Exploring Library Accessibility and Social Impact in Baltimore:

A Geographic Analysis of Distribution and Equity

Table of Contents

Introduction

Research Scope

This analysis looks at library access and use in Baltimore City. Using demographics such as race and age, as well as a number of socioeconomic indicators such as the number of Supplemental Nutrition Assistance Program (SNAP) recipients and households without Wifi, this research aims to understand the distribution of public libraries in relation to the community need for library resources. Additionally, this research looks at library use to investigate how *access* and *utilization* compare.

Using these guiding questions, the research culminates in a multi-criteria decision analysis (MCDA) to determine potential suitability for a new library location.

Libraries are one of the most powerful resources in American communities.

Beyond places of learning, libraries remain one of the only free spaces open to the public. Additionally, libraries distribute resources to vulnerable populations daily.
This year, the Enoch Pratt Free Library, Baltimore's public library system, provided over 30,000 residents with Chromebooks, 1,400 children with winter coats, and thousands of adults with care coordination services. This fall, Enoch Pratt also opened a grocery store in their Southeast branch, in which food is available free of charge to residents.

"My library shall be for all, rich and poor, without distinction of race or color..." — *Enoch Pratt*

...however, how equitably are these resources distributed and utilized?

Despite this wealth of resources, only about **20%** of Baltimore residents have a library card. Additionally, programs like the Social Worker or Lawyer in the Library and Housing Navigator services are utilized by just around **5,000** people annually.
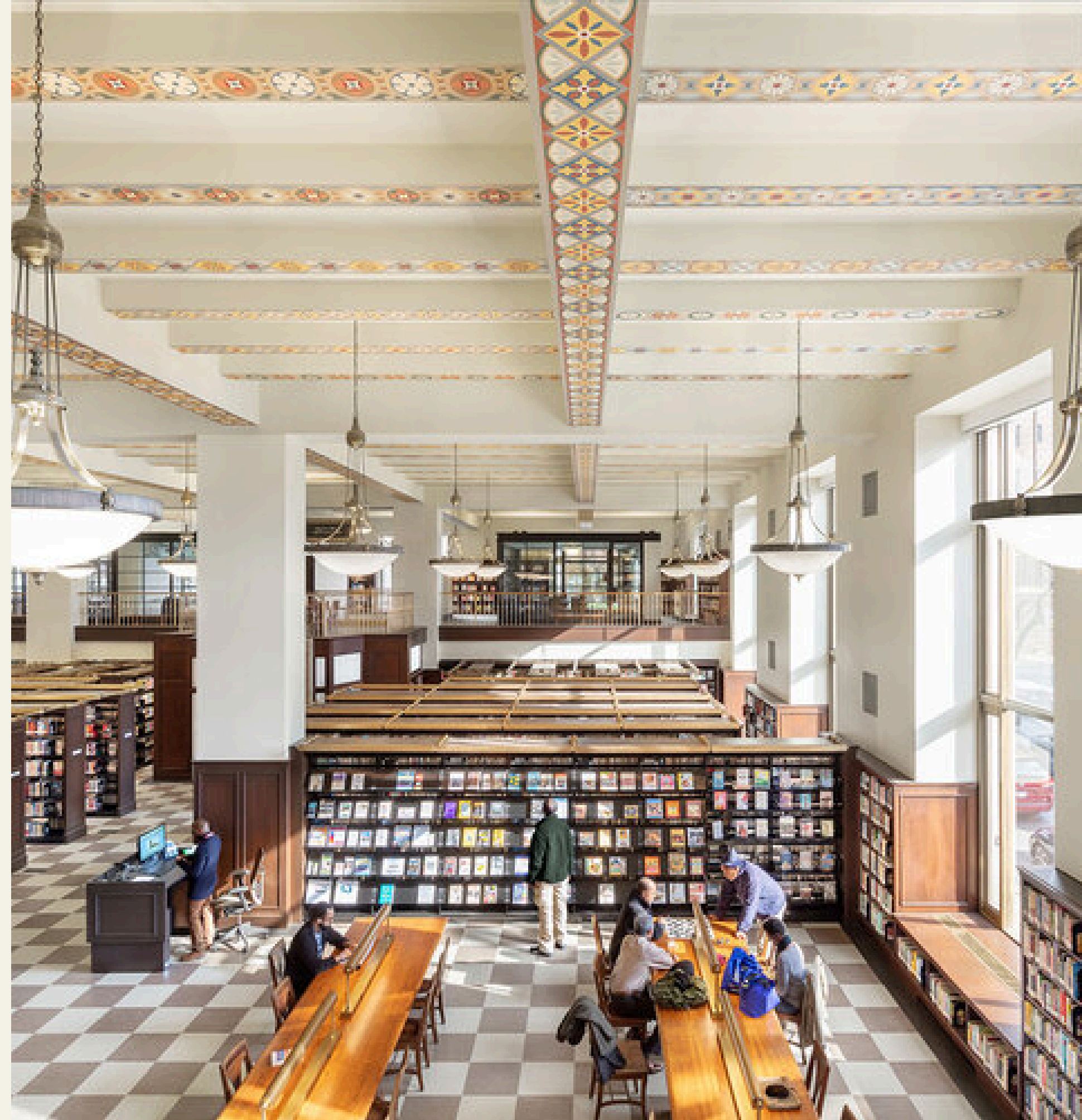
Central Library
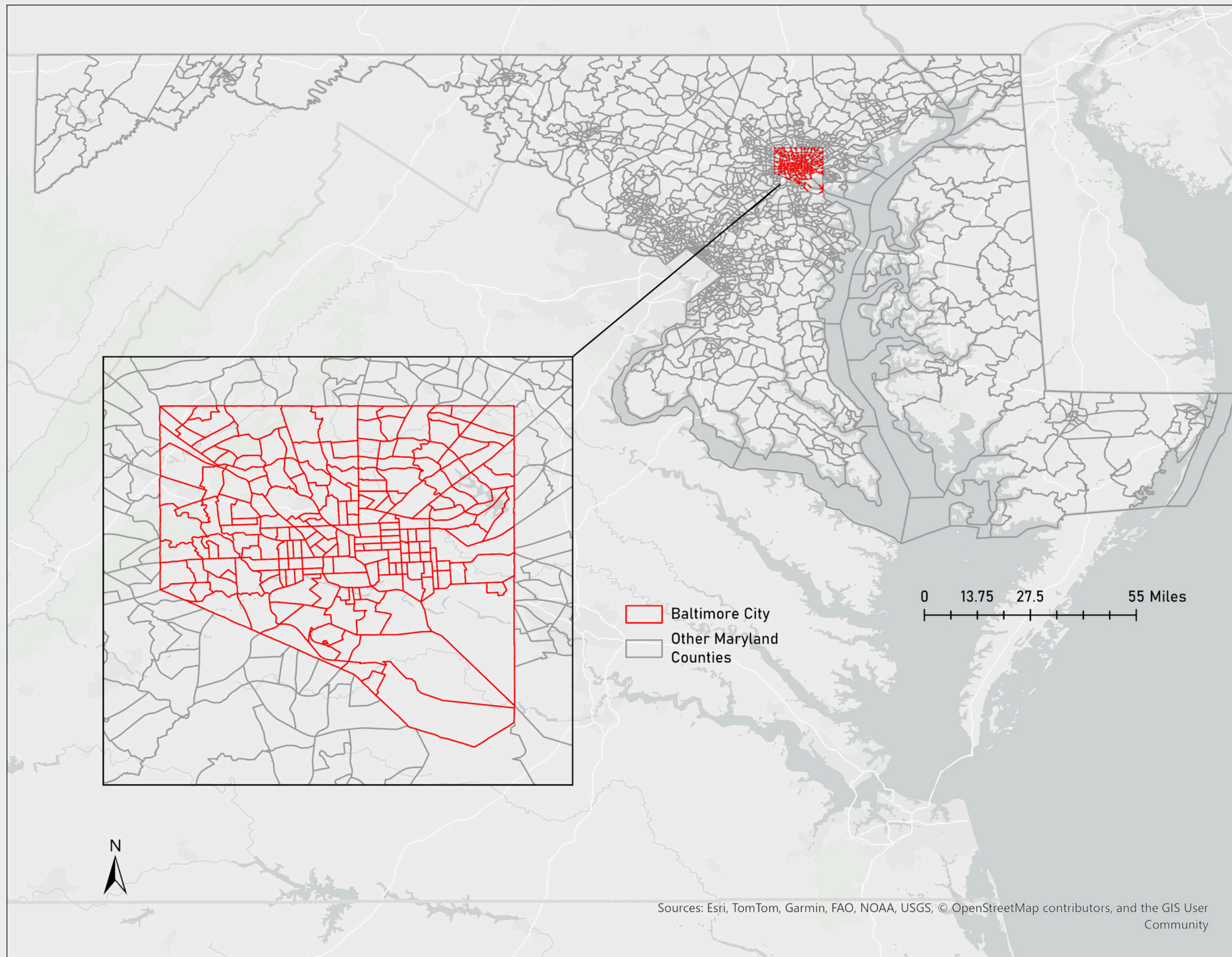
Image source: Tillotson Design

Research Questions

Central Library

Source: Enoch Pratt Free Library

1. Who currently has access to libraries in Baltimore City? Who is most in need of access to libraries, both for social services and key reading resources?

