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Urban Economics (ECO 229)

CRP2

An Industry Case Study on the Spatial Distribution of Shopping Centers in Nashville, Tennessee

I. Introduction

In the past decade, shopping malls have been considered a “dying” market. Technological changes and the COVID-19 pandemic have ushered in a new era of online shopping. Additionally, Nashville, Tennessee has seen the construction of new, outdoor shopping centers that contain a mixture of shopping, dining, and entertainment services. In this project, I located shopping centers throughout the Nashville-Davidson balance. For the purpose of my analysis, I defined “shopping centers” to include indoor and outdoor malls that contained at least one major, national clothing company. I located ten such shopping centers throughout the Nashville-Davidson region. I also pinpointed one other shopping center that lies just outside of the south end of the border. I will first introduce the “back of the envelope” model, discussing its predictions of spatial distribution and market areas of firms within a certain industry. I will apply the model to the case of shopping malls in Nashville, Tennessee, evaluating to what extent the model accurately predicts the observed distribution and market areas of shopping malls. I will seek to explain why shopping malls are located where they are, instead of where the model projects. To do so, I will examine patterns of population density and income in relation to demand density along with patterns of land values. Finally, I analyze how the shopping mall market has changed in its recent history, and I postulate how the spatial distribution of shopping malls in Nashville will change over the next decade. In particular, I highlight underserved and overserved regions along with neighborhoods currently experiencing gentrification as areas that might change. Ultimately, this paper examines the spatial distribution of shopping centers in Nashville and the factors that influence it with respect to the “back of the envelope” model of market area.

II. “Back of the Envelope” Model Predictions

The “back of the envelope” model seeks to determine the optimal number of firms in an industry to serve a region and the market area of these firms. The model predicts that firms’ market areas will

follow a honeycomb pattern throughout the region. Firms will be evenly distributed throughout the region. Each firm will have equivalent market areas and the market areas will not overlap. The total number of firms required to serve the region is given by the total region demand divided by the output per typical firm. The total region demand is demand density, which is per capita demand times population density, times the region area. The model assumes that population density is uniform throughout the region, transportation costs are equal at all locations and in all directions, and elasticity of demand is 0 (meaning households and individuals do not respond to changes in the prices or transportation costs).

Applying the “back of the envelope” model to Nashville yields the following predictions. The Nashville-Davidson balance has an area of 475.78 square miles and a population density of 1,449.1 persons per square mile.¹ I was unable to determine the specific per capita demand for shopping centers and output from a typical shopping center due to the lack of data available and the range of scale of shopping centers. Therefore, I made the assumption the theoretical number of firms needed to serve Nashville is equal to the observed, which is ten. This allowed me to still be able to calculate market area, which I determined by dividing the region area of 475.78 square miles by ten and which equals 47.48 square miles. Thus, the shopping centers would be evenly distributed throughout the city’s 475.78 square mile region in a honeycomb pattern with each shopping center having a market area of around 47 square miles. However, as my paper will show, this is not the case. I observe multiple shopping centers clustered around the center of the city, in and to the south of Downtown. The central and southern regions of Nashville contain the most, while North Nashville and the city outskirts contain the least.

It is important to note that my assumption that the number of total firms needed to serve the region is ten is a limitation. Given that shopping malls have experienced high vacancy rates recently, it could be hypothesized that the observed value of ten is more than the necessary value. The value of ten likely overestimates per capita demand. If the required number is actually lower, the model would predict fewer shopping centers in Nashville than ten with greater market areas.

¹ “QuickFacts: Nashville-Davidson Metropolitan Government (Balance), Tennessee,” United States Census Bureau, <https://www.census.gov/quickfacts/fact/table/nashvilledavidsonmetropolitangovernmentbalanceTennessee/POP010220>.

III. Demand Density, Population Density, Median Household Income, and Land Values

Demand density is a product of per capita demand and population density. Thus, a high per capita demand and/or population density would entail a high demand density. Furthermore, a high demand density would result in a smaller market area, as market area can be calculated by dividing output from a typical firm by demand density. Intuitively, it makes sense that a firm located in an area with high demand density for its goods or services would have a smaller market area than that same firm if it was located in an area with lower demand density; the firm in an area with lower demand density may have to expand its network to reach the same amount of customers.

The “back of the envelope” model assumes that population density is uniform throughout the region. However, as Map 1 shows, this assumption does not hold for Nashville. The northwest area of the Nashville-Davidson region has low population density and contains no shopping centers. Population density is the highest in the center of the city, near the Downtown and Vanderbilt areas marked on Map 2 from CRP1. The four shopping centers Fifth + Broadway, One Hundred Oaks, Hill Center, and Nashville West shopping center are located amidst this high-density area. Map 3 zooms in closer and reveals that there is actually another shopping center in close proximity to the Hill Center, making it five shopping centers located around the high-density center of Nashville. Economic theory would predict that the high population density in this region, and, therefore, high demand density (assuming per capita demand is not offsetting this) would result in smaller market areas for shopping centers. And, this may be why we see the five shopping centers located where they are. Overall, it seems population density is a factor that may explain the locations of some of the shopping centers in Nashville.

