2.3 Data Analysis
Diversity

2.3 Data Analysis
Diversity
Figures

What does diversity mean in this analysis?

This analysis looks at both socio-economic diversity and demographic diversity in MCPS.

For the purposes of this analysis, the key measures of diversity in MCPS include Free and Reduced Meals System eligibility (FARMS) and Ever-FARMS rates (a proxy for socio-economic status), English for Speakers of Other Languages (ESOL), and student race and ethnicity.

This analysis compares student diversity at various scales of analysis: the school level, the cluster/consortium level, and finally, districtwide.

Section Overview

This set of analyses is divided into four subsections:

- Distribution: Diversity Across the District
- Adjacencies: Comparing Nearest Schools to Each Other
- Feeder Patterns: Comparing Schools Across School Levels
- Special Conditions: Island Assignments and Special Programs

Each subsection opens with a set of key insights.

Diversity by the Numbers

- Across MCPS, **the overall FARMS rate is 34%**. The overall eligibility rate for students who have ever been eligible for Free and Reduced Meals (Ever-FARMS) is 46%.

- About **1 in 6 students** in MCPS receive services to help improve their English-language proficiency (ESOL), and 36% of high school students have received ESOL services at some point during their time in MCPS.

- Overall, the student body in MCPS is approximately **33% Hispanic, 27% White, 21% Black, 14% Asian, and a combined 5% "Other"** (Pacific Islander, Native American, or multi-racial).

Diversity at a Glance

What does diversity mean in this analysis?

Diversity is one of MCPS's considerations for educational facilities planning and boundary alignment. Diversity in a student body refers to differences between students. While diversity is complex and carries many meanings, for the purposes of this analysis, we focus on the three primary markers of diversity that MCPS draws upon in facilities planning: race and ethnicity, socio-economic background, and English language proficiency. MCPS values diversity in schools, and seeks to support schools that reflect the diversity of the communities they are in. Two of the many ways that MCPS assesses implications on its resources is by looking more closely at socio-economic diversity factors, such as FARMS, and student language proficiency, such as ESOL—both of which have implications for resource distribution, staffing, and administrative support at MCPS schools. This analysis will look at both of these factors in greater depth.

MCPS has grown increasingly diverse in recent decades as the county's overall population has diversified.[1] MCPS has various policies and programs in place to advance socio-economic and racial equity in the school system. In some cases, these programs follow state standards and funding (as in Title I schools). In other cases, these programs are particular to MCPS, such as the district's Equity Initiatives Unit.[2] Programs and policies such as these are described in this chapter wherever relevant to our analysis.

> ### Diversity: Broader than this Analysis
>
> While this analysis focuses on the key measures of diversity described in this chapter, we recognize that diversity is much broader and more complex than the measures discussed in this analysis. To MCPS students, staff, and families, diversity includes other factors such as gender, sexual orientation, religion, learning and ability differences, and more. For the purposes of this interim report analysis, we focus on the key measures that most impact MCPS facilities planning and programmatic needs, and for which there is data readily available at the school system and school level. For further reading and resources about diversity in MCPS and education, please see the **Further Reading section on page 406**.

---

1   See **Introduction Section, page 38,** for more detail on demographic changes in student enrollment.

2   See https://www.montgomeryschoolsmd.org/departments/clusteradmin/equity/

MCPS conducts annual reviews of diversity at each school, as mandated by Policy ACD: Integrated Quality Education.[1] As part of this annual review, the superintendent presents a diversity profile of each school to the BOE. These diversity profiles guide BOE decision-making about programmatic needs and administrative support at the school level. A fuller understanding of diversity across different scales—as presented in this section of the report—can enrich MCPS's understanding of diversity in school clusters, groups of adjacent schools, and the district as a whole.

Diversity in Context

This analysis represents a snapshot in time of diversity across the school system today. For more context about changes in diversity over time (in MCPS and districtwide) and the distribution of racial and socio-economic groups throughout Montgomery County, see **Montgomery County Context on page 38**. For a discussion of changes in MCPS policy over time with regards to racial diversity and integration, see **Policy History on page 54**.

---

1   "Policy ACD: Quality Integrated Education." 1993. Board of Education of Montgomery County. https://www.montgomeryschoolsmd.org/departments/policy/pdf/acd.pdf

Diversity Methodology

Measures of Diversity

This section examines diversity in MCPS using the following three markers of difference:

1. **Student race and ethnicity** measured by group clustering and the dissimilarity index.

2. **Socio-economic status** measured by the Free & Reduced Meals eligibility rate (FARMS) and Ever-FARMS rate, as well as the dissimilarity index.

3. **English language proficiency** measured by the rate of students receiving English for Speakers of Other Languages (ESOL) services and the Ever-ESOL rate.

In order to better understand these three aspects of diversity, we conducted four stages of analysis.

First, we looked at the **distribution** of different diversity indicators across the school district. This laid the context for deeper understanding of the key measures of diversity, by understanding their overall distribution across MCPS.

Next, we analyzed **adjacency** of schools and students of similar or different socio-economic and racial/ethnic backgrounds.

We then turned to **feeder patterns** between schools to better understand how they affect diversity at different school levels.

Finally, we analyzed the diversity of the student body by **special conditions** in MCPS, including consortia, Title I schools, and focus schools.

As in other chapters of this report, our focus is on groups of nearest schools and countywide trends, as opposed to focusing within individual schools. To facilitate closer inspection of schools across MCPS, we have included detailed maps of school locations by geographic zone in the Appendix. Please see Geographic Zones in **Appendix B1: Geographic Zones on page 428.**

Unless otherwise mentioned, data on racial and ethnic diversity, FARMS, Ever-FARMS, and ESOL rates are based on student enrollment data for the 2019-2020 school year.

As in other sections of this report, diversity is considered at the level of the school and not within special programs. Choice programs are considered separately as part of **Special Conditions, starting on page 240**.

Defining Diversity Scales of Analysis

How do we define scales of analysis for diversity? Researchers use many different approaches for thinking about diversity and segregation.[1]

Measuring diversity often requires establishing a scale of analysis and comparing how dissimilar or similar schools, clusters, or programs, are from that standard. Throughout this section, we frequently use the cluster as our scale of analysis. For much of Subsection 2, which deals with adjacencies, we also use the three nearest schools (even across cluster boundaries) as a measure of how dissimilar or similar a school is from its nearby schools. Throughout this section, we are explicit about which scale of analysis is used and why it was chosen.

---

1   The U.S. Census Bureau in one report examining racial and ethnic residential segregation defined as many as seventeen different measures. We use two of these in this section. For more information see: U.S. Census Bureau. Racial and Ethnic Residential Segregation in the United States: 1980-2000. "Appendix B: Measures of Residential Segregation." August 2002. https://www.census.gov/prod/2002pubs/censr-3.pdf

Key Data Sources

2019-20 Student level data (unless otherwise stated), existing and historical school boundaries, and school level data provided by MCPS

2021-2026 CIP Plan (Superintendent's Recommended FY2021 Capital Budget and the FY 2021-2026 Capital Improvements Program)

Fiscal Year 2016 Educational Facilities Master Plan and Amendments to the FY 2015-2020 Capital Improvements Program

Superintendent's Recommended FY 2011 Capital Budget and the FY 2011-2016 Capital Improvements Program

U.S. Census Bureau

MCPS Division of Capital Planning

Analyses Conducted

A. **Distribution: Diversity Across the District**

B. **Adjacencies: Comparing Nearest Schools to Each Other**

C. **Feeder Patterns: Comparing Schools across School Levels**

D. **Special Conditions: Island Assignments and Special Programs**

2.3 Data Analysis
Diversity

A. Distribution: Diversity Across the District

In this set of analyses, we examine three kinds of diversity at the scale of the school district as a whole. We present general findings about the distribution of racial demographics, FARMS/Ever-FARMS rates, and ESOL rates across the district.

Questions:

What are the racial demographics of MCPS, and how are racial groups distributed across the school system as a whole?
What is the overall distribution of FARMS and Ever-FARMS students in MCPS?
How is English language proficiency distributed across the school district?
What are some of the ways these measures of diversity relate to one another?

Analyses:

A.1 Distribution of Racial Demographics
A.2 Distribution of FARMS and Ever-FARMS Students
A.3 Distribution of ESOL Students

Insights

1. In this set of analyses, one measure we use to understand the distribution of diversity across MCPS is race/ethnicity. It is informative to look at the representation of the major racial/ethnic groups at the district and school level.

At the district and school level, a certain racial group may represent a majority of students, or an absolute majority of students (50% or more of the student body):

No single racial/ethnic group represents a majority of students in MCPS.

- Three of the four major racial/ethnic groups in MCPS make up over 20% of the student population, and none makes up more than a third of the student body.

42% of all MCPS schools have a student body where one racial or ethnic group makes up an absolute majority of students.

- At these 83 schools, one racial group represents an absolute majority (50% or more) of all students. 19 of these schools have one racial group that represents more than two thirds of students at that school.

The large majority of schools in MCPS (79%) have two or three racial/ethnic groups each representing more than 15% of those schools' students.

- These schools most closely resemble the overall student body in terms of racial and ethnic demographics. Twenty-six schools (13%) have only one racial or ethnic group representing more than 15% of the student body, with all other groups each representing less than 15%.

2. Approximately one in three students in MCPS is currently enrolled in the Free and Reduced-price Meals System (FARMS). An additional 12% of the student body has previously been FARMS eligible (Ever-FARMS).

FARMS and Ever-FARMS are both measures of socio-economic diversity. Ever-FARMS captures all students who have ever enrolled in FARMS. Students are less likely to be enrolled in FARMS as they advance through school levels:

- 37% of elementary school students are enrolled in FARMS, and 44% have ever been enrolled in FARMS.

- 34% of middle school students are enrolled in FARMS, and 48% have ever been enrolled in FARMS.

- 27% of high school students are enrolled in FARMS, although 46% have ever been enrolled in FARMS.

3. English for Speakers of Other Languages (ESOL) allows us to understand the proportion of students at a school or in the district whose first language is not English, and who receive support for English language development at school. ESOL rates decline greatly across school levels.

- The ESOL rate is 25% at the elementary school level, and decreases to 11% at both the middle and high school levels.

- The sharpest decline in ESOL rates is between 3rd and 6th grades, where the average drops from 27% to 12% districtwide.

4. In this first set of analyses, we begin to see some of the ways that these three measures of diversity exist in relationship to one another. Both FARMS and ESOL rates correlate strongly with racial and ethnic demographics:

Hispanic and Black students make up a disproportionate number of FARMS students.

- Black and Hispanic students make up a combined 88% of FARMS students, despite making up only 54% of the total student population. Hispanic students account for the majority of this group, at 57%. This points to a strong correlation between racial and ethnic identity and FARMS programming needs in MCPS.

73% of students enrolled in the ESOL program are Hispanic.

- This points to a strong correlation between racial and ethnic identity and language-related programming needs in MCPS.

A.1 Distribution of Racial and Ethnic Demographics

MCPS maintains records of students' self-identified race and ethnicity to better understand who the school system is serving. It is widely acknowledged in the scientific community that race, as we understand it today, is socially constructed. However, the resulting lived experience and historical repercussions of culturally imposed racial identity in the United States has measurable impacts on individuals' physical health, mental health and socioeconomic status among other factors.

Today, the student body of MCPS is very diverse. No single racial or ethnic group represents a majority of students.

| 14% Asian | 21% Black | 33% Hispanic | 5% Other | 27% White |
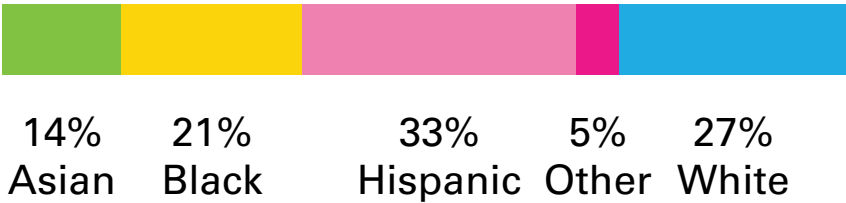
Figure 2.3.1 *Overall MCPS Racial and Ethnic Demographics*

Student Demographics Countywide

● Asian ● Black ● Hispanic ● Other ● White   1 dot = 25 students
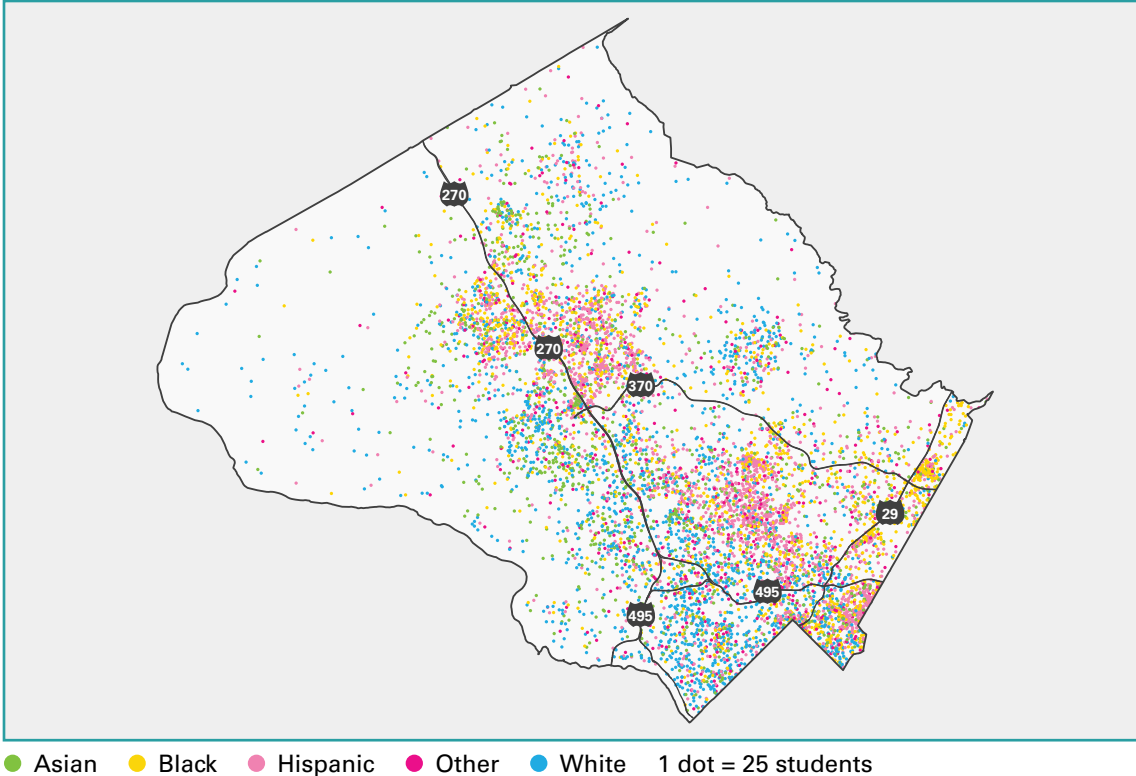
Figure 2.3.2 *Student Demographic Distribution*

Dots on the map do not represent any individual student's exact place of residence. Dots on the map were placed randomly within each Census Block Group where the 25 students represented by each dot reside.

