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# **CSE 545**

# **Good Health and Well Being**

**Bengaluru Bigdata Boys**

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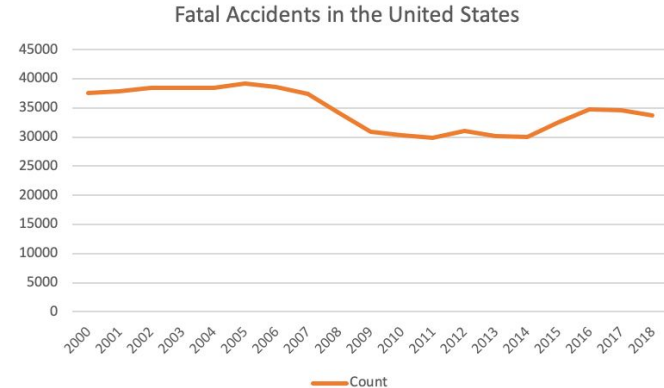
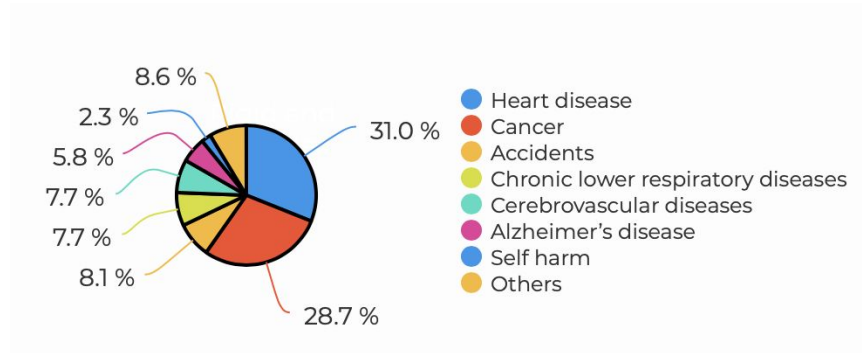
Abhiram M Kaushik, Ajay Gopal Krishna, Rajat R Hande, Rajesh Prabhakar

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# Introduction

Give pointers to achieve the SDG Goal-3 related to

- Premature mortality
- Health impacts, caused by **Air Pollution** and **Traffic Accidents**



# Background

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## Related Research:

- Health impacts due to Air pollution, 2019 [[paper](#)]
  - Traffic accidents rates in the US [[paper](#)]
  - Leading causes of deaths in US 2017(NVSS): [[paper](#)]
  - California Air Pollution Analysis: [[paper](#)]
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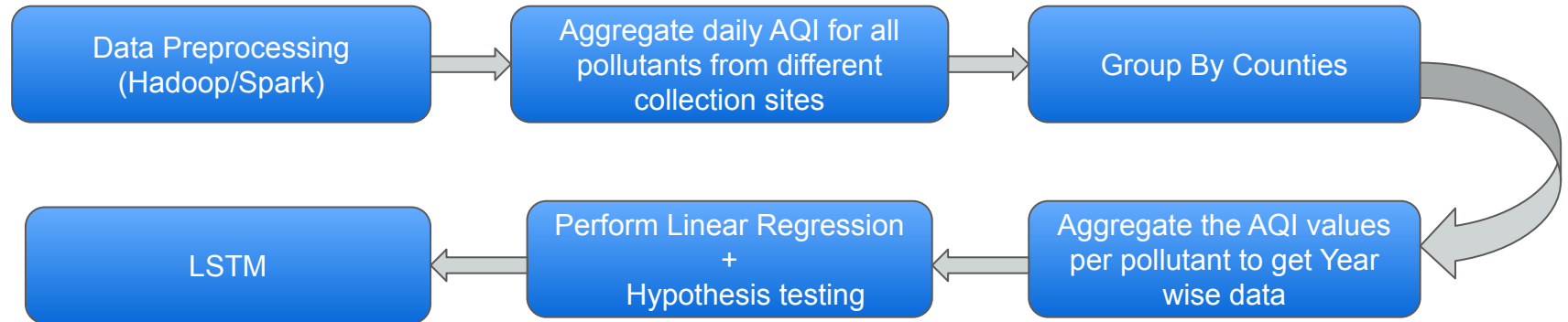
# Datasets

