Starbucks and Dunkin Donuts

A locational and economic analysis using GIS

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Introduction

The use of GIS as a tool to pinpoint ideal locations for businesses has flourished over the past two decades. For a company to be successful it must determine who its target market is and how to connect with them. A visible and accessible location determines a business' ability to reach out to its ideal customer base. By using GIS the process of finding a proper location for a business can be done easier, faster, and more accurately.

The purpose of this project is to use GIS to analyze the locations of two competing business chains, Starbucks and Dunkin Donuts, across the state of Massachusetts and to determine differences in the placing of each business by comparing various relevant demographic statistics pertaining to the surrounding neighborhoods. By finding pronounced differences in the aggregate demographics that each business locates themselves within I can then draw conclusions about the locational practices of each company.

Objectives

My main goal for this project is to use GIS to find the differences in demographics between the surrounding areas of Starbucks and Dunkin Donuts coffeeshops. For this project I examined the differences between the two businesses along the lines of income, land value, race, education, and access to major road infrastructure.

To generate results to answer my question I went about the following steps.

•Data Acquisition

•Geocoding

•Joining

•Interpreting data and generating statistics

•Presenting data in graph form

Data Acquisition
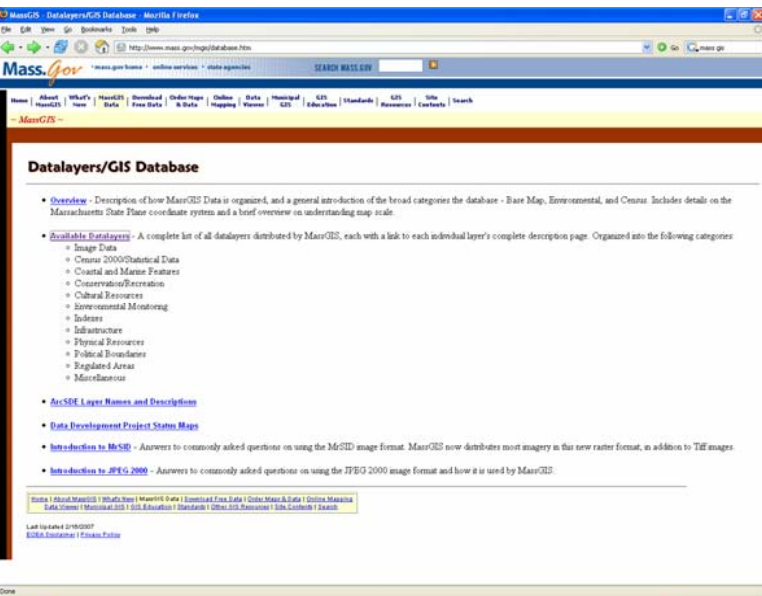
Retrieve demographic data from MassGIS website.

- Census2000 Block Group shapefile.

- TIGER Linework shapefile.

- Relevant demographics tables, including household income, housing value, education attainment, and race.

Retrieve business location data from ReferenceUSA website to be geocoded.

- All Starbucks locations in Massachusetts in .csv format.