The map above, **Figure 2.3.2. Student Demographic Distribution**, illustrates the racial and ethnic demographics of students across MCPS. The map shows both the density and distribution of different racial groups, with each dot representing 25 students. While many attendance areas of the district appear to be well-integrated, we still observe some clustering of racial and ethnic groups, as represented by the grouping of dots of the same color.

In this analysis, we seek to understand racial isolation in schools. It is important to acknowledge here that the overall diversity represented in MCPS at a districtwide scale does not reflect even distribution of racial/ethnic groups. For example, although there are five major racial/ethnic categories, 33% of students are Hispanic.

Many schools reflect the diversity of MCPS overall. Seventy-two percent of schools in the district have student bodies where at least two racial groups each represent 20% of more of the school's student body. Among them, 20 schools – 1 in 10 schools overall – have three racial groups each representing 20% or more of the school's student body.

Other schools are more racially uniform. At 28% of MCPS schools, only one racial group represents at least 20% of the student body, while all other racial or ethnic groups represent less than 20% of the student body. A total of 83 schools – 42% of all schools – have a student body where one racial group represents an absolute majority (50%) of all students. 19 of these schools have one racial group that represents more than two thirds of students at that school.

This metric helps us to identify situations where there is a high degree of racial and ethnic isolation, as seen in the analyses that follow.

Racial Group Representation Districtwide

		4 groups	
1 group	**2 groups**	**3 groups** ↓	
26	107	50	17

↑

Overall, MCPS has three racial groups each representing at least 15% of the student body.
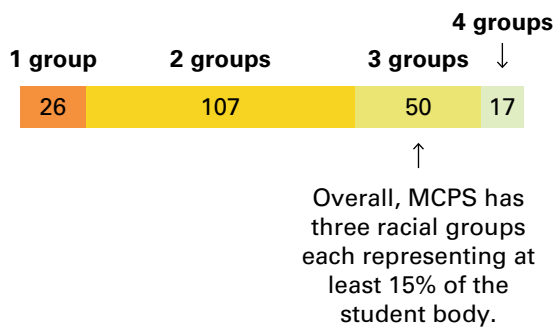
Figure 2.3.3 *Schools by Number of Racial Groups Representing More than 15% of the Student Body*

Figure 2.3.3above shows a breakdown of MCPS schools by number of racial groups representing more than 15% of the student body. There are 26 schools in MCPS where there is only one racial group representing more than 15% of the school's student body overall. On the flip side, there are 17 schools in MCPS where four racial groups each represent at least 15% of the school's student body.

The large majority of schools – 157 of 200, or 79% – have two or three racial groups representing more than 15% of those schools' students. These schools look more like the overall student body.

Racial Clustering Districtwide
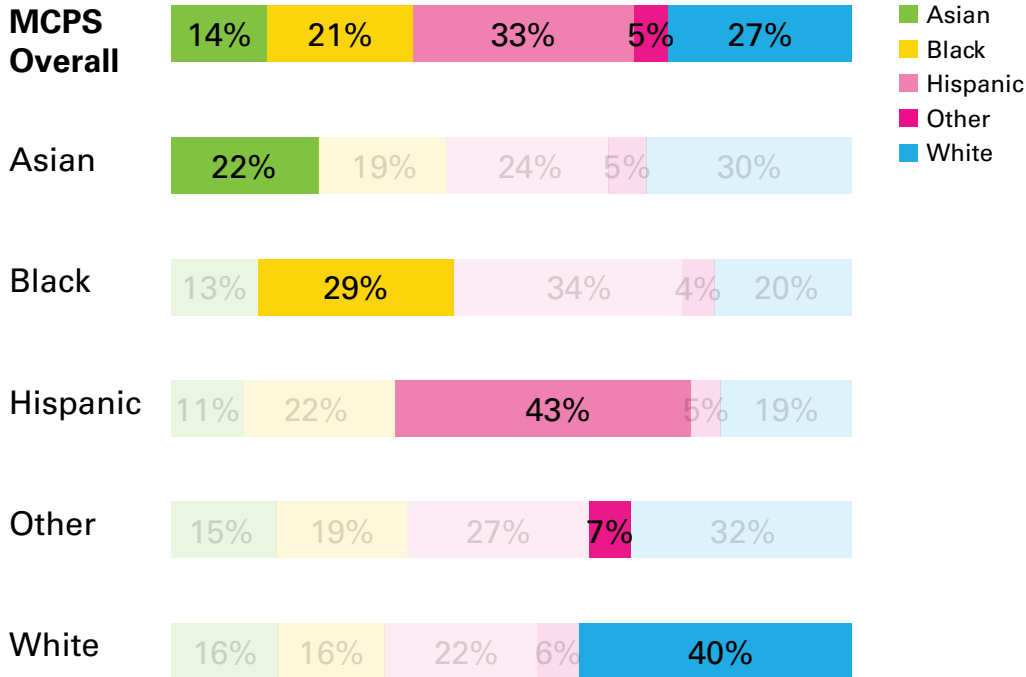
Figure 2.3.4 *The Racial Composition of Schools Attended by the Average Student by Racial Group*

Another way we can look at the distribution of racial diversity in MCPS is through racial and ethnic group clustering. Looking at school diversity through the lens of group clustering points to disparities in racial diversity that is experienced by students from different racial and ethnic groups in MCPS.

Figure 2.3.4 above illustrates the average racial demographics of schools attended by students of each major racial group. As seen here, MCPS students are more likely to attend schools with students of their same race. For example, Hispanic students represent 33% of students in MCPS but the average Hispanic student attends a school where 43% of the student body is Hispanic. Nevertheless, MCPS students, on average, attend schools that are racially diverse, and resemble MCPS student enrollment demographics overall.

Although the average MCPS student attends a school that is reasonably representative of the school system's racial demographics, we still observe clustering by racial groups. These typical cases seen in figure above do not capture the full range of conditions experienced by students in MCPS--where some schools are very racially homogeneous, and others are very diverse. Clustering will be discussed further in **Section 2. Diversity by School Adjacencies** (starting on page 203).
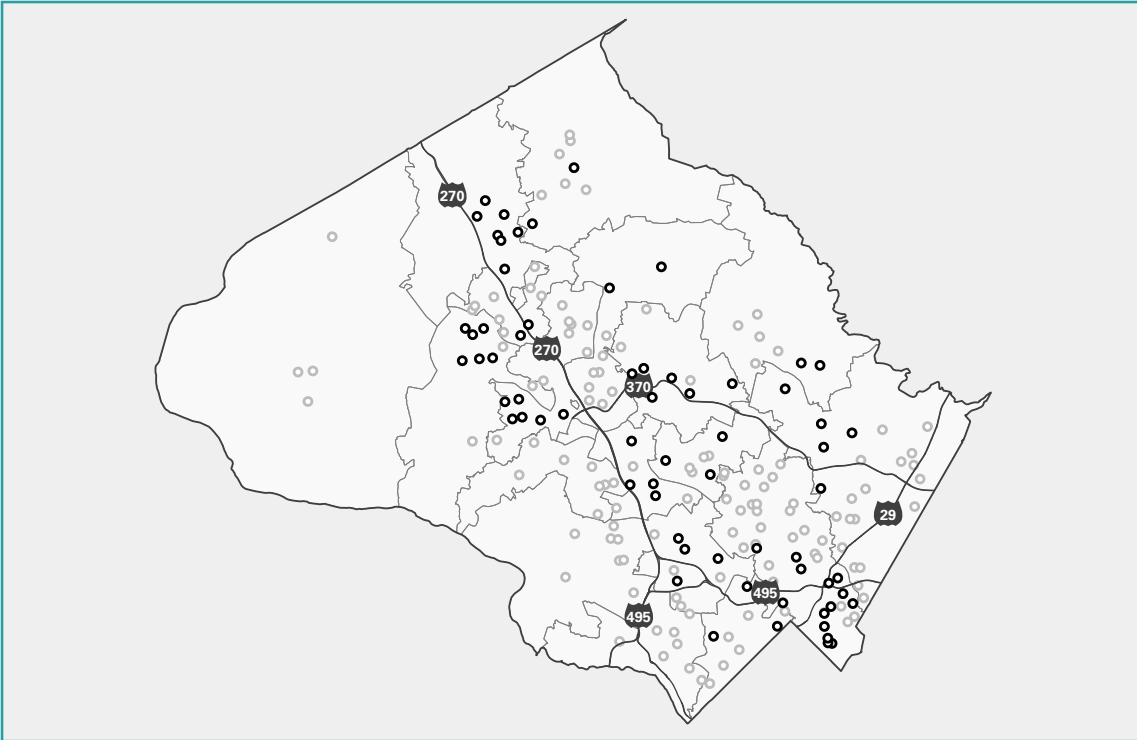
○ Schools with 3-4 dominant (>15%) racial/ethnic groups   ○ Other schools

Figure 2.3.5 *Elementary, Middle, and high Schools with Three or Four Dominant (>15%) Racial Groups*

Figure 2.3.5above, indicates schools with three or four "dominant" racial groups, representing more than 15% of the student body individually. These are the most racially diverse schools in MCPS. We see that these schools are concentrated along the central spine of Montgomery County, particularly along I-270 and I-495. Certain clusters are more likely to include schools with multiple large, or "dominant" racial groups, such as the Downcounty Consortium, Richard Montgomery Cluster, Quince Orchard Cluster, Northwest Cluster, and Clarksburg Cluster. We will see throughout this section that schools in these five clusters, in particular, are very diverse on average.
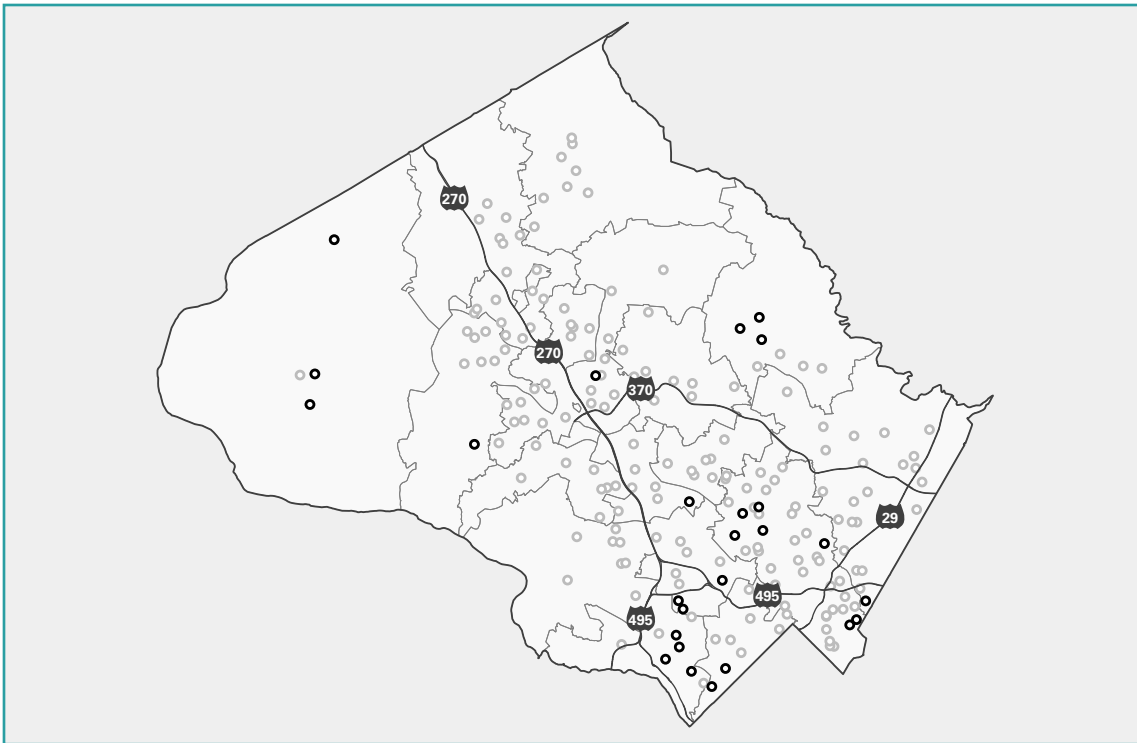
○ Schools with 3-4 dominant (>15%) racial/ethnic groups   ○ Other schools

Figure 2.3.6 *Elementary, Middle, and High Schools with a Single Dominant (>15%) Racial/ethnic Group*

Figure 2.3.6, above, shows MCPS schools with only a single racial group representing more than 15% of its student body. These are the schools with the highest levels of isolation of one racial or ethnic group in MCPS. These schools are concentrated in the Walt Whitman, Water Johnson, Winston Churchill, Poolesville, and Sherwood clusters, as well as in the Downcounty Consortium. We will find throughout this section that schools in these attendance areas are often outliers in terms of racial and economic measures of diversity.

