

The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect.

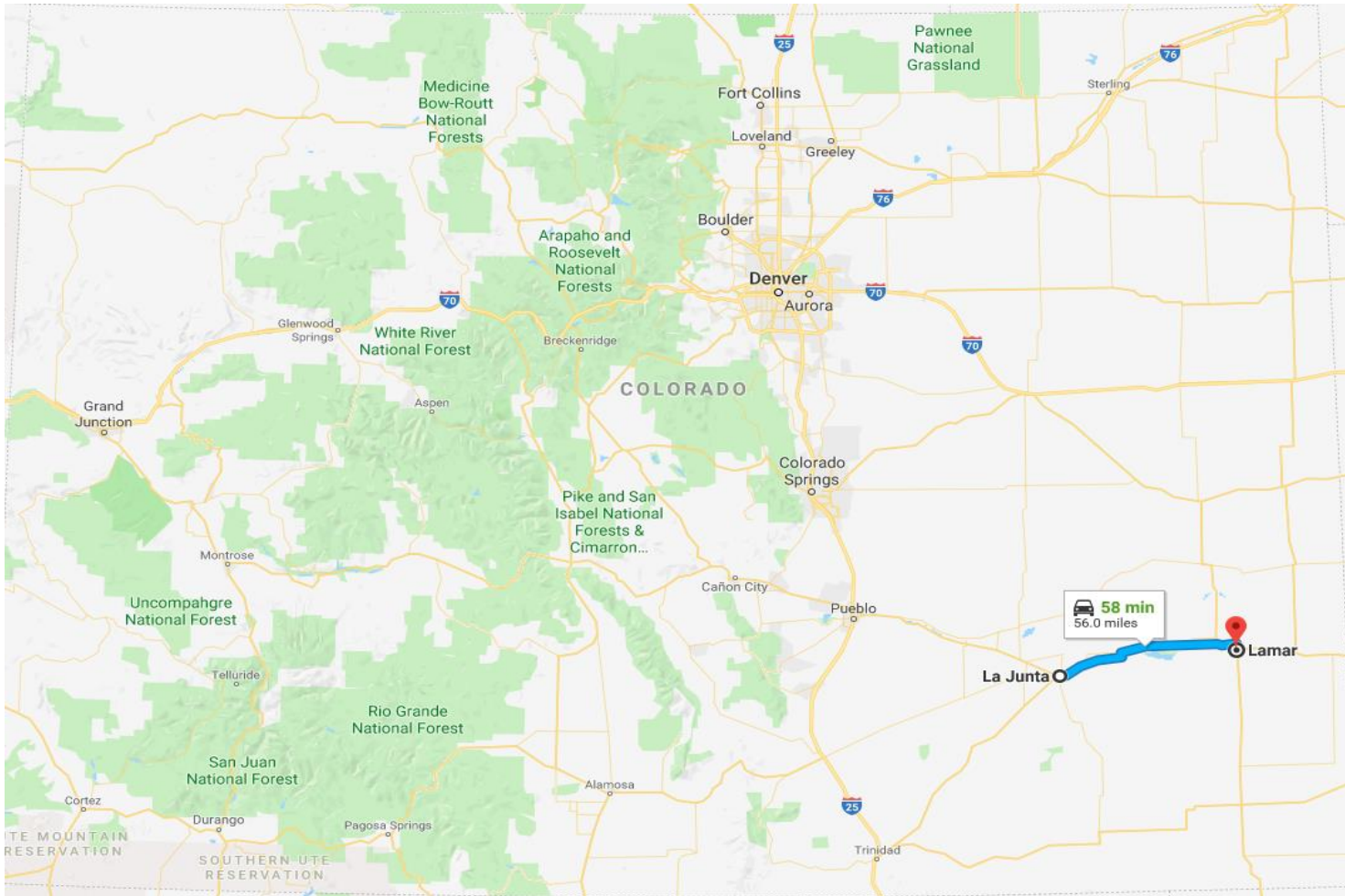
Battle of the Cities: Small Town USA

Analyst: Roger Smith

Purpose of Study

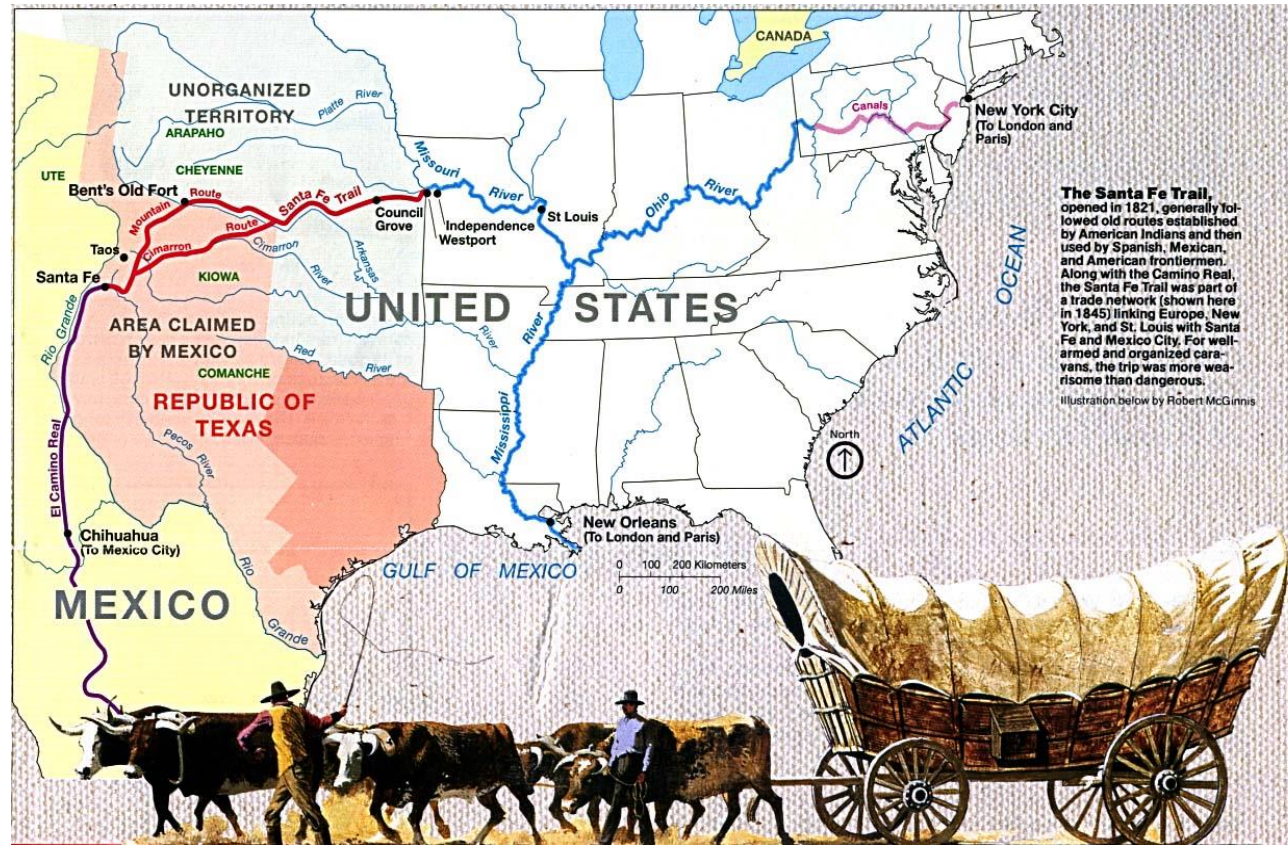
- ▶ This report uses Four Square location data and machine learning techniques to explore and compare two of these towns in Southeastern Colorado. The objective is to identify the advantages and quality of living in both towns. The data and report will be useful to the cities' leaders as they seek to develop a more robust economy for their community.

Where are we studying?



Colorado map showing location and distance between target towns.

Origins of the Towns



The two towns selected for this study are Lamar, CO, and La Junta, CO. The towns have very similar histories, locations, economies, and population sizes. Both serve as the county seat and are the largest communities in their respective counties. Both towns were established in the 1880's along the Arkansas River and the Santa Fe Trail, which was the major commercial highway from Missouri to Santa Fe New Mexico from 1820 to 1920, with its peak occurring around 1880

Lamar, CO



Historical population		
Census	Pop.	%±
1890	566	—
1900	987	74.4%
1910	2,977	201.6%
1920	2,512	−15.6%
1930	4,233	68.5%
1940	4,445	5.0%
1950	6,829	53.6%
1960	7,369	7.9%
1970	7,797	5.8%
1980	7,713	−1.1%
1990	8,343	8.2%
2000	8,869	6.3%
2010	7,804	−12.0%
Est. 2016	7,534 ^[6]	−3.5%

U.S. Decennial Census^[13]

Lamar is the county seat for Prowers County and reports a 2017 population of 7,601. The census identifies it as 75% white and 44% Hispanic, with all other races having less than 2% each. (Note: census race categories are overlapping, so totals are always more than 100%.) Median income for the city is \$31,521. Per capita income is \$16,944.