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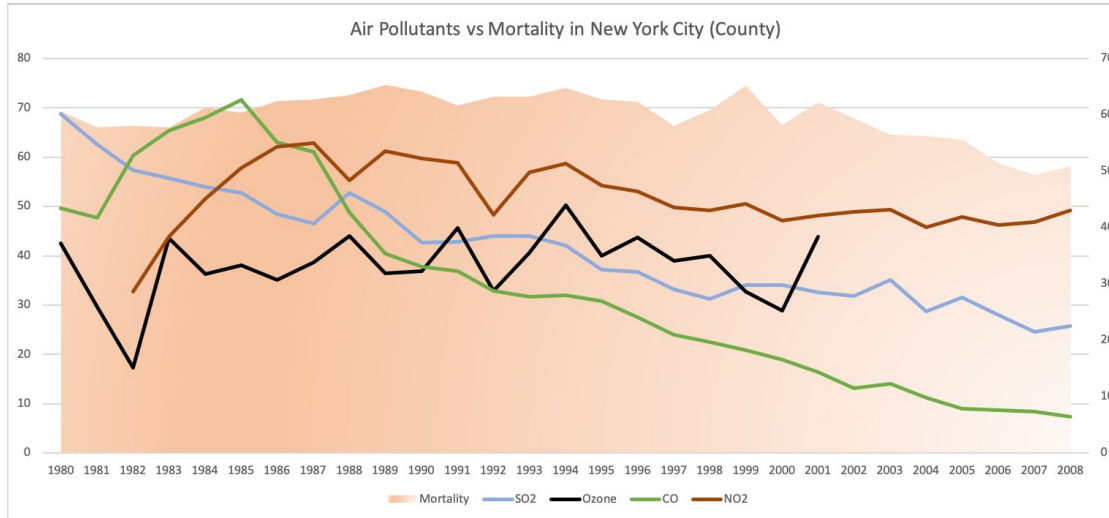
Pollution dataset: <a href="#">EPA</a>	1.2 GB	Daily AQI for different pollutants (8 hour run) : 1980 - 2019
Fatal traffic accidents: <a href="#">FARS</a>	3.83 GB	Fatal accident (1.4M), Vehicle, Person related parameters: 1970-2018
Accident dataset: <a href="#">Kaggle</a>	1 GB	Accidents data across United States : 2016-2019 (3M rows)
Chronic Respiratory Diseases Mortality Data: ( <a href="#">GHDx</a> )	700 MB	County wise mortality rates: 1980-2019
Mortality dataset from <a href="#">CDC</a>	4 GB	All deaths in US: 2000-2015

# Air Pollution - Method

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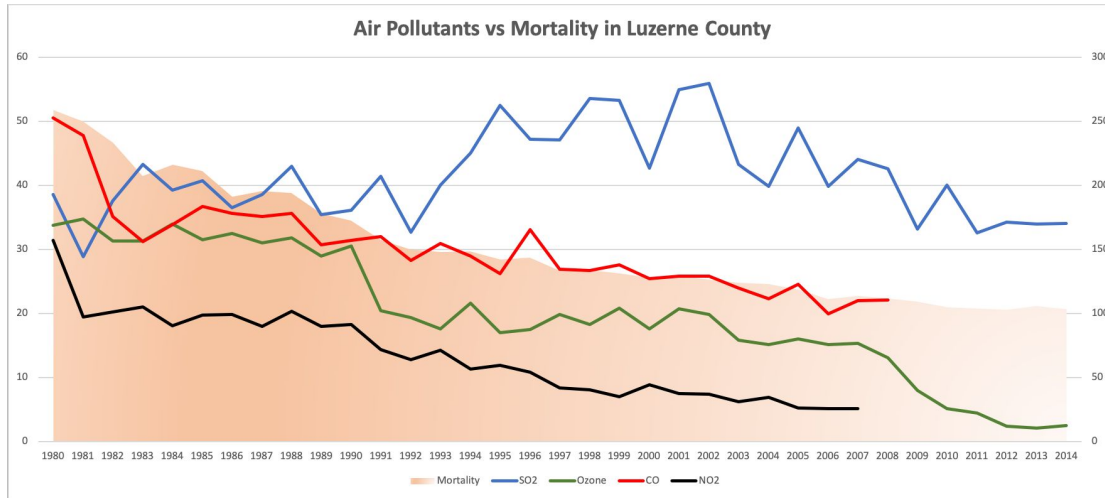


# Results



Pollutant	Betas	p-Value
Ozone	-0.06	0.0065
SO2	0.4	5.11e-15
CO	0.34	1.35e-13
NO2	0.24	1.27e-10