2. Which Baltimore neighborhoods use the library most?

3. If Baltimore were to invest in a new library location, where would it be best located to serve populations that do not currently have access? Beyond merely locating the library in an area that does not currently have a branch, how do other factors such as educational attainment, youth population, and socioeconomic distribution impact this potential decision?

Area of Study

This analysis focuses on library access in Baltimore City, Maryland. The largest city in Maryland by population, Baltimore is in the center of the state and is located along the Chesapeake Bay.

Baltimore City

Other Maryland Counties

| 0 | 13.75 | 27.5 | | 55 Miles |

N

Data source: US Census Bureau, 2020

Units of Analysis

Community Statistical Area (CSA)

Similar to Neighborhood Tabulation Areas (NTAs), CSAs look at geographic clusters of neighborhoods in analyzing data. The CSA was initially designed by the Baltimore Data Collaborative with the Baltimore City Department of Planning. CSAs:

-Align with Census Tract boundaries;

-Consist of 1-8 tracts with total populations in the range of 5,000 to 20,000;

-Define a relatively, demographically homogenous area.

CSAs are the standard unit of analysis in Baltimore, so data is calculated on a neighborhood level.

Census Tracts

Racial demographic data is displayed by Census tract to best illustrate the racial divides of the city on a more granular level.

Data and Methodology

Spatial Data Used :

- US Census TIGER/Line Shapefile

- Baltimore City Open Data

  - Age, race, educational attainment, library locations, unemployment and poverty rate, SNAP utilization, library utilization.

- US Census American Community Survey, 2023
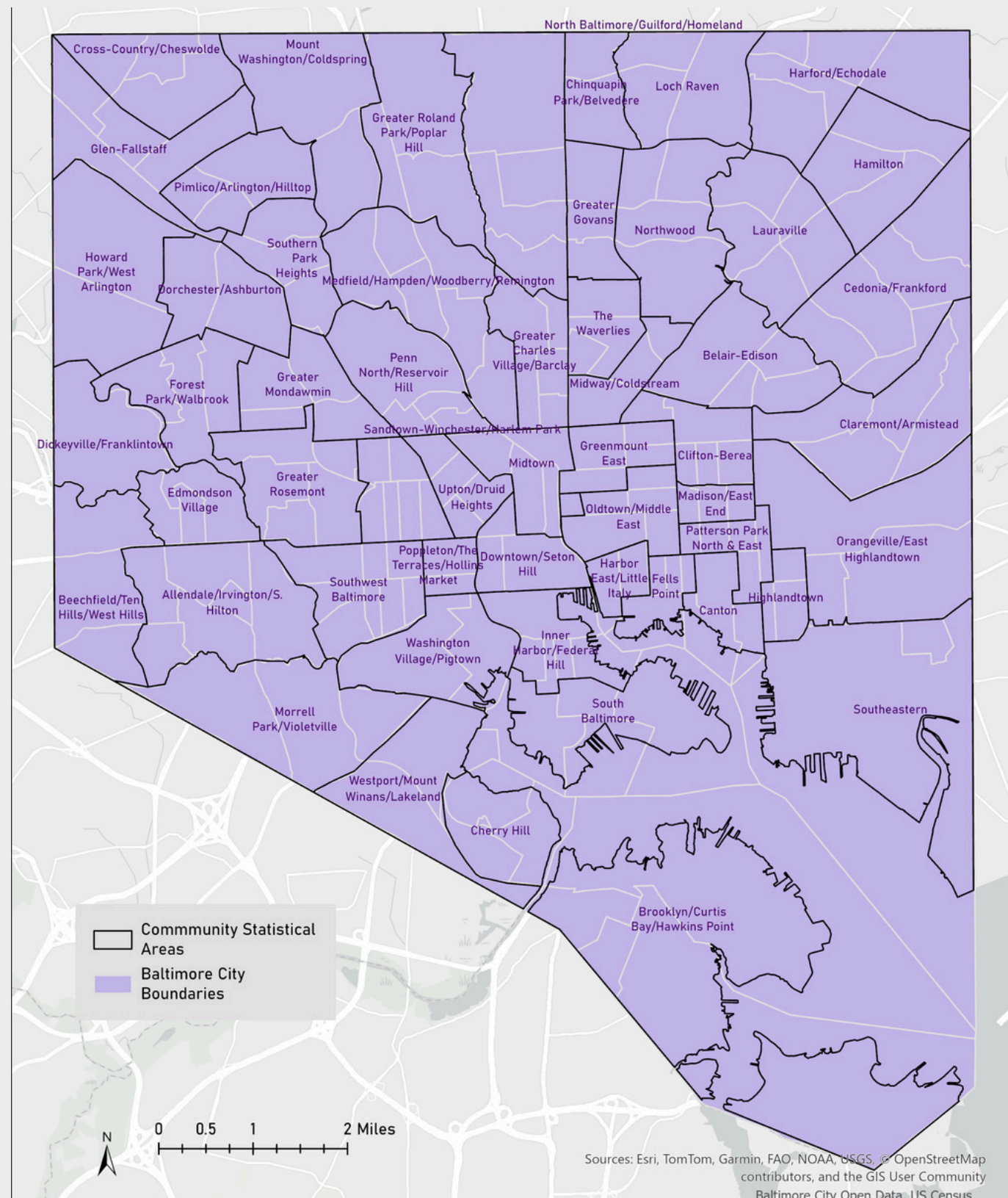
Data Collection

Data was collected and cleaned at the CSA area level. Data not available through Baltimore City Open Data was collected from the Census Bureau and grouped by CSA boundaries.

Thematic Mapping

Demographic data and social vulnerability indicators were normalized against total population and visualized through thematic maps. A half-mile buffer for library locations was included in most maps.

Multi-Criteria Decision Analysis

After choosing four key variables, polygons were converted to rasters for the multi-criteria decision analysis.

The "City of Neighborhoods"

Baltimore has many nicknames, including "Charm City," "The City That Reads," and "The Greatest City in America" – all attempts by elected officials to rebrand the city from its negative associations with crime. However, the most enduring nickname is the "City of Neighborhoods," a nod to Baltimore's many distinct neighborhoods.

Research and many policy decisions are made at the Community Statistical Area (CSA) level, which correspond to neighborhood boundaries. This map shows Baltimore at the CSA level with neighborhood names labeled.

*Data source: Baltimore City Department of Planning*
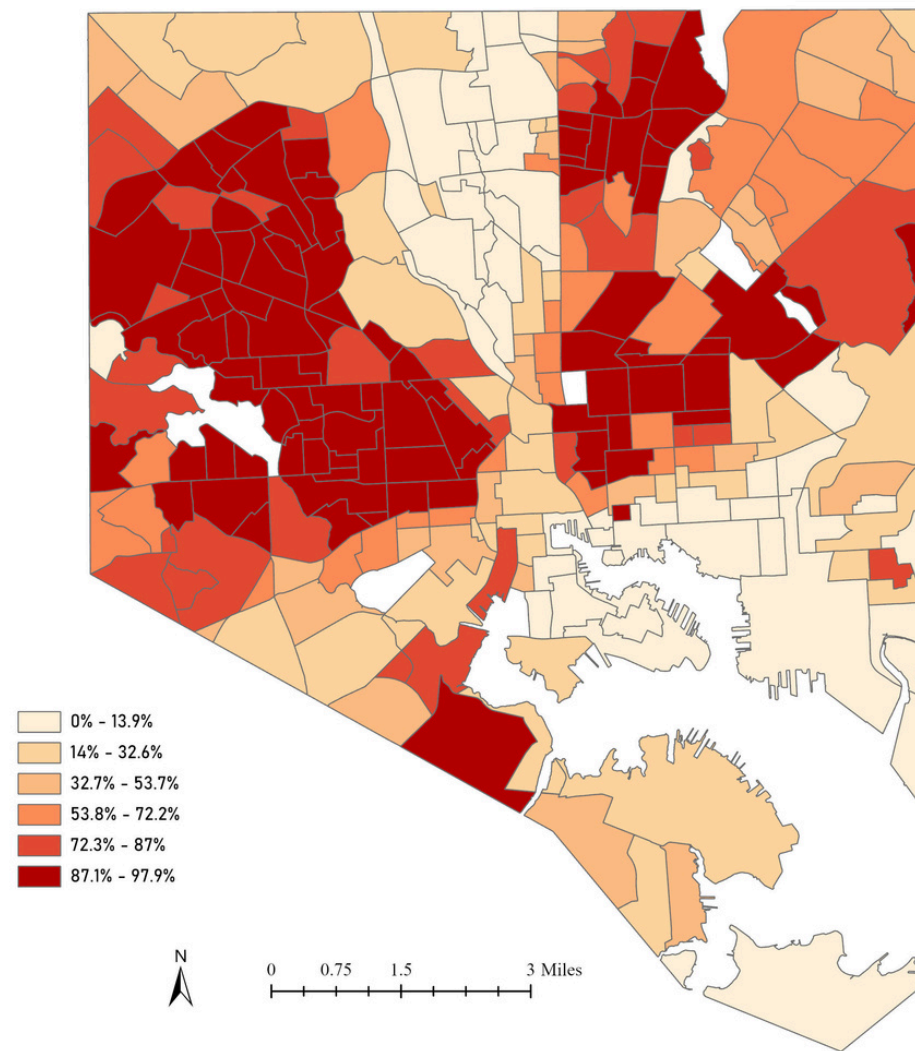
Mapping and Analysis

Acknowledgements

Guiding this analysis is Baltimore professor Lawrence Brown's conceptualization of the "Black Butterfly" of Baltimore, referring to the spatial distribution of Black and white residents, respectively. Professor Brown refers to the East and West sides of the city with a large Black population as the "Black Butterfly," while the white population lives in the "White L," the narrow stretch running from the north to the south of the city.