La Junta, CO

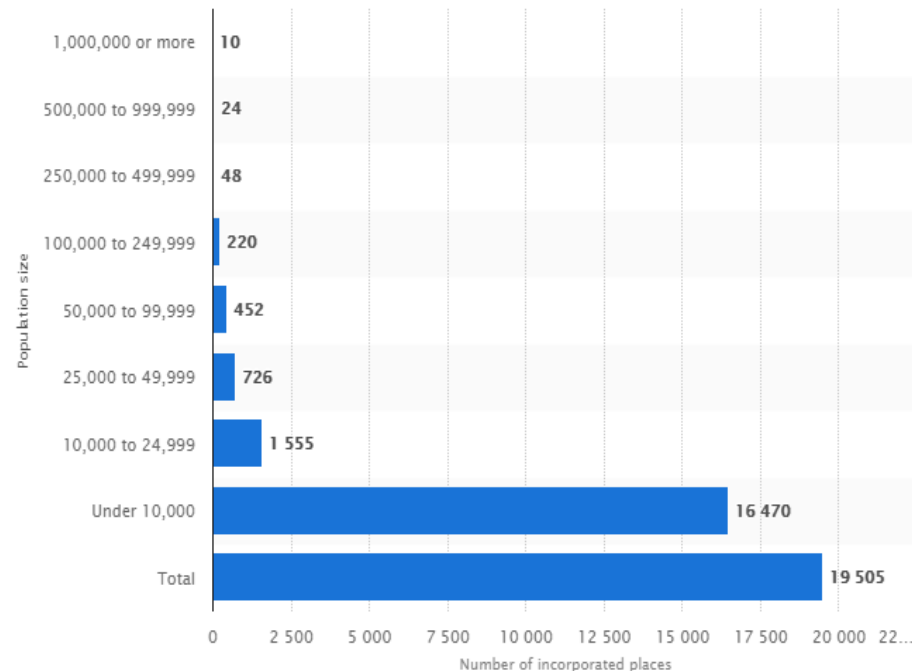


Historical population		
Census	Pop.	%±
1890	1,439	—
1900	2,513	74.6%
1910	4,154	65.3%
1920	4,964	19.5%
1930	7,193	44.9%
1940	7,040	-2.1%
1950	7,712	9.5%
1960	8,026	4.1%
1970	8,205	2.2%
1980	8,338	1.6%
1990	7,637	-8.4%
2000	7,568	-0.9%
2010	7,077	-6.5%
Est. 2016	6,930 ^[5]	-2.1%
U.S. Decennial Census ^[15]		

La Junta is the county seat for Otero County and reports a 2017 population of 6,898. The census identifies it as 74% white and 44% Hispanic, with all other races having less than 2% each. (Note: census race categories are overlapping, so totals are always more than 100%.) Median income for the city is \$29,002. Per capita income is \$14,928.

Why Study Small Town USA?

Number of cities, towns and villages (incorporated places) in the United States in 2015, by population size



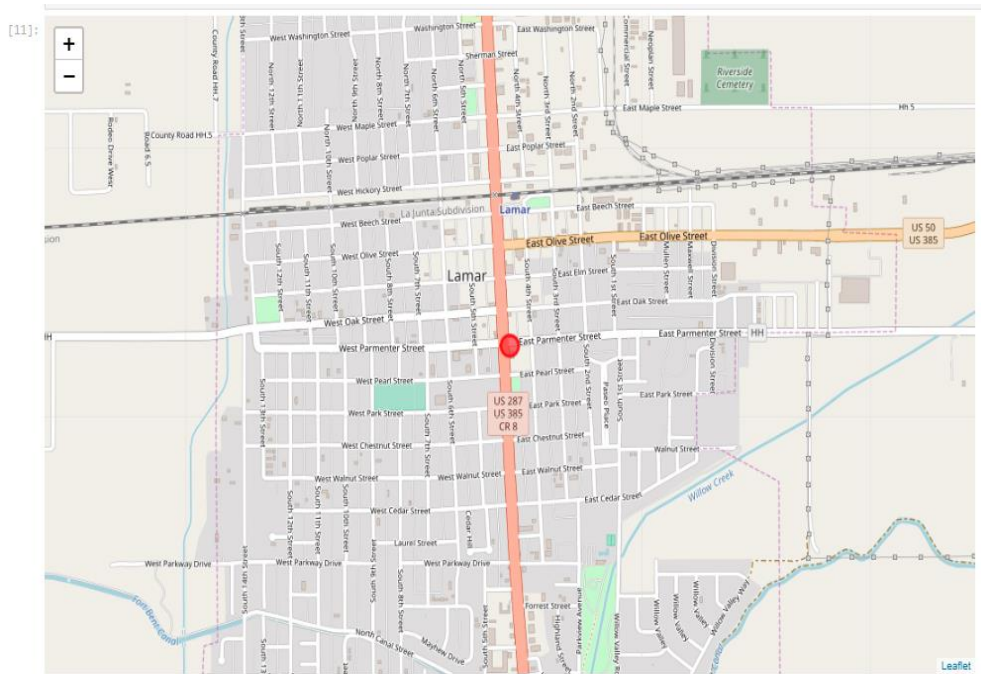
In the USA there are 10 cities over 1 million in population, but there are over 16,000 towns under 10,000 people