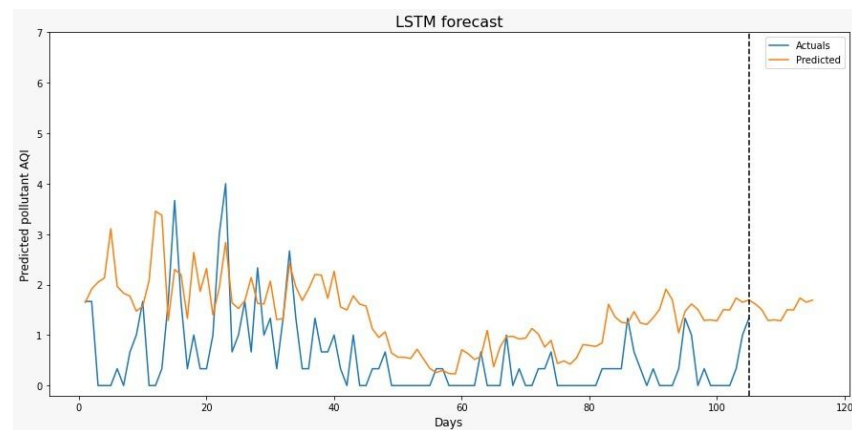
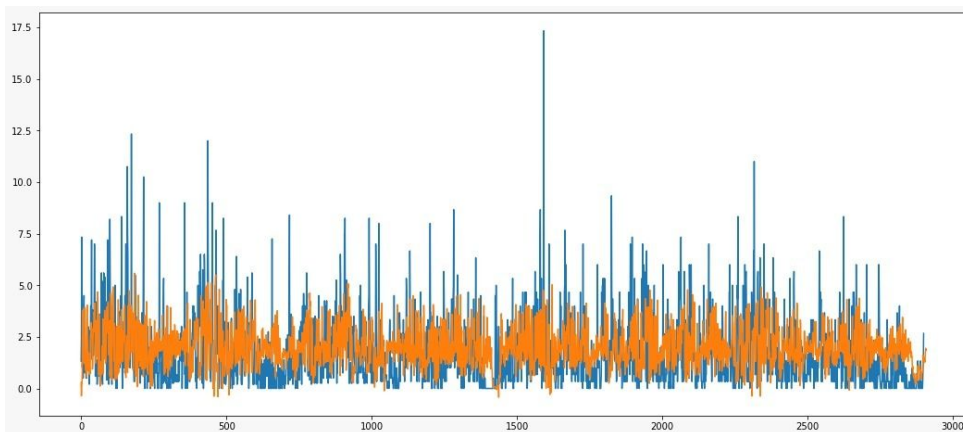
# Results



Pollutant	Betas	p-Value
Ozone	0.048	0.3151
SO2	-0.43	0.0001
CO	0.040	0.34
NO2	0.516	3.094e-05

# Results - LSTM

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# Pointers to reduce mortality due to AP

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From our analysis we can clearly see that deaths due to air-pollution has steadily gone down.

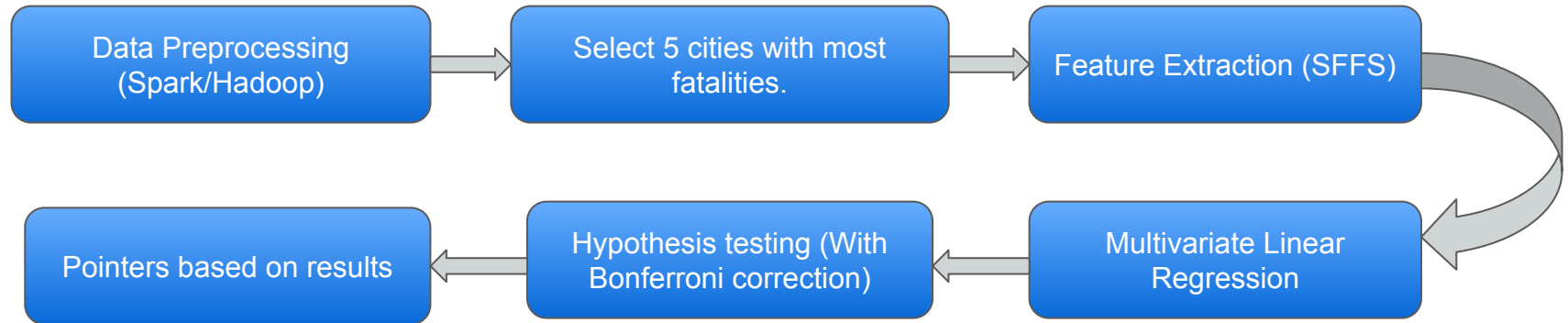
This is due to the fact that US has adopted **Clean Air Act Amendments (CAAA) of 1990**.