The Home Owners' Loan Corporation (HOLC)'s "redlined" map of Baltimore (right) reflects the Black Butterfly pattern. As the following page demonstrates, Baltimore's Black and white racial distribution has had little change since the 1930s. This pattern will continue to be recognizable in subsequent social vulnerability maps.
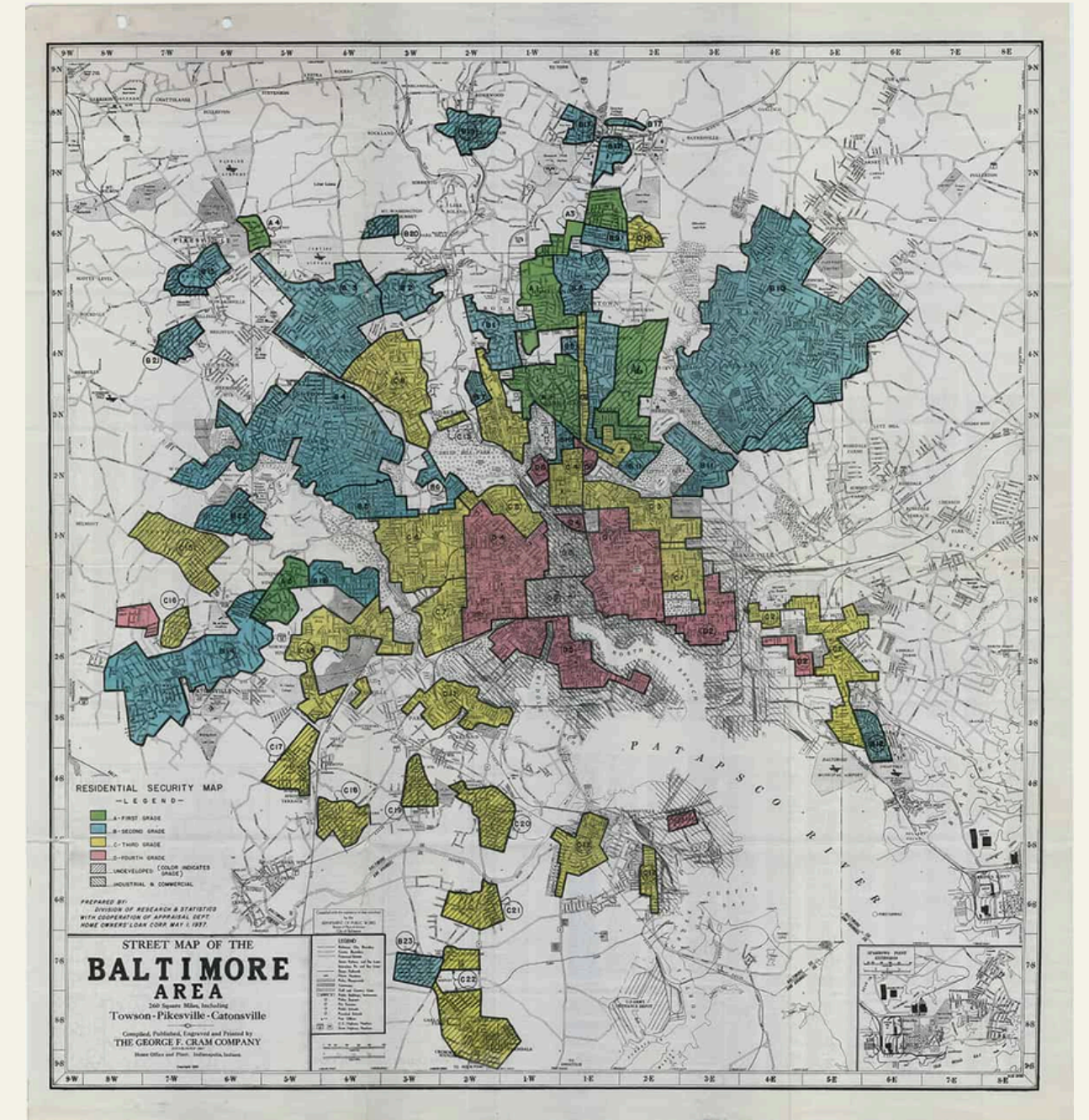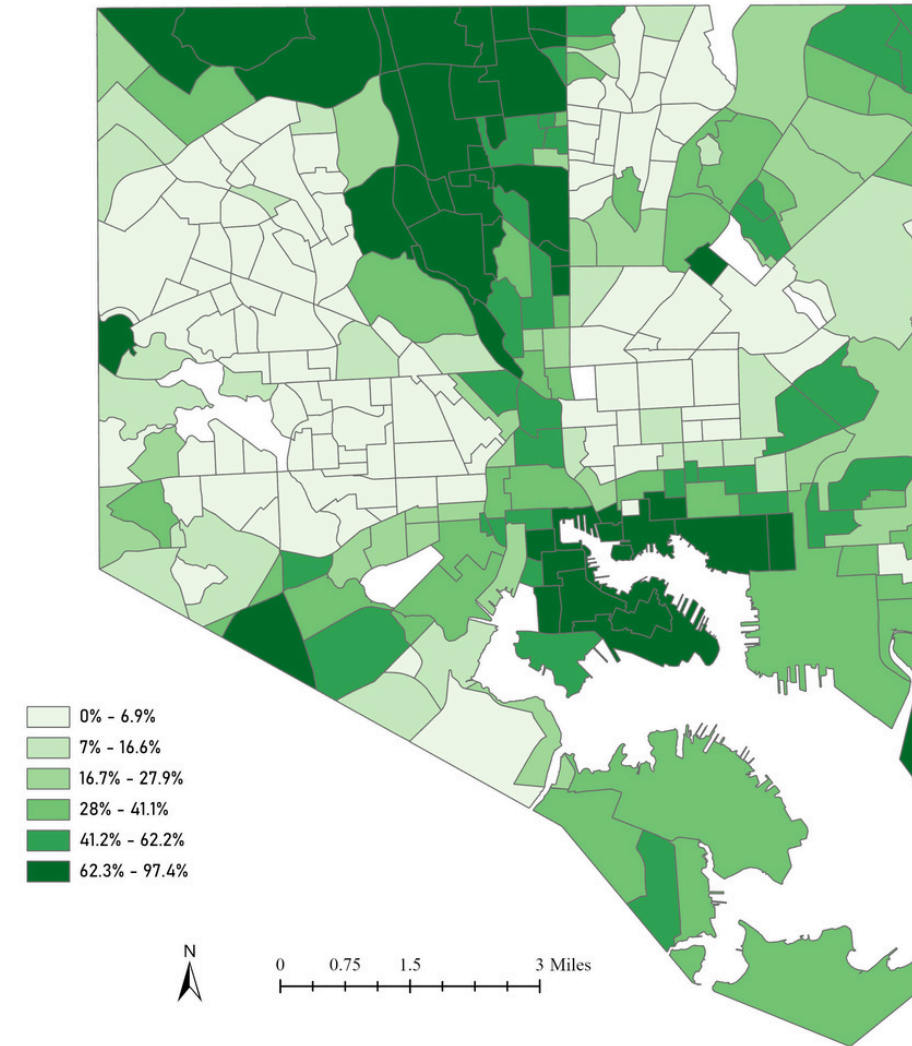

Source: University of Richmond; HOLC

Population Percent, Black

Population Percent, White

Black and White Racial Distribution, 2020

Black Legend:
- 0% – 13.9%
- 14% – 32.6%
- 32.7% – 53.7%
- 53.8% – 72.2%
- 72.3% – 87%
- 87.1% – 97.9%

White Legend:
- 0% – 6.9%
- 7% – 16.6%
- 16.7% – 27.9%
- 28% – 41.1%
- 41.2% – 62.2%
- 62.3% – 97.4%

N
0 0.75 1.5 3 Miles

N
0 0.75 1.5 3 Miles

Data source: 2020 Census

These maps show the 2020 Black and white racial distributions. The "Black Butterfly" is visible in the first map, where large pockets of the East and West sides of the city have up to a 97% Black population.