The per capita demand in an area may be another factor that explains the location of shopping centers. Income may play a role in the amount of demand consumers have for shopping centers. For instance, those with higher incomes have more disposable income to spend on clothes and non-necessity, luxury goods. As CRP1 found and as Map 4 shows, the south is the most affluent region of Nashville. Map 5 zooms further into the south, revealing a sufficient number of shopping malls located around the wealthy neighborhoods of Belle Meade and Forest Hills. Economic theory would predict that the high

income and the resulting high demand and high demand density would result in smaller market areas for shopping centers in this southern region. And, this may be another reason why we see six shopping centers (Green Hills Mall, Hill Center, Nashville West Shopping Center, One Hundred Oaks, One Bellevue Place, and Brentwood Place) located relatively nearby. The majority of these shopping centers are not located within the wealthy residential neighborhoods but just outside. Map 6 shows that Green Hills Mall, Hill Center, and Brentwood Place are located in areas with higher land value, but the other four are located where land is cheaper. It may be that these four shopping malls are located close enough to attract customers from wealthy neighborhoods without paying as high of rents. In sum, it seems that income (which may be able to serve as a proxy for per capita demand) and land values may be factors that explain the locations of some of the shopping centers in Nashville.

IV. Spatial Distribution Change over Time

Shopping Malls in the United States have experienced a sharp decline in the past decade. While they were widely popular during the late-1900s, technology developments and the 2008 recession contributed to their recent downfall.² The COVID-19 pandemic only further shut down malls and drove buyers to online shopping. Consumer tastes and preferences have changed, especially after the pandemic, with more people opting for online shopping or an outdoor experience that offers activities, shopping, and dining. Nashville has seen a resurgence of outdoor shopping centers, particularly those that offer a variety of shopping, dining, and entertainment services. For example, Tanger Outlets just opened a new location on the southeast corner of Nashville, the first new opening for the company since 2017.³ In 2021, Fifth + Broadway, another venue with a mix of shopping, restaurants, and entertainment services, opened in the heart of Downtown Nashville.⁴ After closing in 2008, One Bellevue Place, located in southwest Nashville,

² Avery Hartmans, “The Rise and Fall of the American Shopping Mall,” Business Insider, January 6, 2023, <https://www.businessinsider.com/shopping-mall-rise-fall-timeline-1950s-to-today-2023-1>.

³ Sabrina Escobar, “This New Mall Is About More Than Just Shopping,” Barrons, August 4, 2023, <https://www.barrons.com/articles/tanger-new-outlet-mall-nashville-e847eb9a>.

⁴ Sandy Mazza, “Opening Set for Nashville’s Huge Fifth + Broadway Shopping, Dining Complex,” The Tennessean, February 10, 2021, <https://www.tennessean.com/story/money/2021/02/10/opening-set-nashvilles-huge-fifth-broadway-shopping-dining-complex/6702442002/>.

reopened in 2018.⁵ The shopping center underwent much transformation to become an outdoor, mixed-use shopping center with the whole project costing \$268 million.⁶

In terms of my predictions for the next decade, I think consumers will continue to lean away from large, indoor shopping centers, as technology continues to advance and make online shopping simpler and more efficient. Some of the shopping centers, particularly the indoor ones, pinpointed on my maps may close in the upcoming decades or transition into outdoor, mixed-use centers. If, in the future, per capita demand for shopping centers and, thus, demand density decrease, then total region demand will decrease and the market area will increase.

Taking into consideration my findings from CRP1, I predict outdoor shopping centers may open in East Nashville and Edgehill, two neighborhoods that have been experiencing “urban renewal” and gentrification. Though Map 7 shows that these neighborhoods already have shopping centers nearby, I would not be surprised if a shopping center with national brands moves in. These neighborhoods have already seen developments of smaller-scale, local retail move in. In addition, gentrification has continued with, big real estate companies building new apartments, bringing in wealthy residents and, thus, demand for such shopping centers. Given the pattern in Nashville of shopping centers clustering close to the city center, I do not think firms will expand to the underrepresented areas of North Nashville. As CRP1 noted and as Map 8 shows, North Nashville is home to a majority black population and is farther away from shopping centers. As Map 9 shows, the parts of Nashville with a high percentage white population are close to multiple shopping centers. Additionally, as Map 10 shows, Nashville’s Hispanic population is concentrated in the southeast part of the city, which lacks a shopping center but is pretty close to One Hundred Oaks and the new Tanger Outlets. However, this region was underrepresented and, now, Tanger Outlets have opened nearby, so maybe a similar pattern will emerge for North Nashville.