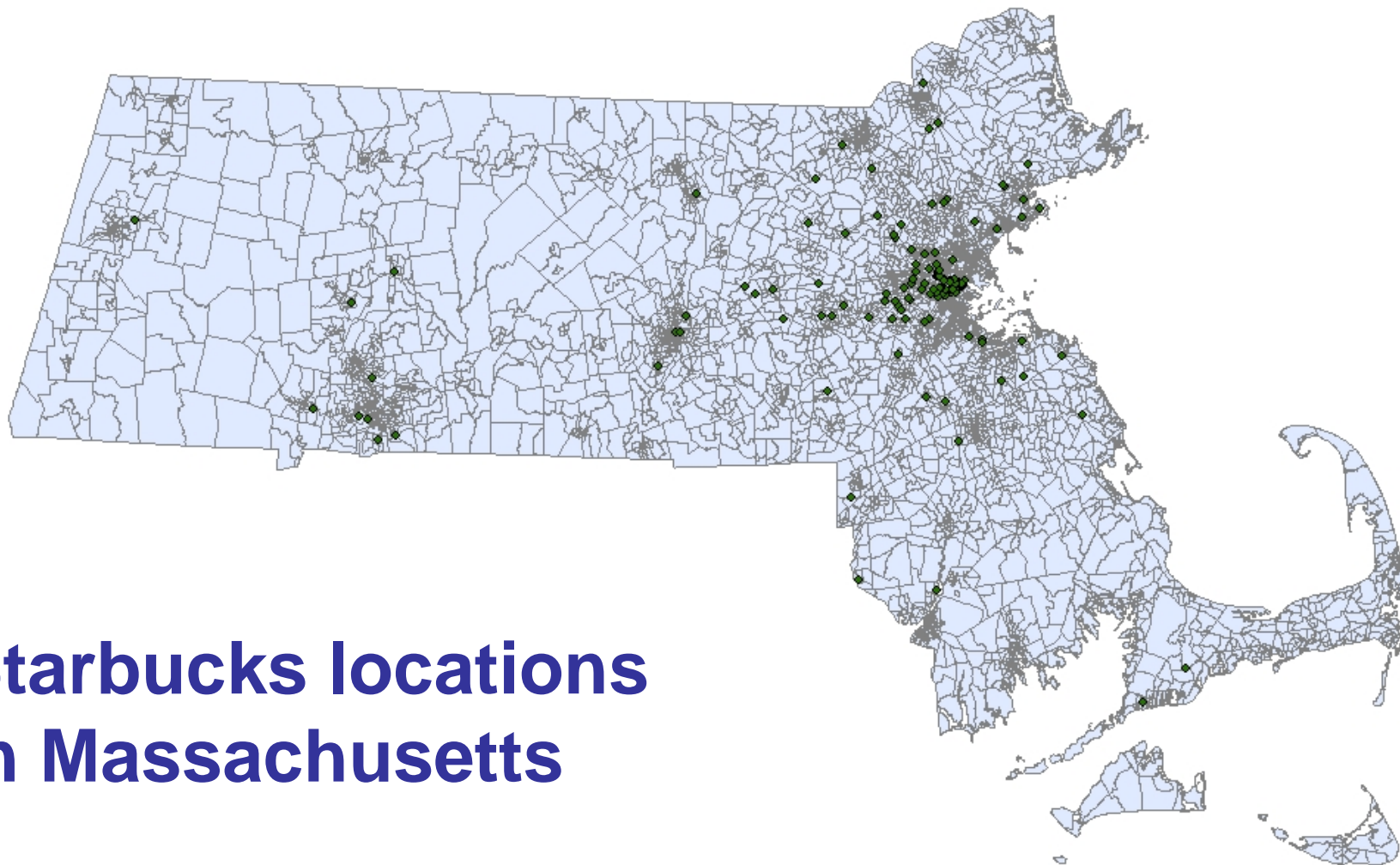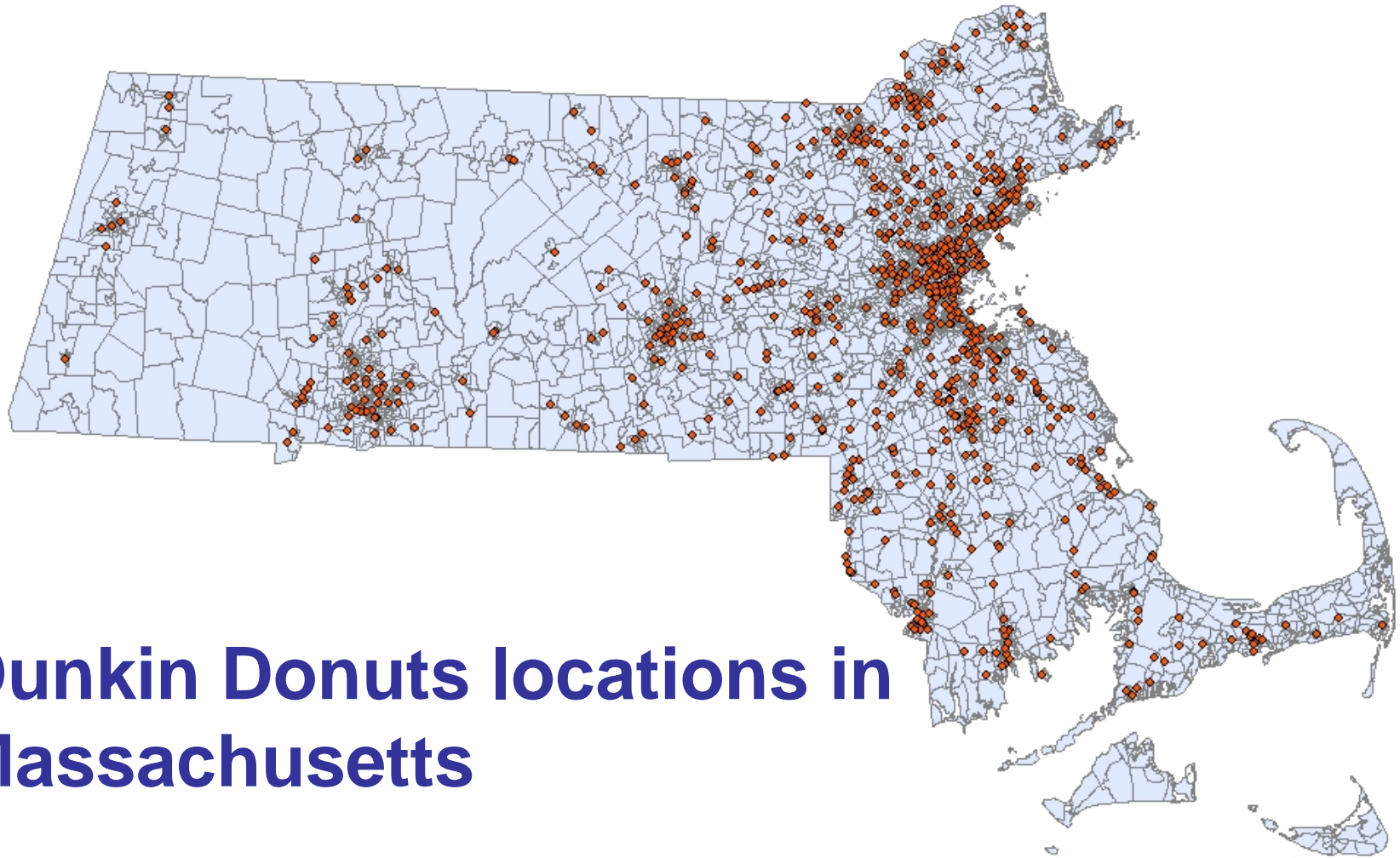- All Dunkin Donuts locations in Massachusetts in .csv format.