Also, the results suggest that ozone pollutant has not steadily decreased. Few pointers to control ozone pollutant are

- Suggest EPA to set stronger limits on ozone pollution.
  - Choose a cleaner commute.
  - Use environmentally safe paints and cleaning products.
  - Conserve electricity.
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# Traffic Accidents - Methods

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# Hypothesis Testing

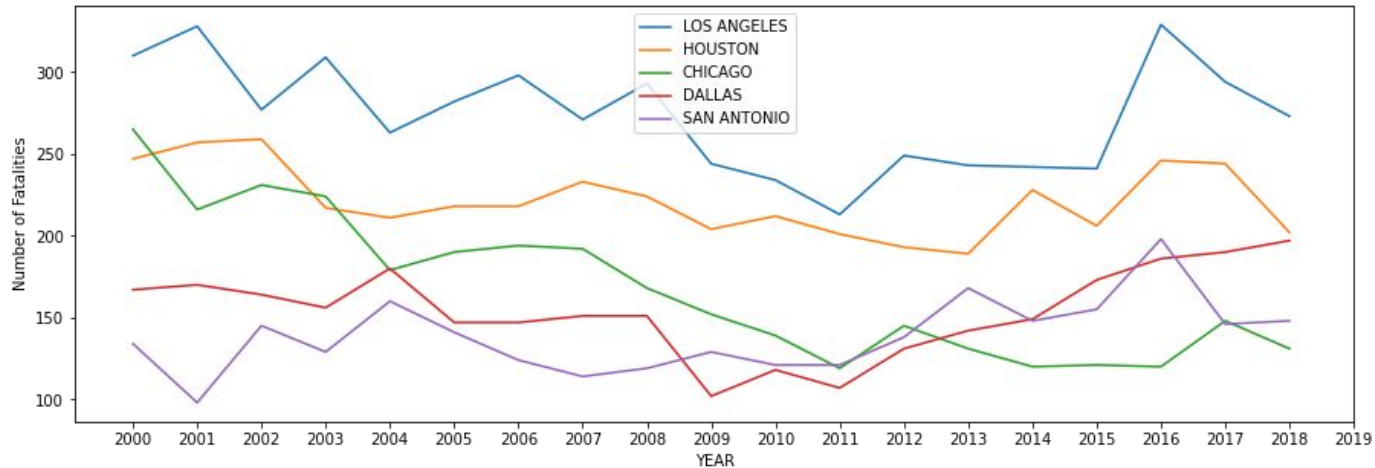
City	p-Value	Significance	Feature Name
LOS ANGELES	2.31E-08	Significant	DAY_WEEK
	4.88E-11	Significant	ROUTE
	0.349228219	Not Significant	A_INTER
	5.07E-65	Significant	A_INTSEC
	1.98E-15	Significant	A_ROADFC
	1.91E-26	Significant	A_JUNC
	0.016845275	Not Significant	A_RD
	1.12E-23	Significant	A_HR
	1.15E-25	Significant	A_MC
	1.87E-72	Significant	A_ROLL

City	p-Value	Significance	Feature Name
HOUSTON	0.00066507	Significant	DRUNK_DR
	0.004962341	Significant	A_INTER
	1.15E-07	Significant	A_RELRD
	0.222741007	Not Significant	A_INTSEC
	4.27E-09	Significant	A_JUNC
	0.009455903	Not Significant	A_TOD
	2.32E-10	Significant	A_HR
	1.10E-13	Significant	A_MC
	5.05E-29	Significant	A_POSBAC
	3.93E-14	Significant	age65

City	p-Value	Significance	Feature Name
CHICAGO	0.246424494	Not Significant	DRUNK_DR
	0.013847505	Not Significant	PEDS
	3.03E-06	Significant	A_INTER
	7.22E-35	Significant	A_ROADFC
	0.000231669	Significant	A_RD
	7.40E-41	Significant	A_TOD
	4.68E-20	Significant	A_HR
	5.69E-31	Significant	A_MC
	3.13E-26	Significant	A_PED
	8.44E-21	Significant	females