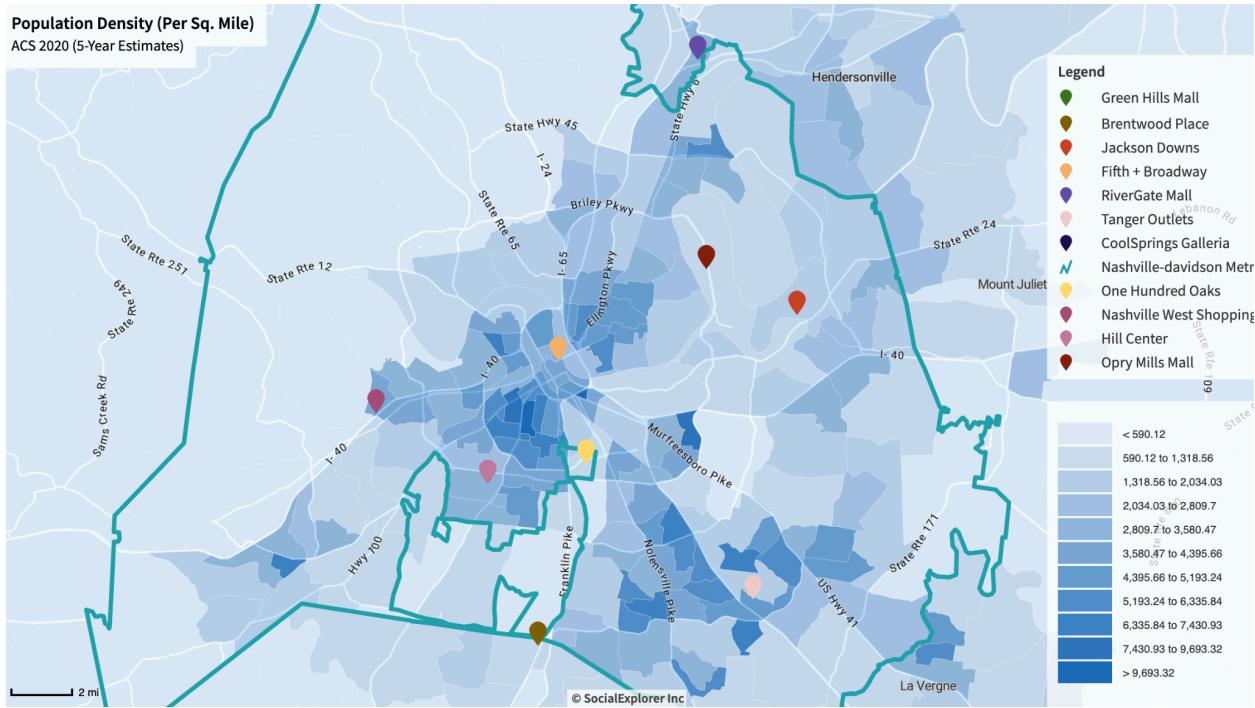
V. Conclusions

⁵ Lizzy Alfs, “Massive Development Brings New Life to Bellevue,” The Tennessean, August 22, 2018, <https://www.tennessean.com/story/money/2018/08/23/one-bellevue-place-nashville-malls-developments/1018147002/>.

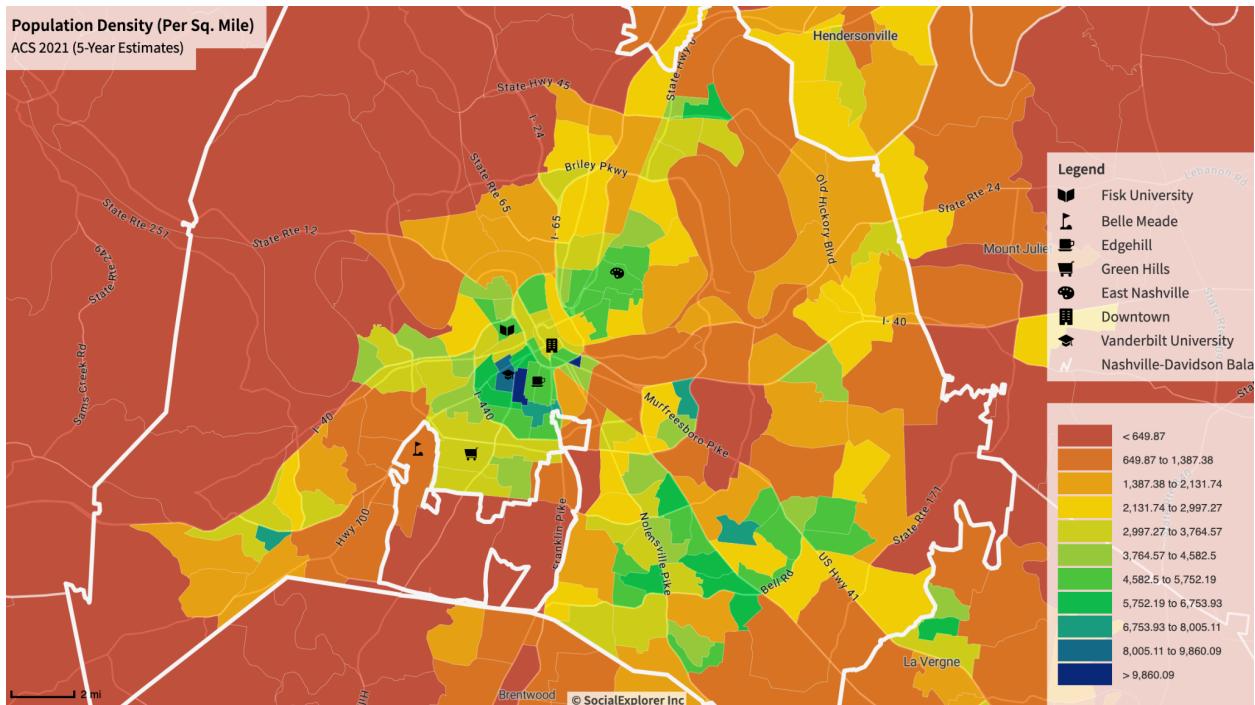
⁶ Alfs, “Massive Development Brings New Life to Bellevue.”

