

Supermarket Service Analysis in the Latino Population of Santa Ana, CA



Introduction

The city of Santa Ana, California is located in Orange County, one of the wealthiest counties in California, however it has the second highest rate of overweight and obese youth of the county at 53.7%¹. Having grown up in Santa Ana this information concerned me and I wanted to do an analysis of an obesity factor: supermarkets. I chose supermarkets because it has been found that neighborhoods with better access to supermarkets have lower obesity levels and residents of low-income and minority neighborhoods tend to have poor access to supermarkets². Knowing that the city has a majority Latino population I wanted to do an analysis to assess how supermarket accessibility in Santa Ana



corresponded to 1) how much of the Latino population has good access and 2) the median household income.

References:

- ¹Orange County Community Indicators 2014 Report. http://www.occhildrenandfamilies.com/images/pdf/OCCIR_2014_Report.pdf
- ²Larson, N.I., Story, M.T., Nelson, M.C. (2009). Neighborhood Environments: Disparities in Access to Healthy Foods in the U.S. American Journal of Preventive Medicine, 36(1), 74-81.

Methods

All data layers were clipped into the Santa Ana city boundary and set to the same projection prior to analysis.

Supermarkets:

I selected stores that were big chain supermarkets and ended with 33 stores fitting the criteria. I selected these because big chain supermarkets tend to have more food variety and lower prices than convenience stores³. Then I geocoded the points with their XY coordinates.

Census Data:

I edited the tables in Excel and then joined them to the 2010 census block groups shapefile to have a more exact representation than census tracts.

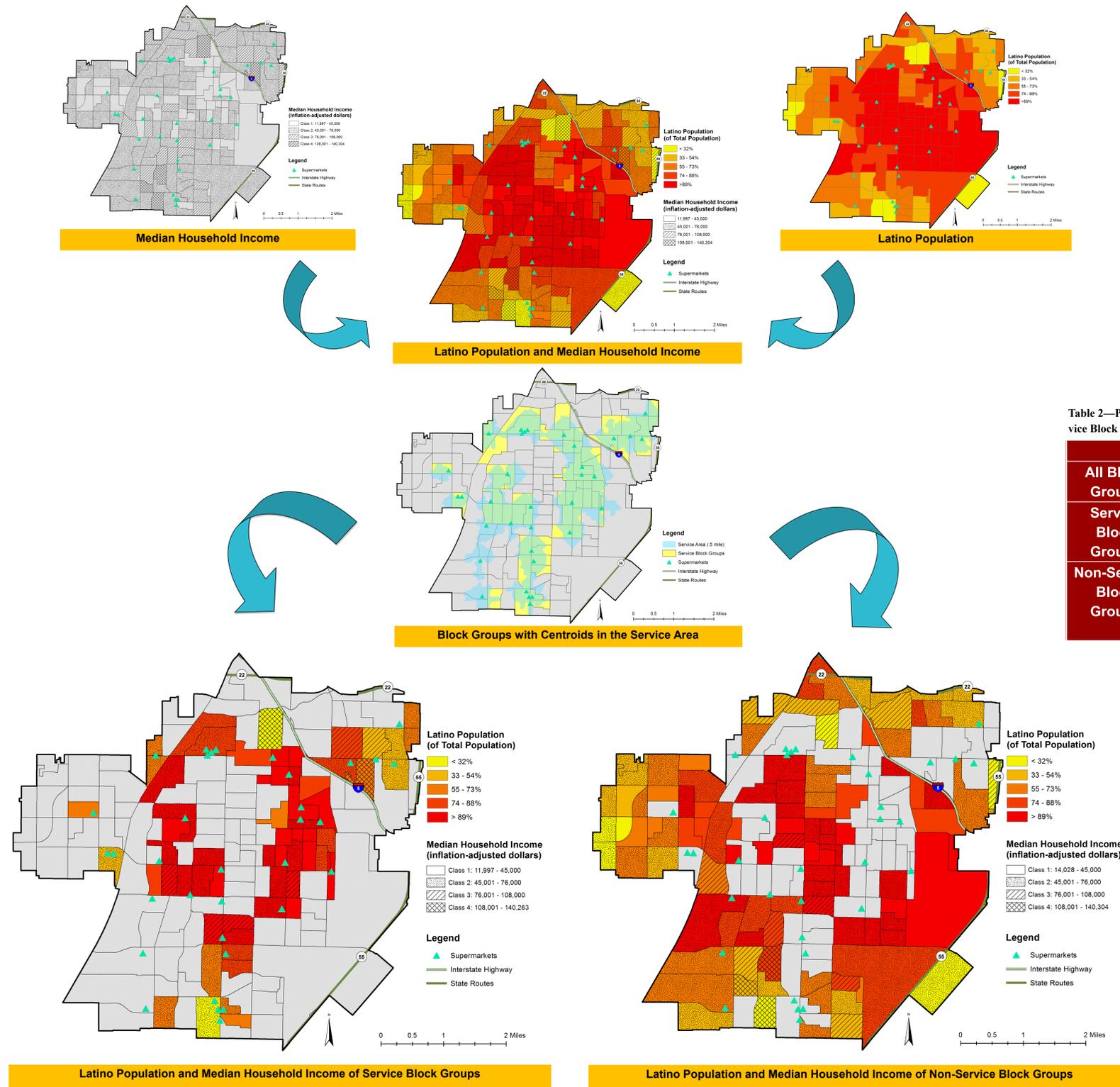
Service Area:

