Analyzing car accidents in the city of Seattle (2010-2020)

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The city

- Seattle is a big city located in the Northwestern part of the United States, the Seattle Metropolitan Area has a population of 3,263,497 habitants.

- Since 2013, it been in the top five of cities with the most annual growth rate.

- The city has gained the reputation of 'Rain City' because the of the constant precipitation it has all year long.
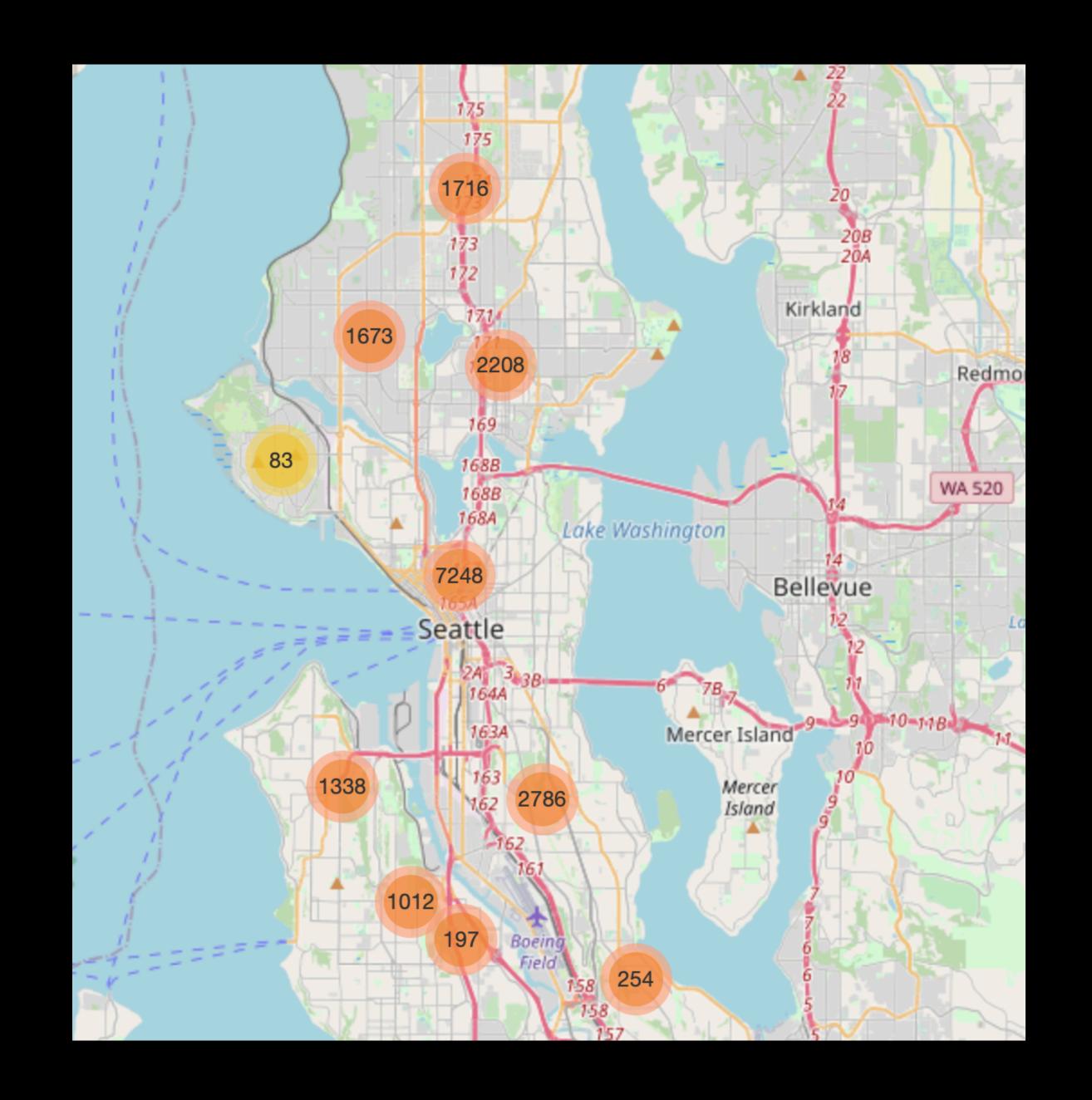
Problem Background

- Car accidents ate the leading cause of death in the US, around 100 die and around 2.5 million drivers and passengers are threatened with injuries.

- The expense that car accidents generate is around 75 billion dollars.