On the right, the white population map shows that large portions of North Baltimore are predominantly white; this pattern follows the "White L" shape.
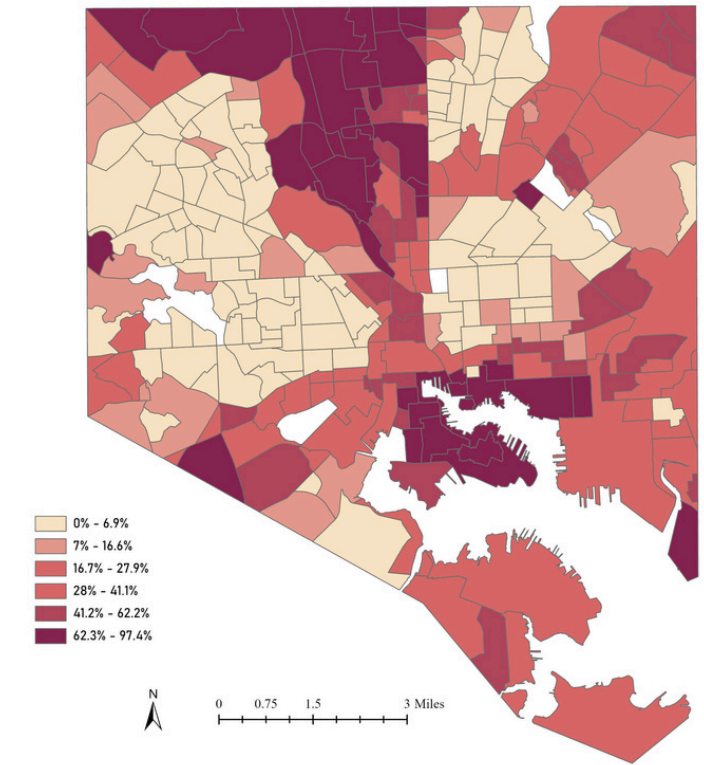
This data looks at 2020 Census tract populations and is normalized by total population.
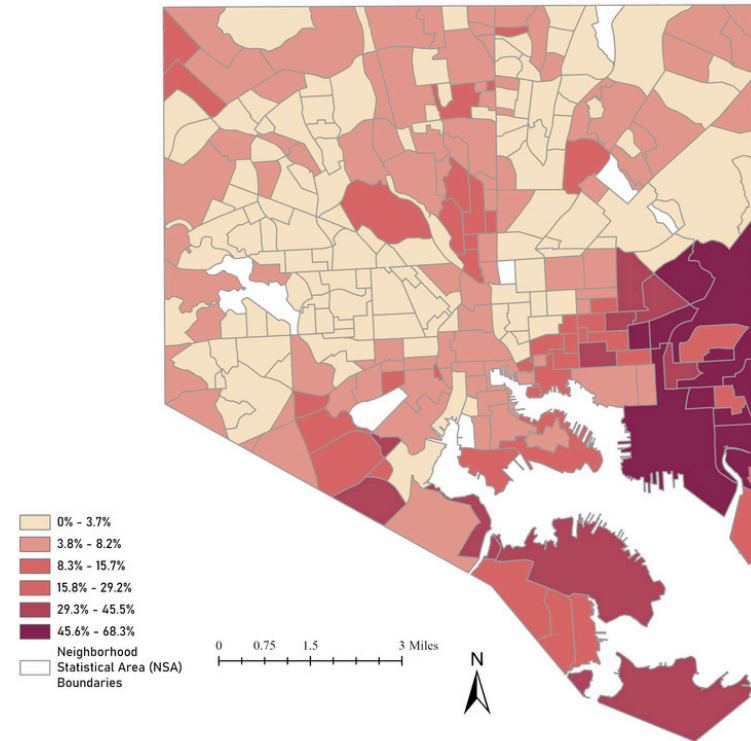
14

Baltimore Demographics by Race

Demographics by Census tract, normalized by total tract population, 2020 Census
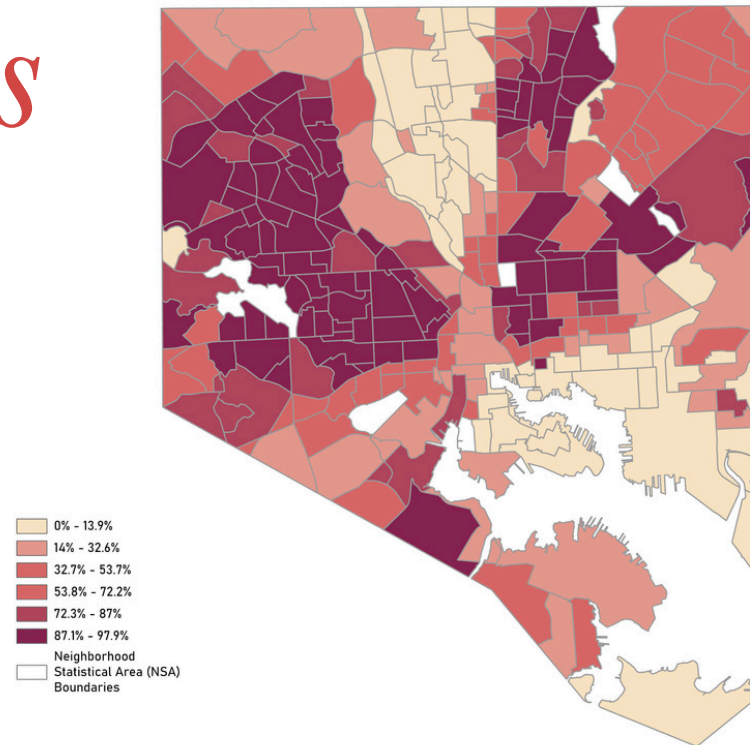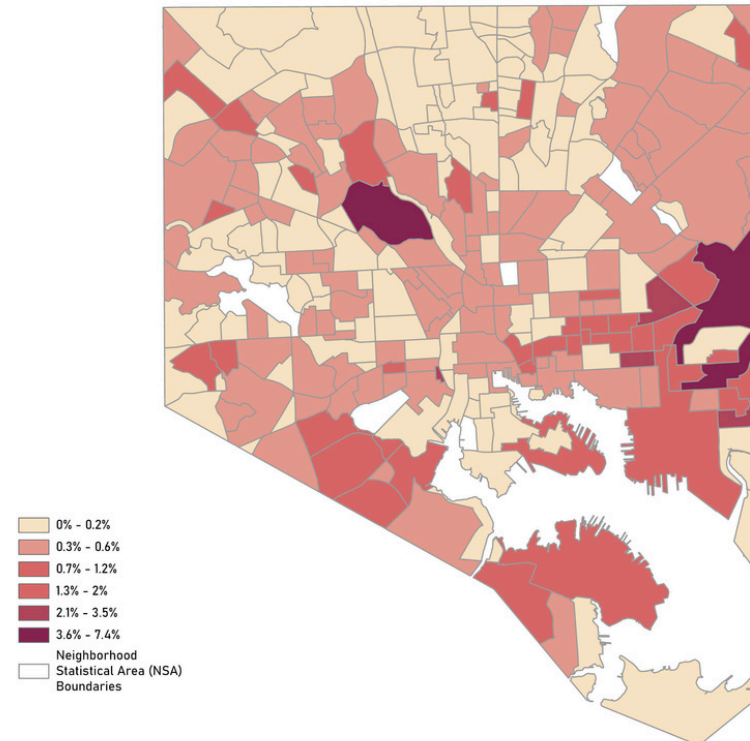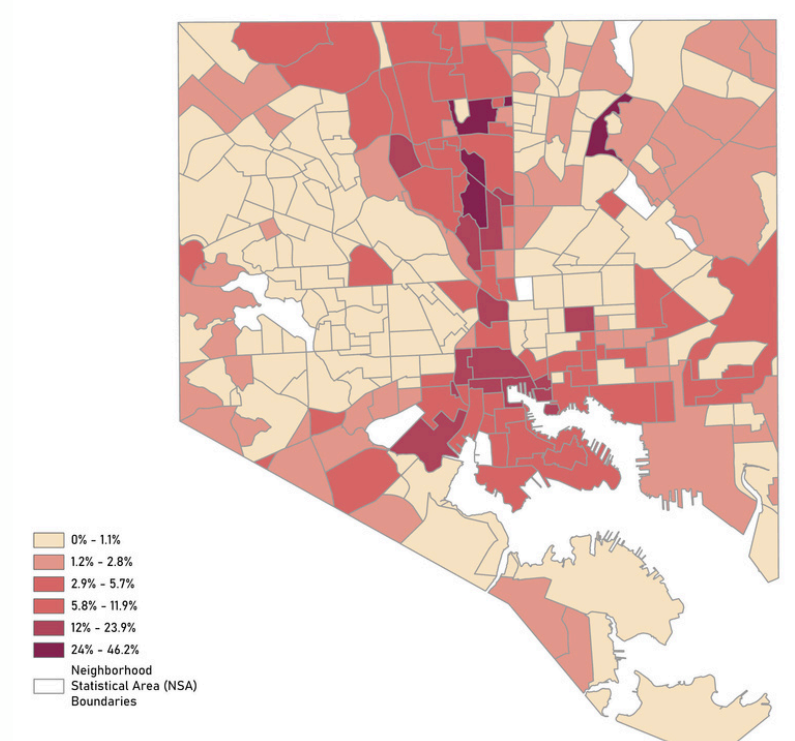

