An Inside Look into how the Spatial Distributions of City Amenities Affects Household Income and Vice Versa

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ABSTRACT

The present study is aimed at comparing the annual income per household to amenities in districts within the Dallas Fort Worth metroplex. Several datasets and analysis results including the spatial distribution of public and private schools, school ratings, proximity to health facilities, parks, and other government provided services will be combined to investigate the research question. Some of the data analysis techniques that will be implemented using ArcGIS Pro include creating buffer zones which act as visual guides to better demonstrate comparisons and communicate the findings in an interactive way.

BACKGROUND

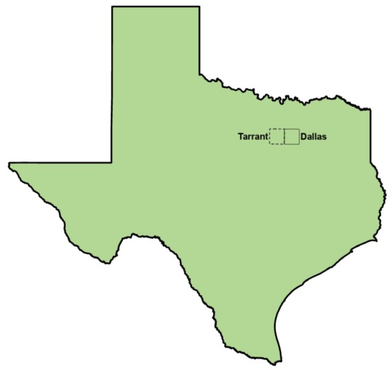
Both Fort Worth and Dallas are large cities in the sate of Texas with growing population. With this growth the question follows can the government provided services keep up. Using Arc GIS Pro to help as a visual aid and run simple analysis on the data.

OBJECTIVES

There are several objectives that this project is aimed at accomplishing. First, there will be accurate maps showing amenities within Dallas and Tarrant county. These include things like schools, hospitals, libraries, fire stations, and parks. Within the research, a query will be run to determine the average distance between these things in comparison to densely populated areas and neighborhoods. Next, average income per household will be determined in combination with these residential areas to see what people are making the most money within these locations. Then, correlations will be drawn in order to see if there is a positive link between higher earning income areas and easy access to amenities within the two counties. Lastly, Dallas and Tarrant county will be compared to highlight the differences between the two.

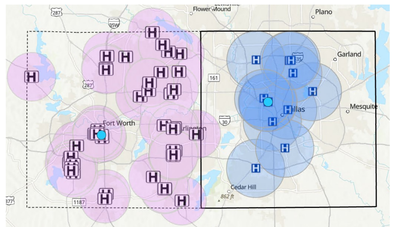
DATA

1.



Average household income Tarrant $71,399
Average household income Dallas $63,549

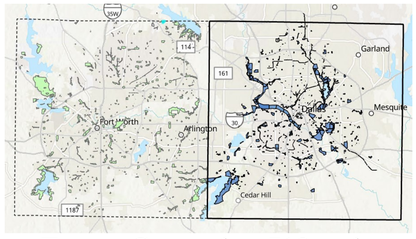
2.



Tarrant County has 55 hospitals with an average of 10.38 miles between each.

Dallas county has 13 hospitals with an average of 5.52 miles between each.

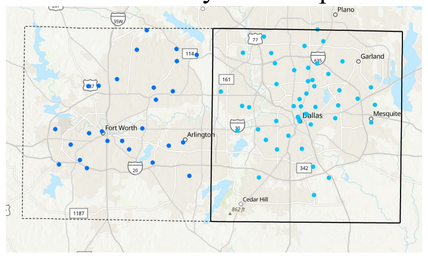
3.



Tarrant County has 718 parks

Dallas County has 584 parks

4.

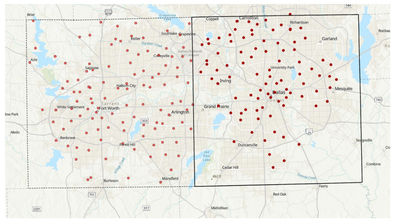


Tarrant has 26 libraries

Dallas has 49 libraries

DATA

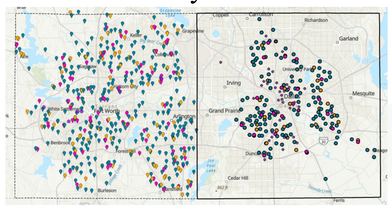
5.



Tarrant County has 113 fire stations

Dallas County has 96 fire stations

6a.



6b.

Tarrant	Dallas
High school 80	High school 22
Middle 99	Middle 30
Elementary 303	Elementary 136
Other 7	Other 62

Tarrant County Schools are rated 5/10

Dallas County Schools are rated 3/10

METHODS

Data will be collected mostly using government provided websites in order to get accurate data. Most of this data will be in the form of symbology on a map to help visualize the real world locations. Other text based data will be collected from things like the 2022 Census and official Texas economic statistic websites. This data will be turned into maps which are augmented to better show these two areas accurately.

Tools like Central Feature, Select Attribute, and Measure are used. Central feature looks at all points in a certain county then selects the most central point and highlights it. Select Attribute runs a query on the background information on the data and shows the requested data. Select Attribute was used to calculate the number of high schools, middle schools and, elementary schools.

METHODS

The last tool utilized was measure. Measuring the distance between each point from the central feature the average can be calculated.

DISCUSSION/CONCLUSION

Over all Tarrant county has more public amenities.

In the data for hospitals (figure 2) there is a 5 mile buffer to show a reasonable driving distance in a medical emergency. Based on just visuals it seems that Tarrant counties land is covered more in the buffer, meaning it is easier to find a hospital in Tarrant county.

In the school dataset (figure 6a) different schools levels are represented with different colors. Blue-green for elementary, yellow for middle, pink for high school, and purple for other. Other typically means a combinations school containing more than the tradition grade level categorization.

Looking at each county as a potential location to move, overall Tarrant county is more likely to have government provided services. Not only does Tarrant county have the abundance of these services, it has the services spread out making them more easily accessible no matter the starting location in Tarrant county.

REFERENCE/AKNOWLEDGMENT