Schools in the Downcounty Consortium can be found in both Figure 2.3.5 and Figure 2.3.6. By contrast, in the Walt Whitman cluster, we only find schools with a single dominant racial/ethnic group. Racial isolation in a school is often reflective of hyper-local residential segregation. Schools with three or four large racial/ethnic groups can often be found near schools with a single dominant racial/ethnic group.

A.2 Distribution of Free and Reduced-price Meals Eligibility (FARMS)

MCPS measures the socio-economic disadvantage of students by their participation in the National School Lunch Program (NSLP). These students receive free and reduced-price meals (FARMS) at school. FARMS is a means-tested program, meaning students and their families must meet income requirements to qualify. As such, FARMS eligibility is used at the district and state level as a proxy for socio-economic hardship. The overall FARMS rate in MCPS is 34%.

While FARMS and Ever-FARMS are threshold-based indicators and the threshold has changed over the years, both measures are directly based on a student's family income. Our analysis finds that both measures (FARMS and Ever-FARMS) are highly correlated to census measures of economic wealth, including median household income and per-capita income. Please see **Appendix C1: FARMS and Ever-FARMS as Measures of Socio-economic Hardship in Montgomery County on page 479** for further analysis.

About one in three students in MCPS are eligible for FARMS. A further 12% of the student body has previously been FARMS eligible. Altogether, 46% of MCPS students
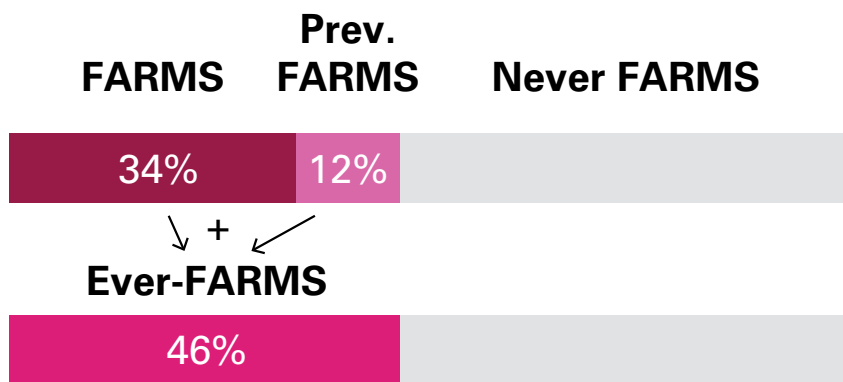
Figure 2.3.7 *Overall MCPS FARMS Eligibility*

have ever been FARMS eligible since entering MCPS; these students are classified as Ever-FARMS students.

MCPS tracks whether a student has previously enrolled in FARMS and maintains the Ever-FARMS metric because it provides a more complete picture of socio-economic hardship in the student body than FARMS alone. A student

FARMS and Ever-FARMS

The Free and Reduced-price Meals System (FARMS) is a federal program to lower or waive the cost of cafeteria lunches in public schools. Students may qualify for free or reduced-price meals based on household size and income. They may also qualify if they are receiving Food Supplement Program or Temporary Cash Assistance benefits. Families must apply every year to determine if they are eligible for FARMS. The FARMS rate is the percentage of students in the district or a given school that are enrolled in FARMS, divided by total students.

The Ever-FARMS rate is a measure of students who are or ever have been enrolled in the FARMS during their time in MCPS, from pre-Kindergarten on. Ever-FARMS provides a more complete picture of socio-economic levels than whether a student is currently FARMS eligible as it accounts for minor changes in need over time, enrollment trends across school levels, and concerns related to social stigma and reporting.

may no longer receive FARMS benefits but still live near the FARMS eligibility income threshold. As such, the Ever-FARMS rate does not change greatly by school level. Additionally, for a variety of reasons including social stigma, students may opt not to enroll in FARMS after being previously enrolled, despite still qualifying for the program.

FARMS and Ever-FARMS Distribution – Districtwide

| 0 - 20% | 20 - 40% | 40 - 60% | 60 - 80% | 80 - 100% |

← Low concentrations of FARMS students   High concentrations of FARMS students →
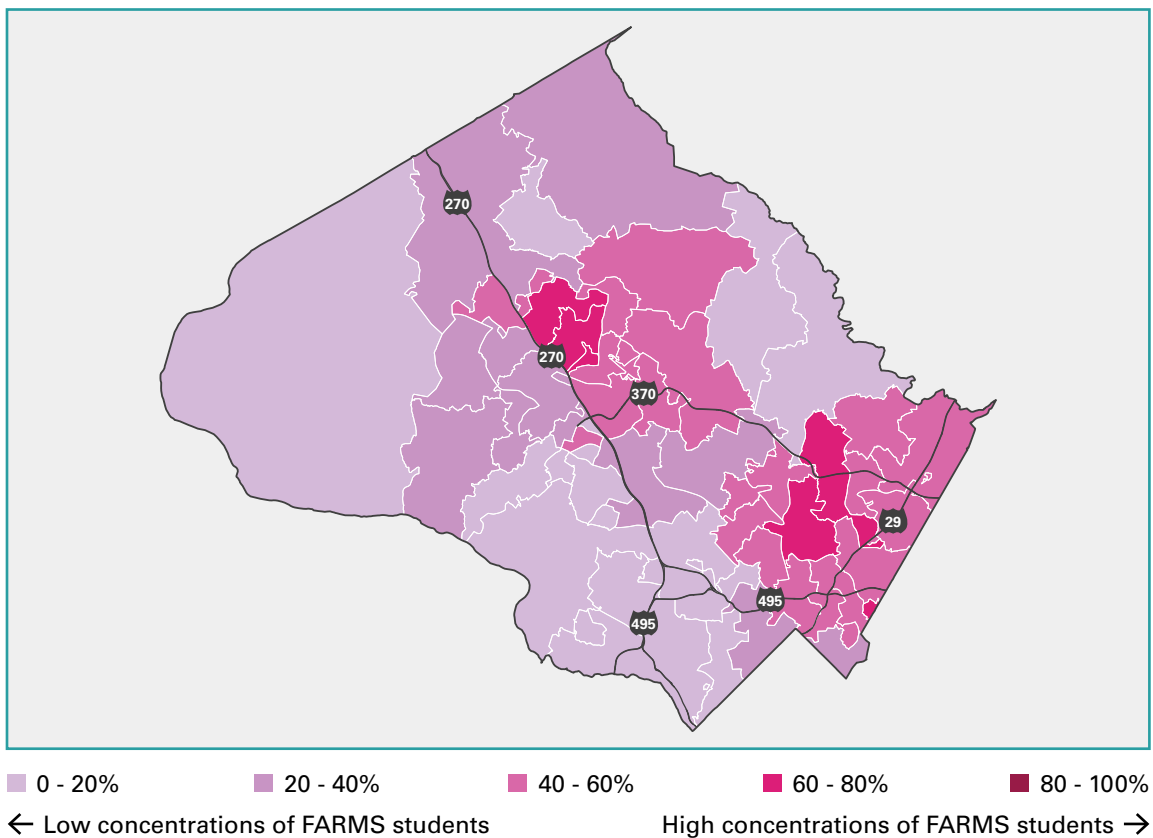
Figure 2.3.8 *FARMS Rate by Middle School Attendance Area*

The map above illustrates the proportion of middle school Ever-FARMS students by middle school attendance area. We can observe disparities across the district, with middle school Ever-FARMS rates ranging from a district minimum of 1%, to a district maximum of 93%.

For corresponding maps and tables of both FARMS and Ever-FARMS rates at all school levels see **Appendix C2:
Additional Maps and Tables on page 484.**

FARMS by School Level
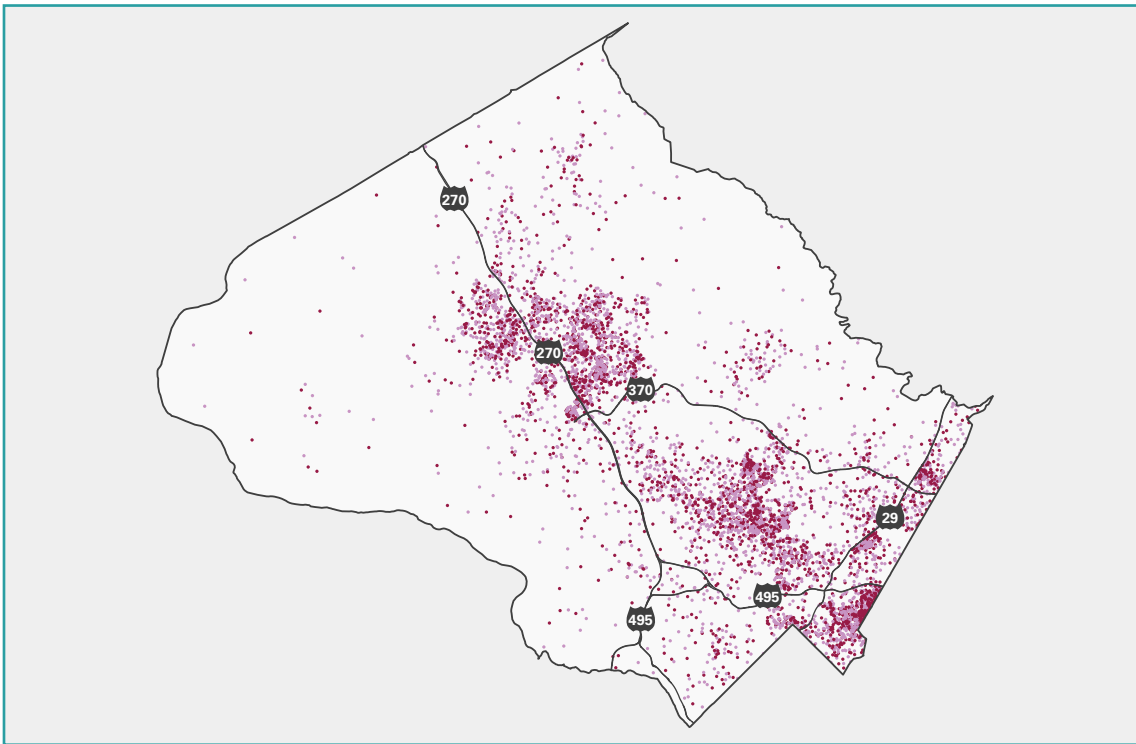
● FARMS ● Ever-FARMS   1 dot = 25 students

Figure 2.3.9 *Distribution of FARMS and Ever-FARMS Students*

Dots on the map do not represent any individual student's exact place of residence. Dots on the map were placed randomly within each Census Block Group where the 25 students represented by each dot reside.

The map above illustrates the distribution of FARMS and Ever-FARMS students at all school levels across the district. One dot on this map represents 25 students, demonstrating the density of FARMS and Ever-FARMS students in different parts of the county. We can see similar trends here as we do in the map of FARMS rates in middle school attendance areas (Figure 2.3.8 on the previous page).

The FARMS rate varies significantly by school level, declining from 37% for elementary school students to 34% for middle school students and 27% for high school students.

ES 37% 7%

MS 34% 14%

HS 27% 19%

Legend:
- FARMS
- Previously FARMS
- Never FARMS
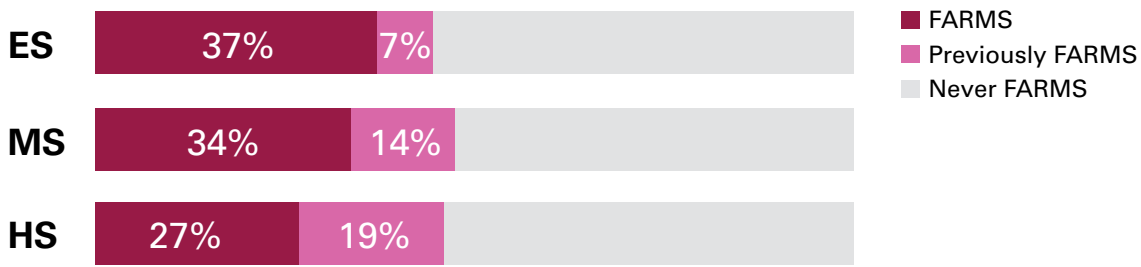
Figure 2.3.10 *FARMS by School Level*

ES 44%

MS 48%

HS 46%

Legend:
- Ever-FARMS
- Never FARMS
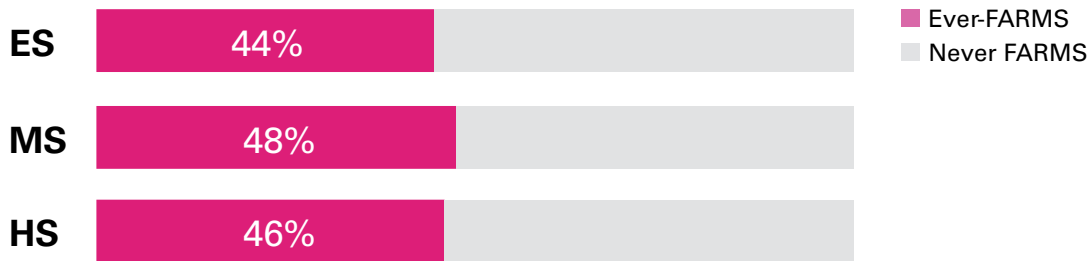
Figure 2.3.11 *Ever-FARMS by School Level*

As indirect measures of socio-economic hardship, it is worth investigating the relationship of FARMS and Ever-FARMS to direct measures of wealth and poverty, such as household and per-capita income as they are captured by the U.S. Census.
Appendix C1:

FARMS and Ever-FARMS as Measures of Socio-economic Hardship in Montgomery County on page 479, explains why MCPS school FARMS and Ever-FARMS rates are strongly correlated with the per-capita income and household median income of that school's attendance area.