Population Percent, Black

Population Percent, White

Population Percent, Latinx/Hispanic
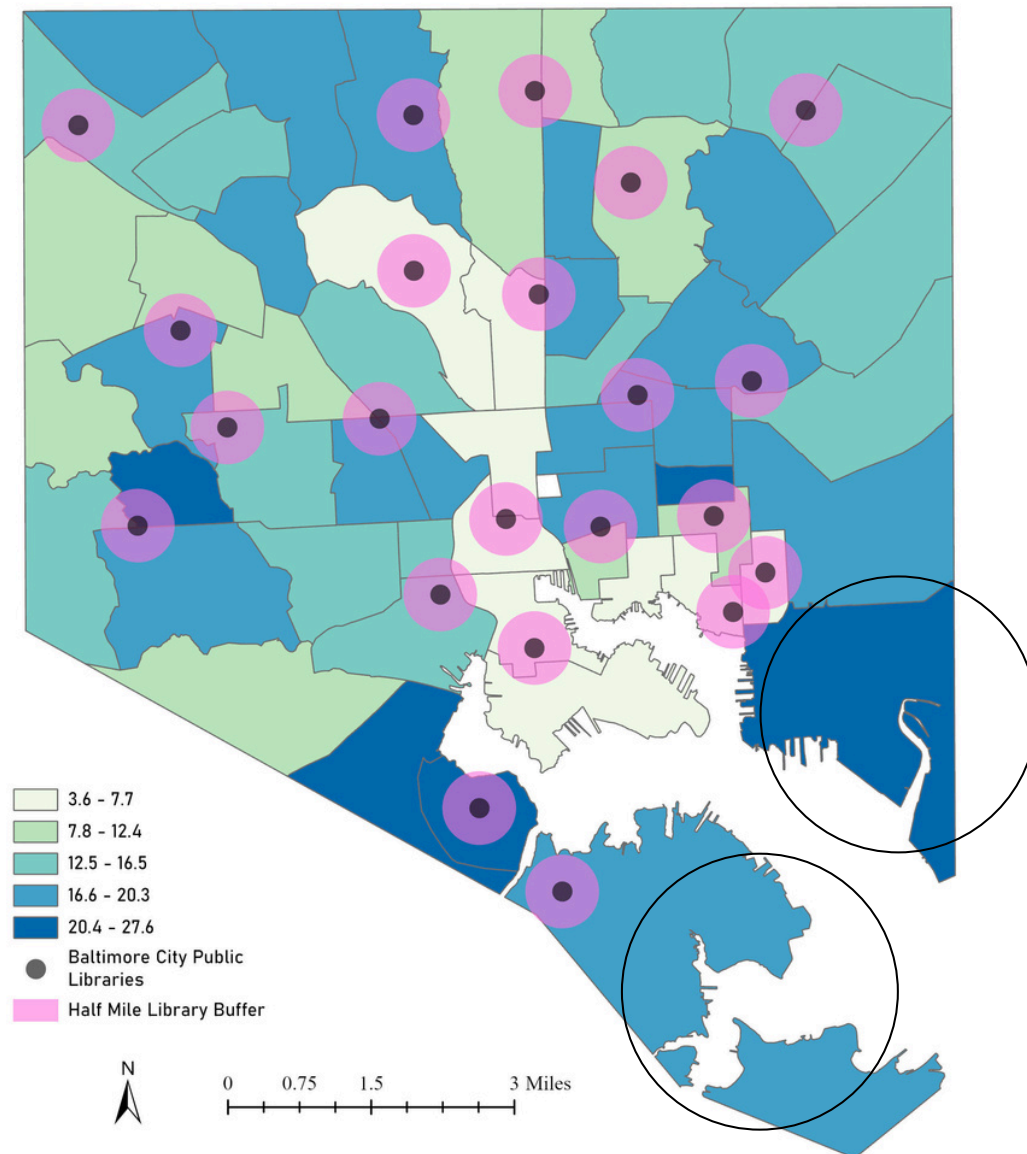

Population Percent, Indigenous

Population Percent, Asian

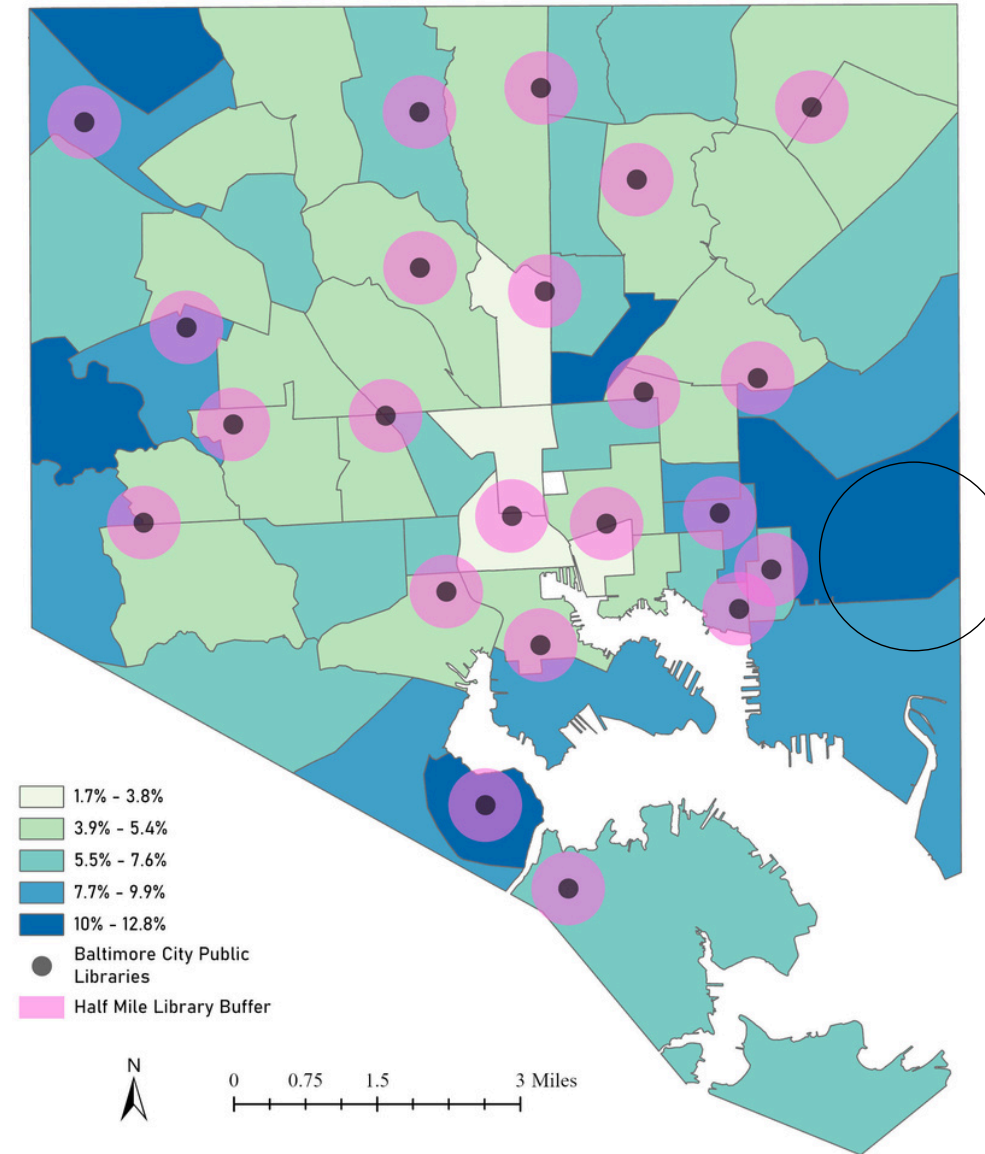*Sources: 2020 Census, Baltimore City Open Data*

Demographic Variables

- *Race*

- *Unemployment rate*

- *Population 25+ with less than a high school diploma*

- *SNAP recipients*

- *Poverty rate*

- *Households without wifi*

- *Youth population percentage*

Percentage of Population Ages 5-17, 2022

Percentage of Population Ages 5 and under, 2022

Youth Population

The population aged 5-17 is highest in the East and West. The library distribution and half-mile buffer show that several neighborhoods with higher distributions (outlined by circles) are underserved by current library locations.

Youth population is considered as a key access factor because, in addition to being an educational resource, libraries are also invaluable spaces for youth to be in outside of school and at home.
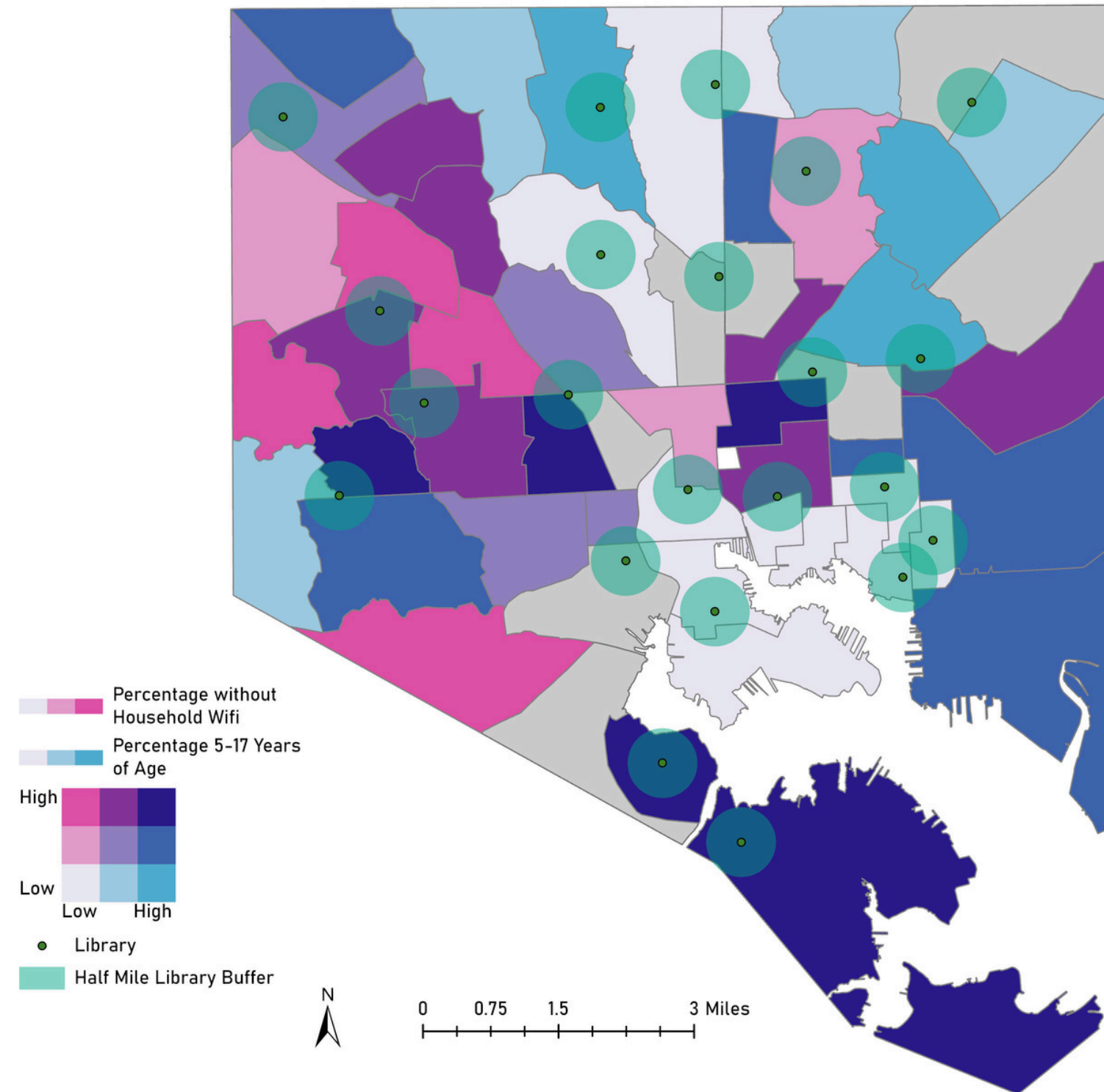
Youth Populations and Home Wifi Access