Methodology

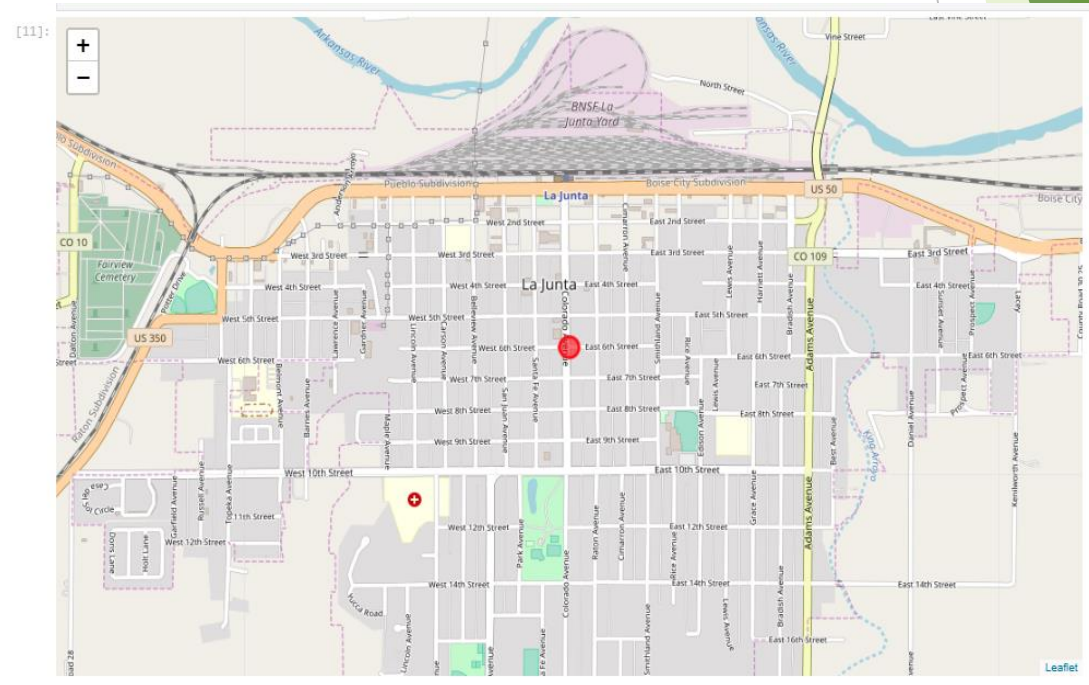
- ▶ General a blank map of the city.
- ▶ Select and plot the centroid for the search for venues in Four Square.
- ▶ Identify the total number of venues for each town in Four Square.
- ▶ Select 100 venues for analysis in each town.
- ▶ Plot 100 venues on the map of the town.
- ▶ Perform basis statistical analysis of the venues collected.
- ▶ Generate basic histogram/bar charts of the types of businesses.
- ▶ Apply K-Means cluster analysis machine learning to the venues.
- ▶ Identify the various business districts (clusters) in both towns.
- ▶ Draw conclusions about the structures of the businesses based on both the Four Square data, maps, and clusters.
- ▶ Report conclusions and recommendations.