The Demographics of FARMS Students

Eighty-eight percent of FARMS students in MCPS identify as Black or Hispanic. As such, instances of socio-economic segregation in MCPS often correlates strongly with racial segregation.

Legend:
- Asian
- Black
- Hispanic
- Other
- White

14% Asian · 21% Black · 33% Hispanic · 5% Other · 27% White
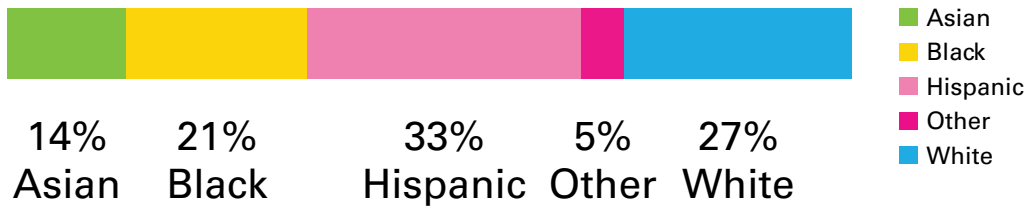
Figure 2.3.12 *Overall MCPS Racial and Ethnic Demographics*

31% · 57%

Figure 2.3.13 *Racial Demographics of FARMS Students*

18% · 17% · 20% · 7% · 39%

Figure 2.3.14 *Racial Demographics of Non-FARMS Students*

20% · 13% · 13% · 7% · 46%
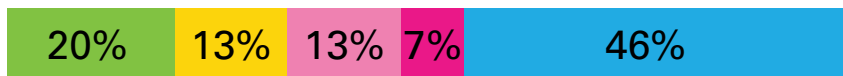
Figure 2.3.15 *Racial Demographics of Never FARMS Students*

We find that students identifying as White, representing 27% of students in MCPS overall – represent 39% of Non-FARMS students and 46% of students that have never been eligible for FARMS benefits (Never FARMS students). Asian students, representing 14% of the student body – are also more likely to be Non-FARMS or Never FARMS students, thought to a much less significant degree than White students in the district.

A3 Distribution of English for Speakers of Other Languages (ESOL)

Approximately one in six students in MCPS receives services to help improve their English-language proficiency. These students are enrolled in the English for Speakers of Other Languages (ESOL) program. An additional one in six students in MCPS has once received ESOL services but later passed the Maryland State Department of Education English Language Proficiency Target, as measured by WIDA ACCESS.[1]

In addition to ESOL, MCPS maintains a student-level indicator called Ever-ESOL which tracks whether a student has previously received ESOL services. This is similar to how to FARMS and Ever-FARMS is measured. Ever ESOL is a useful measure for tracking the performance of students that previously required support with their English skills. These students still may have limited English proficiency despite exiting the ESOL program and as such are an important cohort to track as they may require additional services to achieve academic success.

As such, nearly one in three students in MCPS is identified as Ever-ESOL and currently has low English proficiency or once had low English proficiency as measured by WIDA ACCESS. This represents a substantial portion of MCPS's student body.

ESOL Programming

MCPS' ESOL programming supports English language development for students whose first language is not English. Through this program, MCPS supports students in developing English language proficiency, including dedicated ESOL teachers. The ESOL program is funded through Title III federal funds.

To learn more about ESOL, visit: https://www.montgomeryschoolsmd.org/curriculum/esol/.

---

1   Montgomery County Public Schools. "About ESOL/Bilingual Programs." https://www.montgomeryschoolsmd.org/curriculum/esol/about/

ESOL Rates Distribution - Districtwide

| 16% ESOL | 16% Prev. ESOL | 64% Never ESOL |

Figure 2.3.16 *Overall ESOL Rates*

■ 0 - 20%   ■ 20 - 40%   ■ 40 - 60%   ■ 60 - 80%   ■ 80 - 100%
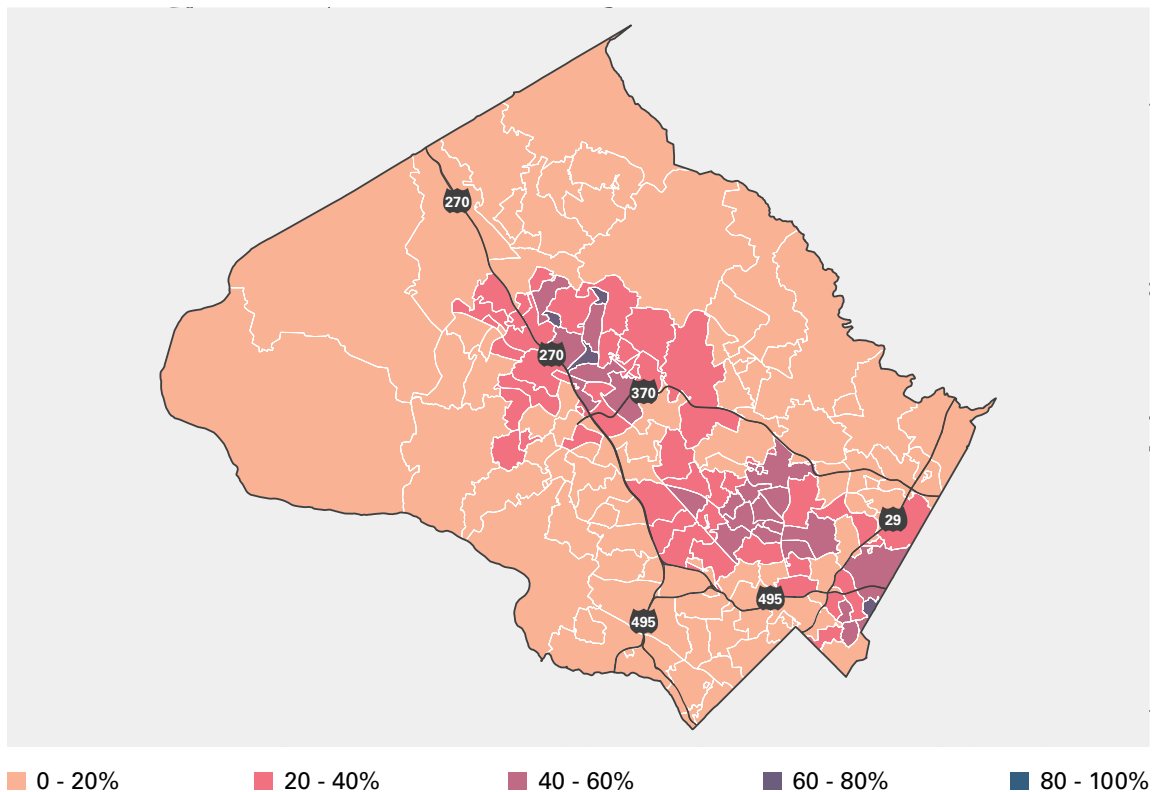
Figure 2.3.17 *Ever-ESOL Rate by Elementary School Attendance Area*

The map above illustrates the proportion of elementary school students who have ever been enrolled in ESOL, by elementary school attendance area. At the elementary school level, the districtwide range in Ever-ESOL rates is 4% at Belmont ES to 87% JoAnn Leleck ES.

Corresponding maps and tables of the elementary and high school level ESOL and Ever-ESOL rates can be found in **Appendix C2: Additional Maps and Tables on page 484**.

ESOL by School Level

As demonstrated in figure below the share of students speaking English as a second language is substantially higher at the elementary school level (25%), as compared to the middle and high school level (11%).

Figure 2.3.18 *ESOL by School Level*

This may point to two conditions: high rates of improvement of English among ESOL students in elementary school before entering middle school. It also may be related to changes in MCPS's student body, with a greater proportion of incoming students speaking English as a second language than in the past.
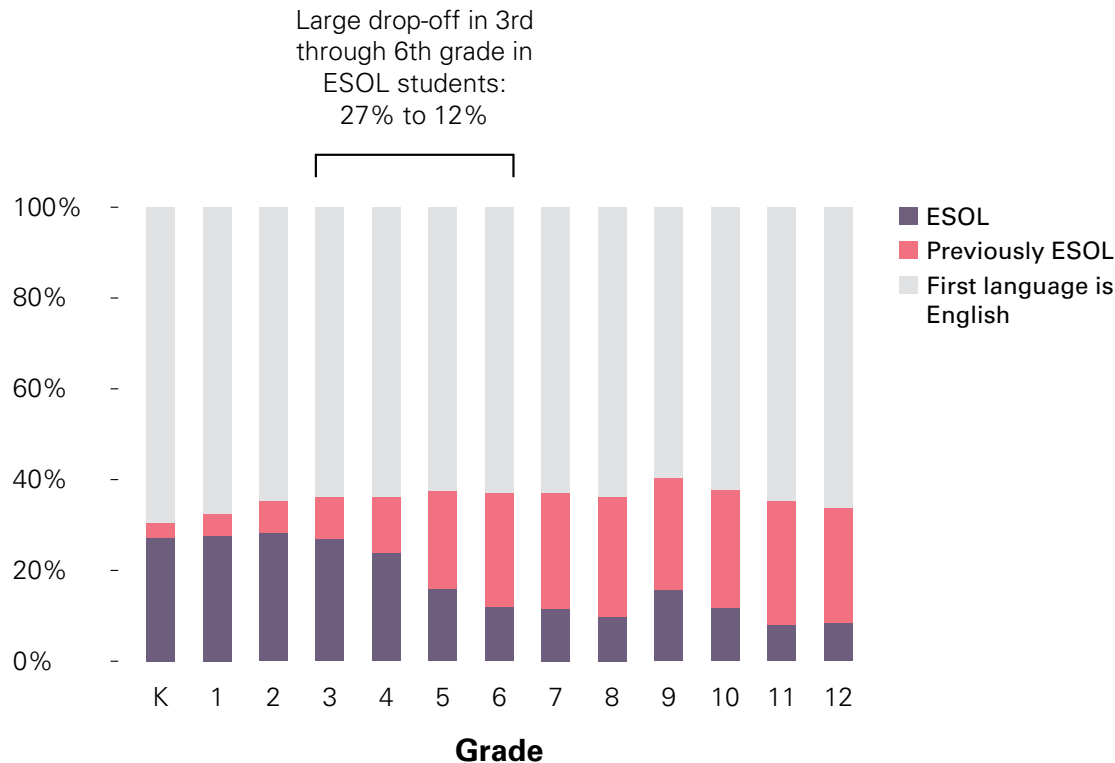
Figure 2.3.19 *ESOL by School Level*

The Demographics of ESOL Students

Seventy-three percent of students that speak English as a second language are Hispanic.

73%
Hispanic
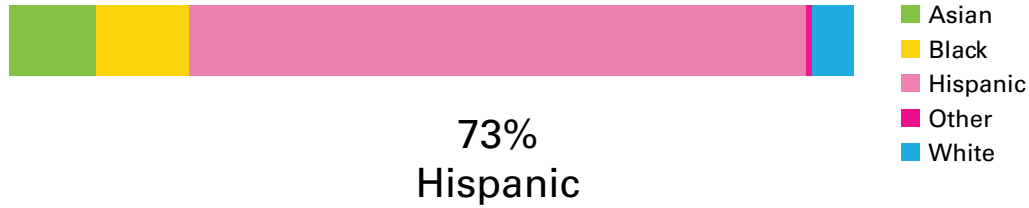
Figure 2.3.20 *Racial Demographics of ESOL Students*

Due to the strong association of ESOL to one ethnic group (Hispanic students) we primarily use FARMS and race as indicators throughout the diversity section, only occasionally analyzing ESOL.

2.3 Data Analysis
Diversity

B. Diversity by School Adjacencies

Now that we have seen a snapshot of diversity in MCPS's schools, this section takes a closer look at the geography underlying this distribution of diversity. First, case studies explain the concept of dissimilarity—a statistic which is used throughout the section to compare the diversity of adjacent schools. Then, the section considers disparities in the demographic make-up of schools (including race / ethnicity and socio-economic background) of each school's students. Finally, the section begins to explore the relationships between adjacency and both socio-economic and racial dissimilarity.

Throughout this section we will highlight two types of adjacencies:

1. **Clustering of like with like:** In some parts of the district we see a relatively homogeneous distribution of racial and ethnic groups and wealth relative to the district overall.

2. **Adjacency of unlike with unlike**: In other parts of the district we see neighboring communities with very different demographic and socio-economic make-up.

Questions:

What is dissimilarity and how is it being used in this analysis?
What are the kinds of relationships we see, in general, between the diversity measures of adjacent schools?
How similar are the demographic compositions of neighboring schools?
How similar are the socio-economic conditions of students in neighboring schools?
How does racial/ethnic and socio-economic dissimilarity among adjacent schools relate to one another?

Analyses:

B.1 Dissimilarity Across the District
B.2 Forms of Adjacency

Insights

1. In this set of analyses, we use the dissimilarity index all to look at how different the overall demographic make-up of one school is to another school, or to a shared standard (such as a cluster or districtwide average). We look at both racial/ethnic dissimilarity, and socio-economic dissimilarity. At the district level, there are two general conditions that are important to understand:

Adjacent schools are often very dissimilar, despite being very close to one another.

- There are many cases throughout the district where immediately adjacent school attendance areas are quite dissimilar from one another in terms of racial, ethnic, and socio-economic demographics.

