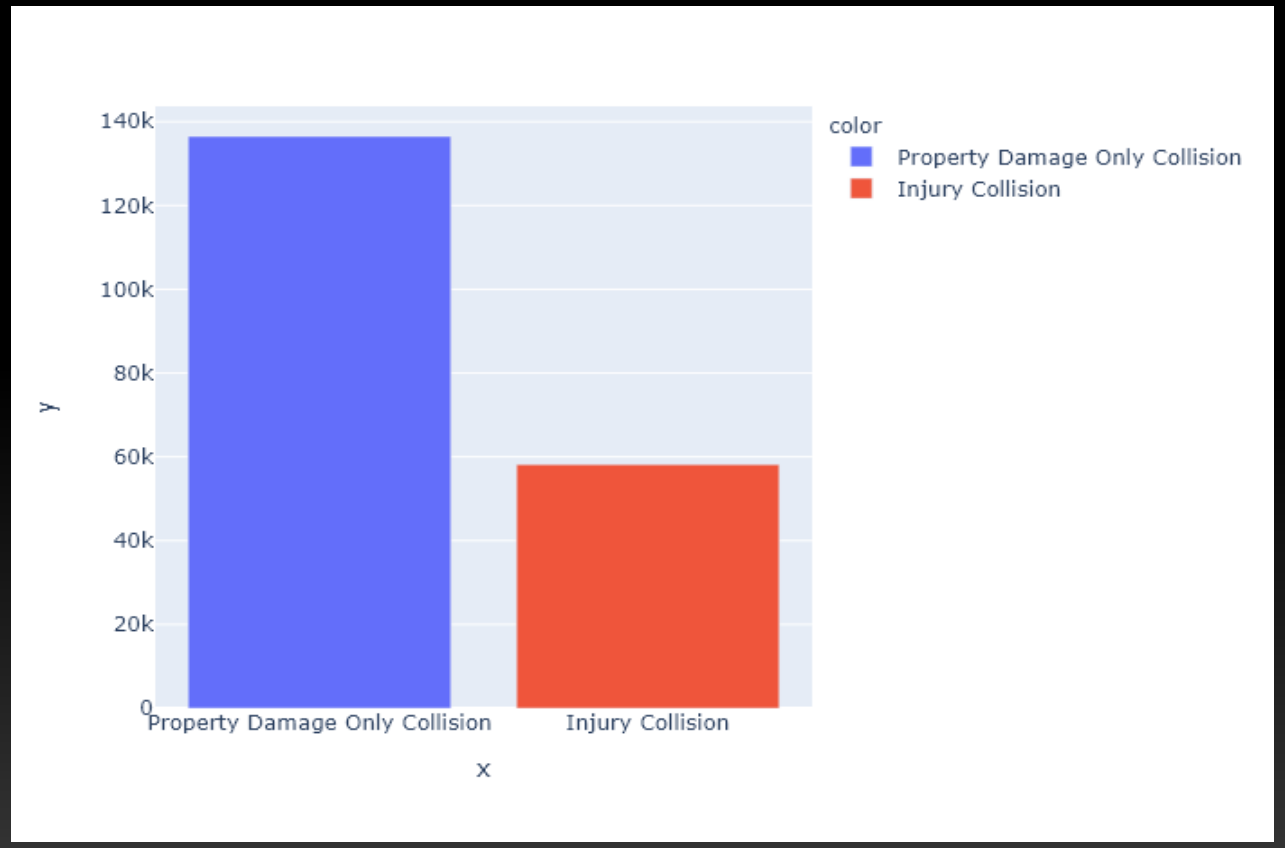


COUNT OF EVERY ACCIDENT DESCRIPTION

Counting each accident description may reveal a hidden pattern. This will let us know if certain type of accidents occurs more than other types.

According to the visualization, property damage due to accidents is more compared to injuries.

