

Capstone Project:

Traffic Accidents vs Nightlife and the relocation of Traffic Enforcement Cameras according to accident data in Medellín

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Traffic accidents

- Second cause of violent deaths in Colombia
- Road safety is a top public health priority
- Traffic enforcement cameras is a polemic approach
- Is there a relationship between nightlife and traffic accidents?
- Are speed cameras properly located?



Data

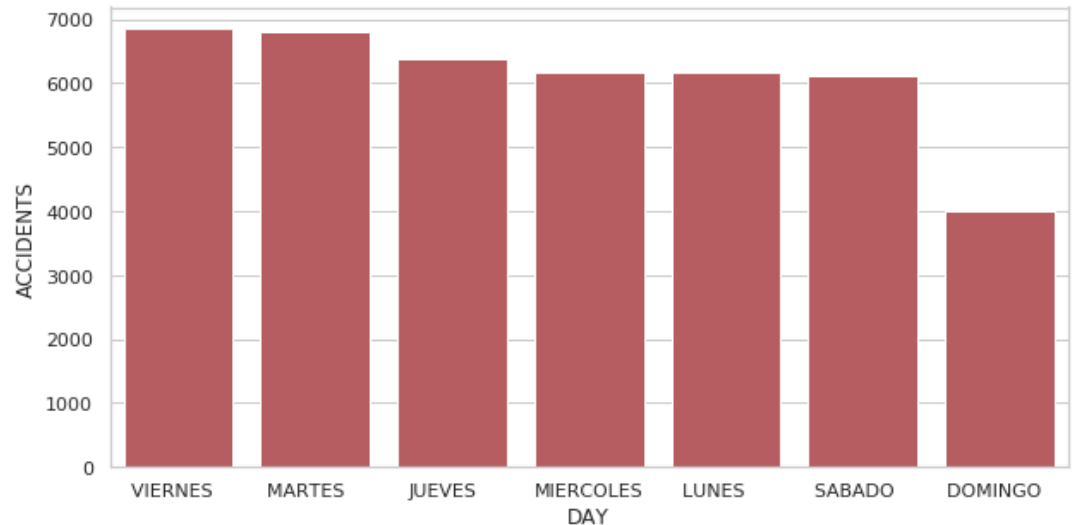
- Reported and georeferenced traffic accidents in Medellín in 2019, from city hall dataset, scrapped from [here](#) (42.473 accidents reported)
- Georeferenced traffic enforcement camera locations, from city hall dataset, scrapped from [here](#) (77 cameras currently working)
- Blank spaces were removed, datetime columns formatted and letter cases fixed. Column titles were traduced to English

Exploratory analysis

Accident severity was checked. 0.51 % of the reported accidents involve deaths

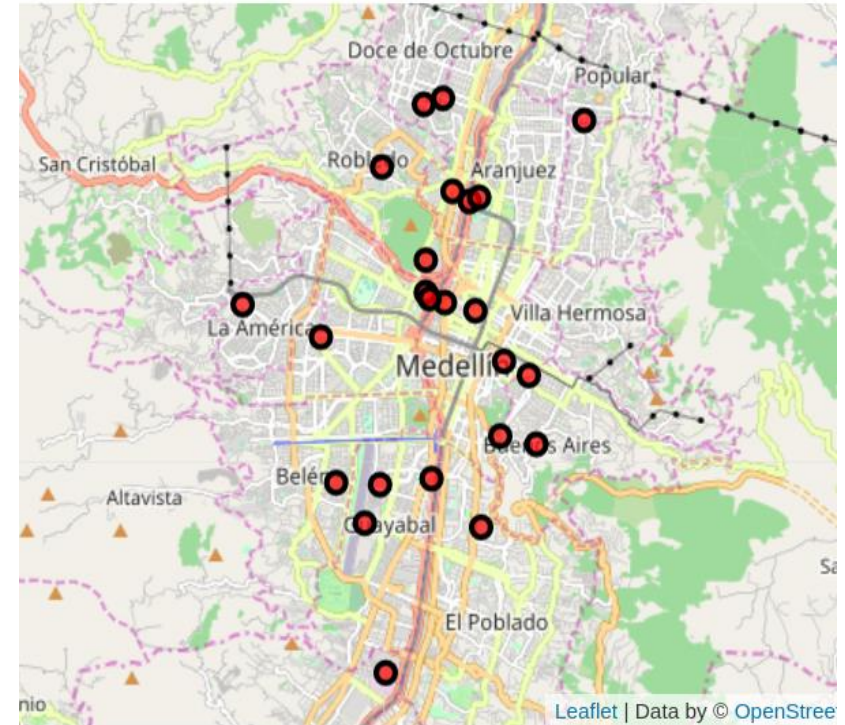
	Gravity	Counts
0	HERIDO	23000
1	SOLO DAÑOS	19256
2	MUERTO	217