At the scale of the district, patterns in dissimilarity vary widely. This reflects the heterogeneity of local communities.

- In general, midcounty schools at the elementary school level tend to be most dissimilar from their nearest schools. Conversely, midcounty middle and high schools tend to be more similar to their nearest schools. Across the county, schools located in rural areas tend to be more dissimilar from their nearest schools.

2. Elementary schools in the Downcounty Consortium (DCC) have among the highest rates of racial and socio-economic dissimilarity, when compared to their nearest schools.

Sligo Creek ES has the highest dissimilarity score among elementary schools in the district, followed by Laytonsville ES, Forest Knolls ES, Kemp Mill ES, and Strawberry Knoll ES. However, none of the top five highly dissimilar middle and high schools are within the DCC.

3. Elementary and middle schools in clusters in the southwest of the county have very low racial and economic dissimilarity from their nearest schools in most cases.

In other words, these schools are more similar to their neighboring schools. This reflects the high degree of racial and socio-economic homogeneity in these areas of the county. In particular, this is the case within the Walt Whitman and Winston Churchill clusters. Their adjacent clusters, Bethesda Chevy-Chase, Walter Johnson, and Thomas Wootton share low racial and socio-economic dissimilarity scores on average, though to a lesser degree.

4. Socio-economic and racially dissimilarity are correlated in most cases, but there are exceptions to this.

Some notable examples of clusters where elementary schools have very different rates of socio-economic and racial dissimilarity from their nearest schools include Poolesville, Watkins Mill, and Northeast Consortium.

Introduction to Dissimilarity

As seen in the Section 1 analyses, the socio-economic, racial, and linguistic background of students varies significantly across the district. This diversity in the student body is reflected in MCPS's schools, where we see considerable differences in FARMS rates, ESOL enrollment, and racial demographics between schools.

Many differences between schools are hyper-local. Schools relatively close to one another may look significantly different when compared based on the aspects of diversity we are studying in this chapter.

In this sub-section, we use case studies to explain the concept of dissimilarity—a statistic which we use throughout the section to compare the diversity of adjacent schools. Then, we look at disparities in the socio-economic and racial/ethnic make-up of schools and begin to explore the relationships between socio-economic and racial dissimilarity.

Case Study: Farquhar Middle School

Take for example the four schools mapped in Figure 2.3.21, Farquhar MS, Parks MS, Parkland MS, and Argyle MS. We are using these schools only for illustrative purposes only.

Farquhar MS has a FARMS rate of 14%. Argyle MS, which is just over 5 miles away, has a FARMS rate about four times as high as Farquhar's (56%). Parkland MS, which is 5 and a half miles away from Farquhar, also has a much larger FARMS rate (52%). Parks MS, which is about a mile closer to Farquhar than Parkland MS, has a much more similar FARMS rate to Farquhar (13%).
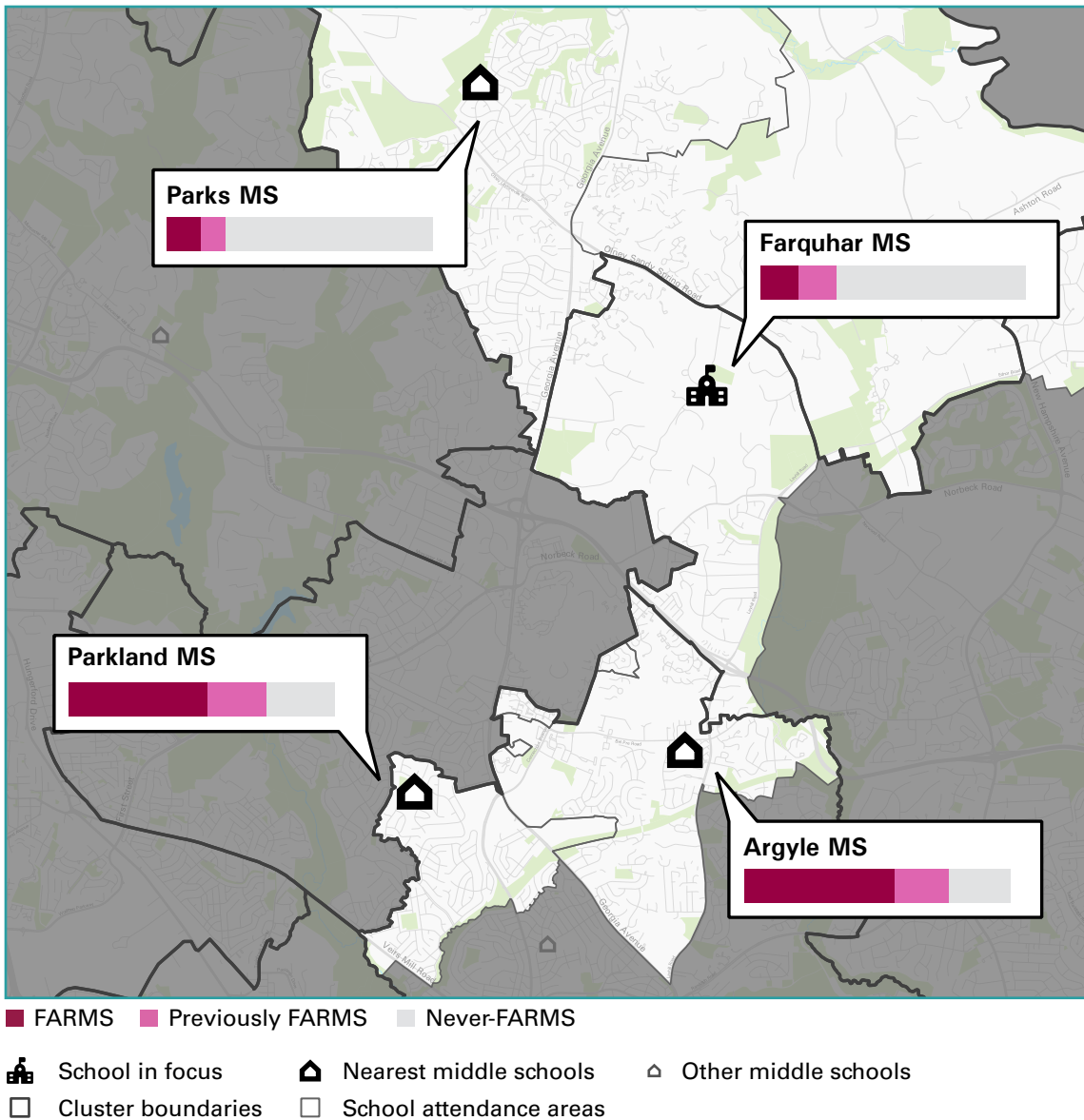
Figure 2.3.21 *An Example of Dissimilarity to Nearby Schools: Farquhar Middle School*

Figure 2.3.21 above illustrates that the socio-economic background of students at Farquhar MS is similar to that of the students at Parks MS. By contrast, we might say that the students at Farquhar MS are highly dissimilar from their counterparts at Argyle MS, at least along the dimension of socio-economic background. How can we reduce these notions of similarity and dissimilarity to a single indicator, comparable across schools?

Defining Dissimilarity in Schools

Throughout this section, we will use a measure called the dissimilarity index. The dissimilarity index allows us to look at how different the overall demographic make-up of one school is to another school, or to a shared standard (such as a cluster or districtwide average).

On the most basic level, high dissimilarity shows a greater difference between the two areas being compared. A low dissimilarity shows a lesser difference between the two things being compared. Conceptually, you can think of a dissimilarity index representing the total change in an area (or school) necessary for that area to look exactly like another.

If you are already comfortable with dissimilarity indices, you can skip past the next section which discusses the method for calculating dissimilarity indices.

Let's calculate a dissimilarity index between two schools, Farquhar MS and Argyle MS. Farquhar MS has a FARMS rate of 14% and Argyle MS has a FARMS rate of 56%. The total change necessary for Farquhar MS to look like Argyle MS and for Argyle MS to look like Farquhar MS would be 56% minus 14%, which is 42 percentage points, divided by two: 21 percentages points.[1] Why is this true? Imagine now if 21% of FARMS students at Argyle MS moved to Farquhar MS, the FARMS rate at Farquhar MS would be 35% (14 + 21 = 35) and the FARMS rate at Argyle MS would be 35% (56 - 21 = 35). Both schools would have the same FARMS rate. That number, 21 percentage points, (or the total change necessary for Farquhar MS and Argyle MS to look alike) is the dissimilarity index.

School	Grades	FARMS	Previous FARMS	Never FARMS	FARMS Dissimilarity to Farquhar	Socio-Economic Dissimilarity to Farquhar
Farquhar	6-8	14%	14%	71%	N/A	N/A
Parks	6-8	13%	9%	78%	1%	7%
Argyle	6-8	56%	21%	23%	21%	48%
Parkland	6-8	52%	22%	26%	19%	46%

Figure 2.3.22 *Farquhar Middle School FARMS dissimilarity*

The dissimilarity index is useful because it allows us to compare schools to one another not just along a single dimension, like an ESOL or FARMS rate, but along many dimensions at the same time. For example, if we compare the FARMS, Previous FARMS, and Never FARMS rates at the same time; doing so might provide us with a more nuanced understanding of the difference between the socio-economic status of students at different schools.

---

1   We can also do the subtraction in the other direction but using the absolute value, multiplying by negative 1: (14% - 56%)/2 * 1 = -21 * -1 = 21.

In practice, we do just this, using slightly more complex formulas to calculate socio-economic and racial/ethnic dissimilarity between schools.

Throughout this section, we call these measures socio-economic dissimilarity and racial/ethnic dissimilarity. Let's calculate socio-economic dissimilarity, keeping with the example of Farquhar MS and Argyle MS. We notice that both schools have different Previous FARMS and Never FARMS rates (see Table 1). The socio-economic dissimilarity index calculates the difference between all three of these statistics, not just FARMS. Let's walk through the math: Farquhar has a FARMS rate of 14%, Previous FARMS rate of 14%, and Never FARMS rate of 71%; Argyle MS has a FARMS rate of 56%, Previous FARMS rate of 21%, and Never FARMS rate of 23%. Subtracting these from each other and taking the absolute values we get a difference of 42 percentage points for FARMS (56% - 14%), 7 percentage points for Previous FARMS (21% - 14%), and 48 percentage points for Never FARMS. Summing these together and dividing by two, we get a socio-economic dissimilarity index of 48% ((42 + 7 + 48)/2 = 48.5)). See the box at right, **Calculating Dissimilarity**, for more on how the racial dissimilarity index is calculated.

In **Figure 2.3.21** and examples that follow, instead of comparing a school to just one neighbor at a time, we compare that school to three of its adjacent neighbors.[1] To compare a school to its nearest three schools using the dissimilarity index, as in the previous example and those that follow, we need to take one additional step: Comparing the FARMS rates of two schools, we subtract one from the other, flip the sign of the number if it is negative, and divide by two. If we are comparing one school to many, we calculate the overall FARMS rate (or other indicator) for those schools if we summed their populations together and then compare that number to the original school's FARMS rate.

Calculating Dissimilarity

The racial dissimilarity index calculates the difference between the percentage of students by racial group. The formula for the dissimilarity index, **D**, is as follows:[1]

$$D = \frac{1}{2} \sum_{i=1}^{n} |p_i - P_i|$$

In this formula, p_i is the representation of one group in a population (e.g. 14% Asian, 33% FARMS), P_i is the representation of that group in the population we are comparing against, and n is the number of groups.

---

[1] Benjamin Forest. Dartmouth College. "Indices of Dissimilarity." 2005. https://www.dartmouth.edu/~segregation/IndicesofSegregation.pdf. See "Index of Dissimilarity (D)" page one. The formula included in this document generalizes as the formula provided above for comparing more than two groups at a time.

---

[1] As in the utilization section, we calculate proximity based on the distance along roads. We do not use a straight-line method for determining adjacency.

B.1 Dissimilarity Across the District

The previous subsection introduced us to dissimilarity and examined the unique local conditions (like residential homogeneity) that lead to schools resembling their nearest schools or not. In this subsection, we analyze the geographic distribution of racial and socio-economic dissimilarity across MCPS.

The maps that follow illustrate the range of racial and socio-economic dissimilarities across MCPS. We call attention to specific geographic patterns throughout.