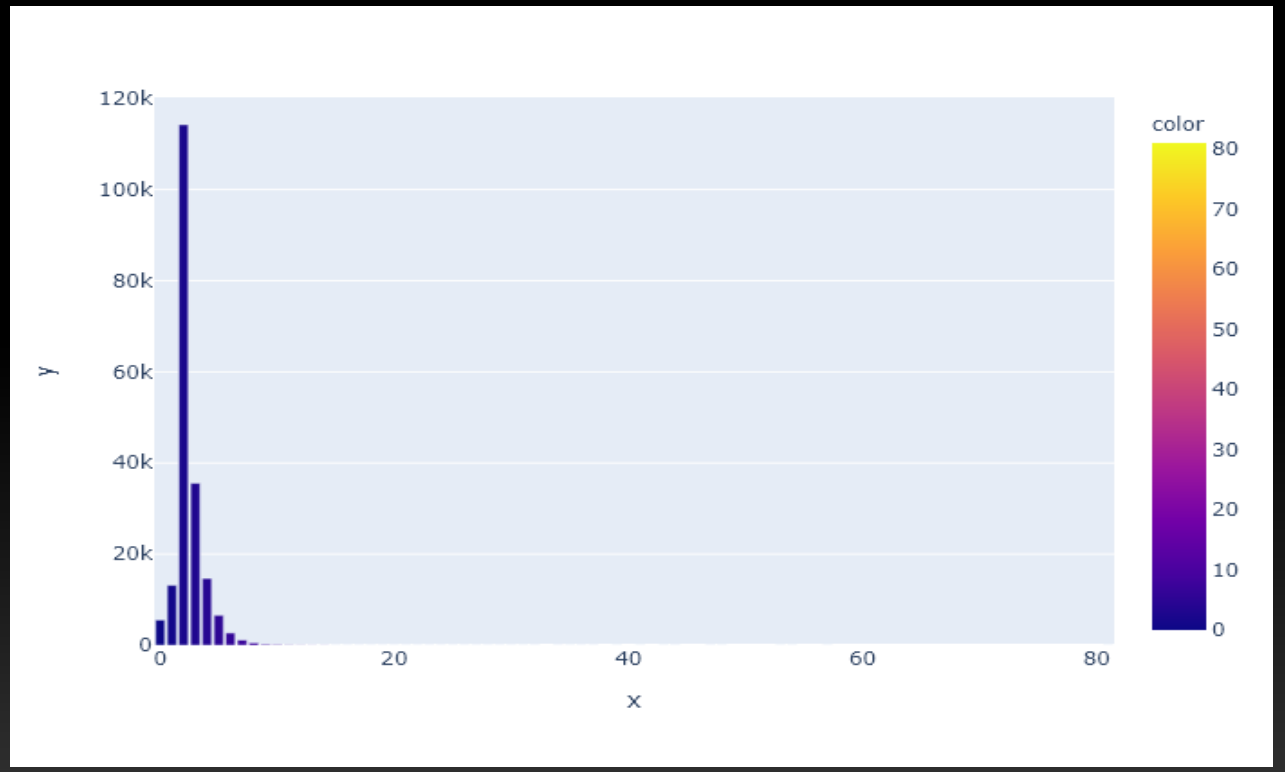
So, this looks like only single vehicles were involved in accidents where they crashed with any property on the road (water pumps, traffic lights, shops or buildings).



NUMBER OF PEOPLE

Now let us see what number of people get involved in a single accident and which is the highest in them. This will let us know if the accidents involved only had a driver or many others with them.