Initial Comparative Maps

Lamar



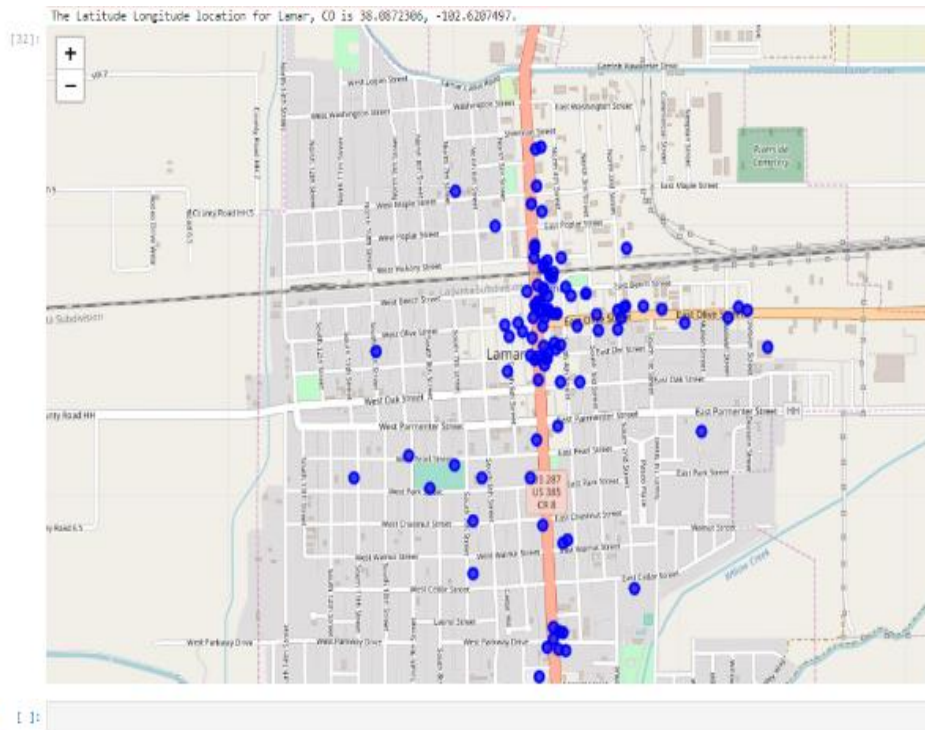
La Junta



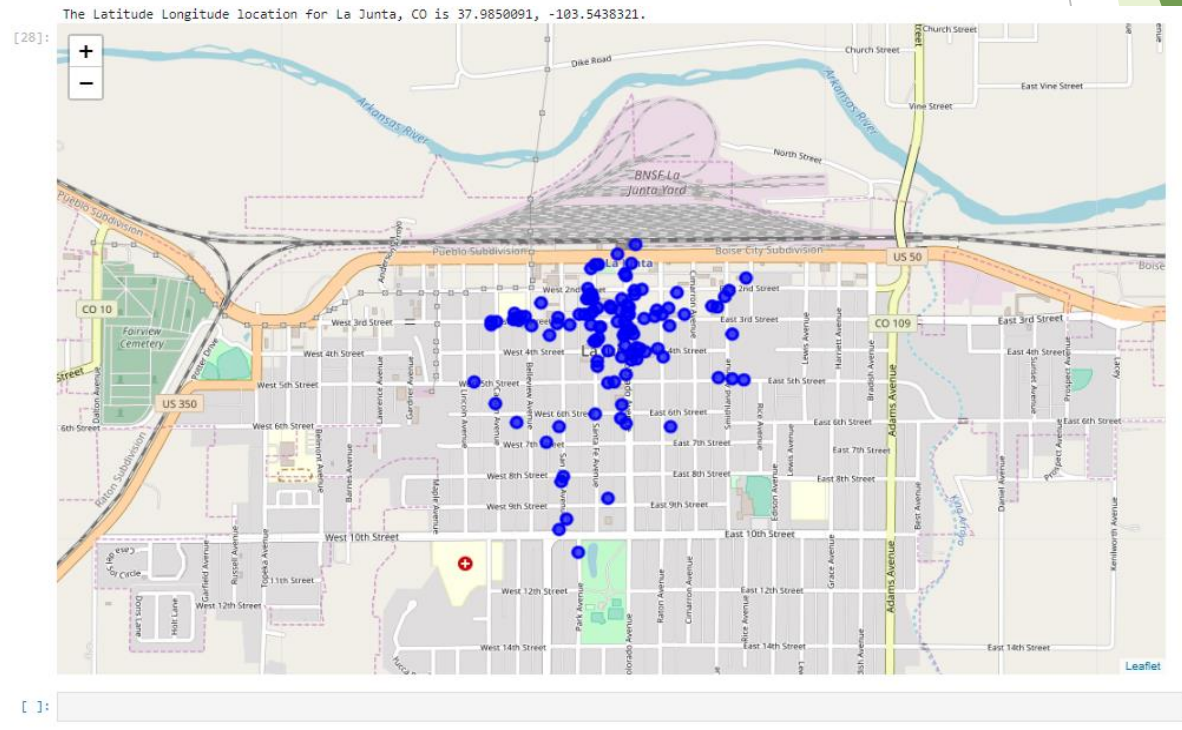
Center point of search is City Hall for both towns

What does the business landscape look like?