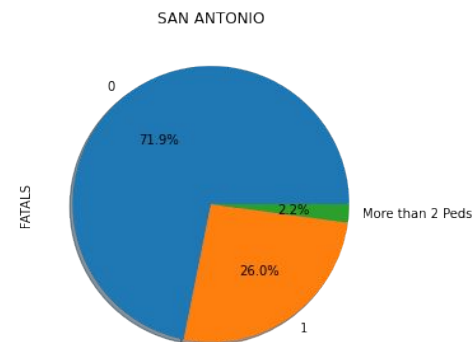
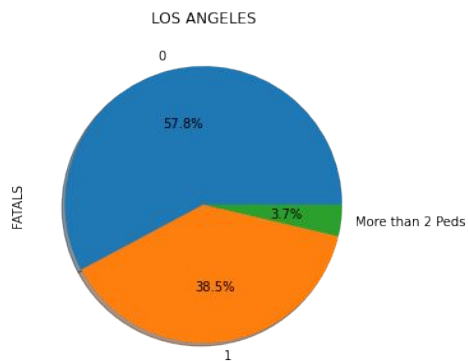
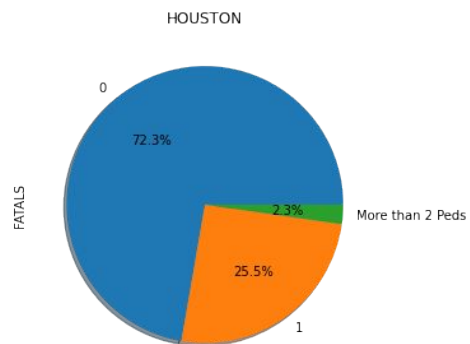
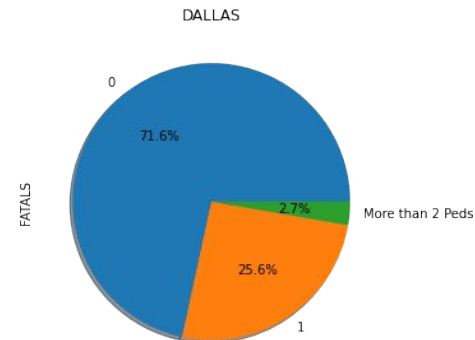
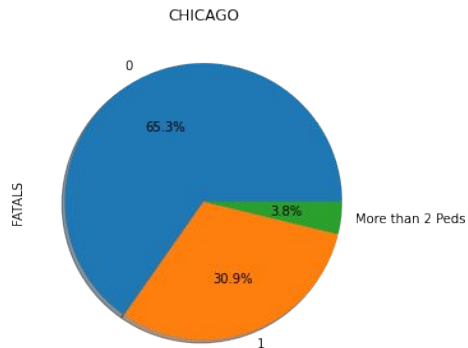
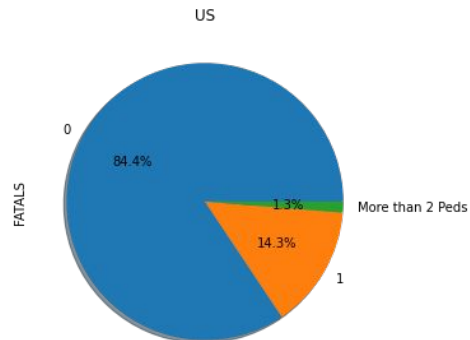
# Results - Traffic Accidents

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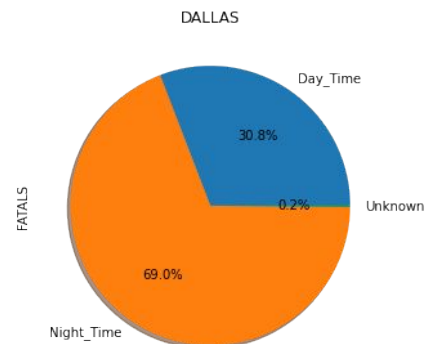
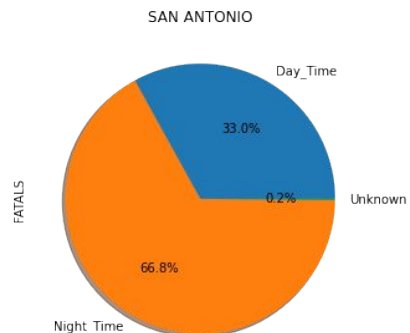
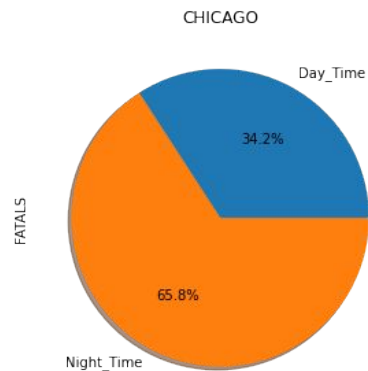
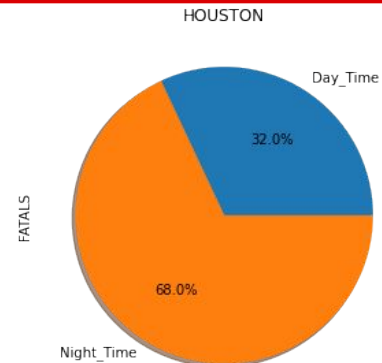
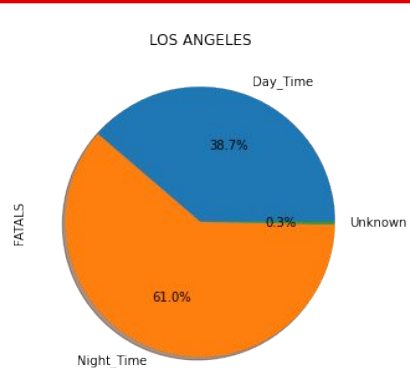
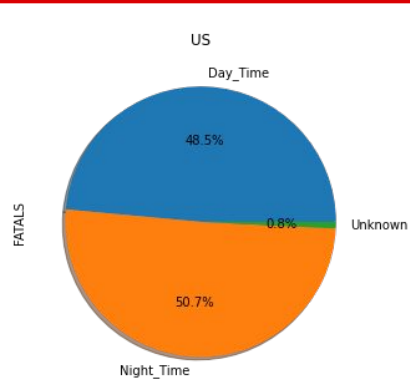
# Pedestrians Involved