- The Seattle Metropolitan area is the 15th largest in the country and the city of Seattle the 24th largest, knowing the distribution of crashes, their tendencies and their causes is crucial for the creation of better road systems, insurance plans, traffic policies etc.

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Data

- The dates contains around 194,673 car accident registries, spanning from 2004 to 2020.

- The dataset contains many attributes regarding accident different accident variables.
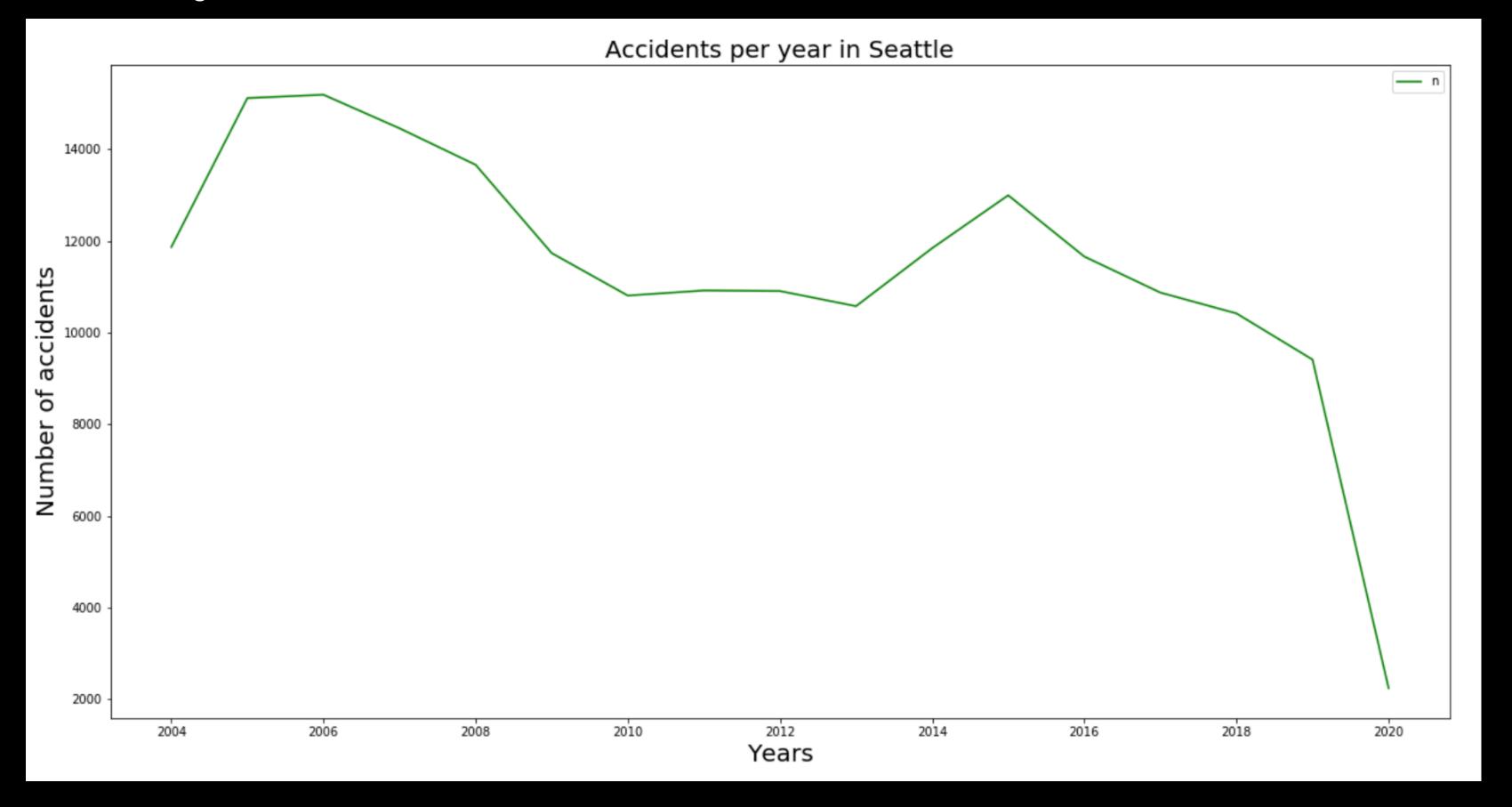
Accident distribution

Seattle (2004-2020)

