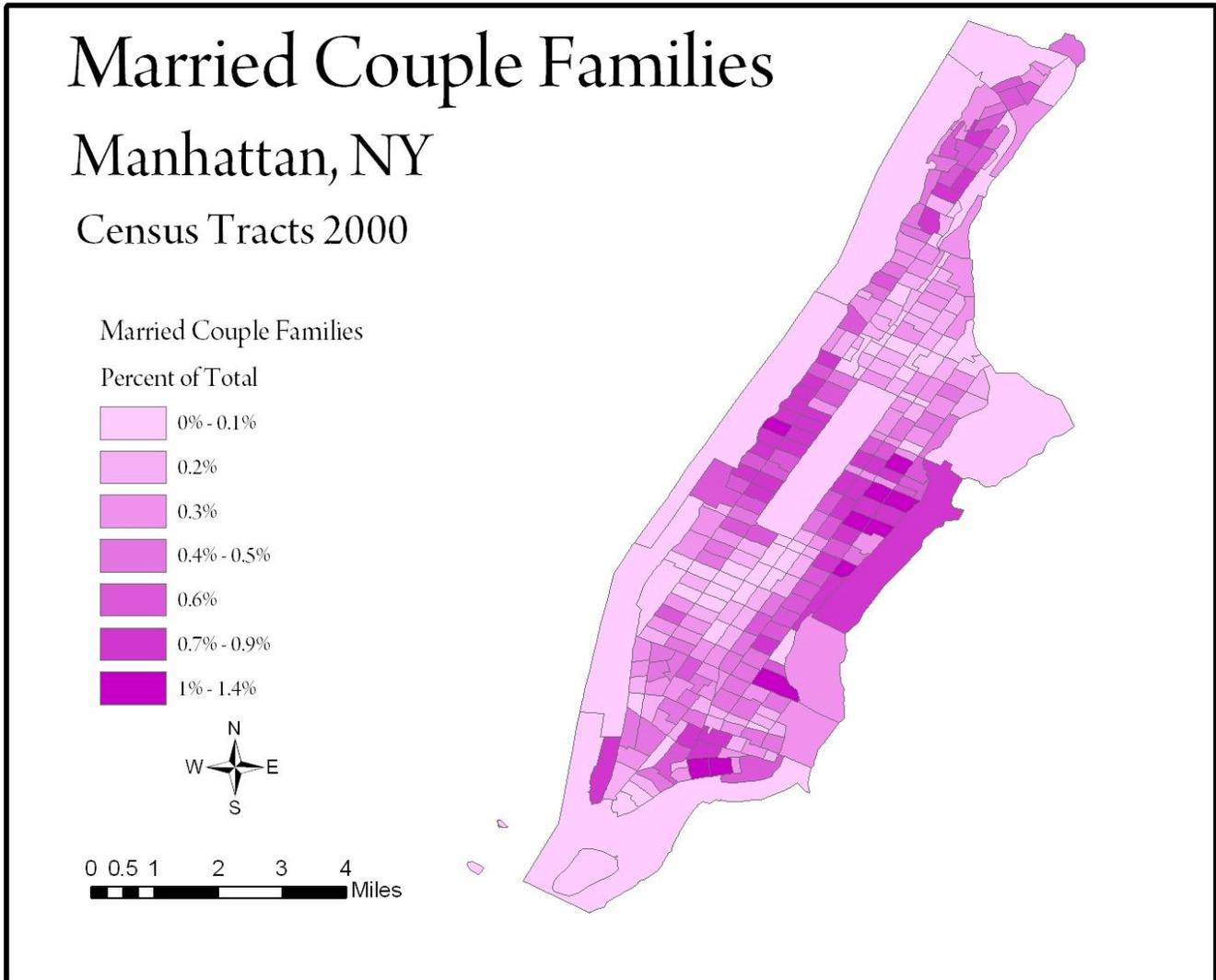


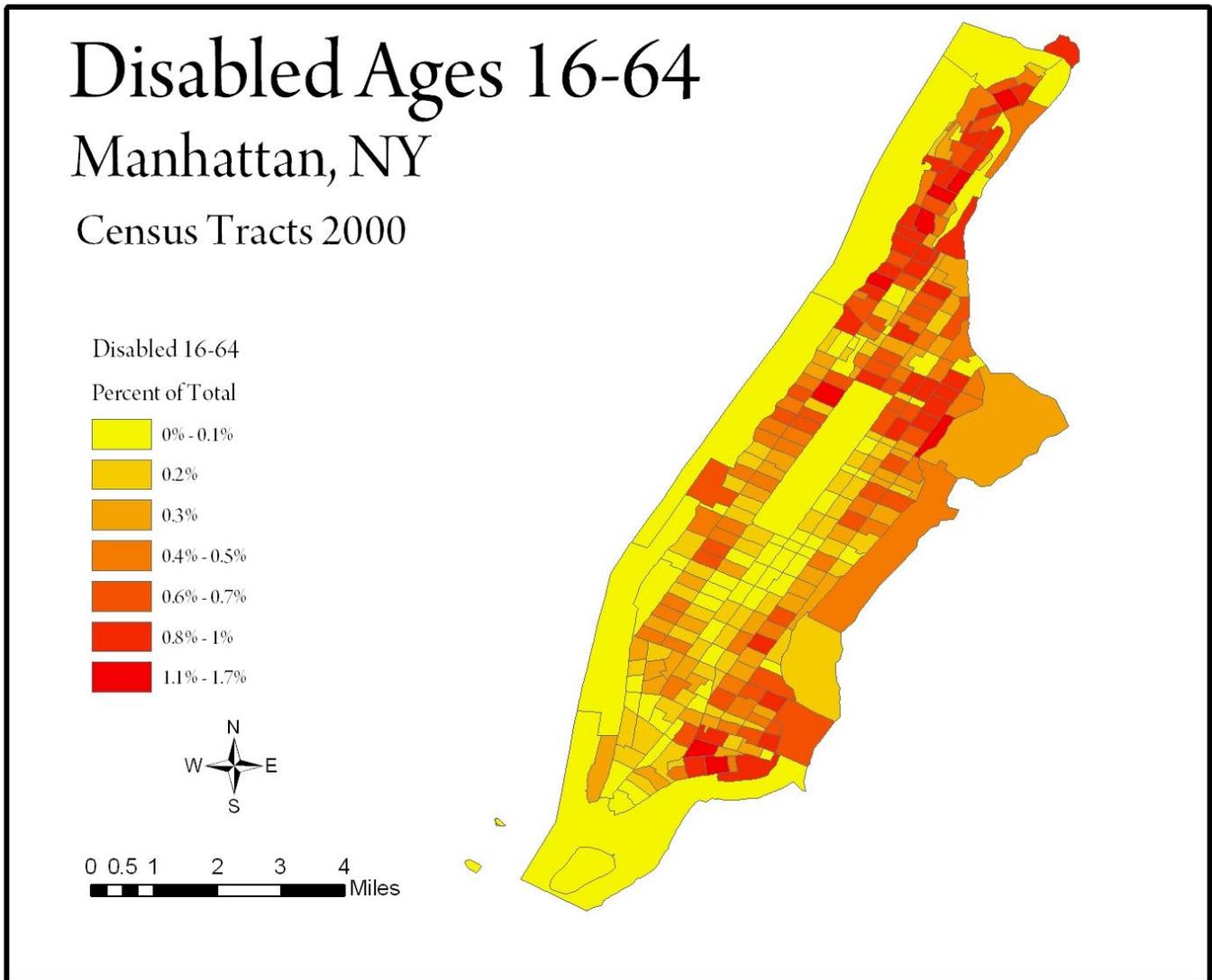
Figure 22.



Observing where married couple families reside indicate the population that is busy and those who may prefer to save time and stress by utilizing the online grocery shopping and delivery service.