Accidents are well distributed throughout the week, except for Sundays, which have considerably less traffic



Traffic accidents vs. Nightlife

There are only 24 accidents late night/ early morning (from 22:00 to 04:00) on weekends which involve fatal victims. (0.06% of the total accidents)



Traffic accidents vs. Nightlife: Drunk drivers

Out of the 24 fatal accident locations, there are only three where the closest venue are bars, and there is only one point where the closest venue is a Nightclub

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	715213	Gym	Construction & Landscaping	Bus Station
1	717337	Food Truck	Recreation Center	Construction & Landscaping
2	718353	Restaurant	Pizza Place	Bakery
3	718780	Burger Joint	Pizza Place	Café
4	719435	Bakery	Italian Restaurant	Nightclub

Traffic accidents vs. Nightlife: Drunk drivers

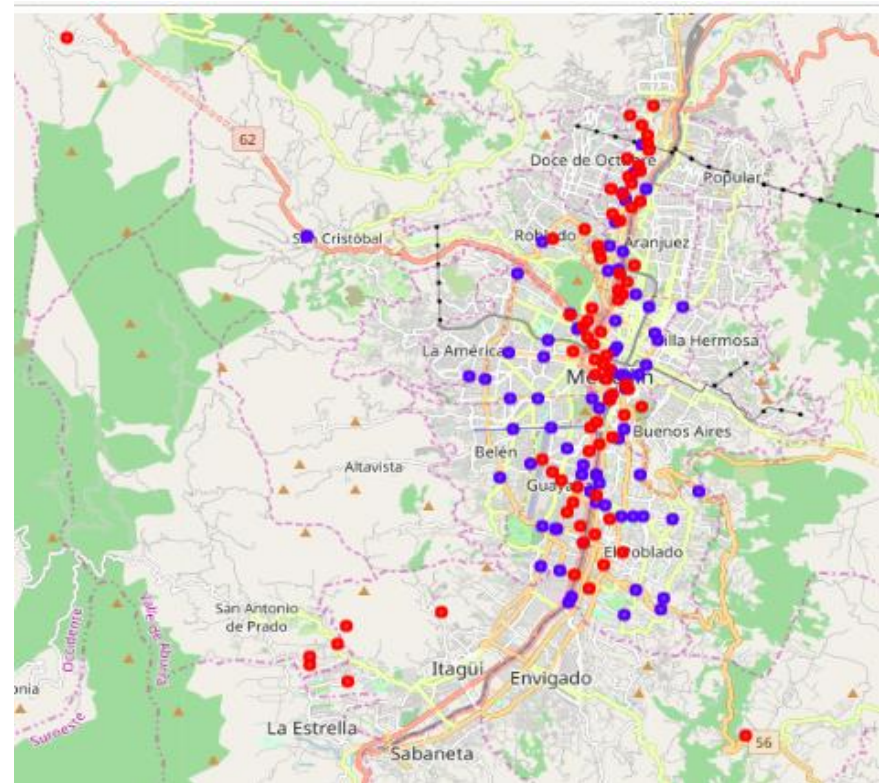
The data doesn't bring strong evidence that fatal incidents might be caused by drunk drivers. Moreover, even if the driver was in fact drunk, the accident location might not be close to the place where the person got drunk, or the driver could have drunk in a different place, not a bar or nightclub.

Relocation of traffic enforcement cameras

- We assume that zones with high concentration of accidents are more risky and need to be intervened with speed cameras installation
- With a K-means model, we cluster zones with higher agglomeration of accidents involving injuries or deaths

Relocation of traffic enforcement cameras

The centroids of the clusters are the new suggested locations for the speed cameras (red dots). The blue dots correspond to the current camera locations



Relocation of traffic enforcement cameras

- New camera locations agglomerate along the most concurred roads across the city (riskier zones)
- New locations in peripheral neighborhoods with numerous accidents and no cameras
- There are also new locations very close to existing speed cameras, which raise a concern about the true usefulness of speed cameras to make the roads safer and save lives (their presence hasn't stopped accidents)

Conclusions

- There is no strong evidence that accidents caused between 22:00 and 04:00 on the weekends are caused by drunk drivers
- In Medellín, there are several zones with high accident risk that aren't covered by traffic enforcement cameras, and should be reconsidered in future interventions.
- The presence of cameras in many of the zones with high accident reports raises questions about its usefulness in preventing said accidents. This should be addressed by the competent authorities and policy makers in future efforts for improving road safety