Through my research, I found that the spatial distribution of shopping centers in Nashville does not follow the honeycomb pattern predicted by the “back of the envelope” model. Every firm does not have a market area of approximately 47 square miles; some have larger or smaller market areas, as demand density differs throughout the city and not all the shopping centers examined are the same. I examined factors, including population density, income, land value, and race, that may influence the location of shopping centers. I examined the recent history of shopping centers and speculated what the future distribution of shopping centers may look like. I guessed that some shopping centers may close, while neighborhoods experiencing gentrification may be the next target for new outdoor shopping centers.

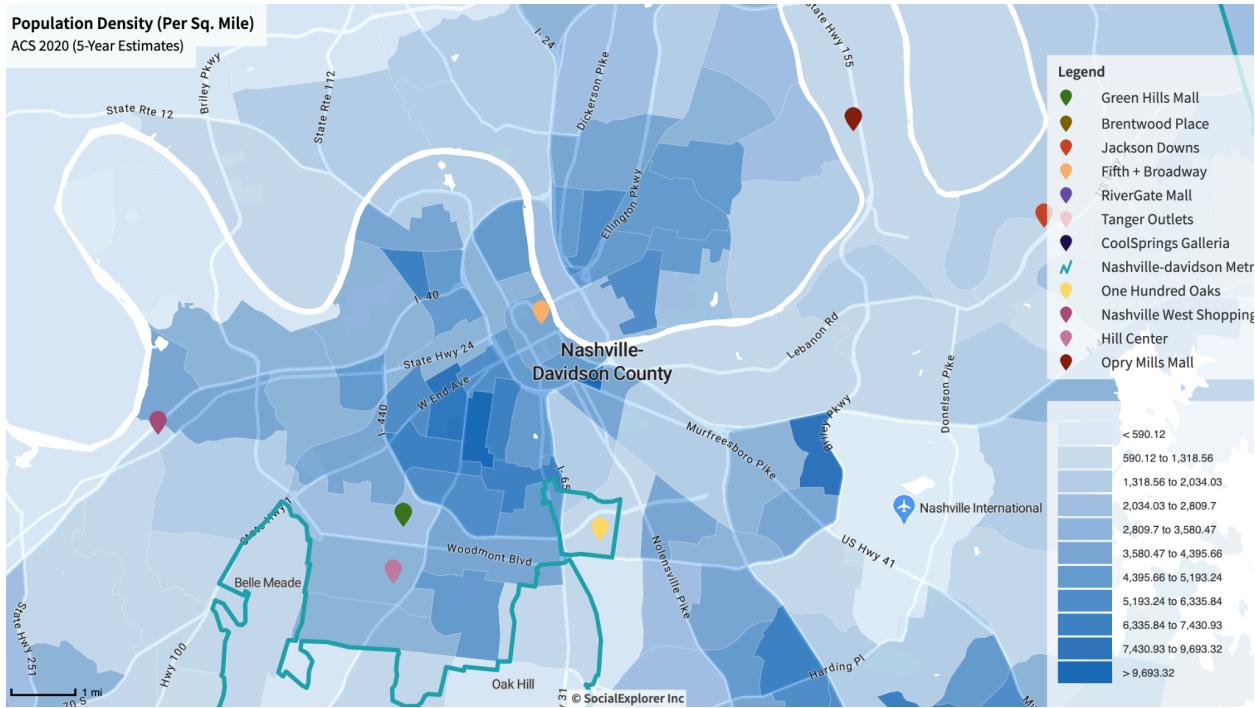
Maps:



