

Logistical Analysis for Investco Property Acquisition

Business and Market Understanding

Investco, a real estate investment company, desires to establish a process for identifying properties that meet the needs of many e-commerce businesses that are seeking to expand their operations. By developing a process, they can proactively acquire properties that meet the needs of multiple business relocating and expanding operations worldwide. In order to invest in these properties, Investco must first understand the needs and business practice of those businesses. XYZ Corporation is an e-commerce business that subcontracts for multiple retail businesses to provide rapid-delivery transportation services. From the time of order the package should be provided to the customer within one hour. The one-hour process includes pick, pack and delivery services. Pick the package includes locating the ordered items from all items available in the distribution center. Packaging includes placing the items in appropriate packaging that is addressed with the right labeling, ready for shipment. The delivery process completes the order by taking the packed boxes from the distribution center to the customer's address. This process has been perfected so that each stage only takes 20 minutes for completion. This is the bases for our research as our team has been delegated to assist with the identification and analysis of additional distribution locations within Collin, Tarrant, Denton and Dallas County as shown in Figure 1.

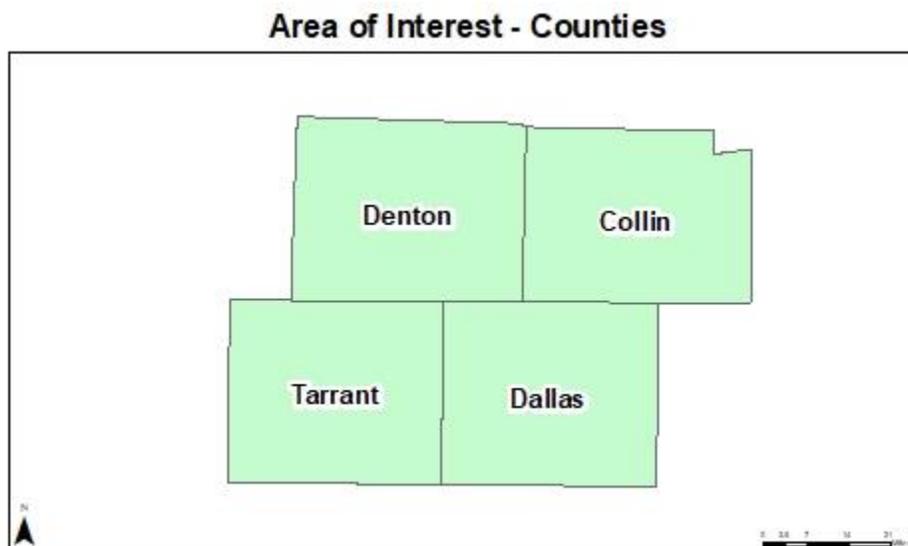


Figure 1

XYZ is new to the DFW area and needs to develop its distribution network from the ground up. XYZ has provided a few key factors to consider:

- XYZ needs to develop a series of distribution centers to cover the D-FW package rapid delivery market for its retail/e-commerce business clients.
- XYZ currently owns or leases no real estate in the D-FW region.
- XYZ's goal is to locate its distribution centers to maximize its coverage of the D-FW market located within the 20-minute delivery time window (distribution center to customer address) as specified above.
- XYZ would like to own or lease property to allow it to operate up to five distribution centers in D-FW, but they are also interested in knowing how many distribution centers are necessary to meet their 20-minute delivery time window.
- While XYZ would prefer to cover the entire D-FW market within this 30-minute delivery time window, it wishes to especially prioritize communities with specific household profiles that represent the most prominent and lucrative customers for its retail/e-commerce business clients.