Do areas with higher youth populations have access to home Wifi?

This map shows that neighborhoods in Southeast and Southwest Baltimore have both a high population of youth and households without Wifi. This issue is worst in the southwestern-most neighborhood in the city, Curtis Bay.

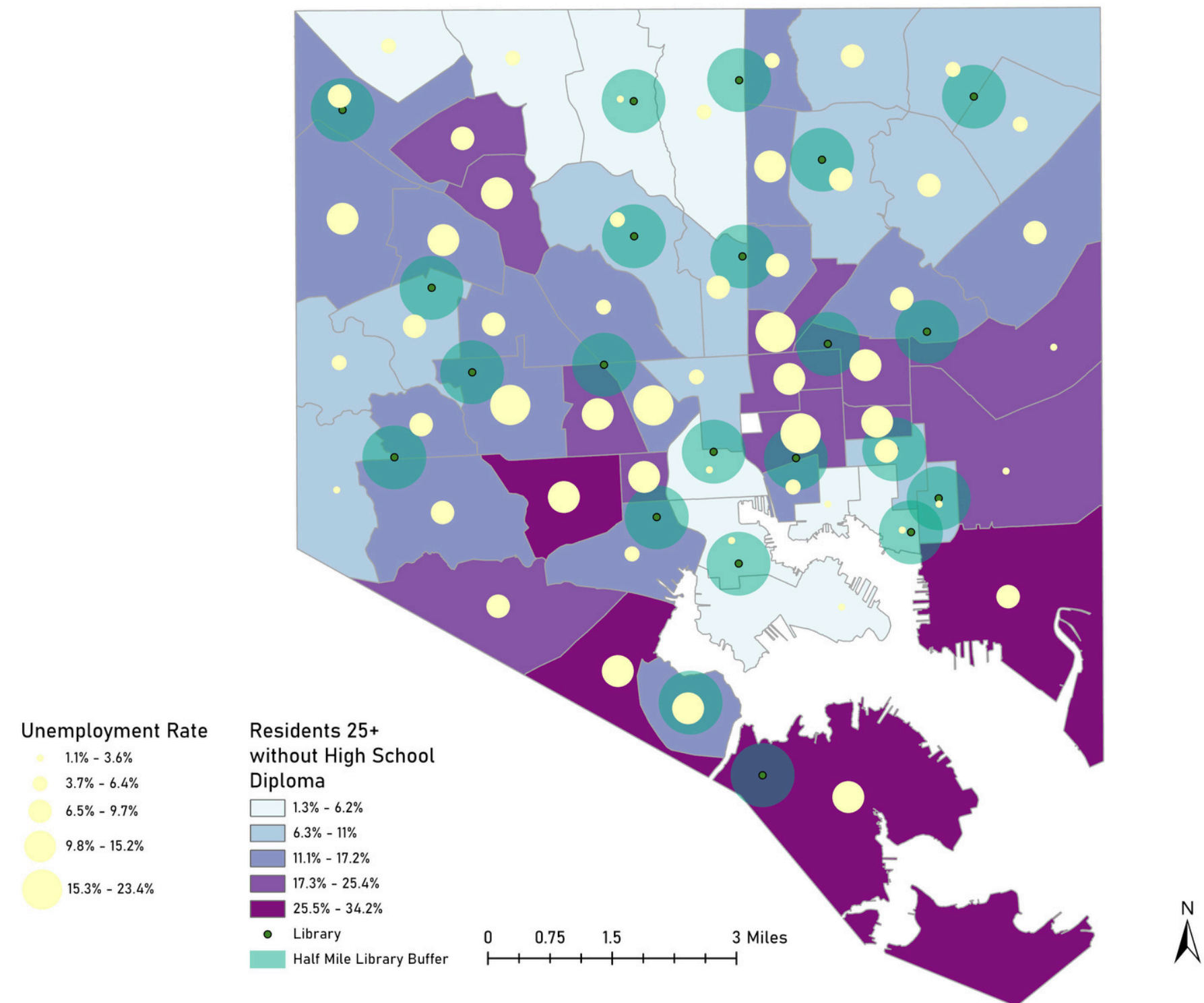Generally, this issue is most prevalent outside of the White L.

Percentage without Household Wifi

Percentage 5-17 Years of Age

High

Low

Low   High

• Library

Half Mile Library Buffer

N

0   0.75   1.5   3 Miles

Sources: 2022 Census ACS, Baltimore City Open Data

Adult Educational Attainment and Unemployment Rate

In addition to their benefit to young populations, libraries also offer invaluable services for adults, including career and educational advancement resources.

This analysis looks at adults 25 and older without a high school diploma and unemployment rates. While unemployment rates are generally higher in the east and west sides, much of the southwest area has higher percentages of adults without a high school diploma.

When compared with racial demographic maps, this map shows that educational attainment is lower in Latinx communities.

Unemployment Rate
- 1.1% – 3.6%
- 3.7% – 6.4%
- 6.5% – 9.7%
- 9.8% – 15.2%
- 15.3% – 23.4%

Residents 25+ without High School Diploma
- 1.3% – 6.2%
- 6.3% – 11%
- 11.1% – 17.2%
- 17.3% – 25.4%
- 25.5% – 34.2%
- Library
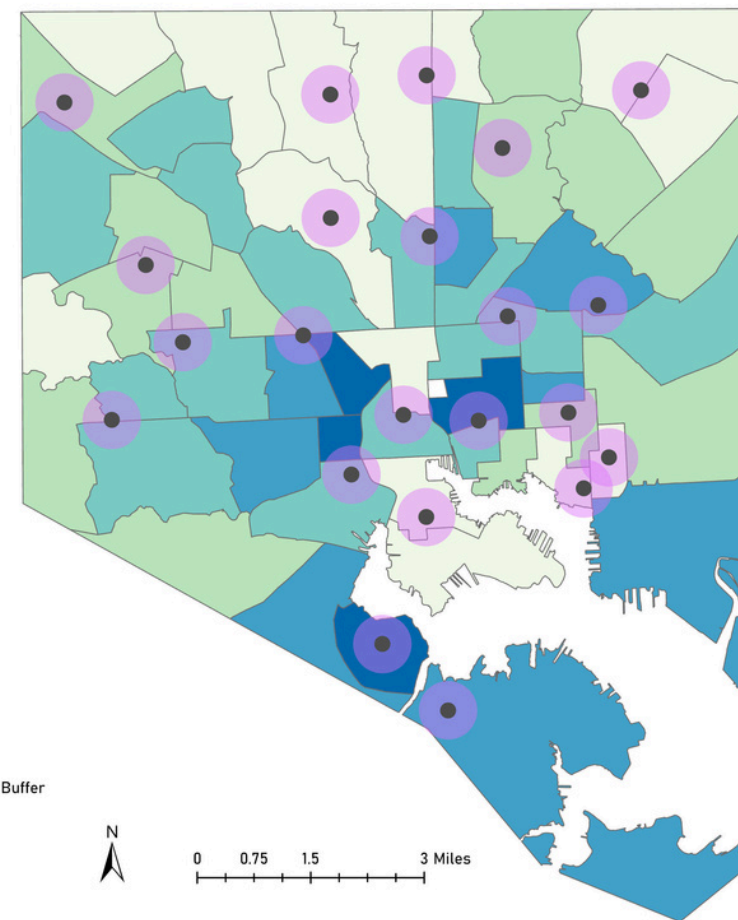- Half Mile Library Buffer