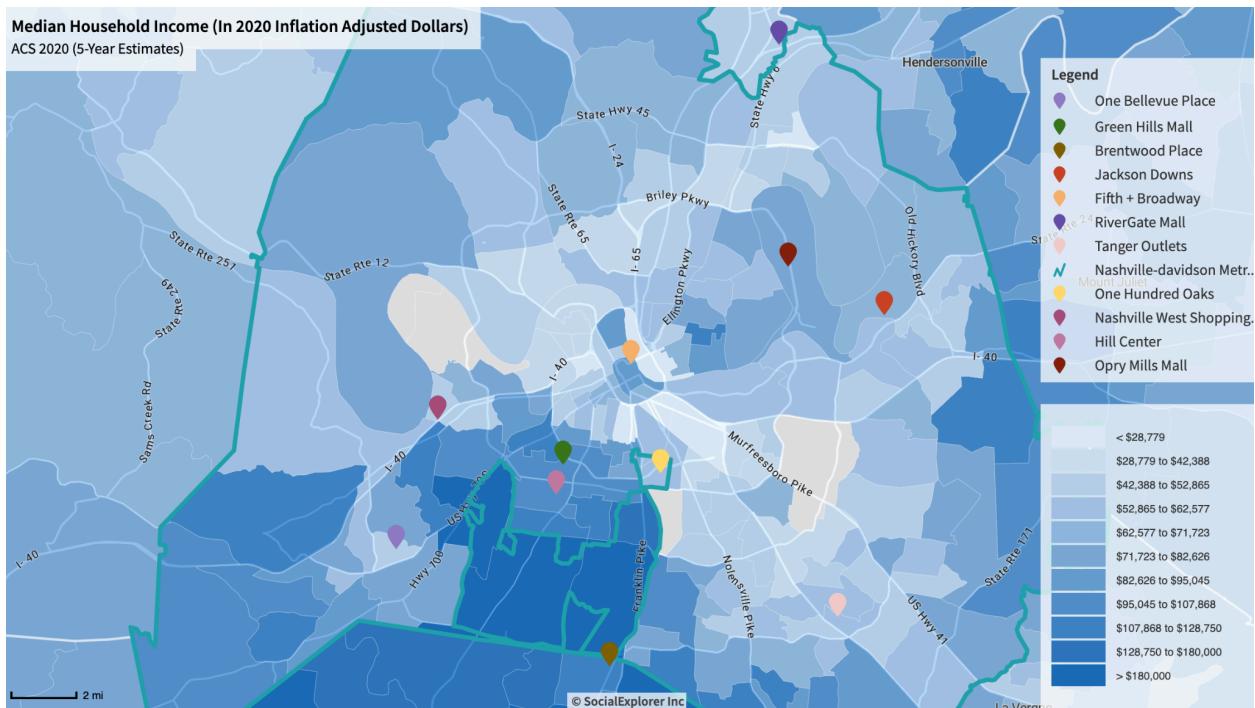
Map 1 – Population Density for Nashville, TN: ACS 2021 (5-Year Estimates)



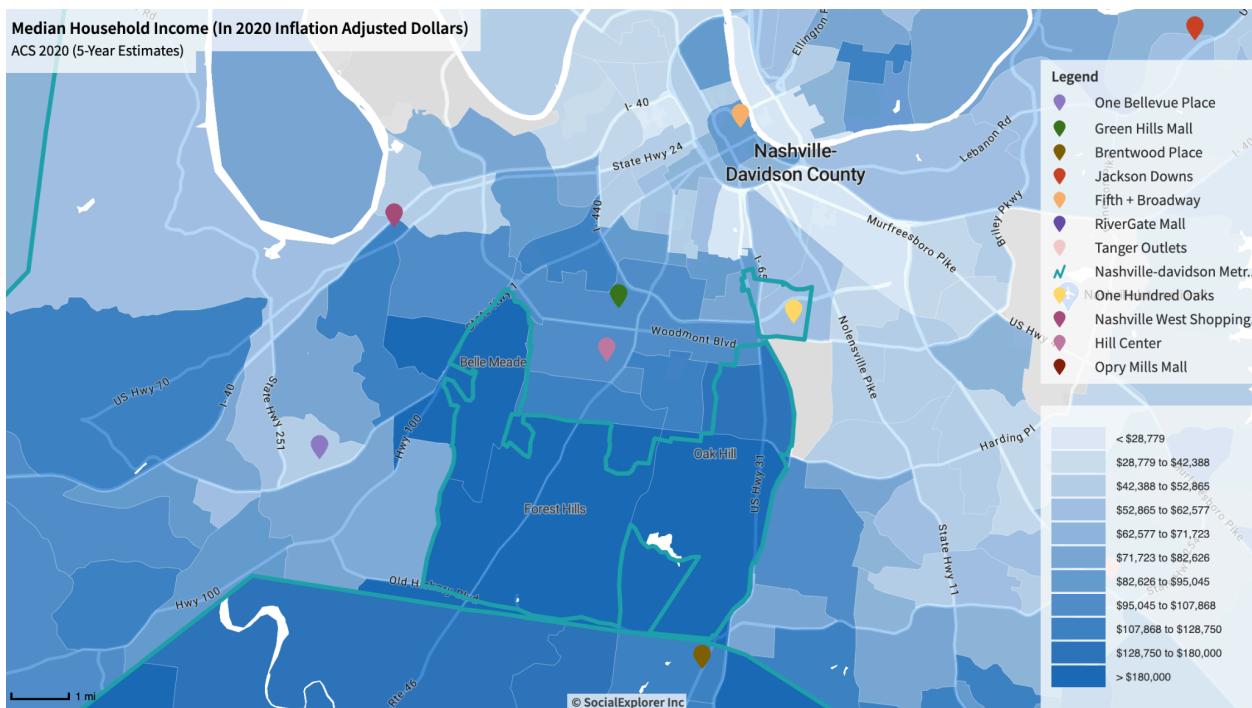
Map 2 – CRP1 Population Density for Nashville, TN: ACS 2021 (5-Year Estimates)