■ 3 - 7% ■ 7 - 13% ■ 13 - 18% ■ 18 - 23%
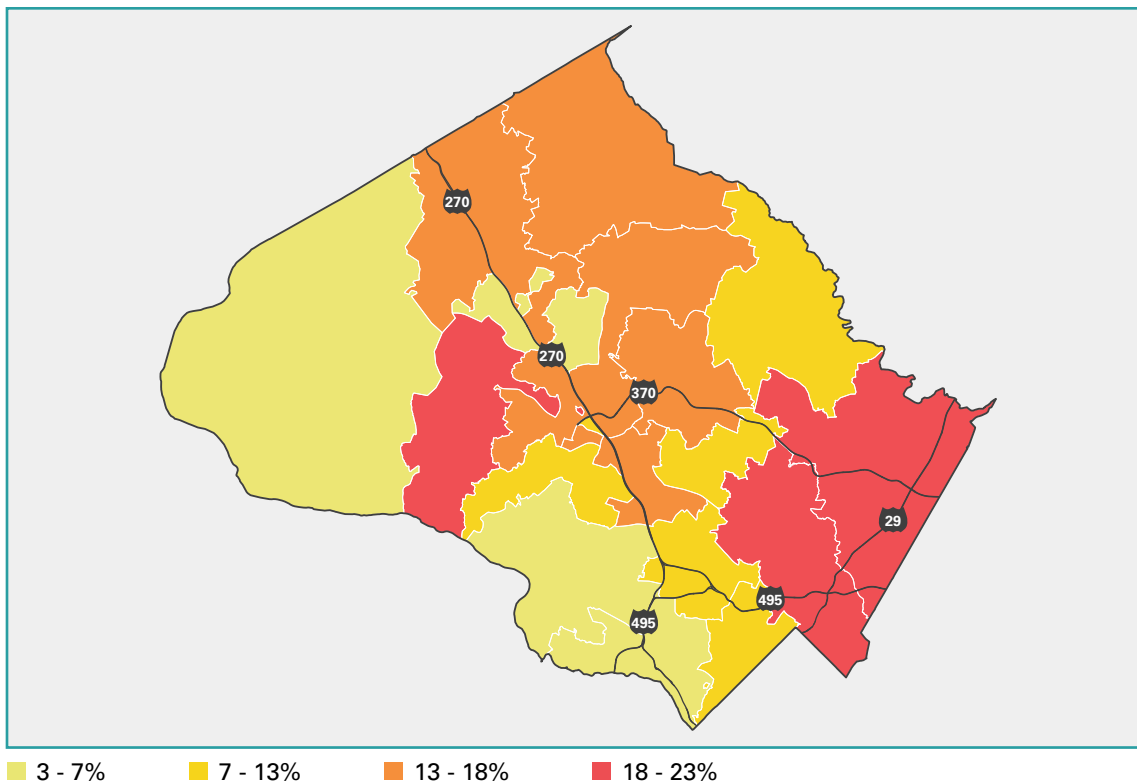
Figure 2.3.23 *Average Elementary School Racial Dissimilarity to the Overall ES Population of Their Cluster*

The map above shows elementary school racial dissimilarities at the cluster level. The cluster dissimilarity index shown represents the weighted average racial dissimilarities of the elementary schools within that cluster. In other words, we are comparing the racial demographics of each elementary school in a cluster to the overall racial demographics of that cluster, for the same school level. The value shown on figure above is the average of these schools' racial dissimilarities to their cluster.

At this scale, we notice three important spatial patterns:

First, midcounty elementary schools are on average more racially dissimilar from their nearest schools than other elementary schools in MCPS.

In particular, clusters along I-270 are more likely to have schools dissimilar from their nearest schools. In particular, elementary schools in the Richard Montgomery, Gaithersburg, and Quince Orchard Clusters look on average more dissimilar from their nearest schools than other elementary schools in MCPS. On average, elementary schools in the Walter Johnston and Clarksburg Clusters, which also run along I-270, have reasonably high racial dissimilarities compared to their nearest schools.

Further, elementary school racial dissimilarity in these areas appears to have some spill-over effects for certain clusters nearby. For example, elementary schools in the Northwest and Thomas Wootton clusters both have reasonably high racial dissimilarities compared to their nearest schools, though their dissimilarity indices are on average less than those in the other clusters that run along I-270 mentioned above.

While this measure of racial dissimilarity highlights some important patterns, it may be more instructive to compare a school to its nearest schools rather than to its cluster's population overall. As such, in the rest of the Diversity section we primarily use another measure of dissimilarity that better captures local dissimilarities.

This measure looks at the socio-economic or racial/ethnic dissimilarity of schools to their nearest three schools.[1] In other words, we compare the socio-economic or racial/ethnic demographics of each elementary school to the overall racial demographics of that school's nearest three schools (which may be in different clusters), for the same school level. The value shown in **Figure 2.3.4 - The Racial Composition of Schools Attended by the Average Student by Racial Group on page 191**) is the average of these schools' racial dissimilarities to their three nearest schools by cluster, even if one or more of their three nearest schools are in a different cluster.

---

1   As in the utilization section, we calculate proximity based on the distance along roads. We do not use a straight-line method for determining adjacency.

| 0 - 10% | 10 - 15% | 15 - 20% | 20 - 25% | More than 25% |
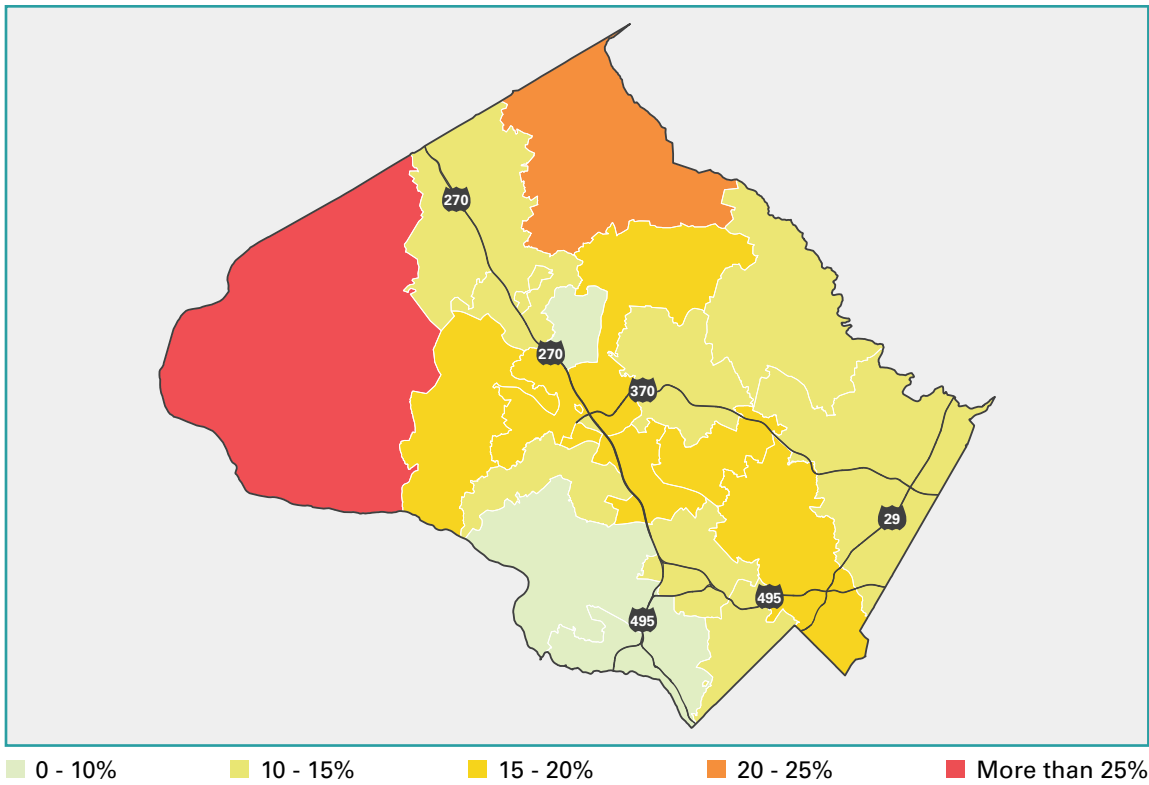
Figure 2.3.24 *Average Racial Dissimilarity of Elementary Schools to Their Nearest Three Schools by Cluster*

Elementary schools with the lowest racial dissimilarities compared to their nearest schools are in the Walt Whitman, Winston Churchill, and Watkins Mill Clusters.

Elementary schools in the rural area of Poolesville and Damascus are highly racially dissimilar from their nearest schools. The two elementary schools in the cluster, Poolesville and Monocacy ES are both far from their nearest schools in the Clarksburg and Northwest Clusters. This is an example where comparing a school's dissimilarity to its nearest schools may not be the best method for understanding racial dissimilarity.

Legend: 0 - 5% | 5 - 10% | 10 - 15% | More than 15%
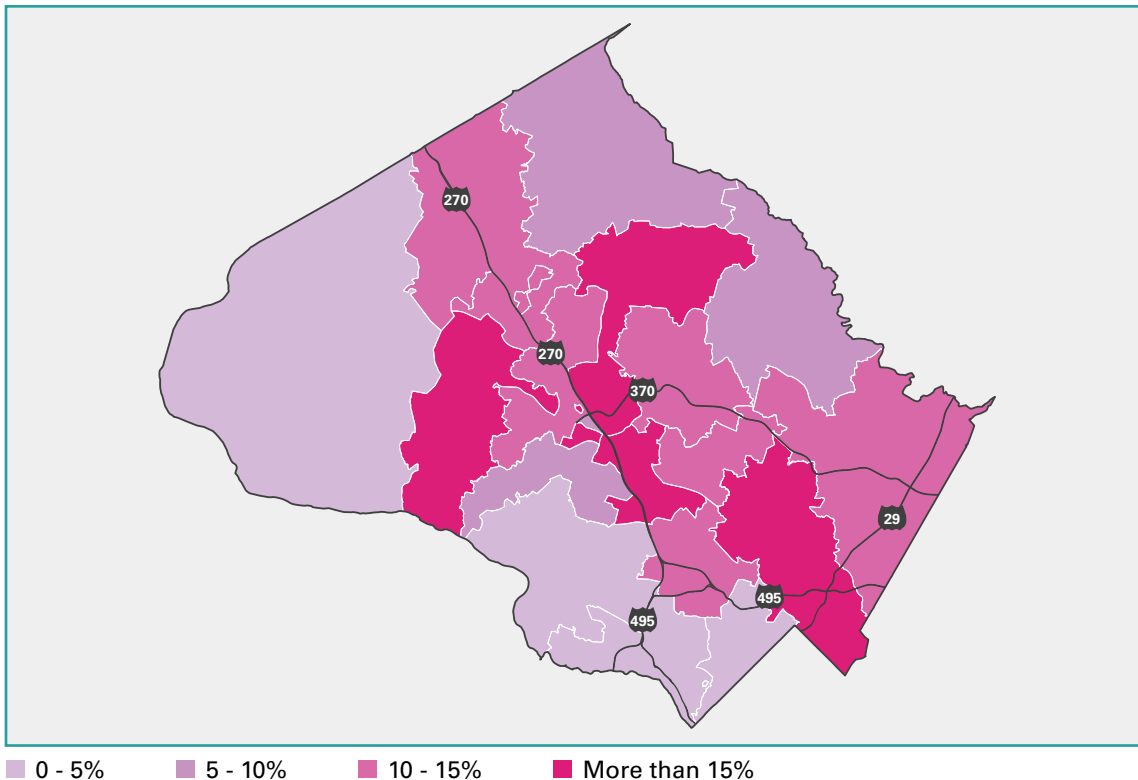
Figure 2.3.25 *Weighted Socio-economic Dissimilarity of Elementary Schools to Their Nearest Three Schools by Cluster*

Examining socio-economic dissimilarity, we find some spatial patterns similar to those we found when examining racial dissimilarity.

For example, elementary schools in the Walt Whitman and Winston Churchill Clusters all have low socio-economic dissimilarity indices when compared against their nearest schools. Elementary schools in these clusters all had similarly low dissimilarity scores for race, when compared to their nearest schools. These are examples of schools where racial and socio-economic dissimilarities overlap closely.

Similarly, we find a high degree of overlap between elementary schools with high socio-economic and racial dissimilarities when compared to their nearest schools midcounty along I-270. In particular, elementary schools in the Downcounty Corsortium and Walter Johnson, Gaithersburg, Quince Orchard, and Northwest Clusters all have high rates of socio-economic dissimilarity from their nearest schools. This is similar to what we found for racial dissimilarity.

Some notable examples of clusters where elementary schools have very different rates of socio-economic and racial dissimilarity from their nearest schools are the Poolesville and Damascus Clusters.

This suggests that socio-economic and racial dissimilarity are correlated indicators in most cases, though counterexamples do exist. This underscores the importance of examining both socio-economic and racial dissimilarities separately.

Cluster	Racial Dissimilarity			Socio-economic Dissimilarity		
	Overall	Min	Max	Overall	Min	Max
Poolesville Cluster	35%	41%	29%	4%	6%	3%
Damascus Cluster	21%	29%	16%	7%	13%	3%
Richard Montgomery Cluster	19%	29%	12%	16%	31%	3%
Northwest Cluster	19%	36%	4%	15%	31%	4%
Quince Orchard Cluster	18%	23%	12%	12%	25%	2%
Gaithersburg Cluster	17%	35%	6%	20%	42%	8%
Downcounty Consortium	17%	34%	2%	16%	48%	4%
Rockville Cluster	16%	21%	7%	14%	25%	3%
Walter Johnson Cluster	15%	27%	10%	11%	23%	5%
Clarksburg Cluster	15%	33%	8%	14%	31%	4%
Northeast Consortium	13%	43%	4%	15%	26%	7%
Thomas S. Wootton Cluster	13%	17%	7%	9%	11%	7%
Col. Zadok Magruder Cluster	13%	24%	5%	12%	22%	7%
Bethesda-Chevy Chase Cluster	12%	19%	3%	5%	8%	2%
Seneca Valley Cluster	11%	20%	5%	10%	19%	3%
Sherwood Cluster	11%	15%	4%	7%	10%	2%
Winston Churchill Cluster	8%	18%	3%	1%	2%	1%
Walt Whitman Cluster	7%	11%	2%	2%	6%	0%
Watkins Mill Cluster	6%	8%	4%	13%	17%	10%