0   0.75   1.5   3 Miles

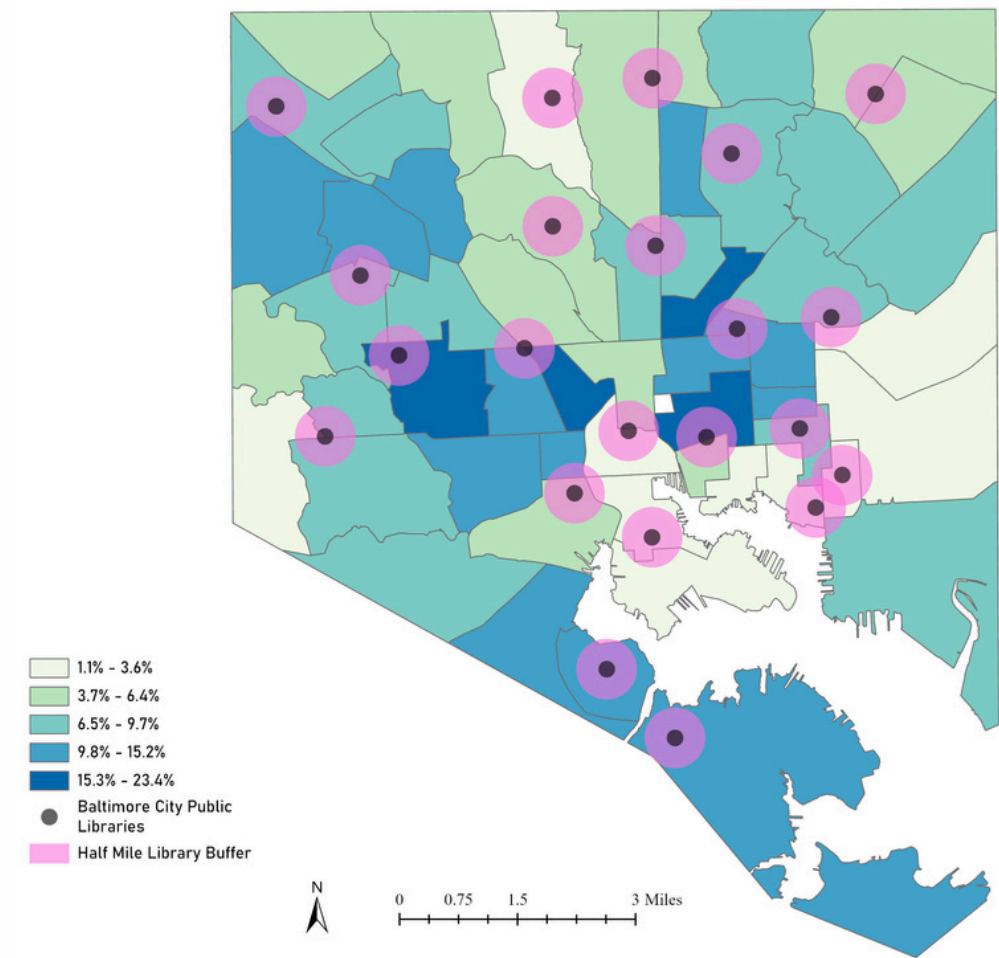*Sources: 2022 Census ACS, Baltimore City Open Data*

Socioeconomic Vulnerability Analysis
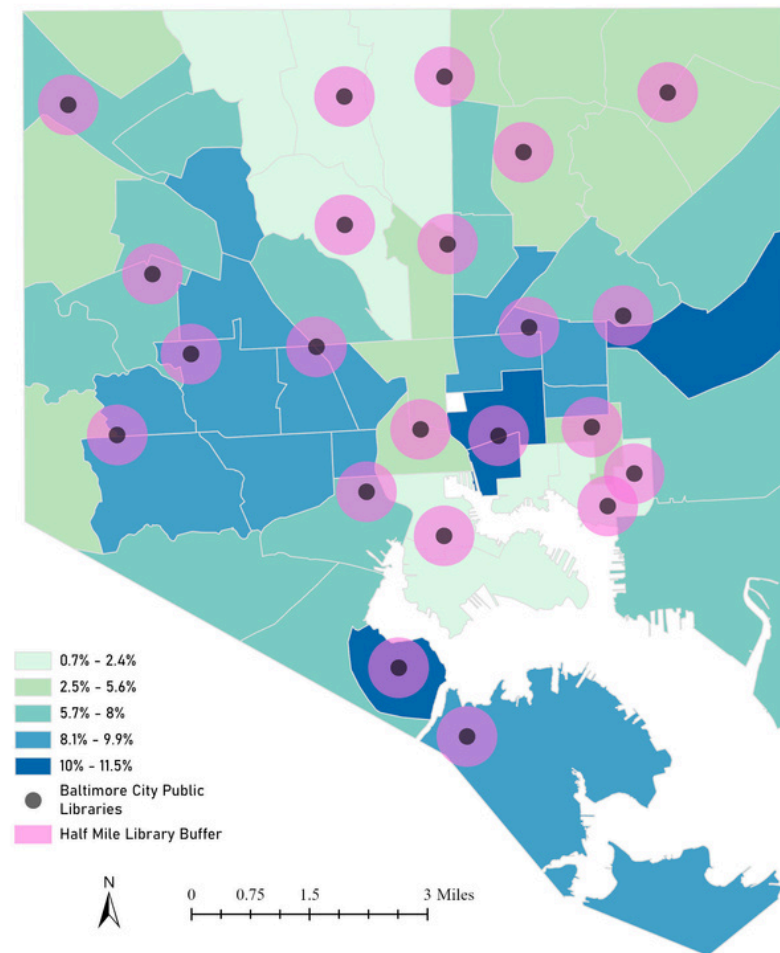
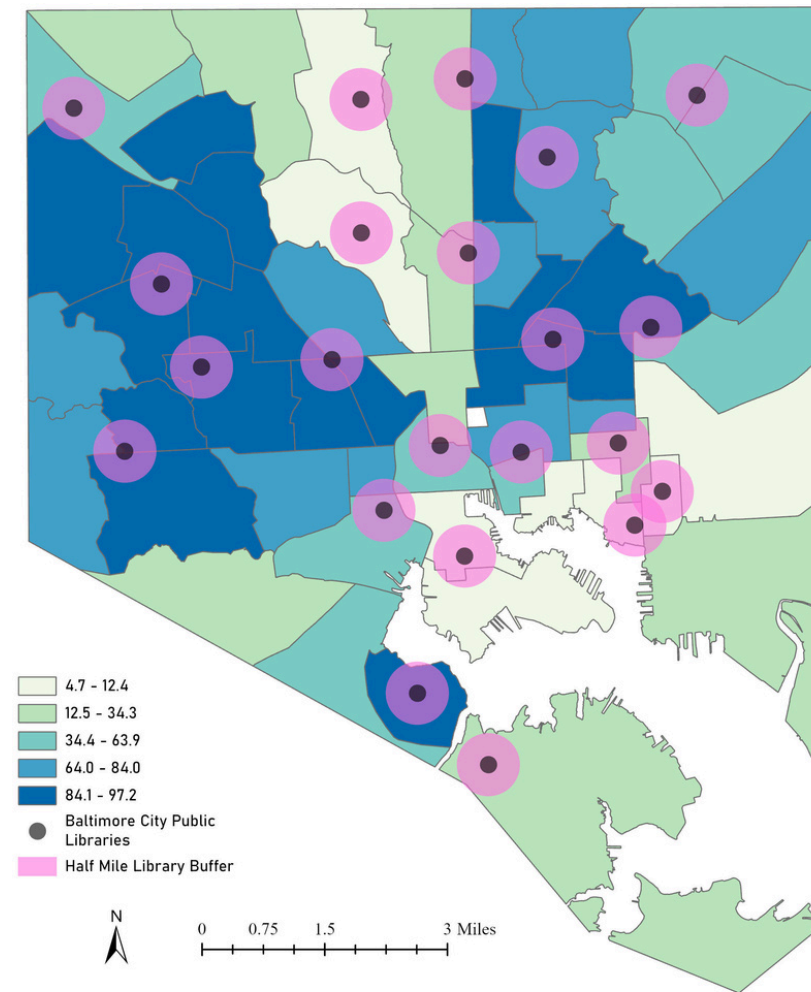*Percentage of SNAP Recipients, 2022*

Poverty Rate, 2022

Unemployment Rate, 2022

Sources: 2022 Census ACS, Baltimore City Open Data

Libraries in the Black Butterfly vs. Library Usage

Percent of African American Residents, 2022

Library Cardholders for Every 1000 Residents, 2022

While there are several libraries in predominantly Black neighborhoods, there are fewer library cardholders in these areas . Cardholders are more likely to live in the White L, complicating the issue of access vs. utilization.

Further research may consider marketing and other factors that may encourage resident utilization.

Sources: 2022 Census ACS, Baltimore City Open Data

Findings and Analysis

Race

Although Baltimore remains racially segregated, Black neighborhoods do not have fewer libraries compared with other neighborhoods. However, there are more cardholders in white neighborhoods than neighborhoods of other racial makeups.

Percentage of Black population was not included in the MCDA.