Lamar

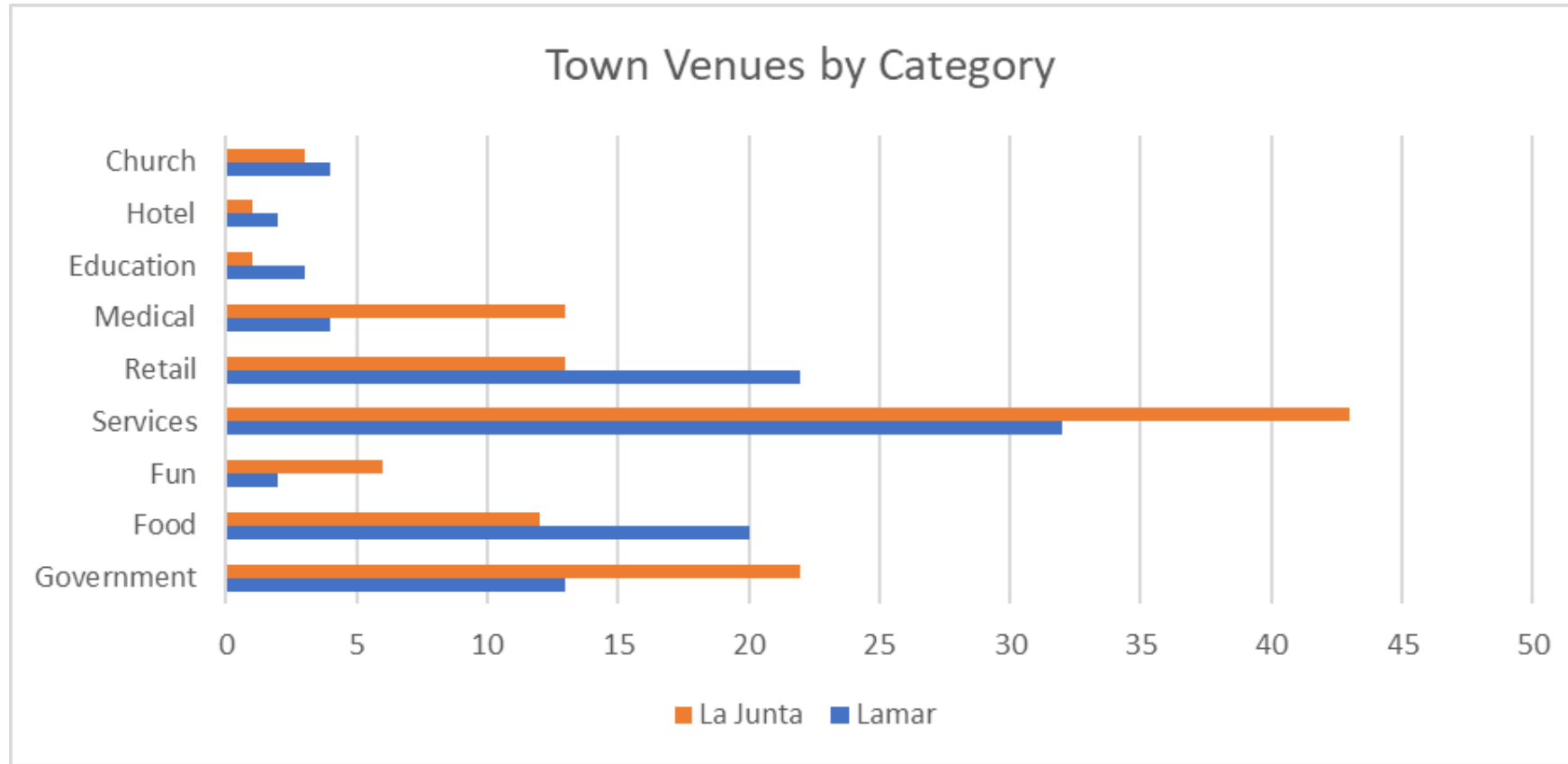


La Junta



Plotting the locations of all listed venues in both towns

Venues condensed into general categories



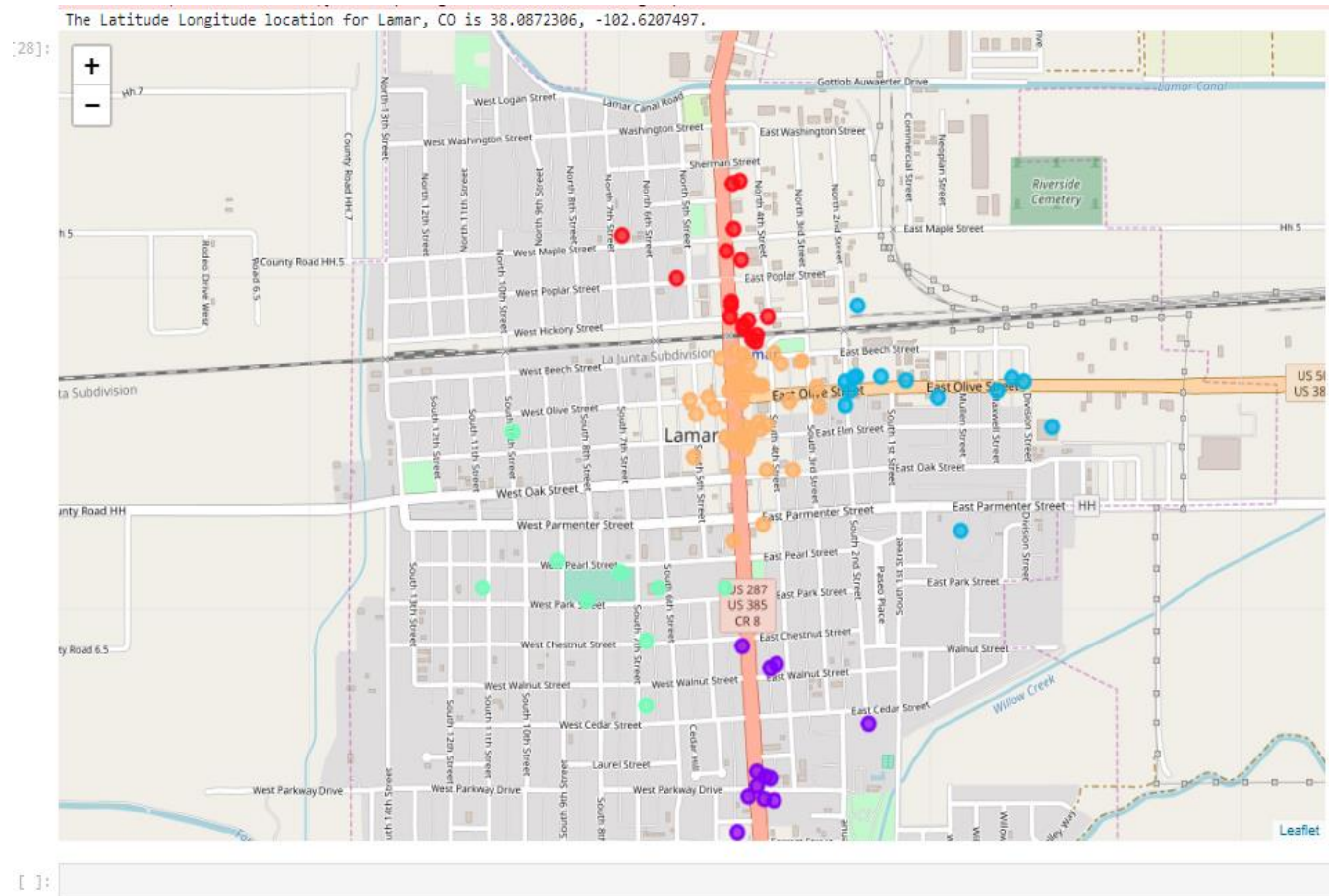
Errors in the Four Square Database

- ▶ Churches. Each town actually possesses several dozen churches. But only 3 and 4 (La Junta and Lamar, respectively) are registered for each town in Four Square.
- ▶ Education. Most of the schools in both towns are not included in the Four Square databases.
- ▶ Wrong Category. A coffee shop named “The Brew House” is registered as a church.
- ▶ Unusual Venues. In Lamar a historical statue known as “Madonna of the Prairie” is registered as a building. In La Junta a street intersection is registered as a building.
- ▶ Location. Jake’s Gym (La Junta) is mis-located by 11 miles.

The Data Scientist must take an active role in examining and correcting the data.