In addition to the operation of e-commerce businesses we must also look at the consumers and regional markets they are targeting. The household profiles targeted by e-commerce businesses include multiple characteristics. First, we can analyze the community, generally the annual income within these communities exceeds the national average, they are technological communities that are well connected and tend to shop through online resources. Most of these communities have the financial resources to support high expenditure lifestyles. Their particular online spending habits include purchasing food, clothing and technology purchases. There are two targeted age brackets, or market profiles, that should be included within these communities. The first market profile should include people in their 40s and 50s that are wealthy, drive late model vehicles, generally imports, luxury vehicle and SUV's. They purchase the latest home furnishings are improving and renovating their homes and are concerned with physical fitness. This generation travels and purchases items that are necessary for that travel. The second market profile includes people in the 20s and 30s with assets closer to the national average for those ages but that are in a positive career and financial tract. These individuals have higher education levels, above average neighborhood employment levels, and have an above average utilization of technology and social media. For a property to be considered it should be highly accessible to neighborhoods that fit in the market range of these households.

Furthermore, the characteristics of the property or area need to be considered when recommending properties for acquisition. Municipal regulations at the State, county, and Local regions regulations govern what is allowed and what is prohibited. prohibit or allow certain types of uses and when we research properties, we should be considering those regulations. The cost to change those regulations is extensive and the probability of changing those regulations is questionable. You can not guarantee a customer that you can change regulations. It is the decision of the citizens whether the regulations the regulations can be

changed. The zoning of a property is the governing document that determine the development regulations and the allowed uses for a property. Without the appropriate zoning an applicant would need to convince a council of citizens that your proposed use is beneficial to the community and the municipality for future purposes and those who reside in the community. The property characteristics are also important, the access, parking and building attributes must be considered for each site. An e-commerce requires spaces that are greater than 50,000 square feet. They can be stand online building or contained in a multitenant building and whether they own or lease the building is not a contributing factor. The access needs to consider the delivery and distribution of multiple deliveries and accommodate enough vehicles to accomplish both tasks simultaneously. The access points should be large enough to accommodate and 18-wheeler, small van and cars. In additional to municipal requirements the analysis should consider the parking necessary for workers and delivery vehicles. The zoning should allow industrial or commercial uses, the allowances will vary depending on each municipality and should be researched independently. Space within each building should be laid out to utilize staking of large amounts of product, high ceiling elevations are preferred to accommodate this need. A specific study area has been designated for this analysis. This area includes the counties of Collin, Denton, Dallas, and Tarrant County. Everything included in the previous section should be considered when analyzing properties for acquisition. The process should progress into a data gathering and preparation phase.

Data Preparation

The data preparation phase is generally a time-consuming process that involves the gathering and validation of data used during the analysis process. Considering the target markets discussed in the previous section, the following information needs to be collected and analyzed:

- County Shapefiles for Colling, Dallas, Denton, and Tarrant County;
- Existing Transportation Networks within target area;
- Future Thoroughfare Plans within target area;
- Zoning layers within target area;
- US Census Data;
- American Community Survey Data
- ESRI Business Analyst
- Regional Demographics and Regional Consumer Purchases
- Existing E-Commerce Locations
- Available Properties
- Local Zoning Ordinances for Municipalities in Collin, Dallas, Denton, and Tarrant County
- Municipal Boundaries
- Zip Code Boundaries
- Existing Water Line and Sewer Lines – this information is considered confidential by most municipalities
- Future Water Line and Sewer Line Locations – Capital Improvement Plans