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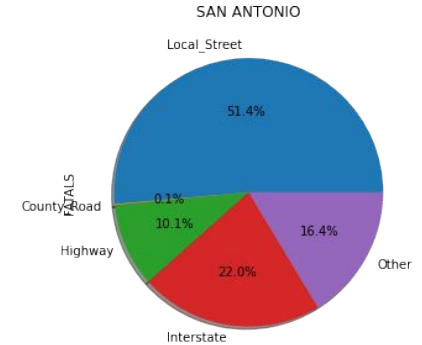
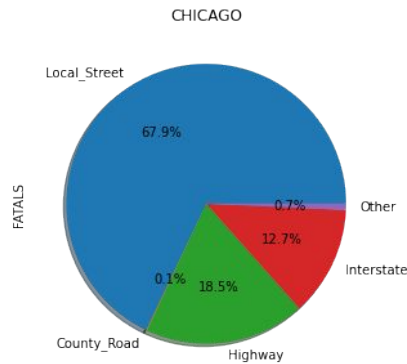
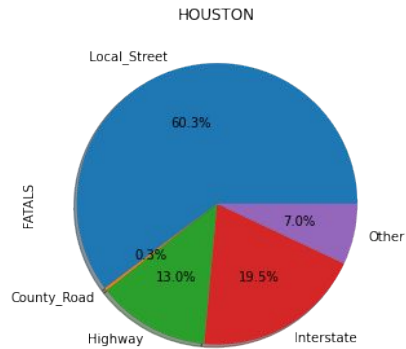
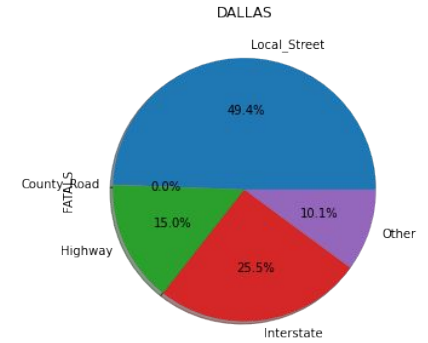
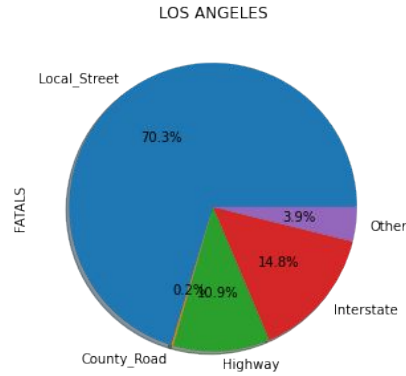
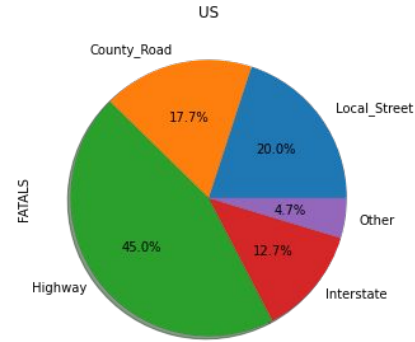