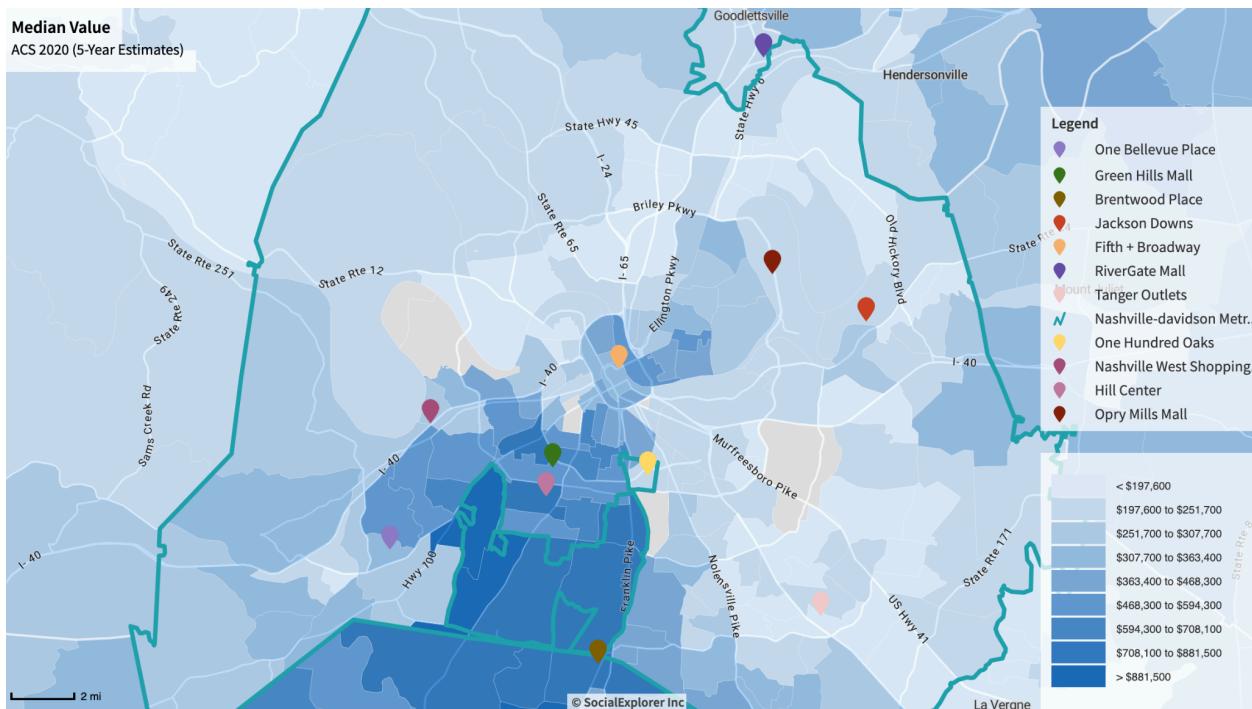
Map 3 – Zoomed-In Population Density for Nashville, TN: ACS 2021 (5-Year Estimates)



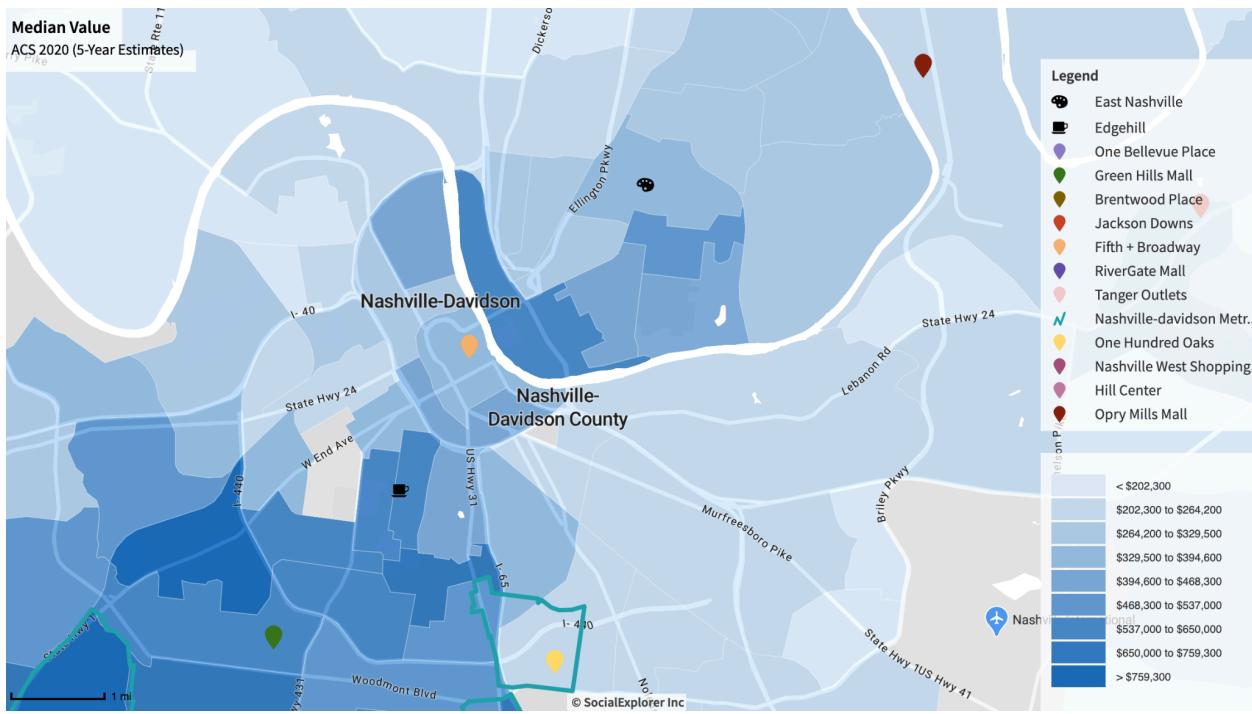
Map 4 – Median Household Income for Nashville, TN: ACS 2021 (5-Year Estimates)