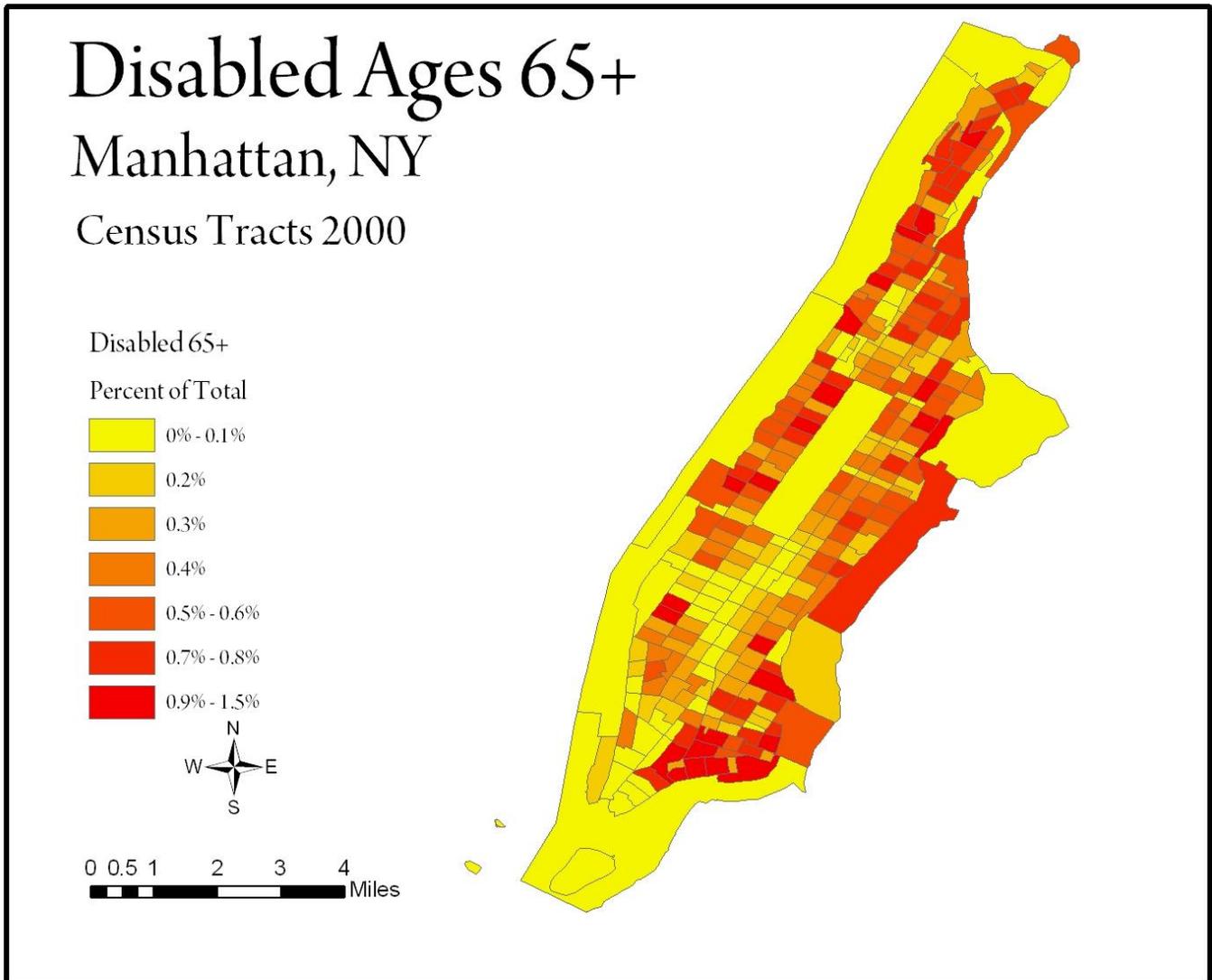
The disabled population is an important variable to study because they may have a condition that may hinder the ability to see, walk, or hear. This group may have difficulty shopping for groceries.

Figure 23.



The disabled group ages 16 to 64 are found in the Northern Manhattan but are present in the target area as well.

Figure 24.