I merged all road data layers into one roads data layer and created a Network Dataset. With the Network Analyst toolbar I created a service area of .5 miles from a each supermarket, with overlap, to show a realistic walking distance and the area surrounding it. With the service area data layer I then used Select by Location to select the block groups with their centroids within the service area and create the layer of focus block groups that will represent the service area. The focus block groups become a proxy for the service area, while the service area is a proxy for accessibility.

From that focus block layer I able to use the Clip tool on the census data to create a layer that displays the demographics of the population within the new defined service area. I also used the Erase tool to create a layer that displays the block groups that fall out of the service block groups. This establishes two groups that allow a visual of the characteristics of the population that falls within the service area and the population that falls outside the service area.

References:

- ³Eckert, J., Shetty, S. (2011). Food Systems, planning, and quantifying access: Using GIS to plan for food retail. *Applied Geography*, 31, 1216-1223.



Results

Over all, only about 33.9% of the city's population are in the service area block groups while 66.1% falls outside. Within the service area population 83.1% are Latino, but from the entire city only 39.3% of the Latino population falls within the service area block groups leaving 60.7% of the Latino population in the excluded service block groups.

To find how median household income relates to the accessibility of supermarkets I divided them into four different classes. Class 1 is the lower income class, and only 46.8% of the lower income class fell within the service block groups. Class 2, the lower middle income class, has 30.7% of its population in the service block groups. Class 3, the upper middle income class, has 23.3% of its population in the service block groups. Class 4, the higher income class, contains 20.9% of its population within the service block groups.

Table 2—Population Totals for Latino and Median Household Income within Santa Ana, the Service Block Groups, and the Non-Service Block Groups

	Total	Latino	Class 1	Class 2	Class 3	Class 4
All Block Groups	386,810	277,061	107,258	214,730	50,331	14,491
Service Block Groups	130,953	108,815	50,243	65,954	11,722	3,034
Non-Service Block Groups	255,857	168,246	57,015	148,776	38,609	11,457

Conclusion

In conclusion, the results show that the big chain supermarkets are not fully accessible to the majority of the city's population and the majority of the Latino population, although the majority of the population within the service area is 83.1%. It appears that the supermarkets serve more of the Class 2 population out of all the other classes. At 46.8%, the majority of the population in the service block groups is in Class 1, however 53.% of that population remains in the non-service block groups. Big chain supermarkets in Santa Ana need to increase their accessibility to the Latino population, Class 1, and Class 2 because they make up the majority of the city's population, 27.7% and 55.5%, respectively.

One major limitation to this study is the use of block groups as a proxy to accessibility to the supermarkets. It does not reflect real life distance and access but it did work to get estimates of what percent of the Latino population in Santa Ana falls within that good accessibility group. The percentages calculated are estimates of the populations that fall within the service area of .5 miles and the population that falls outside.

Table 1—Percentage of Populations within Santa Ana, the Service Block Groups, and the Non-Service Block Groups

	% of Population	% Population is Latino	% of Total Latino Population	% of Income Class 1 Population	% of Income Class 2 Population	% of Income Class 3 Population	% of Income Class 4 Population
All Block Groups	100%	71.6%	71.6%	27.7%	55.5%	13.1%	3.7%
Service Block Groups	33.9%	83.1%	39.3%	46.8%	30.7%	23.3%	20.9%
Non-Service Block Groups	66.1%	65.6%	60.7%	53.2%	69.3%	76.7%	79.1%



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Data Sources: Santa Ana GIS; Orange County GIS; Reference USA; US Census American FactFinder; Tiger, 2010 Decennial Census; 2013 American Community Survey 5-Year Estimates

Projection: NAD_1983_2011_StatePlane_California_VI_FIPS_0406, meters