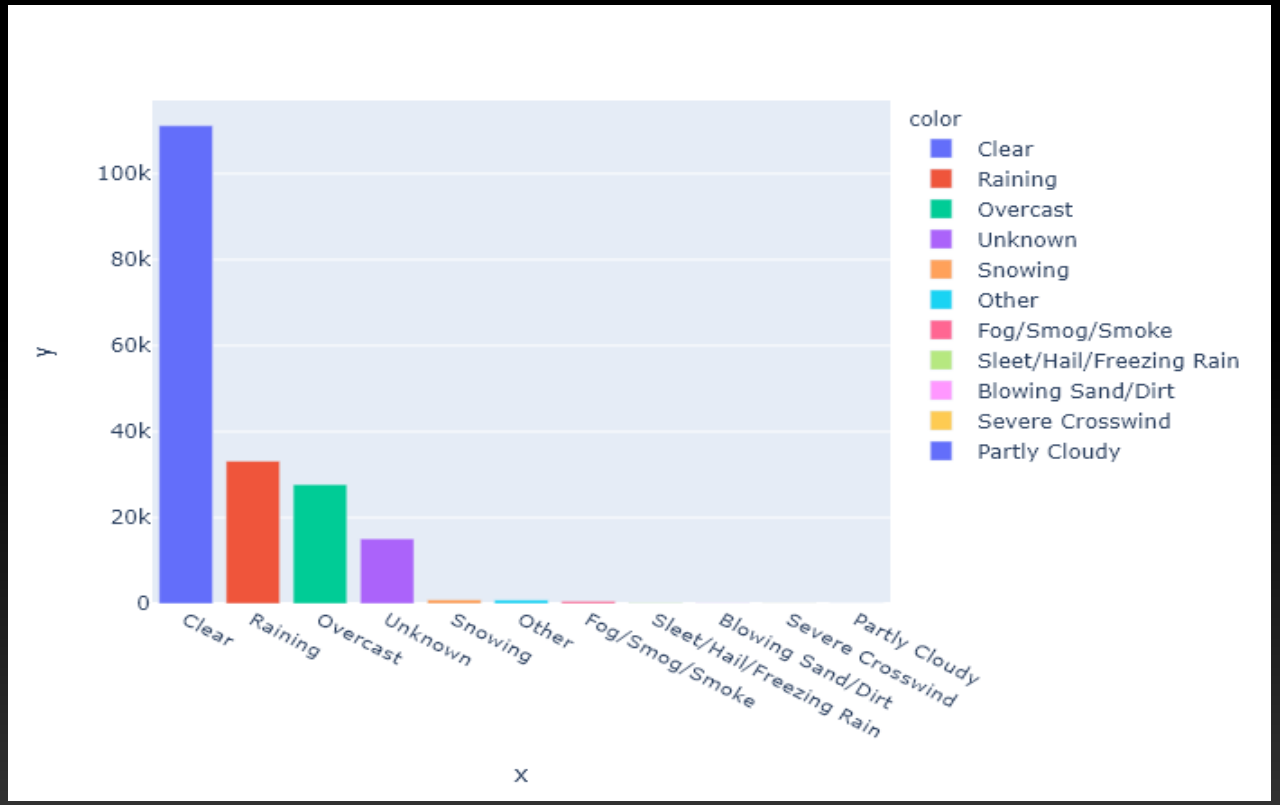
Visualization shows many accidents had more than 1 person involved. Most of them had 2 and 3 persons involved. We can assume that there are two people in their vehicles and the third one involved might be a pedestrian walking by.



VISUALIZING WEATHER

Now, we will visualize weather conditions for the day when accidents occurred and see if any hidden pattern pops up.

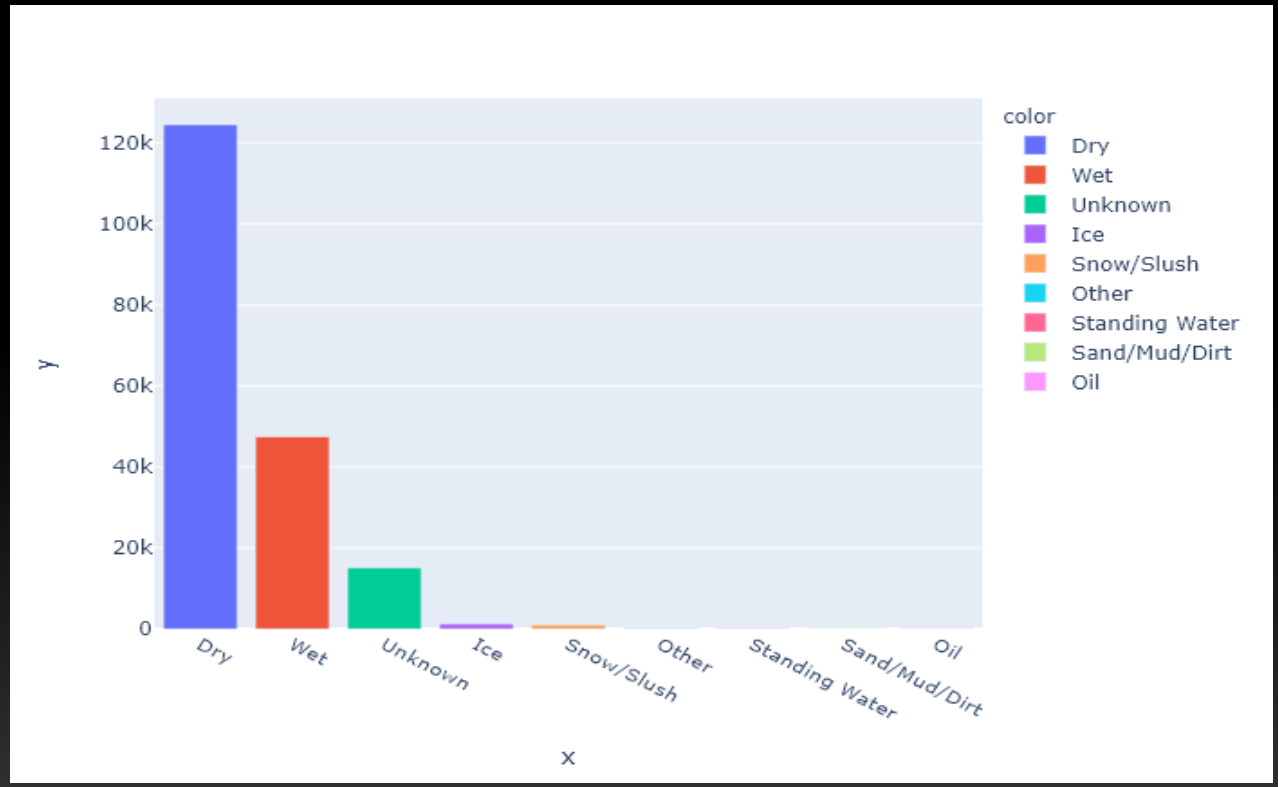
Graph tells that most of the accidents that have occurred had a clear weather on that day.