Lamar Business Clusters

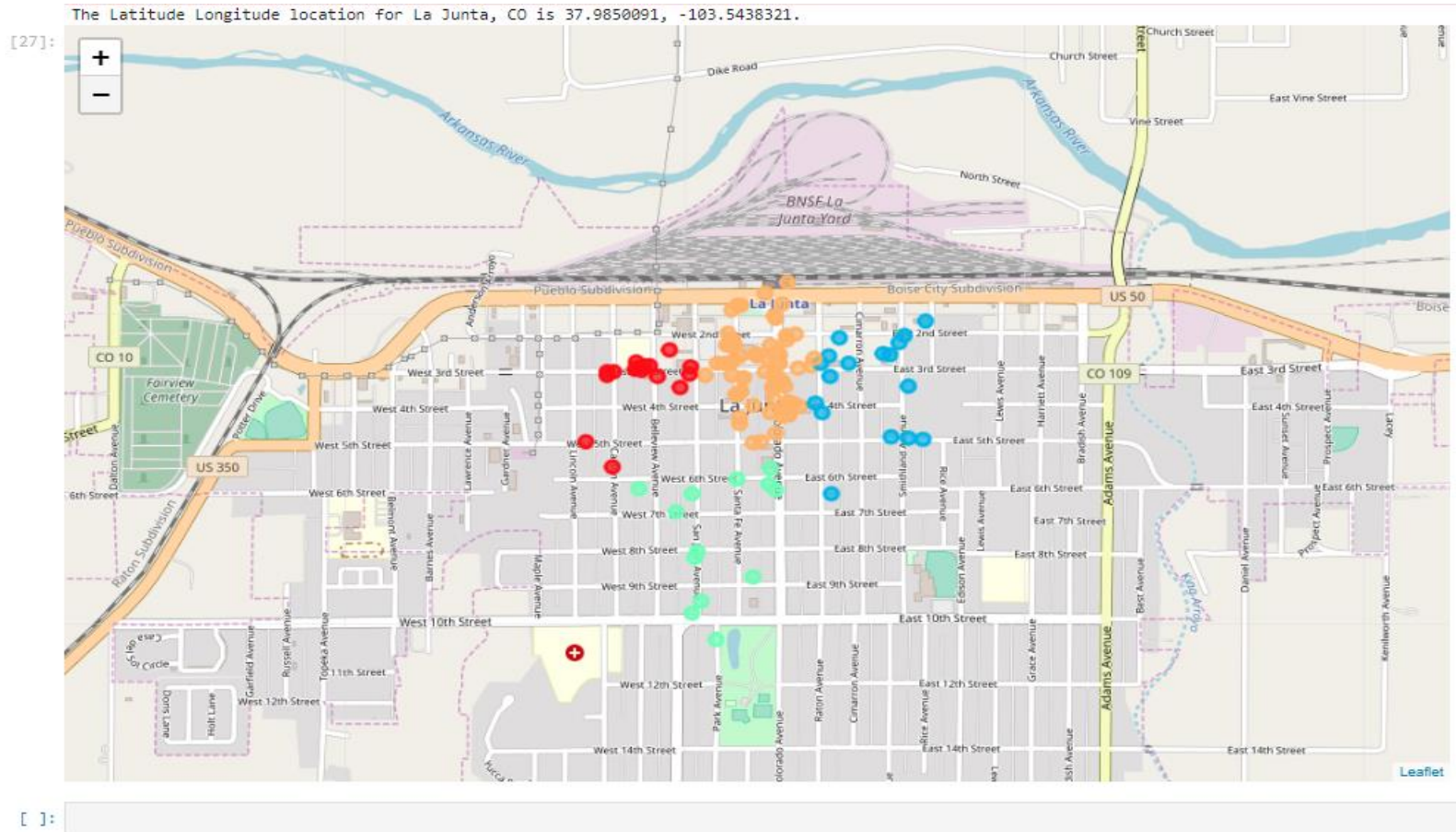
Calculated by K-means clustering algorithm



4 concentrated clusters, 1 dispersed cluster

La Junta Business Clusters

Calculated by K-means clustering algorithm



3 concentrated clusters, 1 dispersed cluster

Conclusions

- ▶ Lamar
- ▶ Offers more complementary businesses and more opportunities for entertainment
- ▶ Strongly influenced by long-haul trucking
- ▶ La Junta
- ▶ Offers more service and government businesses
- ▶ Strongly influenced by railroad business

A great deal of human analyst intervention, examination, and judgment are necessary to compensate for erroneous and missing data. And to interpret facts which are not evident in the data records.