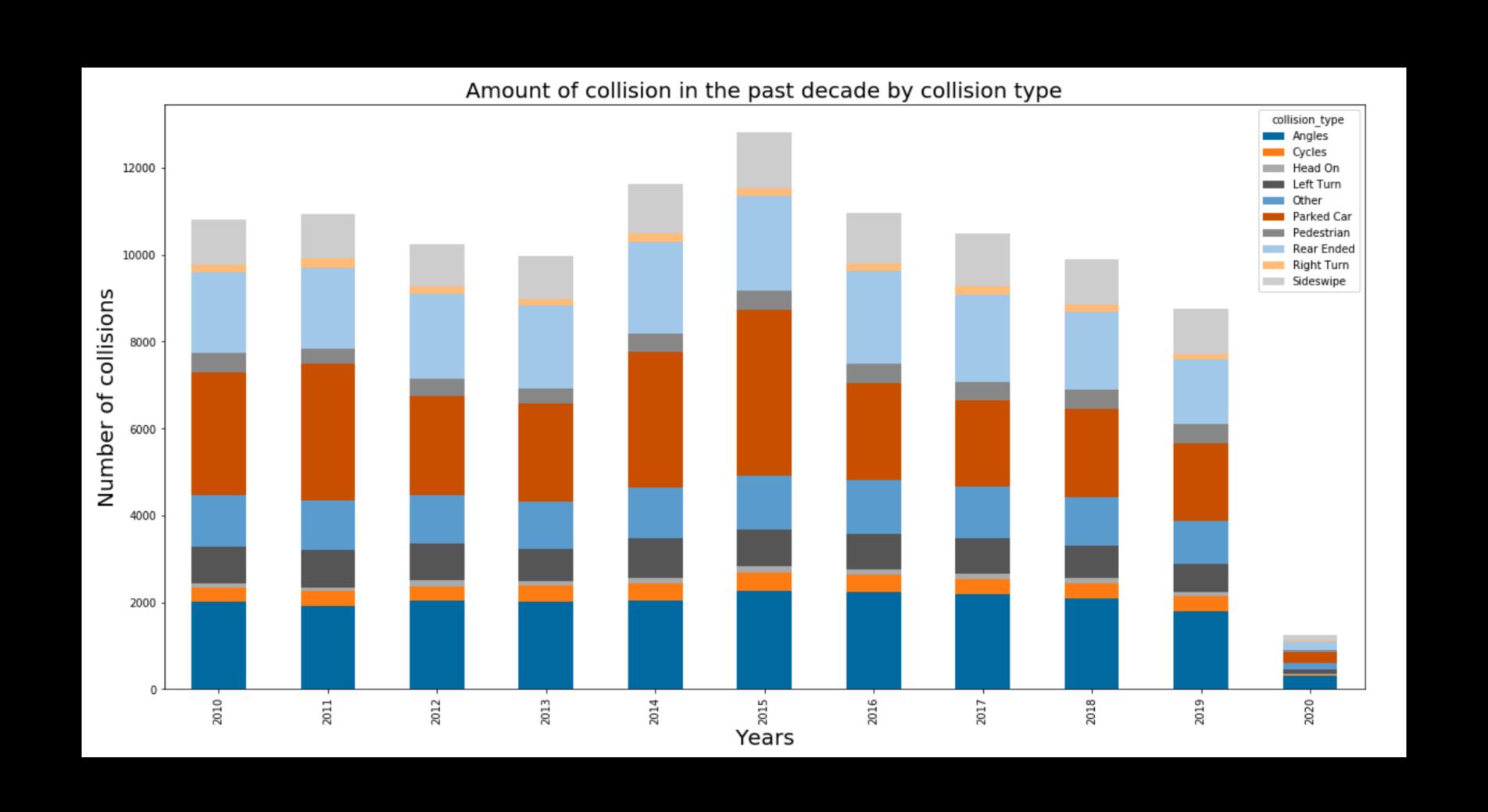- Because the dataset contains 194,673 registries, a random 10% sample was selected to save computing value.

Amount of accidents per year (2004-2020)