Geocoding

    To input the locations of all Starbucks and Dunkin Donuts locations in Massachusetts I had to geocode them using the TIGER Linework as a reference layer. As previously mentioned I was able to download all the addresses from ReferenceUSA and was then able to load the files directly into the address locator I set up. Most matched with a score of >80. Around a 100 locations between both chains had to be matched interactively and fewer than 50 had to be dropped entirely due to lack of any matches.

In the end I had successfully geocoded a total of 845 locations for Dunkin Donuts and 151 locations for Starbucks.

Starbucks locations in Massachusetts

Dunkin Donuts locations in Massachusetts

Joining

My next step was to join the information together, first by performing multiple joins between the destination Census block group layer and the source demographic tables for each type of statistic I wished to generate. During this point I had to add new fields for a few joined demographics and calculate percentage per total population statistics for them using the total sampled population field and whatever field I wanted the percentage for. Additionally, certain tracts coming up with a total population of zero had to be removed in order for the calculate function to work, this required me to select all the populations >= 1 and export them a shapefile which to do the percentage calculations with.

Once joined and with necessary percentages calculated, I had to once again export the joined data as a new shapefile so it could be joined spatially with the geocoded data. Both the Dunkin Donuts and Starbucks point layers were joined polygons to points to each exported shapefile that had been previously joined with each demographic table. Each point or shop would then be given the attributes of the polygon or block group it fell within.

Interpreting data and generating statistics

My next step simply involved gathering statistics from the attribute tables of the shapefiles created by the spatial joins.

This simply involved using the statistics function on fields I wished to generate statistics for. For all the results I used the mean of all the statistics generated across the state for each block group for both Starbucks and Dunkin Donuts.