# Time of the Day

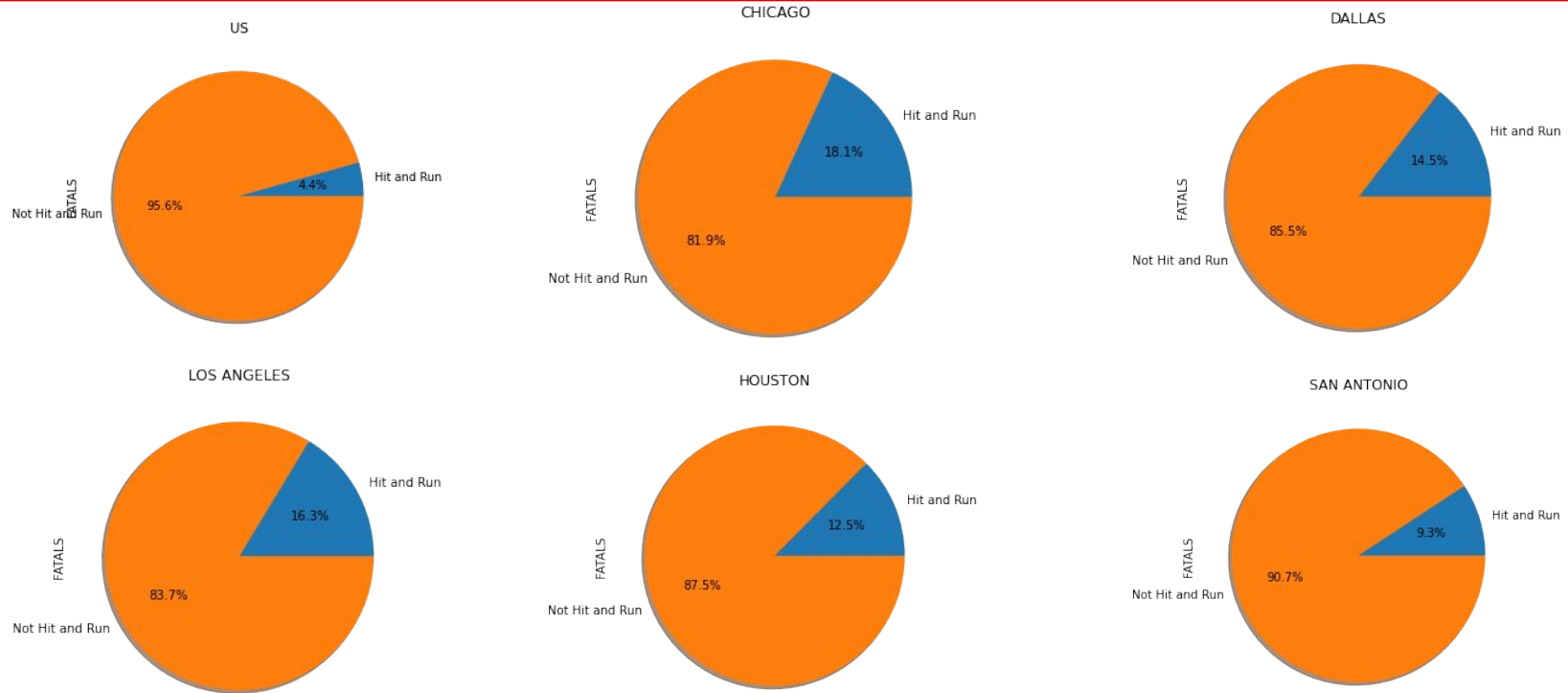
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# Route