Figure 2.3.26 *Average Elementary School Dissimilarities to Their Nearest Three Schools By Cluster*
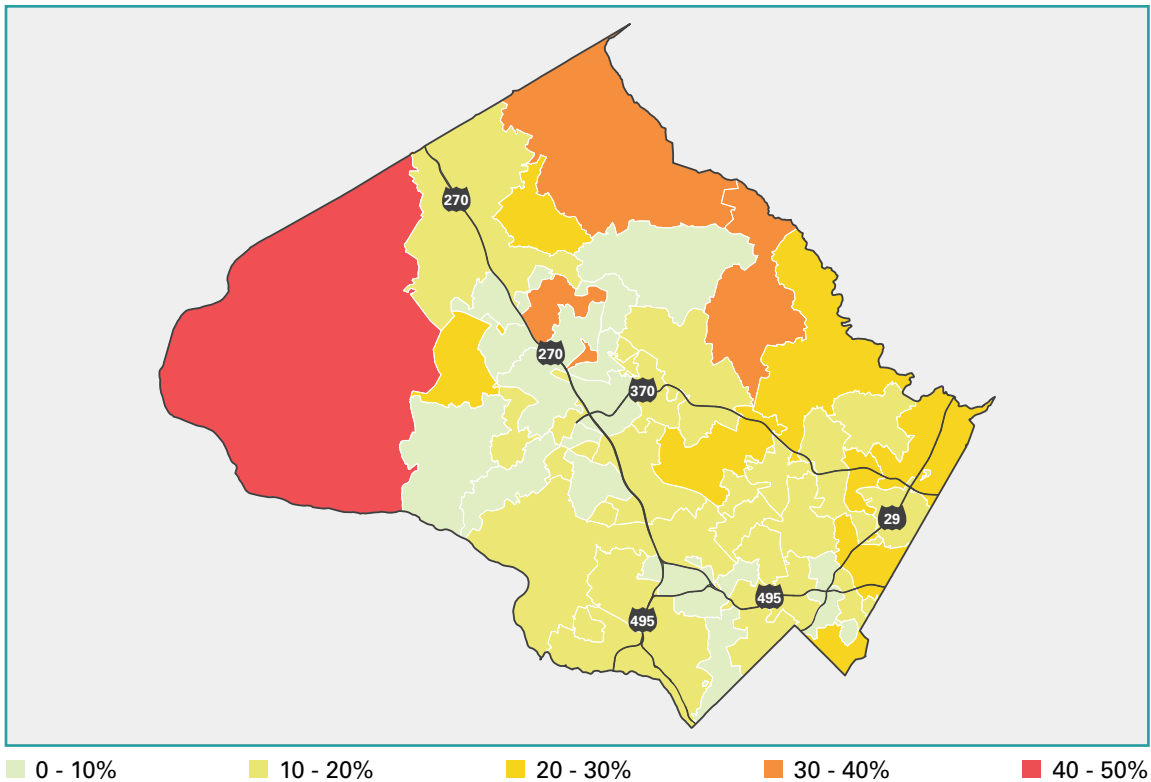
Figure 2.3.27 *Middle School Racial Dissimilarity to Nearest Three Schools*

Similar outliers emerge when we examine racial and economic dissimilarity at the middle school level, though we notice some important differences. Schools in the midcounty still appear more likely to be racially dissimilar from their nearest schools, with the notable exceptions of middle schools in and around the Quince Orchard Cluster.

Middle schools in lower density areas, particularly in the Poolesville, Damascus, and Sherwood Clusters have higher racial dissimilarity indices.

Finally, schools in the Downcounty and Northeast Consortia all have racial dissimilarity indices between 10 and 30 percent, when compared to their three nearest schools.

| 0 - 10% | 10 - 20% | 20 - 30% | 30 - 40% |
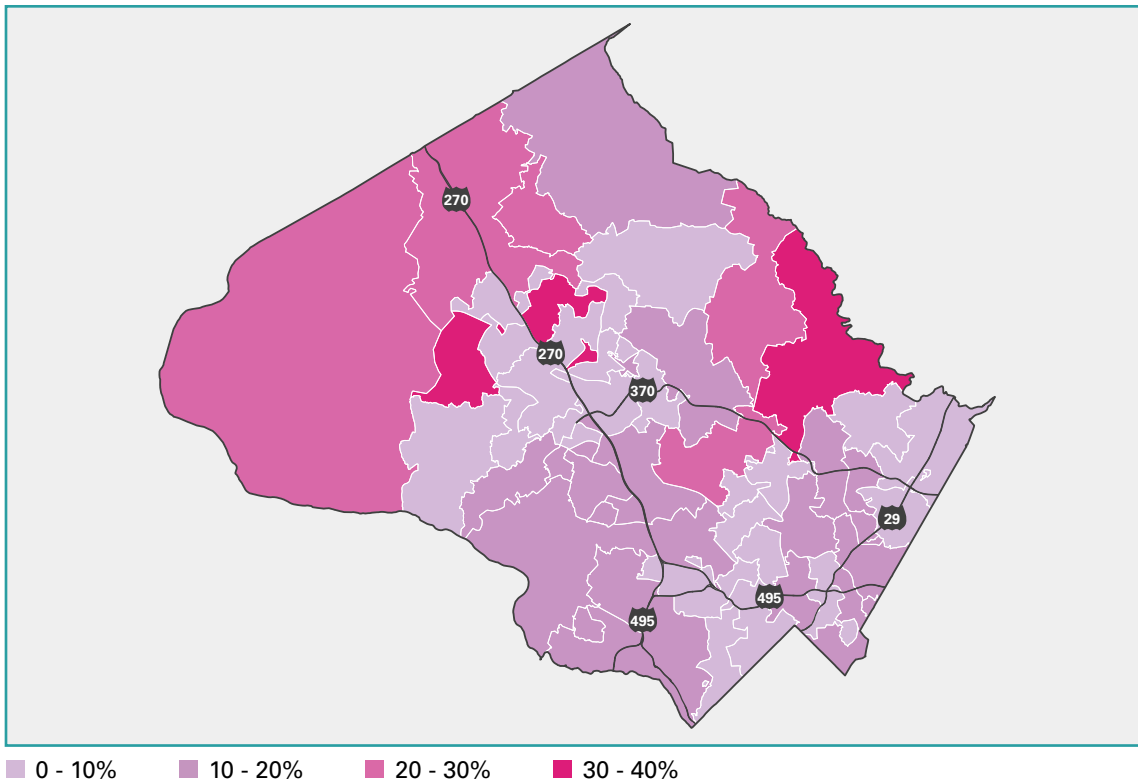
Figure 2.3.28 *Middle Schools FARMS Dissimilarity to Three Nearest Schools*

While generally we find that indicators of racial and socio-economic dissimilarity overlap, examining the socio-economic dissimilarity of middle schools to their nearest schools reveals some notable patterns we have not seen before.

Middle schools in the Winston Churchill, Walt Whitman, Thomas Wootton, Richard Montgomery, and Walter Johnson Clusters all show socio-economic dissimilarity indices between 10 and 20% when compared to their nearest schools. These indices were much lower for racial dissimilarity, all under 10%.

Other patterns across the district remain steadfast: middle schools in low density areas such as in the Poolesville, Damascus, and Clarksburg Clusters have high socio-economic dissimilarity rates, as do middle schools in the Downcounty Consortium.

Less dissimilar from three nearest schools ←

More dissimilar from three nearest schools →

13%: median

Most schools look neither very similar nor dissimilar from their nearest schools

A small number of schools look very dissimilar from their nearest schools

Number of Schools

ES Racial Dissimilarity to Three Nearest Schools

Figure 2.3.29 *Racial Dissimilarity to Three Nearest Schools of the Same School Level*

Figure 2.3.29, above, groups and counts the number of elementary schools by their racial dissimilarity to their nearest three schools. A lower value means that a school is more similar to its nearest three schools and a higher value means a schools is more dissimilar from its nearest three schools.

Examining Figure 2.3.29 we see that half of elementary schools have dissimilarity scores under 13% when compared to their nearest three schools. The other half have dissimilarity scores between 13% and 43%. This distribution suggests that while most schools in MCPS look similar to their nearest schools, a small number of schools look highly dissimilar to their nearest schools.

Less dissimilar from three nearest schools ←

More dissimilar from three nearest schools →

9%: median

Most schools look neither very similar nor dissimilar from their nearest schools

A small number of schools look very dissimilar from their nearest schools

Number of Schools

ES FARMs Dissimilarity to Three Nearest Schools

Figure 2.3.30 *Racial Dissimilarity to Three Nearest Schools of the Same School Level*

When we examine diversity from the point of view of FARMS and Ever-FARMS we find similar patterns to racial diversity. The distribution of elementary school FARMS dissimilarity scores, seen in Figure 2.3.30 above, follows a similar left-skewed pattern as seen for racial dissimilarity. Half of elementary schools have dissimilarity scores under 9%, the median in MCPS, with the rest ranging between 9% and 48%.

B.2 Forms of Adjacency

Throughout this section we will highlight two types of adjacencies:

1. **Clustering of like with like (similar schools):** In some parts of the district we see a relatively homogeneous distribution of people and wealth relative to the county overall.

2. **Adjacency of unlike with unlike (dissimilar schools):** In other parts of the district we see neighboring communities with very different demographic and socio-economic make-up.

In this section, we will go through examples of greatest and least similar adjacencies, in terms of both racial demographics and FARMS.

Clustering of Like with Like Schools (Similar Schools)

Across MCPS we see large discrepancies in how similar or dissimilar schools are from the nearest schools. Some schools have very similar socio-economic and racial backgrounds to their nearest schools. Others have very different socio-economic and racial backgrounds from their nearest schools.

Wood Acres Elementary School in the Walt Whitman cluster is more racially similar to its nearest three schools – Bannockburn, Somerset, and Westbrook – than any other elementary school in MCPS. It's dissimilarity index when compared to its three nearest schools is 2%. This is an example of like schools clustering with like schools along the lines of race.

Asian ■ Black ■ Hispanic ■ Other ■ White ■

School in focus   Nearest elementary schools + Other elementary schools
Cluster boundaries   School attendance areas
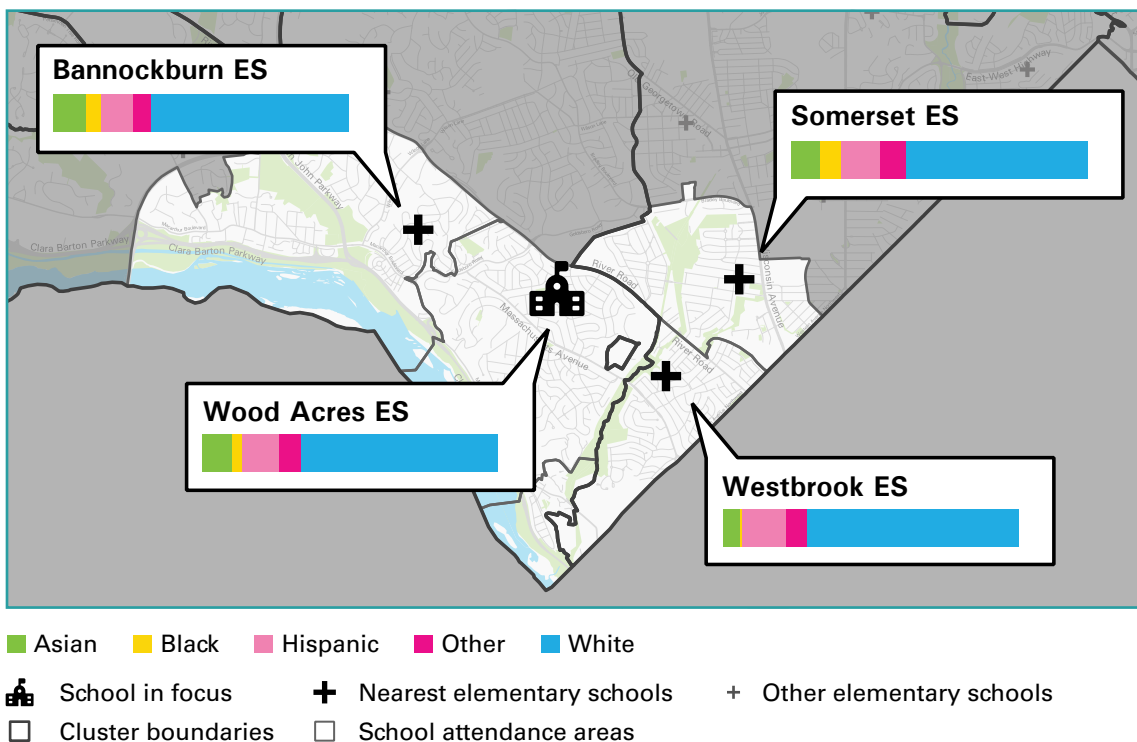
Figure 2.3.31 *Wood Acres ES: Most Racially Similar to Three Nearest Schools*

School	Grades	Asian	Black	Hispanic	Other	White	Dissimilarity to Nearest Schools	Dissimilarity to Wood Acres
Wood Acres	K-5	10%	3%	13%	7%	66%	2%	NA
Westbrook	K-5	6%	1%	15%	7%	72%	9%	7%
Bannockburn	K-5	11%	5%	11%	6%	67%	5%	3%
Somerset	K-5	10%	7%	13%	8%	61%	3%	6%

Figure 2.3.32 *Wood Acres ES Dissimilarity to Three Nearest Schools*

Wood Acres ES and its nearest three schools all have very low racial dissimilarity scores when compared to their nearest schools. This is an example of an area where racial demographics are relatively even across a large geography.

We can do a similar comparison for the FARMS rates of nearby schools.

The elementary school most similar to its three nearest schools along the dimension of socio-economic status is Bannockburn Elementary School in the Walt Whitman Cluster. Bannockburn is adjacent to Wood Acres ES, as seen in the previous example for racial dissimilarity. Bannockburn ES has low proportion of FARMS (2%) and previously FARMS (1%) students.

We see a similar spatial pattern in FARMS dissimilarity at Bannockburn ES as we saw with racial dissimilarity at Wood Acres ES. Bannockburn's three nearest schools have similar FARMS rates and FARMS dissimilarities compared to their nearest schools.

