

# Which place should the city of Medellín carry out traffic accident prevention strategies?

## 1. Introduction

### 1.1 Background

Medellin is one of the main cities in Colombia with a population of 2,427 million. This city is recognized for its performance in avoiding traffic accidents. Medellín received two awards for being the capital city of the country with the best campaign on road safety and the most effective strategy to save lives. The recognitions were delivered in Bogotá by the Ministry of Transportation and the National Road Safety Agency, through Colombia Líder. The Antioquia capital, which was nominated in both categories, stood out for the actions undertaken that made it possible to avoid 17 fewer deaths compared to the first period of 2017. According to the National Road Safety Agency, Medellín reduced this indicator by 13.6 %, given that the previous year 125 people died in the first six months, while in 2018, 108 went.

This year the city wants to make different strategies that motivate people to become aware of traffic accidents, the main strategy is to make events or campaigns that involve recreational activities and promote good coexistence and respect for the rules. For this reason Medellín needs to find nearby places where more accidents occur and adapt the spaces for this strategy.

### 1.2 Problem

Using the open data of the city hall of Medellín where more cases of accidents occur and the geographical location of these cases, it is possible to determine which area is the most dangerous and to determine which place is the most appropriate so that strategies can be given to raise awareness of the population

### 1.3 Interest

The city hall of Medellín is interested in knowing where it can carry out recreational strategies to avoid traffic accidents, taking as a reference the places of greatest risk

## 2. Data acquisition and cleaning

The data is taken from the open data source of the city of Medellin and is integrated with the program that we will show in this document. To determine the most appropriate nearby places to carry out the recreational campaigns, we will take them using the Foursquare API.

### 2.1 Data cleaning

To clean the data, it was grouped by the number of accident cases in the different areas or neighborhoods of the city from the initial data.

#### Initial Data

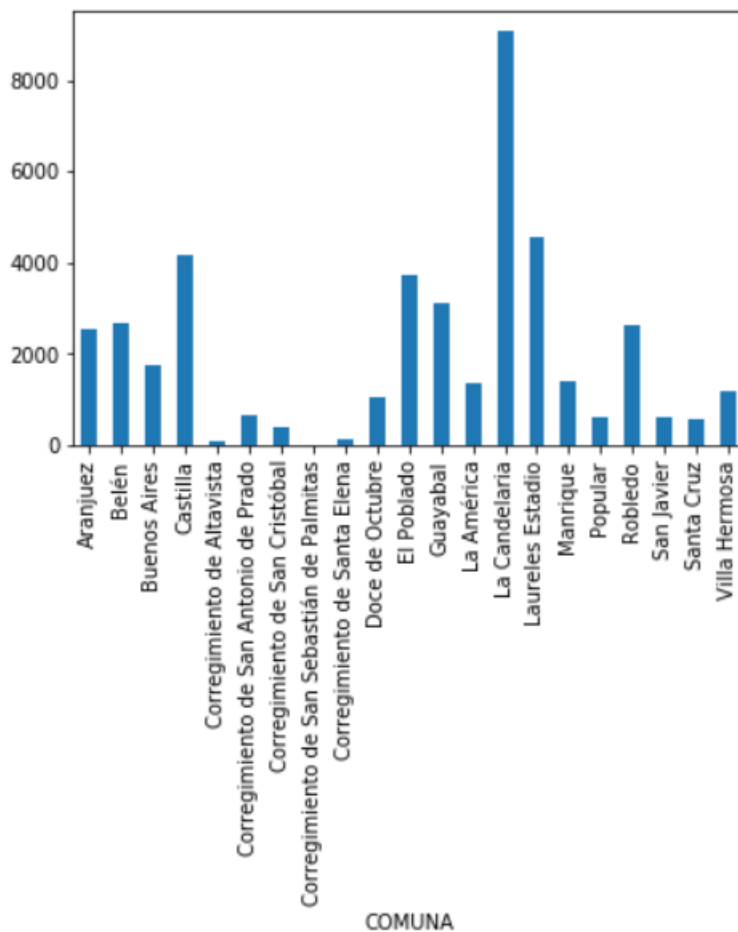
RADICADO	FECHA	HORA	DIA	PERIODO	CLASE	DIRECCION	DIRECCION_ENC	CBML	TIPO_GEOCOD	GRAVEDAD	BARRIO	COMUNA
1656288	2019/01/13 00:00:00+00	11:40:00	13	2019	Choque	CR 63 CL 45	CR 063 045 000 00000	1103	Malla vial aproximada: CR 63-44	HERIDO	Naranjal	Laureles Estadio
1670240	2019/05/10 00:00:00+00	09:00:00	10	2019	Otro	CL 39 CR 105	CL 039 105 000 00000	1310	Malla vial aproximada: CL 39-106	HERIDO	Veinte de Julio	San Javier
1667313	2019/04/14 00:00:00+00	06:10:00	14	2019	Choque	CR 55 CL 96 A	CR 055 096 A 000 00000	403	Malla vial aproximada: CR 55-96	SOLO DAÑOS	Palermo	Aranjuez
1665323	2019/03/26 00:00:00+00	06:30:00	26	2019	Caida Ocupante	CL 94 CR 68	CL 094 068 000 00000	511	Malla vial	HERIDO	Castilla	Castilla
1668074	2019/04/18 00:00:00+00	04:30:00	18	2019	Choque	CR 43 A CL 19	CR 043 A 019 000 00000	1404	Malla vial	HERIDO	Castropol	El Poblado