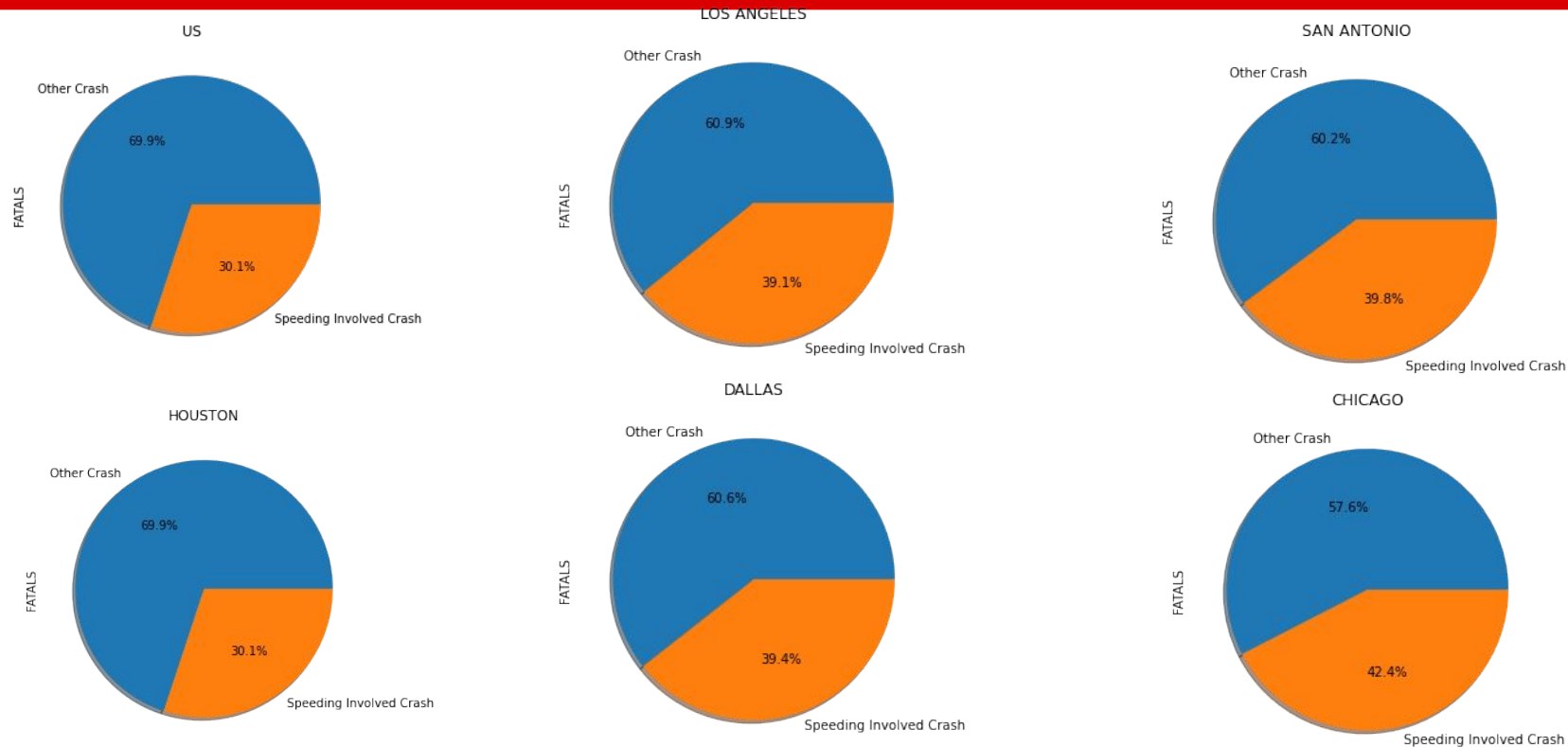


# Hit and Run





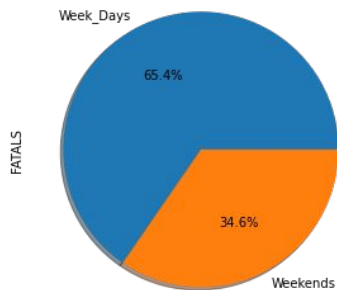
# Speeding Involved In crash



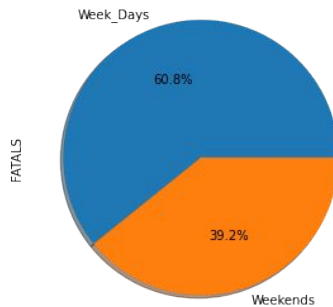
# Day of The Week

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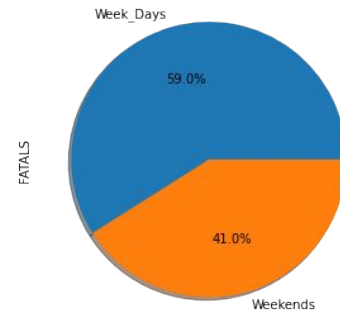
US



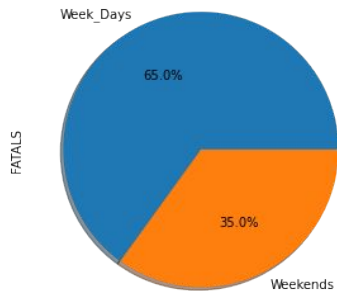
SAN ANTONIO



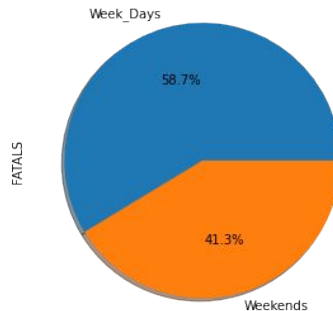
CHICAGO



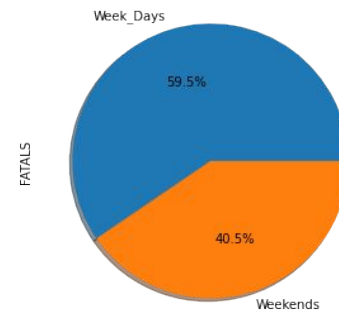
LOS ANGELES



HOUSTON



DALLAS



# Conclusion

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We analysed the Air pollution and Traffic Fatalities data across the years and:

- Identified the counties/cities with most mortalities and found the factors which influences mortality the most.
- Gave pointers to reduce the mortalities.

**Future work** can include a detailed study and how effective these pointers are in reducing mortality.

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Thank you

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