When all the average statistics were generated, I put them into Excel to graph the information so my results could be interpreted and presented better.

# Average median income in blockgroups with Dunkin Donuts compared to Starbucks
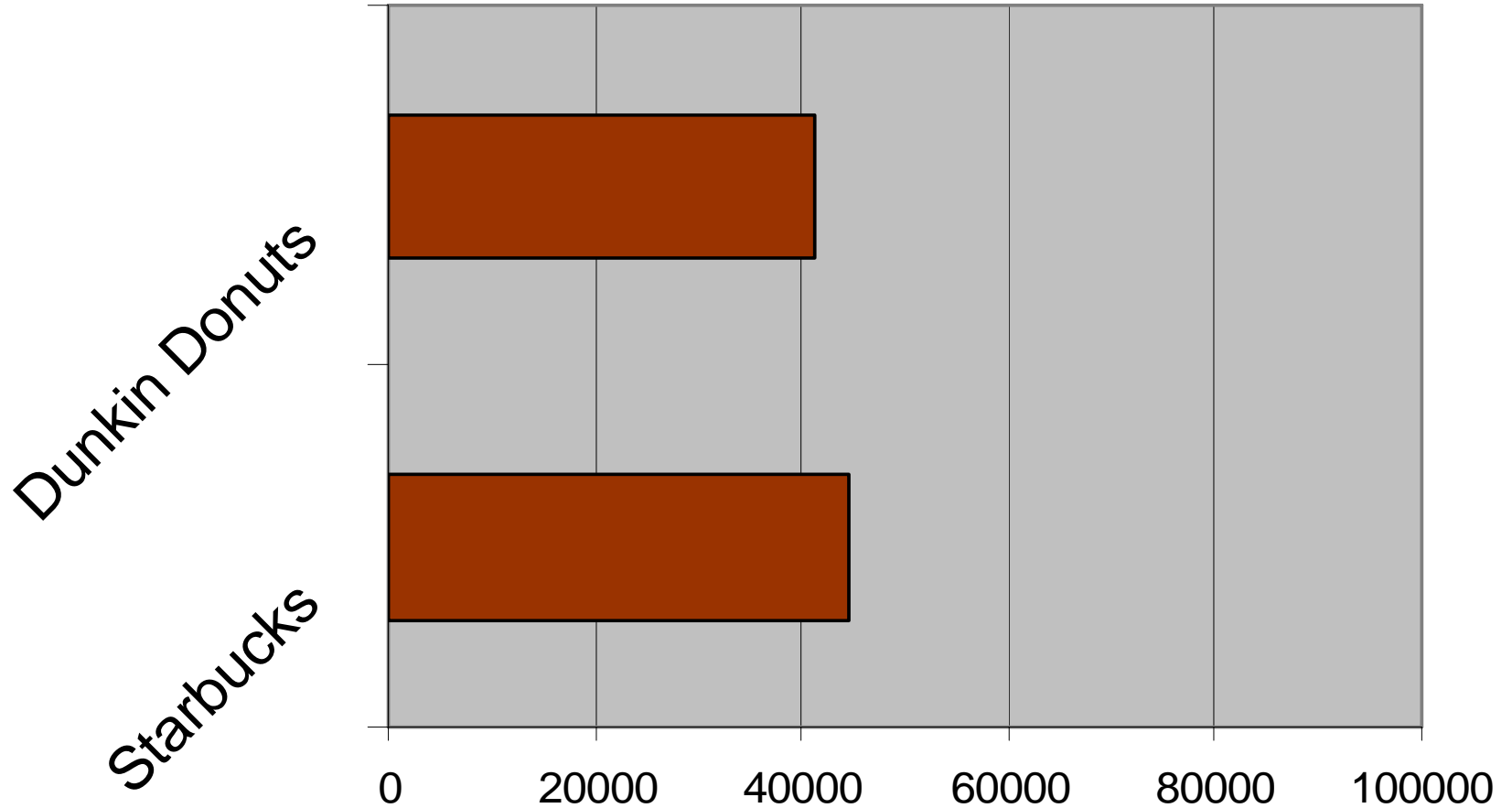
	Starbucks	Dunkin Donuts
■ Average Median Income	44410.47	41415.16