The data can be acquired from multiple agencies. It may require contacting the agency personally and submitting a request for the information. The following items are available through North Central Texas Council of Government: 2010 Census demographics, county shapefiles, municipal boundaries and transportation networks. Only the area that we are specifically researching should be exported. Select the counties included in our study area and create a shapefile that only contains the boundaries for those specific counties. In order to ensure you are analyzing the most current information you should contact the municipality to determine the date on the most recent data. The American Community Survey data can be located on the US Census website seeing as it is the Census that collects the information. The AMC helps local officials, community leaders, and businesses understand the changes taking place in their communities. It is the premier source for detailed population and housing information about our nation, as stated on the “AMC” website (2). In order to obtain the zoning information for each municipal boundary the Development Services or Planning Department will need to be contacted in each jurisdiction. Some information is available for release to the public, but some jurisdictions may be hesitant about releasing their information. There are specific reasons that the data is necessary. In order to understand its importance, we should research specifically what is included in each set of data. The county shapefiles are self-explanatory and include the boundary of each county. The is the same for municipal boundaries and zip codes. However, if a municipal or city boundary includes areas that are shown as extra territorial jurisdiction (ETJ) you will need to contact the city to determine who the regulating authority is. Figure 2 shows municipal boundaries overlaid over our target area. The portions of municipalities outside of the area of interest need to be excluded. The process to eliminate these areas will be presented and discussed in a later section.

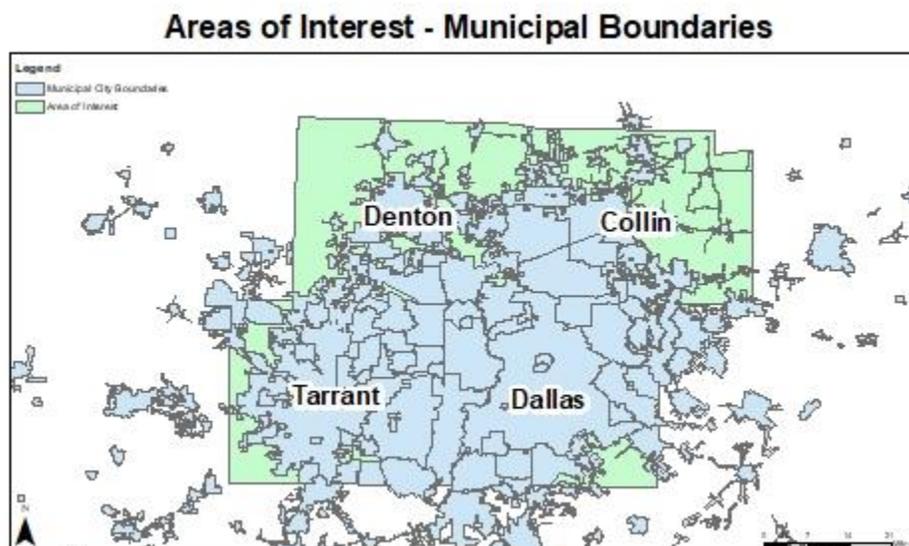


Figure 2

There are specific ordinances and state local government code that regulate how these properties can be developed and used. A Zoning Ordinance is a regulatory document that

contains information regarding uses that are allowed within certain districts. For example, a distribution warehouse is only allowed in Commercial or Industrial districts. Each city will have their own ordinance and the allowances in each district will vary depending on the municipality. The zoning layers will provide information as to what the current zoning is or if there are specific regulations governing the property within a Planned Development ordinance. Properties that are not within city limits will abide by county regulations. If a property is identified that is already constructed, then the proposed use, warehouse and distribution center, should be able to occupy the structure. If the property is not developed, the development of that property could trigger annexation requirements and city zoning regulations. The existing thoroughfare plans will provide detailed information on the size of the roads, speed limits and connections. This information is essential for determining the 30-minute drive time radius. The future thoroughfare plans provide information on the ultimate size of the existing roads. Figure 3 shows the transportation networks available through the North Central Texas Council of Governments. It could be beneficial to keep the transportation networks outside of the area of interests to provide additional information on access to the proposed sites.