ROAD CONDITION

Let us have a visual of the road condition on the day of those respective accidents.

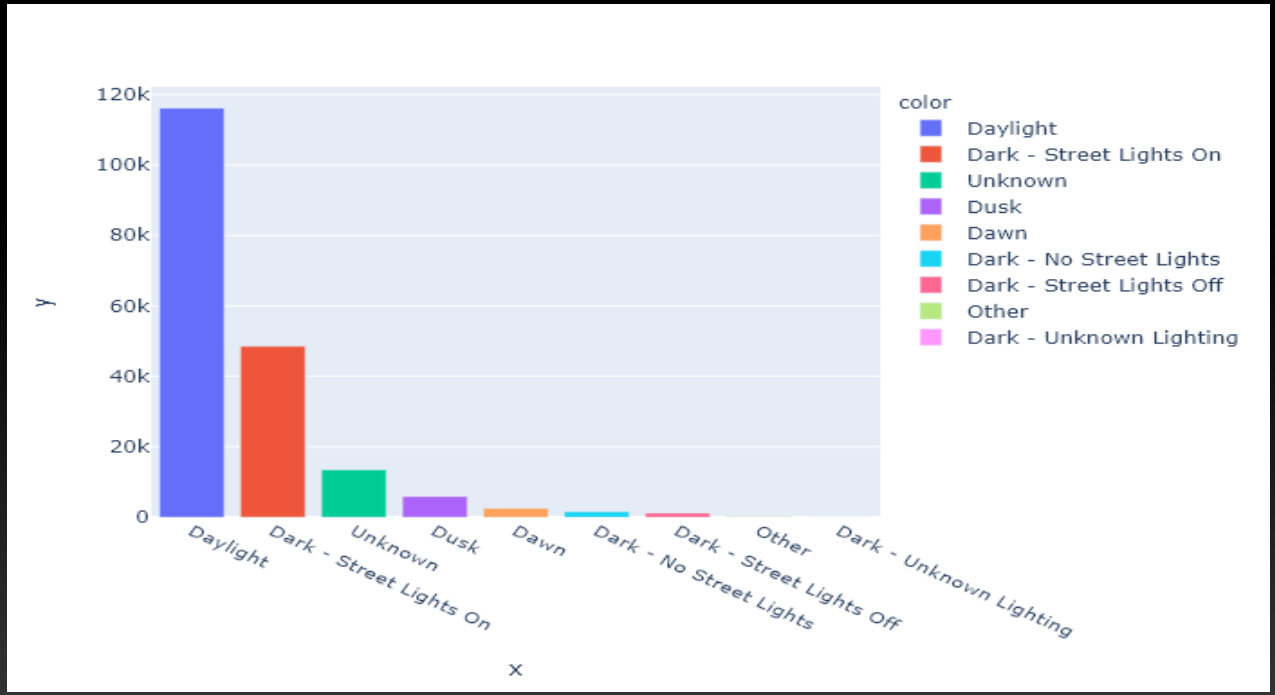
Visuals reveal that road was dry during most of the accidents. This means that roads absolutely did not have anything to do with those accidents.



LIGHT CONDITIONS

Let us see if light has got anything to do with these accidents.