#### Grouped Data

	COMUNA	Longitude	Latitude
0	Laureles Estadio	-75.580468	6.248048
1	San Javier	-75.618559	6.252485
2	Aranjuez	-75.563917	6.289015
3	Castilla	-75.572907	6.288664
4	El Poblado	-75.569421	6.220046

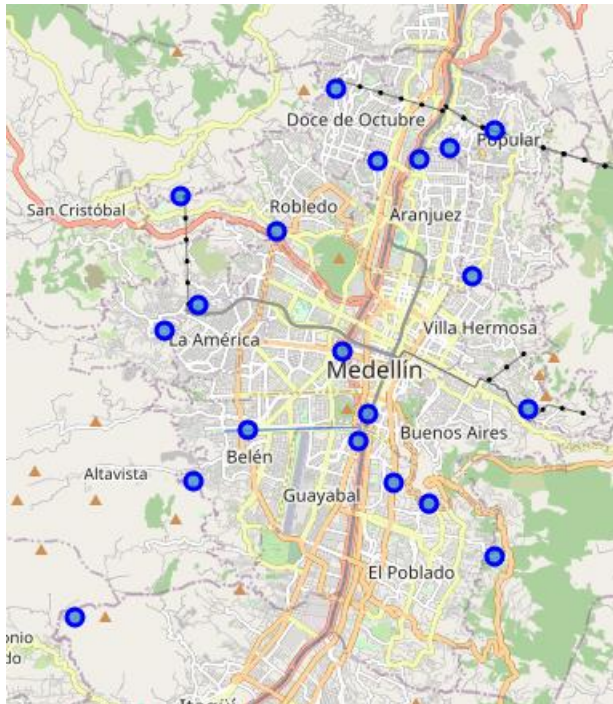
### 3. Explore Data and Preprocessing Data

To choose the neighborhood or area where the strategies will be created, you must know the number of accident cases per area and extract the coordinates