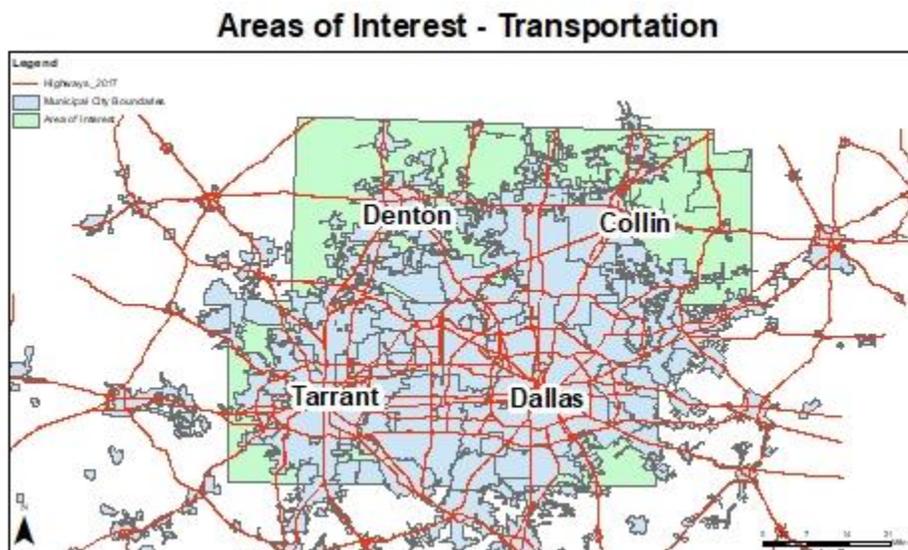


Figure 3

The US Census Data will provide demographics for the entire United States from 2010 but we only need information for the areas that we are researching and identify the market targets. This is also not up to date information. We are researching one of the fastest growing areas in Texas, we need to check the information for accuracy and attempt to get more recent information. The US Census information includes, age, income, household size, ethnicity, education level, language preferences, vehicle profile and purchase profile. This information is necessary to identify where consumers reside and their proximity to the proposed distribution centers. By using Costar, a realty database of commercial properties, we can query the available properties and view information about businesses that currently occupy lease spaces within those buildings. This information will assist with identifying possible distribution center

locations and with identifying the current locations of e-commerce businesses. The zip code information will be beneficial to determine sales percentage for some of the retailers providing goods for delivery and distribution. Think of when you are checking out at a store, what do they generally ask you for at the beginning of the transaction, what is your zip code? This information tells retailers where their customers reside. If a substantial percentage come from a specific zip code that are should be considered when adding additional stores.

The data that has been collected has a specific purpose. The data will provide the crucial information needed to make spatial decisions. By analyzing the information, a recommendation can be made of the locations with transportation, entitled zoning, suitable structures or properties available the meet the criteria provided for distribution centers, and proximity to target markets. The information provided from the US Census and American Community Survey will enable us to geographically place target markets and regions. This information also provides populations for each area and allows an analysis to be prepared regarding percentages of population that are within our target market. We need to look at population, age, spending habits, income, education level, vehicle type and professional. These specific traits are characterized and prepared in a database. The database is updated voluntarily by every community each year, but the Census performs an update by household every ten years. This is the main purpose of the US Census, to collect information on households so that specific areas can be analyzed in order to determine economic benefit. Similar information is also collected and available in a shapefile through the North Central Texas Council of Governments (11).

Welcome to NCTCOG's Regional Data Center Site

Through this portal, you can access a variety of tabular datasets and geographic data layers. The data items available here are those needed by the [North Central Texas Council of Governments](#) (NCTCOG) programs and services. However, they can be beneficial outside the agency and are made available as a public service. To find desired data, click on a category below or use the search bar.

To view or purchase digital imagery and related products, visit [DFWmaps](#).

Explore Data Categories



Boundaries

Administrative, Political,
and Planning Area
Delineations



Demographics

Population Counts and
Characteristics



Census

U.S. Census Bureau Areas
for Data Tabulation

If a site is already constructed, then the water and sewer line information will not be necessary. If the site has not been constructed these items will need to be considered as they can drastically increase the cost for developing a site. The Capital Improvement Plan can provide beneficial information for site cost analysis. If it is necessary to install utilities for a site, a portion of that expense is eligible for reimbursement through a development agreement.