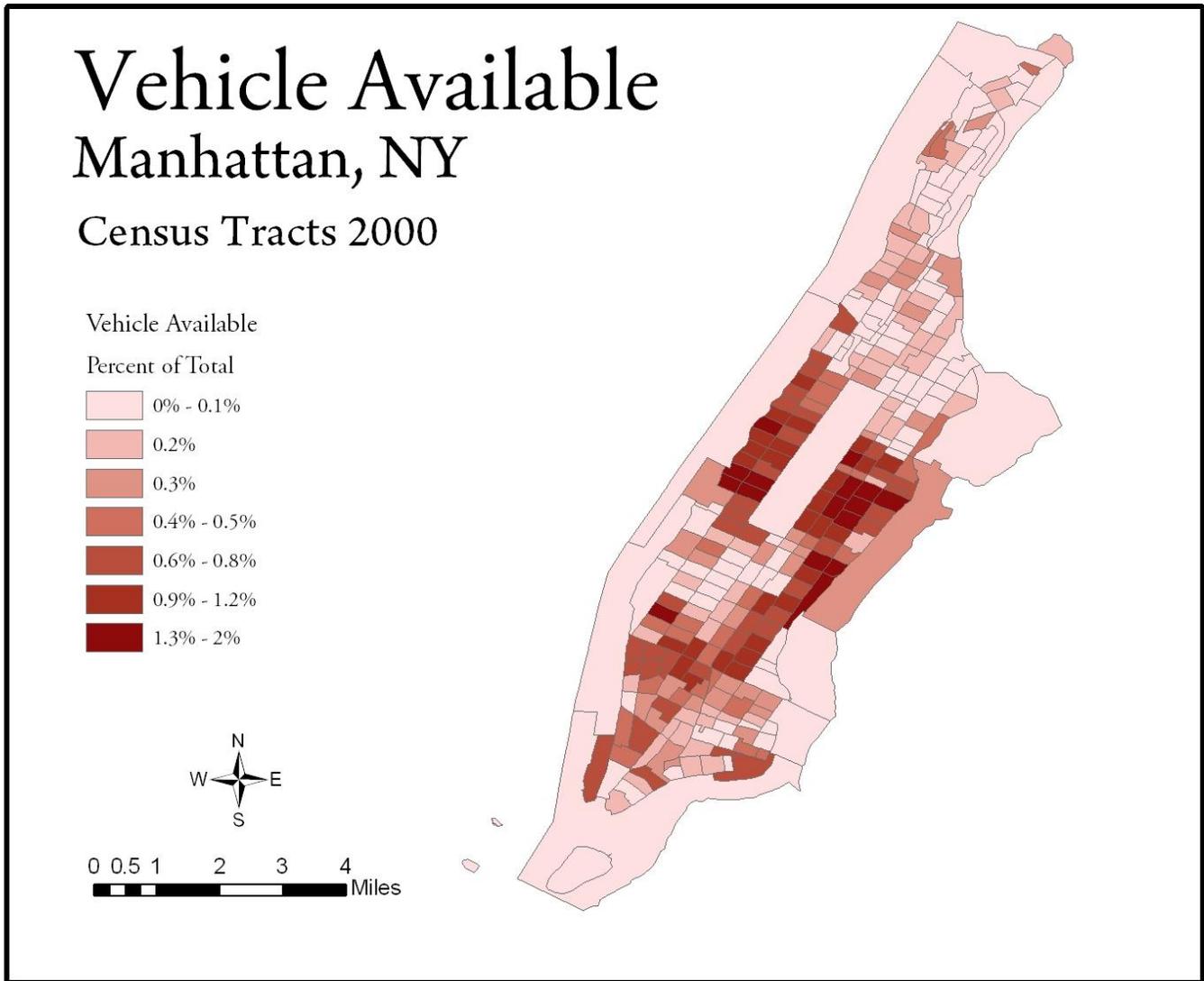


The disabled group older than age 65 is more prevalent than the disabled group ages less than 65. This disabled age group is again found in the Northern Manhattan and is found in high numbers in the target area.

Access to a vehicle is convenient, but driving in Manhattan may be dangerous, stressful, and unnecessary because of very limited parking and the presence of public transportation throughout the city. People who own and use a vehicle are able to transport