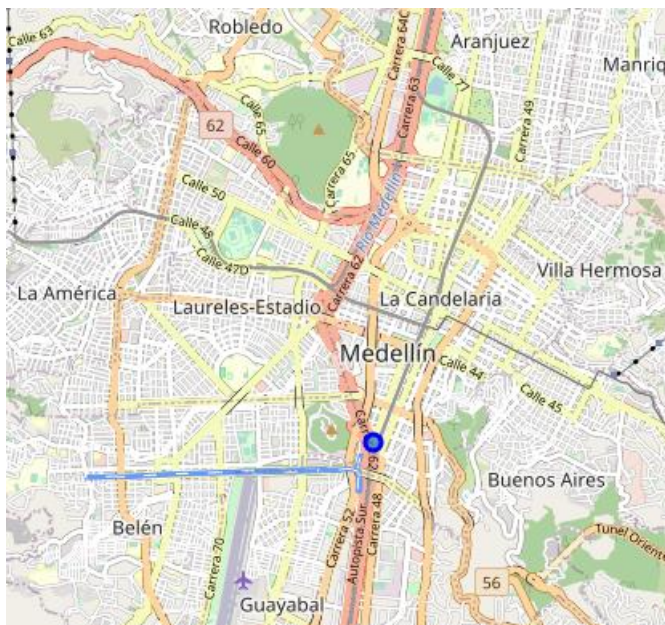


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4	El Poblado	-75.569421	6.220046
5	Robledo	-75.594462	6.273563
6	Guayabal	-75.577127	6.228937
8	La Candelaria	-75.575095	6.234832
12	Buenos Aires	-75.561797	6.215676
16	Manrique	-75.552469	6.264022
34	La América	-75.611401	6.257857
45	Belén	-75.600665	6.231279
50	Villa Hermosa	-75.540588	6.235784
52	Doce de Octubre	-75.581978	6.303999
61	Santa Cruz	-75.557572	6.291379
84	Popular	-75.547901	6.295110
131	Corregimiento de Altavista	-75.612284	6.220436
155	Corregimiento de San Antonio de Prado	-75.637697	6.191561
353	Corregimiento de San Cristóbal	-75.615032	6.281304
1333	Corregimiento de Santa Elena	-75.547855	6.204482
3064	Corregimiento de San Sebastián de Palmitas	-75.701030	6.327439

Coordinates of the points with the highest levels of traffic accidents



With this analysis it is inferred that the sector called "La candelaria" is more likely to have traffic accidents in the city.



## 4. Modeling

Using the services of the Foursquare api we use the connection to establish the closest places to carry out the recreational strategy the following are the results

	name	categories	lat	lng
0	Tierragro	Pet Store	6.233322	-75.574169
1	El Roble Motor	Auto Dealership	6.232751	-75.573576
2	METRO - Estación Exposiciones	Metro Station	6.238458	-75.573178
3	Puente de Guayaquil	Historic Site	6.234021	-75.575608
4	METRO - Estación Industriales	Metro Station	6.230728	-75.575426

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	La Candelaria	6.234832	-75.575095	Tierragro	6.233322	-75.574169	Pet Store
1	La Candelaria	6.234832	-75.575095	El Roble Motor	6.232751	-75.573576	Auto Dealership
2	La Candelaria	6.234832	-75.575095	METRO - Estación Exposiciones	6.238458	-75.573178	Metro Station
3	La Candelaria	6.234832	-75.575095	Puente de Guayaquil	6.234021	-75.575608	Historic Site
4	La Candelaria	6.234832	-75.575095	METRO - Estación Industriales	6.230728	-75.575426	Metro Station

	Neighborhood	Auto Dealership	Historic Site	Intersection	Metro Station	Pet Store
0	La Candelaria	0	0	0	0	1
1	La Candelaria	1	0	0	0	0
2	La Candelaria	0	0	0	1	0
3	La Candelaria	0	1	0	0	0
4	La Candelaria	0	0	0	1	0

	Neighborhood	Auto Dealership	Historic Site	Intersection	Metro Station	Pet Store
0	La Candelaria	0.166667	0.166667	0.166667	0.333333	0.166667

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	La Candelaria	Metro Station	Pet Store	Intersection	Historic Site	Auto Dealership



#### 4. Conclusion

To carry out strategies on how to prevent traffic accidents in the place where accidents most occur in the city of Medellín, we recommend holding events on prevention, messages and ensuring pedestrian safety in Metro Station specifically in METRO - Station Exposiciones and METRO - Station Industriales