Now that we have discussed the type of data that is necessary for the analysis and where it can be obtained, we can begin organizing, reviewing and determining the validity of our information. In order to complete this process a Geographic Information System software is beneficial. A Geographic Information System allows information to be spatially displayed and analyzed.

Modeling

A GIS is a software tool that allows us to store specific information about geography or a place. The GIS system can sort, display, manipulate and analyze spatial information. There are multiple GIS platforms that will be used during this analysis. Two of the systems used during this analysis include ArcGIS Desktop and Maptitude. The software alone will not complete all the tasks necessary for analyzing our information. In addition to the software we require analysis extensions that are not included in a basic software license. The extensions for ArcGIS include Spatial Analysis, Geoprocessing Tools, and Business Analyst (1) which is available with an ESRI online account and annual subscription. The tools within ArcGIS include, select by attributes, select by location, geoprocessing buffer, dissolve, clip, spatial joins and relates. While using the Maptitude software we will utilize the following tools, select by condition, drive-time rings, cumulative demographics, demographic settings, and the facility location toolbox. There are references available for each of these products to assist with the processing features referenced above. Hiring a GIS professional is recommended to ensure accuracy with the data and data manipulation.

Once of the information has been added to the GIS system, we can begin our analysis. Any information that is not included in the four target counties should be excluded. We can separate this information uses multiple methods. First, we need to create one common boundary for the area we are researching. To achieve this, we will select the desired counties and export them into a separate shapefile. The four distinct counties within the shapefile should now be merged into one complete boundary. We can merge the separate features but the interior boundary lines existing from the original county's boundaries will still exist. The preferred method for creating one common boundary is to perform a dissolve operation that will create one boundary and remove any of the interior lines from the new shapefile. The zoning layers for each municipality will contain every existing zoning district but we are only interested in zoning districts that allow warehouse and distribution centers. For this analysis we will only be target districts that have Commercial or Industrial uses. The selected by attributes tools gives GIS professional the ability to search a table for a specific label or title and export that information into a separate file. For example, a query for zoning that contain I for Industrial or C for Commercial, located each field that contains this information and selects them in a single process. This information is exported by each municipality and held for future processing. The same type of review process must be completed for the available properties. The properties that we are considering should meet the requirements for a warehouse distribution center and may need to be reviewed individually instead of using a GIS tool that evaluate on a single attribute. The properties we are researching must meet a minimum requirement of 50,000 square feet or greater, possess a shipping and receiving area, provide

adequate parking for on-site staff and delivery personnel, and have a ceiling height that will permit the stacking of goods and merchandise. The image shown in Figure 4 is an example of a warehouse and distribution center.



Figure 4

These are traits that are difficult to determine from a database and may require for each site to be considered and eliminated individually. Once all the process has been repeated for each municipality, we have several layers remaining that contain the districts that allow distribution centers. Since this information should be considered collectively, we can perform a spatial join to link the information to the target boundary. Remember, for this information to be stored permanently an export function must be completed which makes the join permanent. Now that we have a boundary for the research area, we can process the remaining information to exclude anything that is outside of the target area. If any shapefiles have features outside of the boundary the clip tool can be used to remove the information and new shapefile is created containing only the information within the target boundary. Each time a new shapefile is created it should be exported and renamed to distinguish it from files that contain unnecessary information. The clip tool should be used to exclude roads, zoning areas, available properties and census. Before the demographic information is excluded research should be performed to identify the location of target markets. Target market information can be linked to the municipal boundaries through a spatial join. This insures demographic information pertaining to the population is not excluded from the analysis. If our data has been processed correctly the following shapefiles should be present: target boundary, zoning, transportation, available properties, utilities, and demographic information for the population within the target boundary. If you don't have the ability to gather the most recent demographic information the ESRI Business Analysis service is available for collecting and analyzing this information.