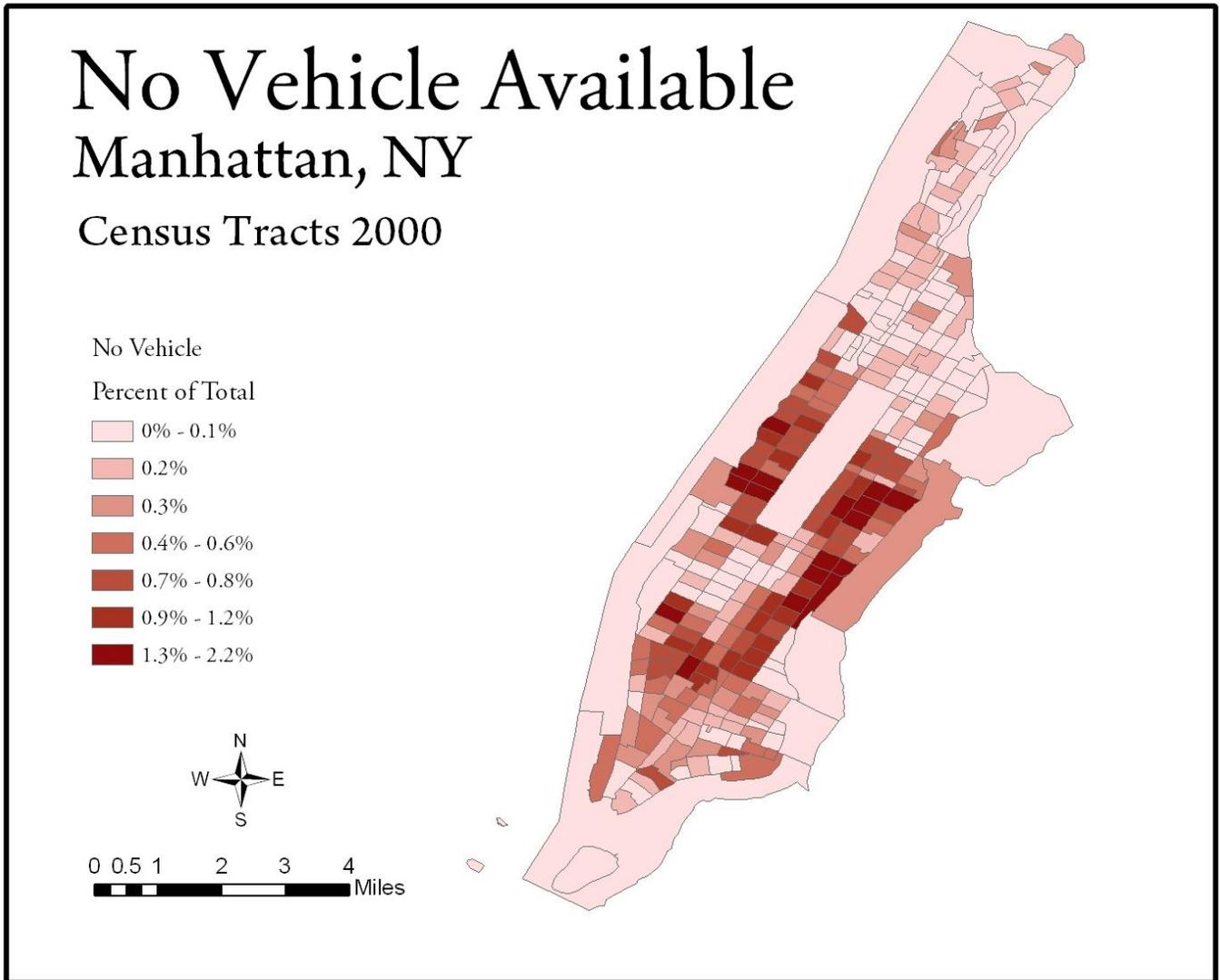
their many and heavy groceries from the store to the house or apartment. It is more difficult to transport groceries by foot or by public transportation, especially if the items are plenty and heavy.

Figure 25.



People who own a vehicle are found mostly in the target area.

Figure 26.



Most people who do not own a vehicle reside in the Upper West Side or the Upper East Side.

Grocery stores exist throughout Manhattan. The following maps created using the Select Phone marketing program illustrate the distribution of grocery stores throughout Manhattan. It is clear that there is an ample amount of grocery stores; the data includes convenience stores, specialty food stores, health stores, coffee shops, caterers, delis, pharmacies, and other non-traditional grocery store were listed under the same Census Feature Class Codes (CFCC) as grocery stores which skewed the number of grocery stores in the grocery store category. The distribution of grocery stores in Manhattan is uniform, but there may be more gourmet and higher end food retail stores in the target area.

Figure 27.



Figure 28.



Figure 29.



Figure 30.



Craigslist listed a number of warehouses and industrial parks within the city and in surrounding areas. I evaluated each warehouse based on its location, distance to the target area, selling or leasing price per square foot, and other strategic variables that must be taken into account. I found that the locations in Red Hook, Brooklyn, Mt. Vernon, Westchester, Prospect Heights, Brooklyn, Northeast Bronx, Astoria, Queens met the criteria of proximity to the target area and reasonable price per square foot. I chose an address located at the corner of Amsterdam and 92nd Street, in the target area of the Upper West Side of Manhattan to be the address for delivery from the various warehousing locations.