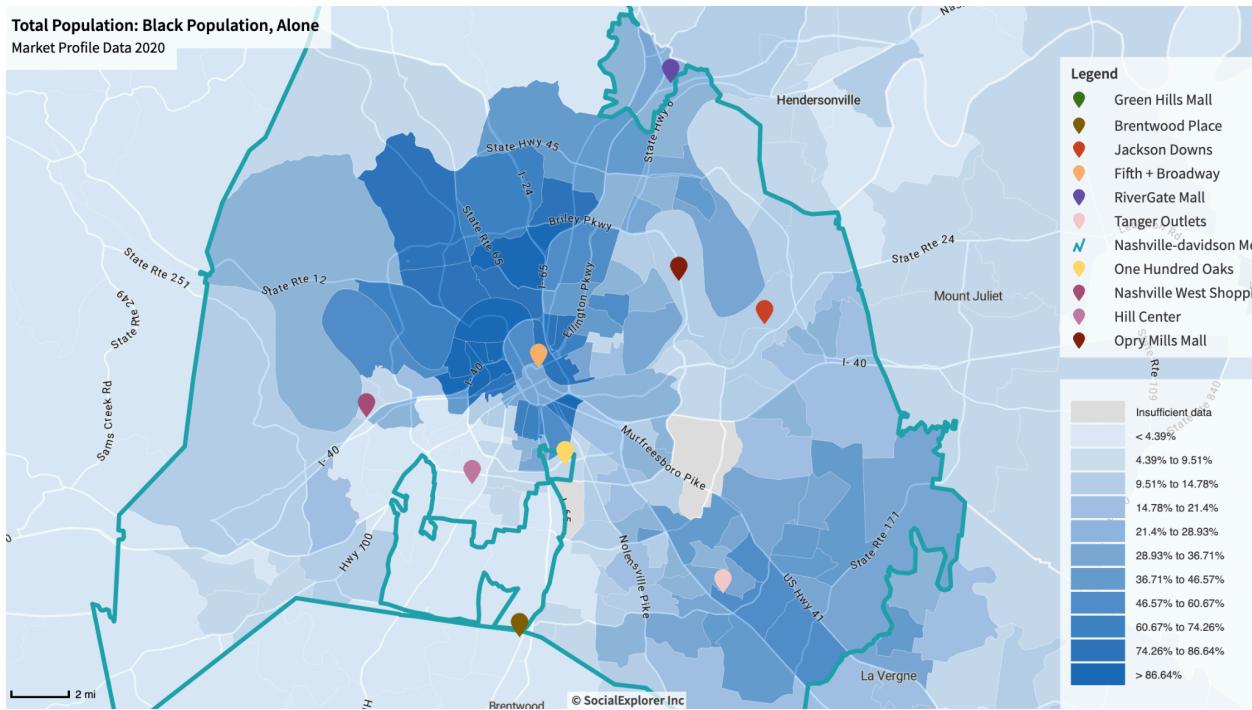
Map 5 – Zoomed-In Median Household Income for Nashville, TN: ACS 2021 (5-Year Estimates)