Now that we have all this information, what do we do with it? Without a basic understanding of how the information relates we would not be able to interpret or program the GIS software to provide recommendations on data. We know the target market and through our preparation we now know where that target population resides within the four counties that we are researching. We need to overlay each of the different layers that have been created. We can display the target population through spatial analysis and create separate layers that symbolize the specific attributes of each target market. This begins a more in-depth and specific part of our analysis, we will rely of features available through the GIS software that are crucial for analyzing information and making recommendations for investment opportunities.

Using this spatial information we can determine the proximity of available properties to existing or future transportation. Additionally we can include the information and location of our target markets and determine which locations contains more attributes of the desired market or increased percentages of our target market exist within a specific area around a possible locations. Once we have identified a set number of locations we can perform a drive-time analysis to develop statistics on the population. This will provide information regarding the population surrounding each of the possible sites. We can therefore create a ranking on each property based on how they service our target markets. The drive-time rings process included in the Maptitude software can evaluate drive-times and calculate demographics on the customers that reside within that area. In order to create the drive-time rings we need the current locations and the transportation system in the area. The facility location tool analyzes locations that we provide and determines which of the locations achieve reaching the greatest percentage of our target market. The results will be the specific number of locations we have specified and the ability to analyze the drive-time wrings and demographics in the proposed areas. We could complete this process on our own for each site but the facility locater tool reduced time and energy spent during the analysis. The parameters for the calculations will be programed into the software during the process. This is known as the p-median problem, it is the most general formulation of location allocation methodology as stated in text... The objective is to locate a given number of facilities, with a maximum driving time, for all customers. Now that all of this information has been prepared, analyzed and presented to use, what decisions can be made from what was provided?

Evaluation

There is an abundance of information that has been prepared and displayed for use. Now we must use the information and make educated recommendations for future site acquisitions. The reasoning for each recommendation should also be provided to demonstrate the basis for each recommendations. We create several data sets to analyze in Maptitude. The first set of possible sites need to overlap with existing zoning and existing transportation networks. This evaluation will provide results for sites that are already constructed, have access to major roads and existing entitlements are present for the proposed use. The next set of data points should be for existing properties that do not have a structure but that are still located next to existing transportation networks, zoning entitlements and access to underground utilities. This is not the preferred investment site but still acceptable to achieve multiple distribution sites. The third set of proposed sites should include information for existing structures and undeveloped properties. This analysis will assist it determining the best sites to reach the target market without taking into consideration any development constraints that exist. The properties can be ranked based on initial cost of development at a later point. The demographics calculated for each properties can be arranged in a table, which enables an evaluation on many site based on the statistics created during the drive-time ring analysis. Each property should be presented in a property analysis summary. Information about the site including square footage, parking, cost, acreage, lot coverage, expansion possibilities, regulating authority, utilities access, and demographics about the population surrounding the proposed site. The demographics should include statistics for each of the target markets and growth rate of the community.

Deployment

Information provided with the property summary analysis should be reviewed and checked for accuracy. Regulations and property characteristics are continuously changing, investors must ensure they are always making decisions based on the most recent information. Analyst should contact each entity to verify zoning and existing infrastructure. Analysts can also request information pertaining to development constraints that may have not been included in the property summary analysis. Property owners have been known to leave out crucial information regarding a site in order to list it at a higher price. Having this information is beneficial during negotiations regarding sale prices. Target market percentages within certain areas should be examined to ensure the greatest number of customers are being reached. Percentages can be misleading when coverage is for a small population of customers. Instead of preparing the information as a how to guide for evaluating properties that information gathered about the properties should be organized and displayed. Background information should be available pertaining to the methods used but the entire focus should not be on how the analysis was performed and rather what determinations are made as a result of the analysis. A sample of a residential comparative analysis is shown below in Figure 5, the same format can be used for comparing commercial properties.