Using GIS, I added weights or increased the importance of major highways and major roadways to use to access the target area from the warehouse location because these roads have a low cost value. Minor roads, possibly roads that run through residential areas, have higher cost values and should be avoided as much as possible to get to the target area in a quicker, easier, and more cost efficient way. The purpose of adding weights to each road segment was to discourage the software from using smaller streets even if the distance would be shorter. Another reason to put more importance on the use of major roadways was because I wanted to avoid trucks driving through residential streets as much as possible for efficiency (speed limits, stop lights/signs, and traffic) and aesthetic reasons.

Figure 31.

Cost Effective Route



From Amsterdam and 92nd Street, NY to Red Hook, Brooklyn, NY

Cost: 114

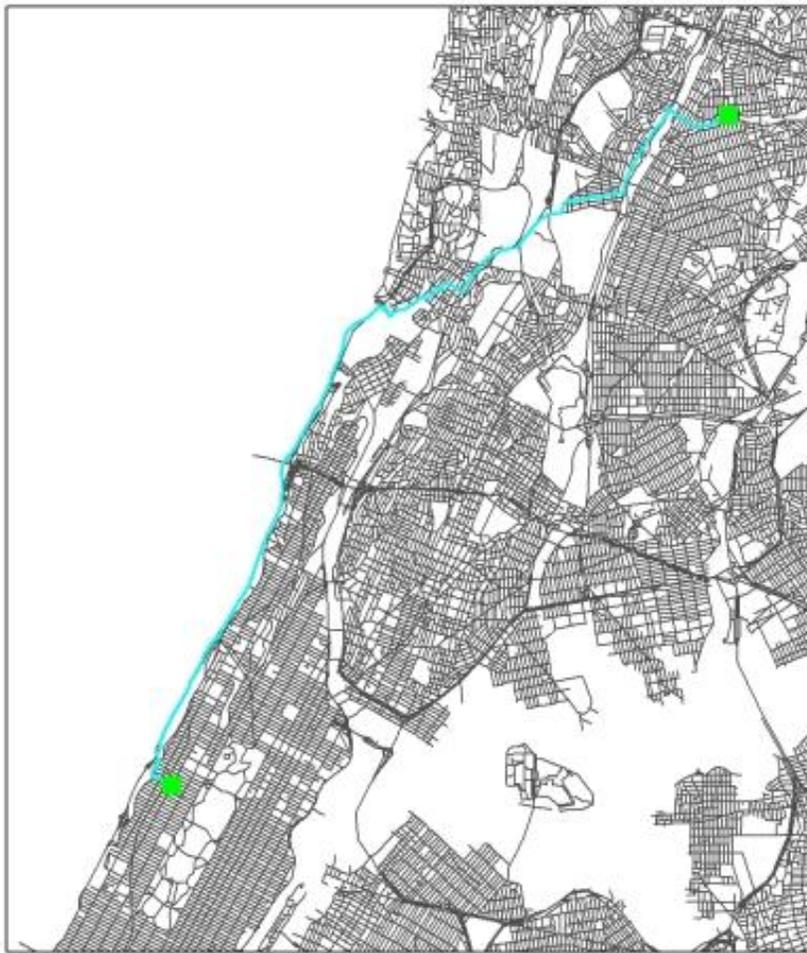
By Sarah Dow

A warehouse located in Red Hook, Brooklyn (Figure 31) has the highest cost route because it must travel through many residential areas which have higher cost values. The use of major roadways is minimal, thus making this warehouse location inefficient.

Locating a warehouse north of Manhattan, in Mt. Vernon, makes this the second highest cost route to the target area. This route is not feasible because of its distance, the time it takes to travel back and fourth, in addition to the gas expenses.

Figure 32.

Cost Effective Route



From Amsterdam and 92nd Street, NY to
Mt. Vernon, NY

Cost: 98

By Sarah Dow

Figure 33 maps the cost route from a warehouse located in Prospect Heights, Brooklyn. Its cost value is 96; this location is inefficient for accessing the target area.

Figure 33.

Cost Effective Route



From Amsterdam and 92nd Street, NY to
Prospect Heights, Brooklyn, NY

Cost: 96

By Sarah Dow

Navigating through many minor roadways makes the cost value of a warehouse's location in the Northeast Bronx very high and not viable.

Figure 34.