Average Housing Value in blockgroups with Dunkin Donuts compared to Starbucks
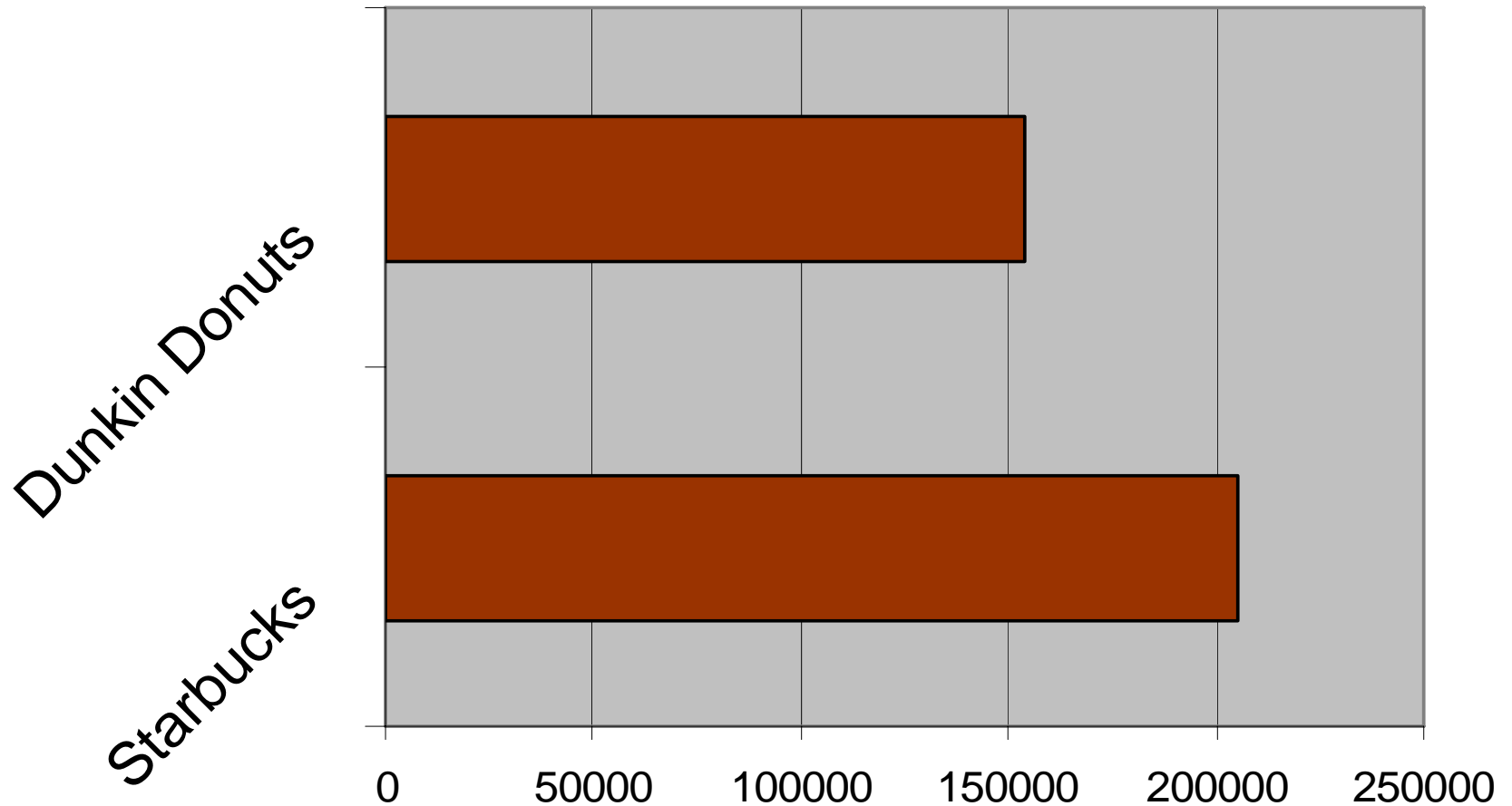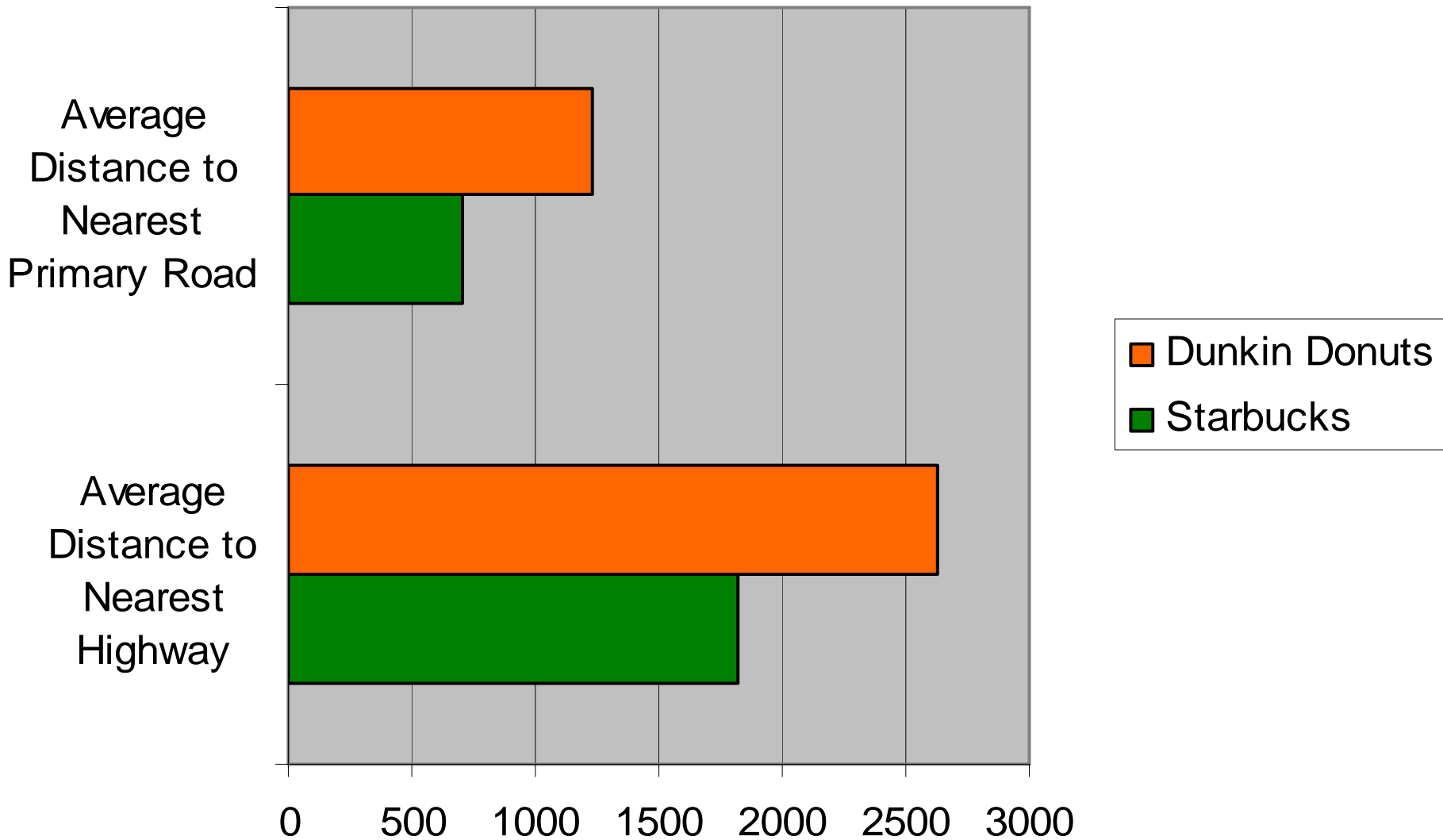