| |  |  |  |  |
|------------------------------|--|--|---|--|
| | Subject | Comparable 1 | Comparable 2 | Comparable 3 |
| MLS Number: | | R1534825 | R1560515 | R1565775 |
| Address: | 46 RIDGECREST DR. Picayune, MS 39466 | 3013 Woods Road Picayune, MS 39466 | 1023 Neal Road Picayune, MS 39466 | 109 Wood Oak Picayune, ms 39466 |
| Suggested List Price: | \$153,568.37 | | | |
| Adjusted Price: | | \$171,553.60 -3.62% | \$135,312.40 4.89% | \$163,259.80 7.76% |
| List/Sell Price: | | \$178,000 | \$129,000 | \$151,500 |
| Sold Date: | | 10/22/2009 | 11/23/2009 | 12/1/2009 |
| Misc Adjustments: | | | | |
| Day on Market: | | 606 | 101 | 88 |
| List Price: \$0 | | \$179,500 | \$129,000 | \$149,900 |
| Days on Market: | | | | |
| Days on Market: | | | | |
| Days on Market: | | | | |
| Submission: | Ridgecrest | The Woods | None | Wood Oak |
| School: | | Pic-Roseland Plant | Pic-Southside | Pic-Southside |
| Lot Size: | | | 70 x 110 | 80 x 120 |
| Acres: | 1 | 0.34 +4,620.00 | 0.18 +5,740.00 | 1.65 +5,845.00 |
| Rooms: | 8 | 10 | 7 | 8 |
| Bedrooms: | 3 | 4 | 3 | 3 |
| Full Baths: | 2 | 3 | 2 | 2 |
| Half Baths: | 0 | 0 | 0 | 0 |
| Year Built: | 1996 | 1896 | 2000 | 2009 |
| Apx Heated/Cooled 1500 Sqft: | | 1685 -11,066.40 | 1563 +572.40 | 1507 +5,914.80 |
| Apx Underbeam 2000 Sqft: | | 3155 | 2030 | 1544 |
| New Construction: | No | No | No | Yes |
| Construction Type: | Existing Home | Existing Home | Existing Home | New Construction |
| Sold Date: | | 10/22/2009 | 11/23/2009 | 12/1/2009 |
| Sold Price: \$0 | | \$178,000 | \$129,000 | \$151,500 |
| | QUALITY BUILT HOUSE ON APPROXIMATELY 1 ACRE | Stunning 4B/R 3B Close to the lake This home has been well | WHEEL OF FORTUNE - YIELD BE THE FORTUNE | Wow! Great home for 1st time buyer! Low maintenance |

Figure 5

The information should be organized so that a prospective client can review information pertaining to multiple properties at the same time. The properties could be organized by ranking and the ranking could be done by county or by number of customers reached by each site. Investco should be able to easily understand the information being presented, see that the recommendations are within the area of interest and make educated decisions based on the information presented to them. Our objective as analyst is to prepare the information, review for spatial importance, establish relationships to geographical demographics and organize the information based on importance.

Resources

1. ArcGIS Business Analyst: <https://www.esri.com/en-us/arcgis/products/arcgis-business-analyst/overview>
2. American Community Survey Website: <https://www.census.gov/programs-surveys/acs/>
3. City of Allen: <https://www.cityofallen.org/>
4. City of Celina: <https://celina-tx.gov/>
5. City of Dallas: <https://dallascityhall.com/Pages/default.aspx>
6. City of Denton: <https://www.cityofdenton.com/en-us/>
7. City of Frisco: <https://friscotexas.gov/>
8. City of McKinney: <https://www.mckinneytexas.org/>
9. City of Plano: <http://plano.gov/>
10. Costar Real-Estate Service: <https://www.costar.com/>
11. North Central Texas Council of Governments: <https://www.nctcog.org/regional-data/geographic-information-systems-gis>
12. United States Census Bureau: <https://www.census.gov/>