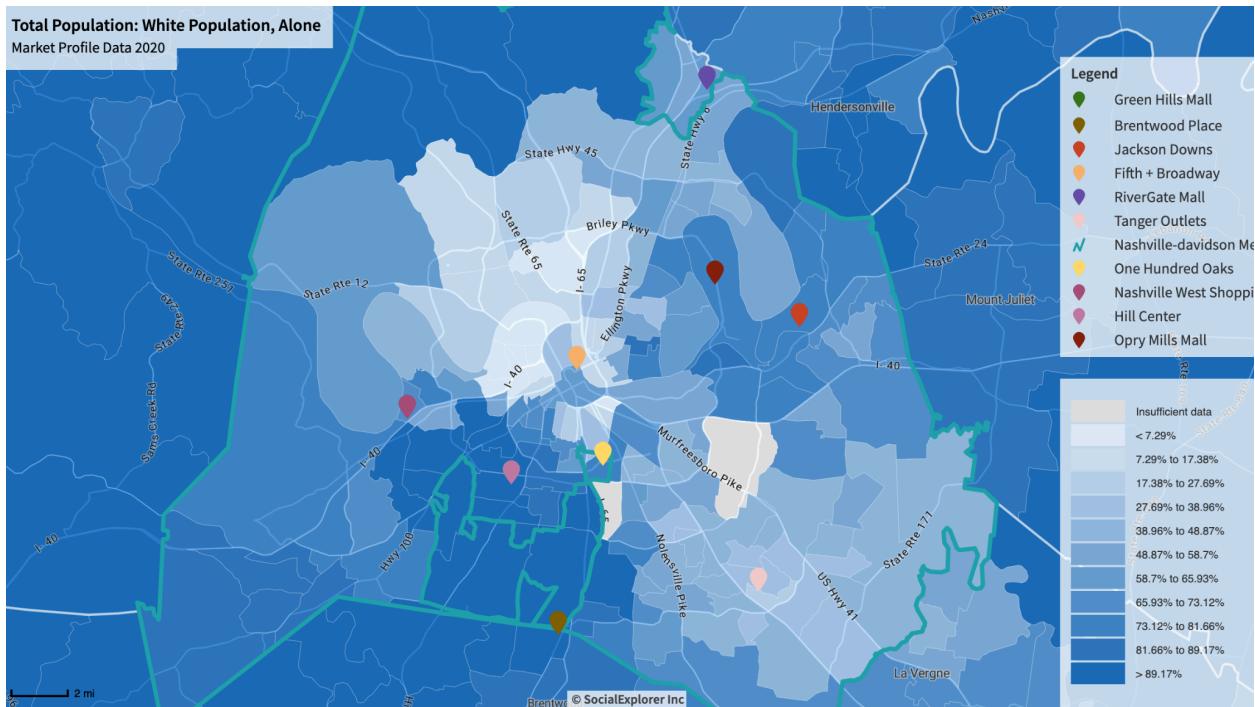
Map 6 – Median Land Value for Nashville, TN: ACS 2021 (5-Year Estimates)



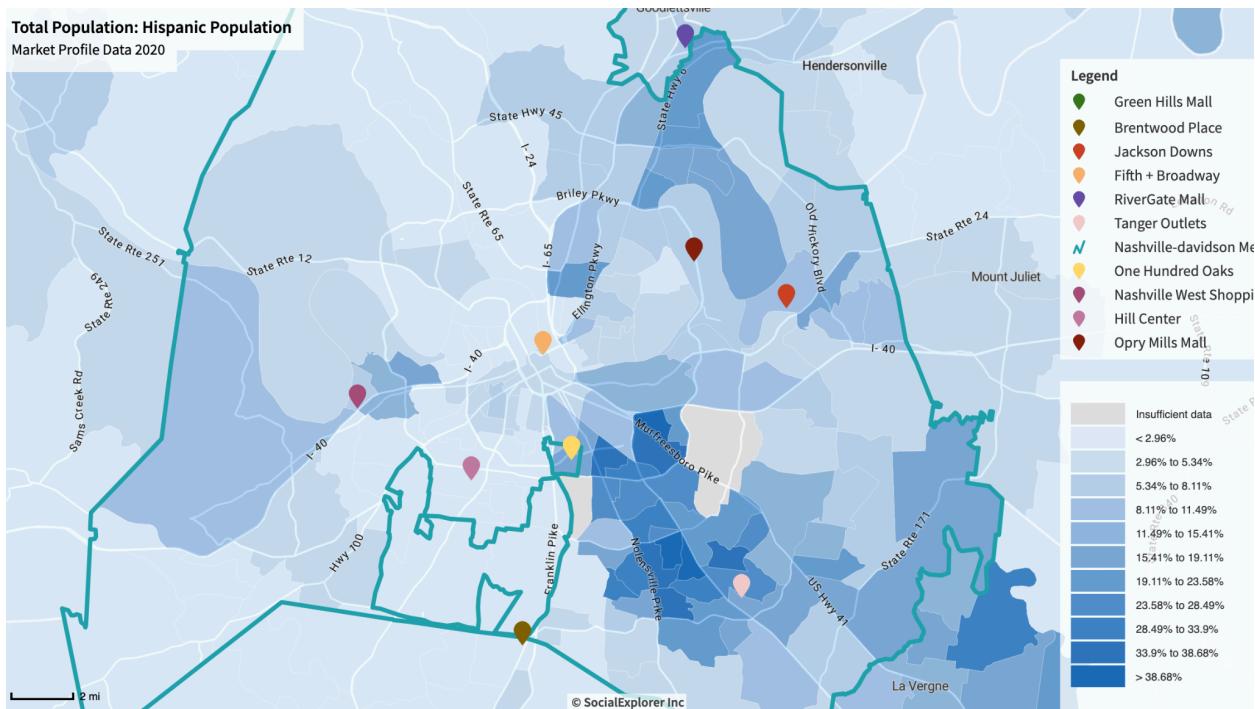
Map 7: Zoomed-In Median House Value for Nashville, TN: ACS 2021 (5-Year Estimates)



Map 8 – Black Percent of Population for Nashville, TN: ACS 2021 (5-Year Estimates)



Map 9 – White Percent of Population for Nashville, TN: ACS 2021 (5-Year Estimates)



Map 10 – Hispanic Percent of Population for Nashville, TN: ACS 2021 (5-Year Estimates)

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- Alfs, Lizzy. "Massive Development Brings New Life to Bellevue." The Tennessean, August 22, 2018.
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