Southwest and Southeast Baltimore, which have a higher Latinx population than other neighborhoods, are two key areas without a library within a half mile. This population is identified in this map.
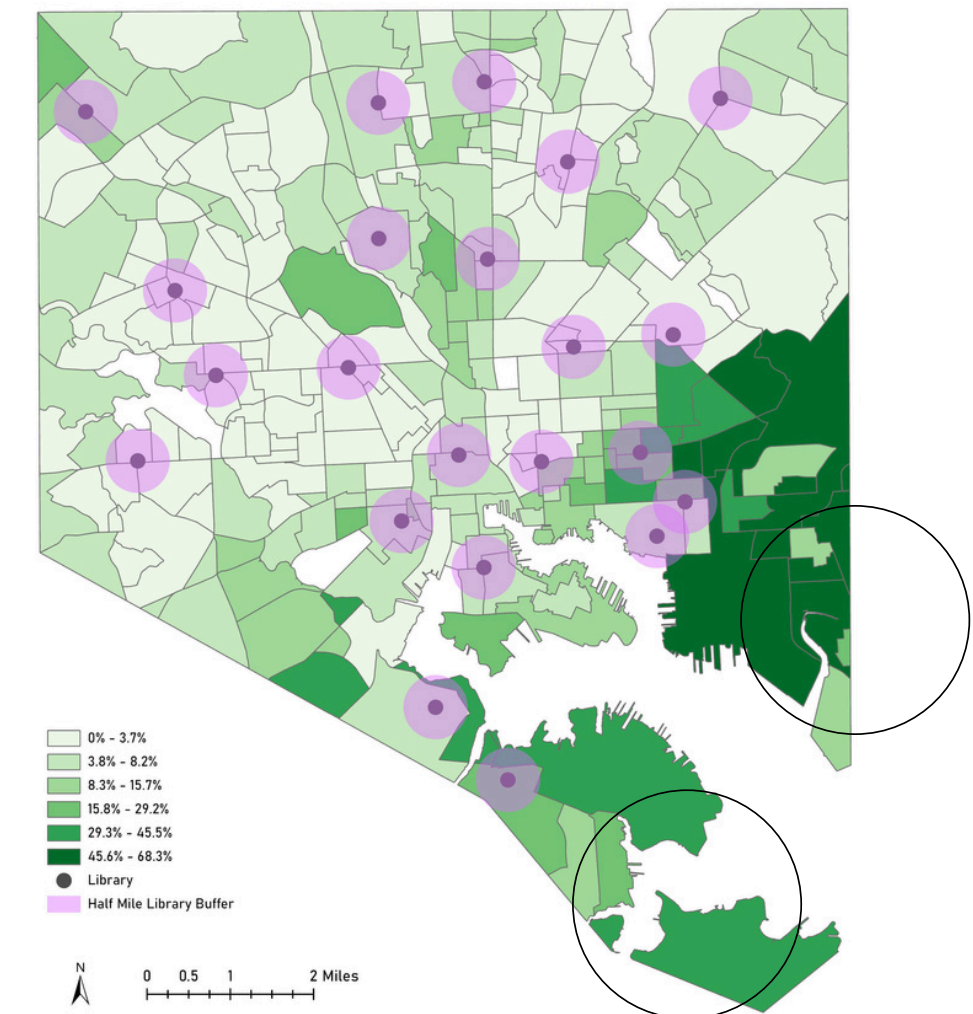
Percent of Latinx Population, Tract Level, 2022

Age

Access for youth remains an issue. There are several limits to youth-related data. For instance, the city does not report literacy rates. Additionally, Maryland has changed standardized tests in the last five years, which means that measuring reading and math proficiency through standardized test scores has a larger margin of error.

However, resource distribution through the library is often strongest for youth. Additionally, Baltimore consistently donates books to families and hosts group reading events, which are crucial for child development.

For this reason, youth population percentage was included in the MCDA.

Social Vulnerabilities

Unlike racial distribution, social vulnerability percentages range by location across the city. While there are fewer households in the Southeast and Southwest without Wifi, the poverty rate is consistently highest in East and West Baltimore.

Likewise, there are more adults without a high school diploma in the Southeast and Southwest, but the unemployment rates are lower in these areas. This uneven distribution of social vulnerabilities makes future library site planning less obvious.

Given Enoch Pratt's efforts towards distributing resources, including food, SNAP recipient percentage was used in the MCDA. Adult educational attainment was included as the final demographic factor. Lastly, current locations were included in the MCDA to avoid concentrating libraries in one area.

Where should Baltimore build its next library?
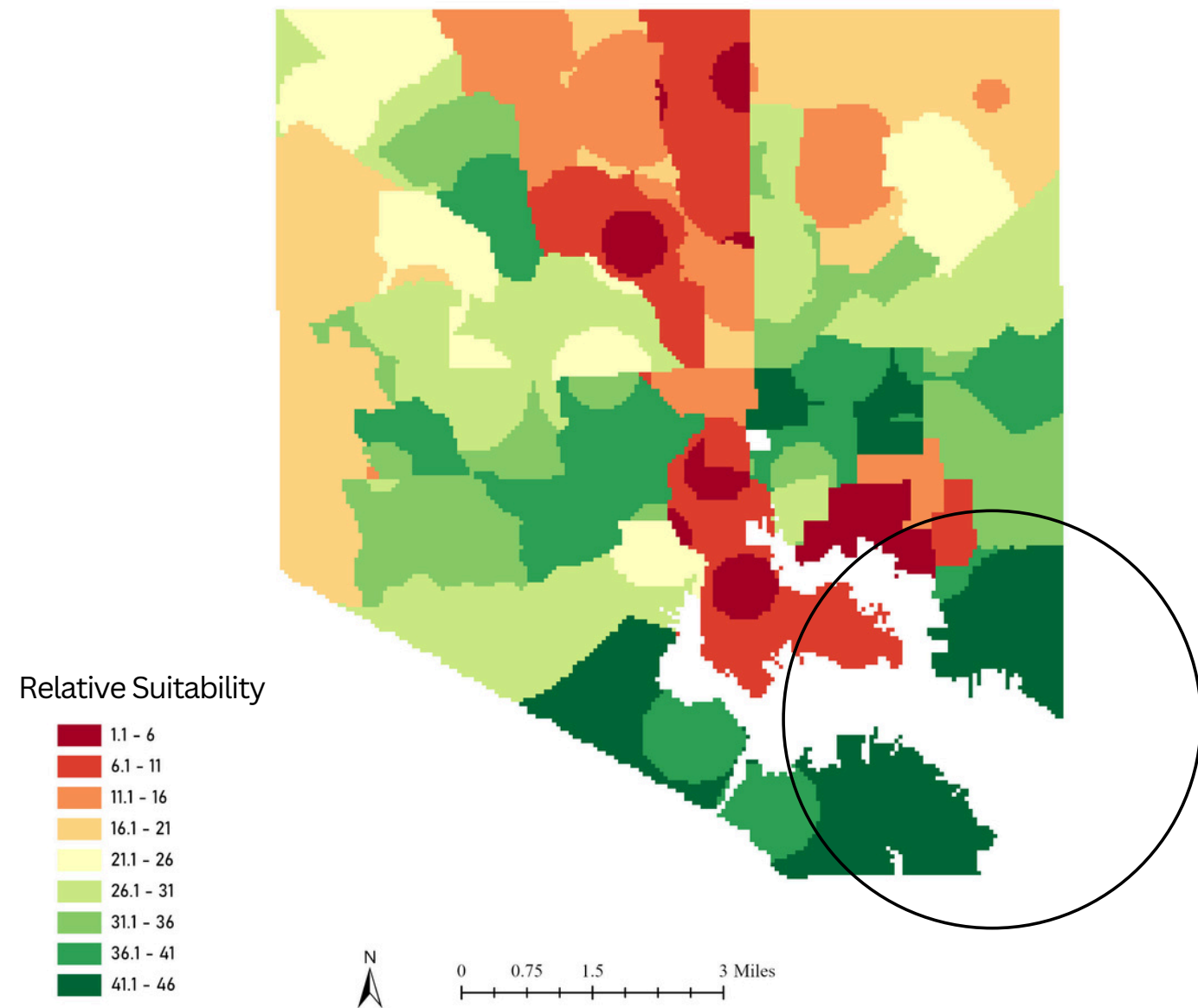
Suitability Criteria
- *Youth population (35%)*
- *Adults 25+ without a diploma (30%)*
- *SNAP recipients (25%)*
- *Current libraries (10%)*

After reviewing several demographic variables and socio-economic factors, the results of this MCDA reveal that the Southwest Curtis Bay and Southeastern neighborhoods would be most suitable for Baltimore's next library. Both neighborhoods have relatively high youth populations and adults with lower educational attainment, suggesting that either location could serve a wide age range.

Both areas also score high in social vulnerability indexes, even those excluded from the MCDA such as home Wifi connectivity, poverty, and unemployment rates. SNAP recipient percentages are actually lower in these areas compared to other neighborhoods, but this may be due to immigration status and SNAP eligibility.

Although East and West Baltimore score relatively highly on suitability, these areas are more greatly serviced by existing libraries, which impacted the MDCA results.

Consistent with most demographic maps included here, as well as Professor Lawrence Brown's research, North Baltimore into South Baltimore scores low on the suitability range. It is worth noting that the final MCDA follows the Black Butterfly/White L pattern.

Data Limitations and Next Steps

1. As previously noted, data on school readiness would have been useful to consider in the MCDA, but finding public, accurate indicators of school readiness is challenging in Baltimore.
2. Though elderly population demographics were initially considered in this project, they were ultimately not included due to a lack of available information on library accessibility. Assessing *proximity* to libraries would have been an inaccurate way of understanding the *usability* of libraries for older populations generally.
3. While collecting data at the CSA level means city-wide research is often consistent in units of analysis, data is often less granular than at the tract level.

Further research with greater time allowances may include means of measuring accessibility, including bus routes, 311 complaints for sidewalk unevenness (as a mobility consideration), and an assessment of library marketing to all residents.

Image source: Enoch Pratt Free Library

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