	Starbucks	Dunkin Donuts
■ Average Housing Value	205150.34	154106.86

Average racial makeup of blockgroups with Dunkin Donuts compared to Starbucks
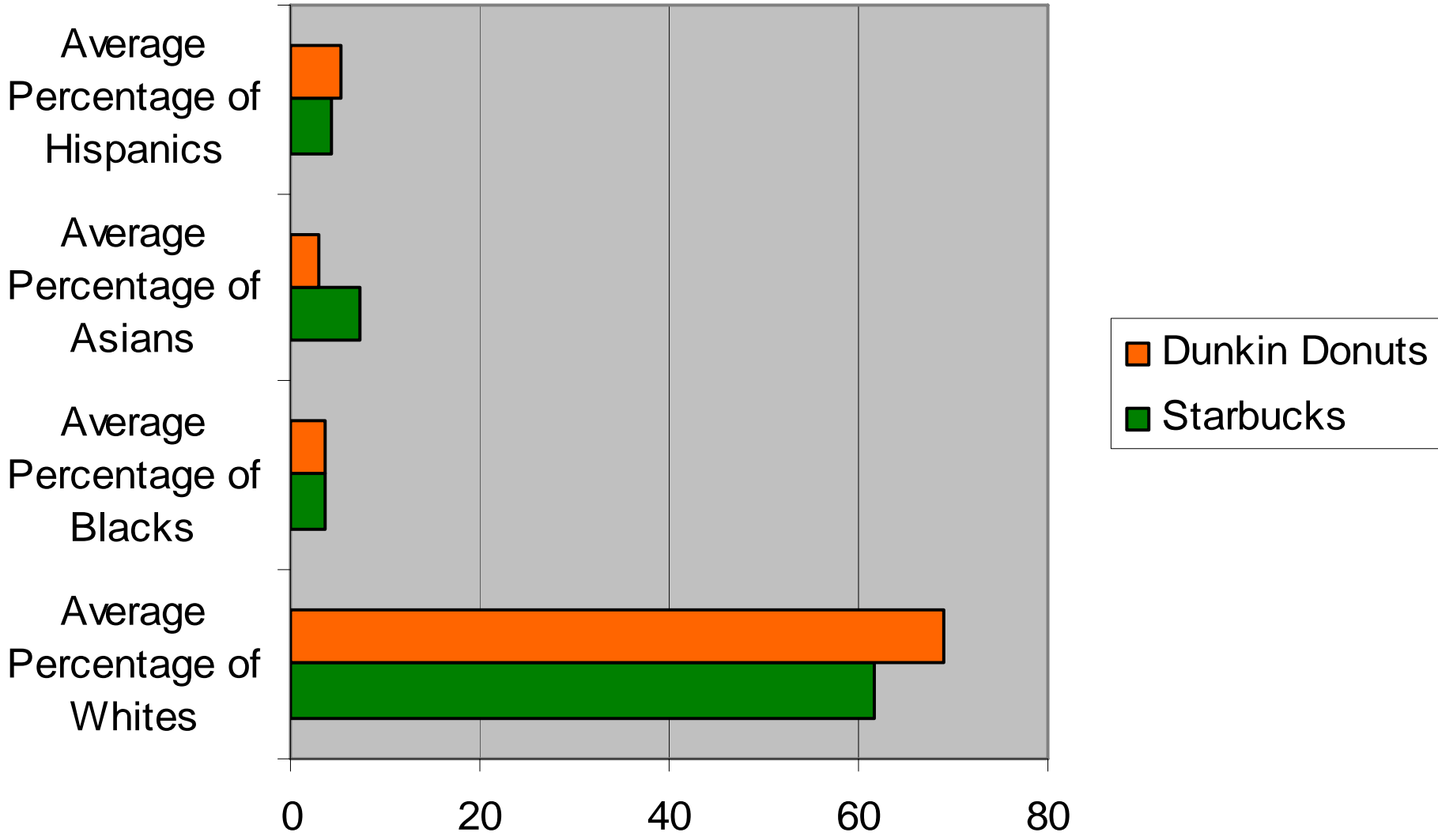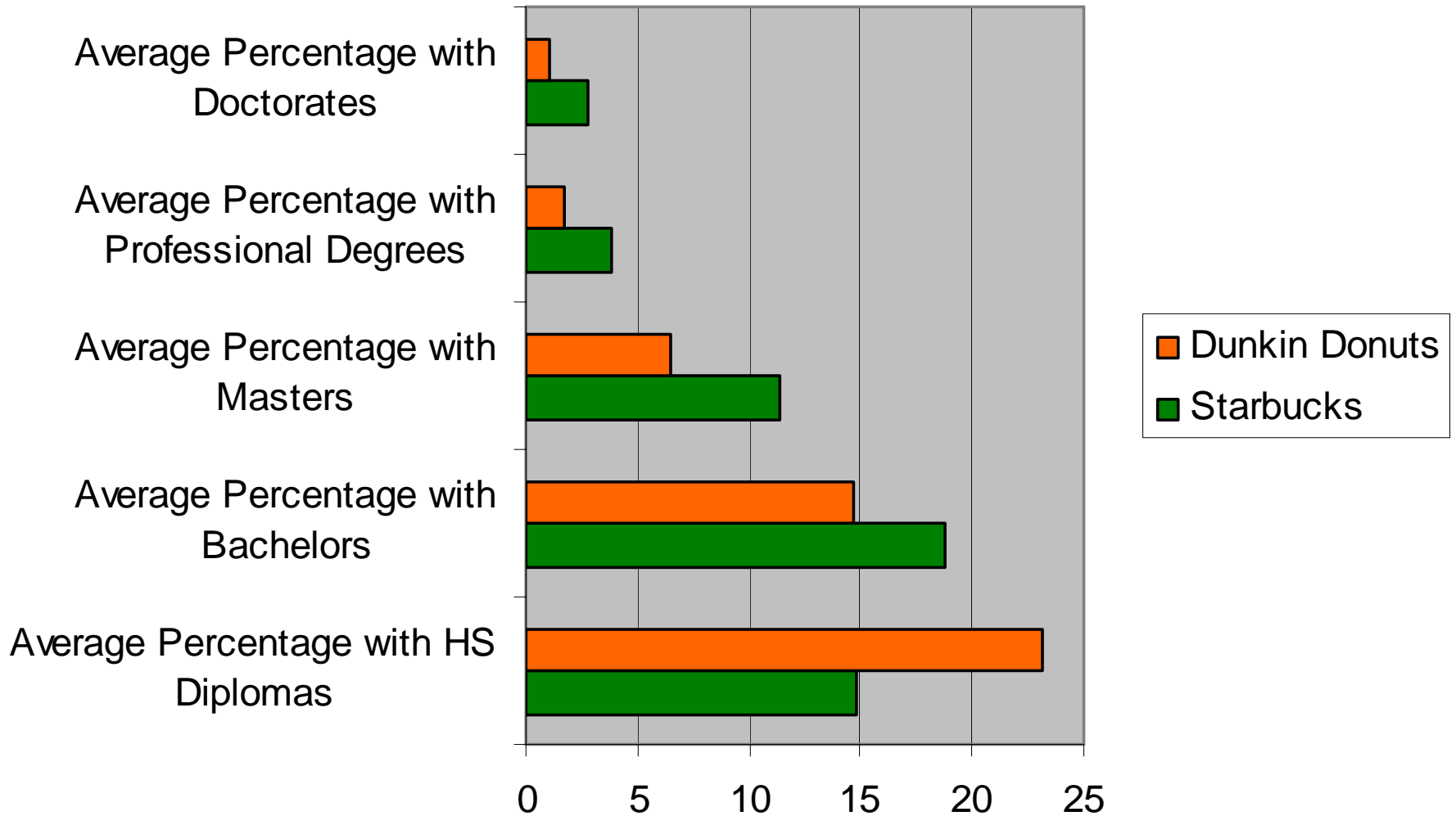
Average distances from major roads to Dunkin Donuts and Starbucks in Meters

Legend:
- Dunkin Donuts
- Starbucks

Conclusion

In conclusion, I found some of my results reflected my preconceived notions while I found others suprising. I thought that there would be a larger gap between the income and housing value averages between the locations of the two companies then there actually was. I expected the populations in block groups with Starbucks to be generally more educated than those living in block groups with Dunkin Donuts on average. However, the statistic showing nearly 10% more high school graduates in block groups with Dunkin Donuts than Starbucks took me by surprise. This anomaly could probably be explained with further research. The higher average Asian population in block groups with Starbucks over Dunkin Donuts also stuck out to me because it was the only racial demographic that had a high average population in neighborhoods with Starbucks.