Cost Effective Route



From Amsterdam and 92nd Street, NY to
North East Bronx, NY

Cost: 92

By Sarah Dow

A low cost value indicates that major roadways are used and navigating through minor roadways is minimal, making travel time faster, trucks consume less gas, and increases the number of round trips a truck makes for grocery pick-up at the warehouse located in Astoria, Queens and delivery to the target area. This is the most effective and least cost route. Both the company and the customer will benefit from a warehouse located in Astoria, Queens.

Figure 35.

Cost Effective Route



From Amsterdam and 92nd Street, NY to
Astoria, Queens, NY

Cost: 43

By Sarah Dow

Locating a warehouse in Manhattan would be very convenient and efficient because it would be in or within minutes of the target area. However, Manhattan is a central business district and large spaces in Manhattan are very costly. Obtaining warehousing on the island would not benefit the online grocer company. The distribution warehouse should be located in a strategic area that is convenient for delivery to customers. Cost effective routes from the warehouse location to the target area can aid in the cost tradeoffs of warehousing operating costs and transportation savings. A warehouse located in Astoria, Queens has the best cost effective route to the target area. Other potential areas included Mt. Vernon, Brooklyn, and the Bronx. Astoria, Queens is the best location for a warehouse to serve the Upper East Side and Upper West Side target area. The route is the most cost efficient and is the closest to the target area, thus saving time, saving gas, and enabling more deliveries.

Analysis and Discussion of Results

Analysis of variables indicates certain patterns which indicate where the target area and target customer are located. That is, New York City contains specific areas or zones where specific advantageous factors coincide. These results indicate that the best area to cater to regarding the type of customer the online grocery shopping and delivery service aims to target, is the Upper East and Upper West Sides of Manhattan. The Upper East and Upper West Sides, is a region with a high concentration of the female population of all ages who do much of the grocery shopping and shopping in general. Also, in this area is significant population of males over the age of sixty. A dense white population is found in the target area. This population group is most likely to have graduated with a Bachelor's degree or higher and is also concentrated in the highest employment tract. The white population found in this target area possesses the highest median household income and the highest annual expenditures on food. Expendable income in a target area is vital for an online grocery and delivery company to succeed and become profitable. In order to decide if the market is viable, I had to take a closer look at the expendable income on food. The Expendable Income on Food map indicates that the target area is a viable market because there is enough money spent on food here. There are many families and married couples who reside in these areas. Many families in this area contain parents who both work full time jobs and children who don't traditionally shop for food for the family. This population is pressured for time, therefore, online grocery shopping and delivery saves time and is convenient for families that fit this criteria. Also found in this region is a large disabled population over the age of 65 as well as people who do not own a vehicle. These groups would have much difficulty shopping

for groceries without transportation or their disability hinders their ability to walk, see, hear, or perform any activity on their own.

After analyzing all the socio economic characteristics and variables of the Manhattan population, it is a clear indication that the online grocery shopping and delivery service has great potential there. The market is viable to support the service due to these characteristics. The analysis also revealed potential warehouse locations along with mapping the most cost effective, timely, and safe delivery routes.

Conclusion

Lifestyles have dramatically changed as a result of the changes in technology. The online grocery shopping and delivery service caters to the current lifestyle that includes internet savvy consumers and people who value time and convenience. The research and map analysis I have done proved my hypothesis to be correct. A deep and thorough analysis of the Manhattan market, warehousing, and cost effective routing based on the results of the data indicates that an Online Grocer would thrive and be feasible. The Upper West Side and Upper West Side of Manhattan is the target area for an online grocery shopping and delivery company. There is a very strong market present for the viability of an online grocery shopping and delivery business. This type of business will appeal to a specific target customer who is a white working woman with a family, whose median household income is \$75,000 and higher and spends approximately \$125 of disposable income towards groceries. This target population is educated and has earned a bachelor's degree or higher. Online Grocers will appeal to the disabled and those who do not own a vehicle. Warehousing with the most cost effective route was found to be in Astoria, Queens. I discovered this was the most logical area since leasing a large building is affordable here and the route a delivery truck would take from the warehouse to the customer's door is the quickest and most economical amongst the other warehousing locations. Retail has transformed and has been molded by the continuously changing lifestyles and the advancement of technology. The most recent trend of electronic commerce and the internet has eliminated the need for consumers to travel to stores to purchase goods. The food industry has taken advantage of this movement and is utilizing this new concept of online grocery shopping and delivery.

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