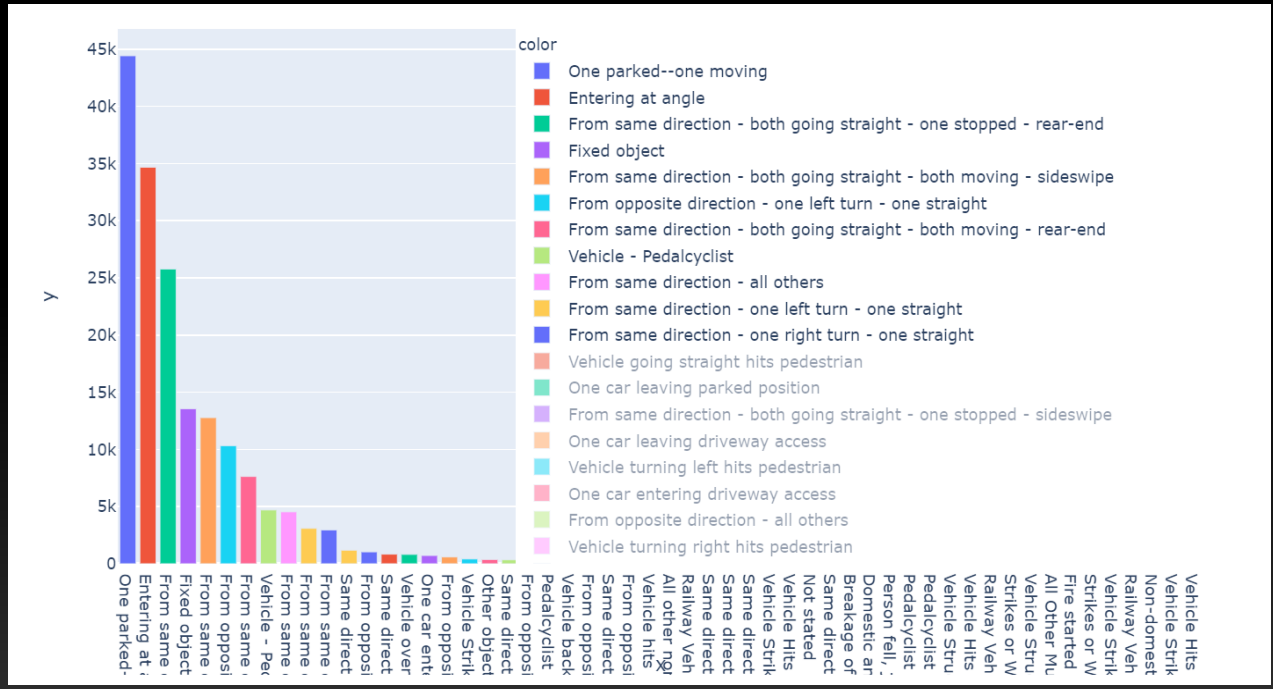
No, even the light has got nothing to do with people crashing at each other



COLLISION DESCRIPTION

Let us see which collision types are famous and most occurring.

From the visualization, most of accidents seem to occur when one of the cars parked and still while the other was moving. This really seems to be a case of trash-driving.



RESULT

The following observations can be concluded after visualization of data:

- Number of accidents with Severity 1 is greater than that with Severity 2.
- More accidents occur at Blocks compared to Intersections or Alleys.
- Most accidents cause only property damage rather than causing injuries.
- Most accidents occurred when cars were not moving.
- Most of the accidents occurred in broad daylight

All these succumb to the conclusion that most probably the roads weren’t well maintained. Therefore, I believe the roads need proper maintenance, although we need to apply Machine Learning to come to any proper conclusions.

CONCLUSION

After training the dataset through various Machine Learning algorithms, we can conclude:

- While 'parked car' category results in few injuries, 'number of vehicles involved' tells another story. When the number of vehicles is three or more, the chance of injury is nearly 50% and if the collision involves only 1 vehicle, the chance for injury far outweighs property damage only. Remember, this is the feature that is most predictive for the model.
- Taking this information and pairing it with the feature, 'number of pedestrians involved', clears the fact that any collision with a pedestrian is likely to cause injury. Chance of injury also goes up when the number of people involved goes up.
- Collisions between midnight and 1 am are frequent and result in many injuries. Collisions also tend to climb throughout the day culminating at 5 pm.

Therefore, as individuals, we can be more aware of ours and others' driving habits in certain conditions, such as Friday at 5 pm, or at midnight when the bars close down. Downtown and highways are also areas where injury tends to occur.

As a city, implementing no turn on red and letting pedestrians go first may be ways to improve injury rates. Lowering speed limits in the areas where injuries occur more often may also be another way.