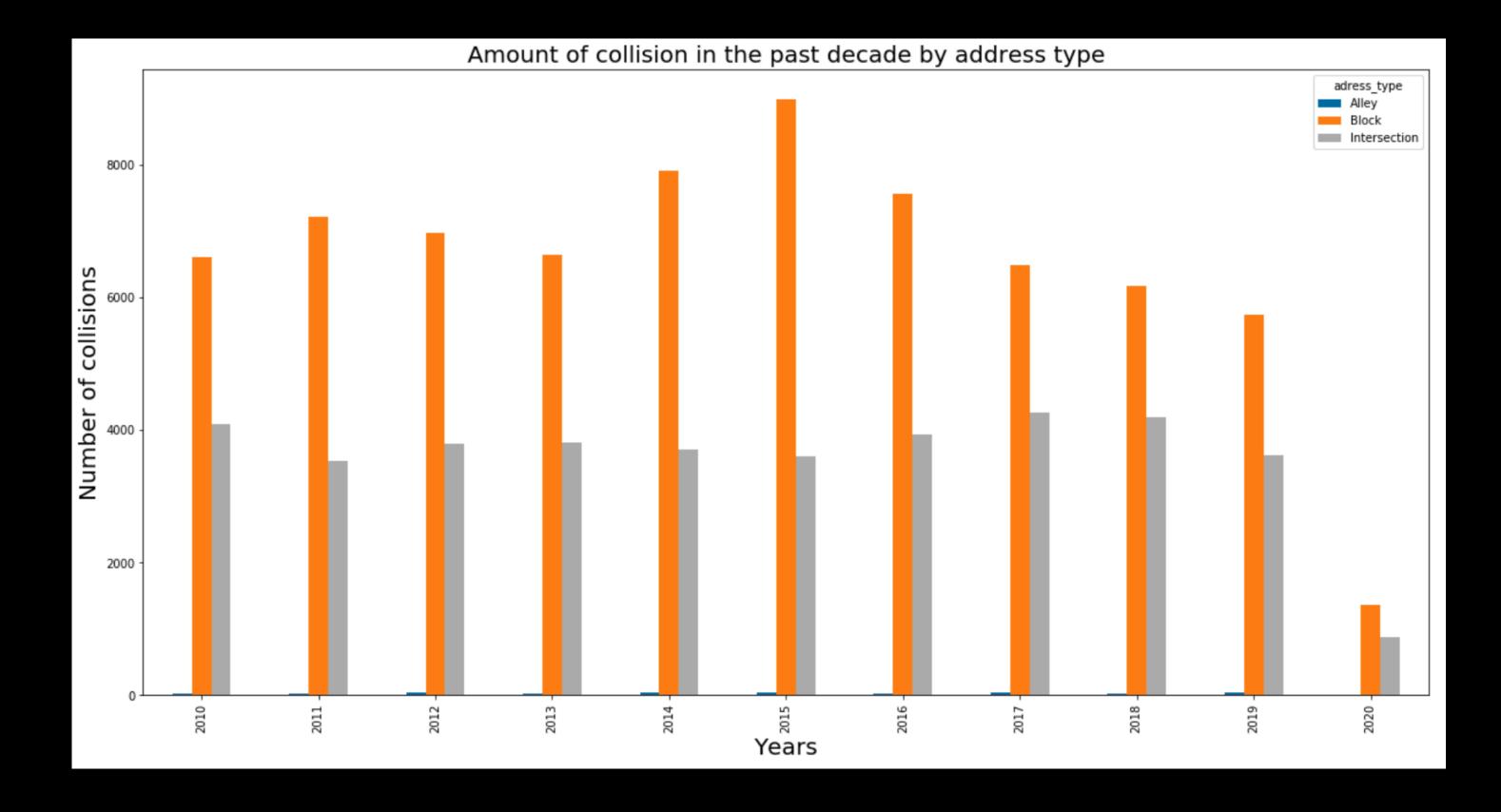A descending trend in the amount of accidents can be seen

Collision type distribution (2010-2020)

Amount of collision in the past decade by collision type

Accidents by address type

(2010-2020)

adress_type year	Alley	Block	Intersection
2010	30	6606	4080
2011	31	7220	3535
2012	34	6969	3792
2013	22	6640	3807
2014	42	7917	3701
2015	45	8990	3599
2016	27	7566	3928
2017	42	6479	4256
2018	32	6166	4191
2019	39	5732	3618
2020	4	1357	881

The table shows the amount of accidents per year in every of the three address types the dataset contains: alley, block and intersection.

Logistic regression model results

	Precission	Recall	F1-Score	Support
1	0.75	0.96	0.84	15606
2	0.77	0.28	0.41	6925
Accuracy			0.75	225331
Macro avg.	0.76	0.62	0.62	22531
Weighted avg.	0.76	0.75	0.71	22531

Conclussions

- Seattle Transportation Department can use this data to improve road safety guidelines and recommendations, as well as improving road infrastructure for particular vehicles, public transport, cyclists and pedestrians.

- Car insurance companies can develop new business strategies and protocols regarding cities because this model approach can be replicated in other places where similar car accident data is available.

- Taking into account all of the independent variables in the model, both stakeholders can now determine depending on the status of all those variables the chances of a car accident resulting in property damage only or injured individuals.