As previously noted, racial diversity, socio-economic diversity, and geography are highly interrelated phenomena across MCPS. Bannockburn, Wood Acres, and their nearest schools are good illustrations of the spatial concentration of affluent, mostly White students in MCPS.
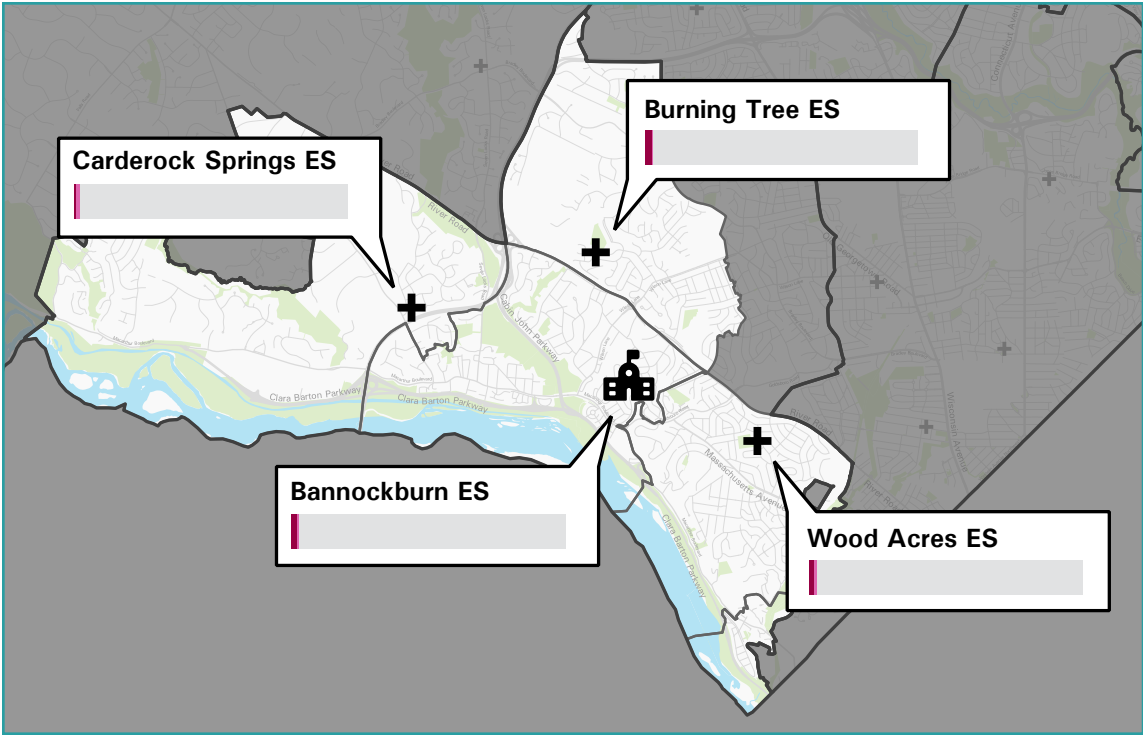
FARMS ■ **Previously FARMS** ■ **Never-FARMS**

🏫 School in focus ✚ Nearest elementary schools ✚ Other elementary schools
☐ Cluster boundaries ☐ School attendance areas

Figure 2.3.33 *Bannockburn ES: Most Socio-economically Similar to Three Nearest Schools*

School	Grades	FARMS	Previous FARMS	Never FARMS	Dissimilarity to Nearest Schools	Dissimilarity to Bannockburn
Bannockburn	K-5	2%	1%	97%	0%	NA
Wood Acres	K-5	2%	1%	97%	3%	1%
Burning Tree	K-5	3%	0%	97%	1%	1%
Carderock Springs	K-5	1%	1%	98%	2%	1%

Figure 2.3.34 *Bannockburn ES Dissimilarity to Three Nearest Schools*

Adjacencies of Unlike with Unlike (Dissimilar Schools)

At the other end of the spectrum is JoAnn Leleck Elementary School, which has a racial dissimilarity index of 43% compared to its three nearest schools. JoAnn Leleck is disproportionally Hispanic compared to its nearest schools and to MCPS overall. Eighty-five percent of JoAnn Leleck's students are Hispanic, compared to a range of 25-55% Hispanic students in the nearest schools. This is an example of a school clustering with very dissimilar schools: unlike with unlike.

Asian ■ Black ■ Hispanic ■ Other ■ White

School in focus   ✚ Nearest elementary schools   ✛ Other elementary schools
☐ Cluster boundaries   ☐ School attendance areas

Figure 2.3.35 *JoAnn Leleck ES: Most Racially Dissimilar from Three Nearest Schools*

Two of JoAnn Leleck's nearest schools, Roscoe Nix and Cresthaven (which are paired), have low racial dissimilarity scores when compared to their three nearest schools (6% and 5% respectively).

Methodological Note

Roscoe Nix ES and Cresthaven ES are paired schools with a shared attendance area, serving grades K-5 between them. Other paired schools in MCPS (which are only at the elementary school level) have separate attendance areas, unlike Roscoe Nix / Cresthaven which share an attendance area. For this reason, we have chosen to treat the two schools as separate.

Across MCPS, racial and socio-economic isolation is often highly unique to a particular school or geographic area. Areas with highly diverse populations overall, such as in Silver Spring and its surrounding neighborhoods, may have neighborhoods with different racial demographics within them. For this reason, we may see schools like JoAnn Leleck with high racial dissimilarity indices next to schools with low racial dissimilarity indices.

School	Grades	Asian	Black	Hispanic	Other	White	Dissimilarity to Nearest Schools	Dissimilarity to JoAnn Leleck
JoAnn Leleck	HS-5	2%	11%	85%	1%	0%	43%	NA
Roscoe Nix	HS-2	11%	34%	50%	2%	4%	6%	35%
Cresthaven	3-5	6%	34%	55%	2%	4%	5%	30%
Burnt Mills	HS-5	5%	57%	26%	5%	7%	19%	59%

Figure 2.3.36 *JoAnn Leleck ES Dissimilarity to Three Nearest Schools*

Nearby Sligo Creek Elementary School is an example of a school that is highly socio-economically dissimilar from its nearest schools. Here, we compare Sligo Creek ES to Highland View ES, Oak View ES, and East Sliver Spring ES. Sligo Creek has a FARMS rate of 8% and an Ever-FARMS rate of 15%. By contrast, its nearest schools all have Ever-FARMS rates greater than 50% of students. At Oakview ES the FARMS rate is 71% and the Ever-FARMS rate is 76%.

■ FARMS ■ Previously FARMS ■ Never-FARMS

School in focus   ✚ Nearest elementary schools   ✛ Other elementary schools
☐ Cluster boundaries   ☐ School attendance areas

Figure 2.3.37 *Sligo Creek ES: Most Socio-economically Dissimilar from Three Nearest Schools*

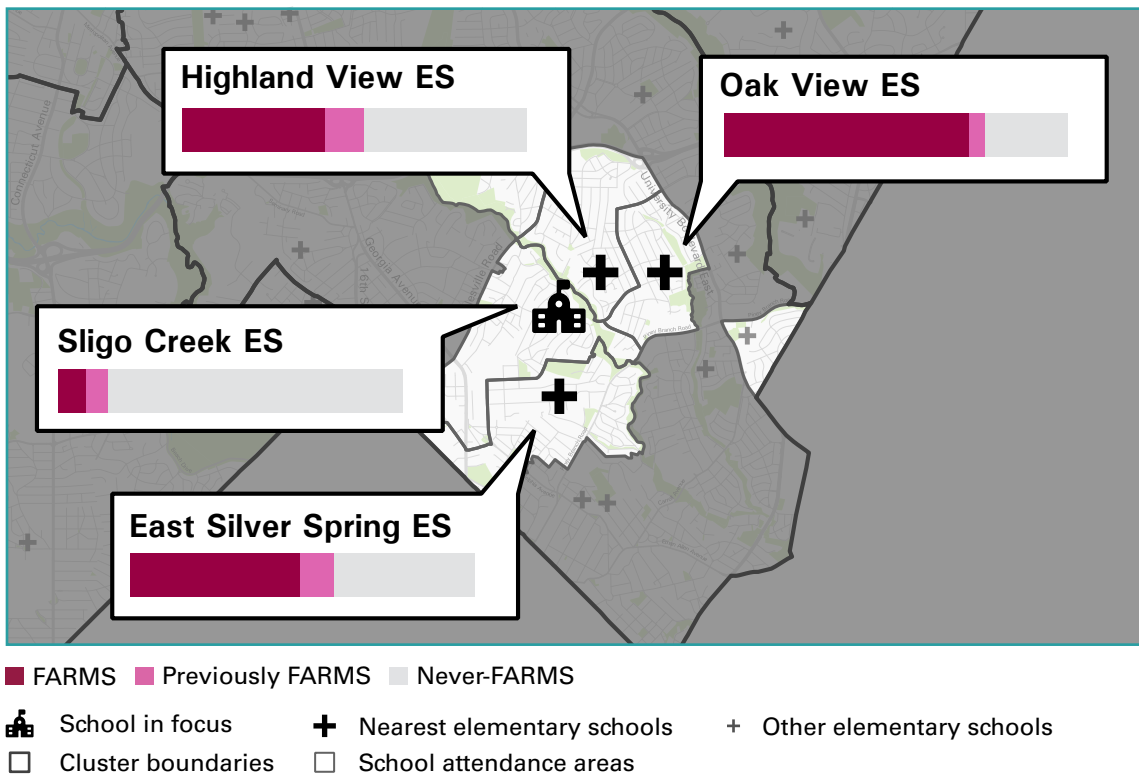| School	Grades	FARMS	Previous FARMS	Never FARMS	Dissimilarity to Nearest Schools	Dissimilarity to Bannockburn
Bannockburn	K-5	2%	1%	97%	0%	NA
Wood Acres	K-5	2%	1%	97%	3%	1%
Burning Tree	K-5	3%	0%	97%	1%	1%
Carderock Springs	K-5	1%	1%	98%	2%	1%

Figure 2.3.38 *Sligo Creek ES Dissimilarity to Three Nearest Schools*

The two previous examples of local dissimilarity – JoAnn Leleck and Sligo Creek – underline that the demographics and socio-economic background of a school's student body are hyper-local. Racial and socio-economic dissimilarity in schools is often highly sensitive to the exact boundaries of a school attendance area. Minor changes in these boundaries can in some cases significantly alter the demographic and socio-economic make-up of a school.

Which Schools Are Most Socio-economically Dissimilar from their Nearest Schools?

Aside from Sligo Creek ES, the other elementary schools with the highest socio-economic dissimilarity to their three nearest schools include Laytonsville ES (Damascus Cluster), Forest Knolls ES (Downcounty Consortium), Kemp Mill ES (Downcounty Consortium), and Strawberry Knoll ES (Gaithersburg cluster). Of these top five most dissimilar schools, three are a part of the Downcounty Consortium.

The most socio-economically dissimilar middle schools in the district from their nearest three schools are Neelsville MS (Clarksburg cluster), Kingsview MS (Northwest HS), Farquhar MS (Sherwood HS / Northeast Consortium), Hallie Wells MS (Clarksbug and Damascus HS), and Rosa M. Parks MS (Sherwood HS/Northeast Consortium).

The most socio-economically dissimilar high schools from their three nearest high schools are Sherwood HS, Poolesville HS, Damascus HS, Whitman HS, and Gaithersburg HS.

2.3 Data Analysis
Diversity

C. The Effect of Feeder Patterns on Diversity

Having analyzed disparities across the district and at nearby schools, we now turn to questions of diversity across feeder patterns. We first examine the effects of cluster boundaries on diversity, then compare diversity measures across school levels. We also look at dissimilarity in terms of the number of nearest schools in a different cluster, to better understand the effects of attendance area size.

Questions:

How does diversity vary throughout the elementary to middle school, and middle to high school feeder patterns?
What is the relationship between elementary school diversity and the overall dissimilarity of elementary schools within a cluster?
Are there any trends across school levels regarding these measures of diversity?
How does diversity vary across different kinds of attendance areas?

Analyses:

C.1 The Effects of Cluster Boundaries
C.2 Diversity by Feeder Pattern

Insights

1. In this set of analyses, we compare schools to their closest schools by roadway distance, including schools across cluster boundaries. This analysis suggests that the cluster boundaries in MCPS may contribute to racial or socio-economic isolation to some degree

In many cases across the district, cluster boundaries isolate schools from one another that might otherwise look more socio-economically or racially similar. For example, elementary schools whose nearest schools are in different clusters are more likely to be racially dissimilar from their nearest schools than if their nearest schools are located in the same cluster:

- In MCPS the median racial dissimilarity rate for elementary schools is 13%.

- Schools with only one of their three nearest schools in a different cluster have a median racial dissimilarity of 12%.

- By contrast, schools with two or three of their nearest three schools in different clusters have median racial dissimilarity rates of 15% and 18%, respectively.

2. In addition to adjacent schools on the other side of cluster boundaries, the shape of these boundaries themselves seems to have a relationship with racial and socio-economic dissimilarity. Schools with high dissimilarities when compared to their nearest schools can often be found in school clusters with boundaries that have highly irregular shapes.

Clusters in midcounty, including the Wootton, Quince Orchard, Northwest, Seneca Valley, Clarksburg, and Gaithersburg have some of the most irregularly shaped cluster boundaries. Elementary schools in these clusters, in particular, are most likely to be racially and socio-economically dissimilar from their nearest neighbors, which often fall in different clusters.

3. Ever-FARMS rates by school are more evenly distributed at the high school level than at the middle school level, and more evenly distributed at the middle school level than at the elementary school level.

Seven out of 25 high schools (31%) have Ever-FARMS rates between 40% and 60%, near the MCPS average of 46%. By contrast, only 18 of 135 elementary schools (13%) fall in that same middle category.

C.1 The Effects of Cluster Boundaries

In this analysis we examine the extent to which cluster boundaries may create schools that are more dissimilar to schools in their cluster than to those they are nearest to. In each analysis in this section, we compare schools to their three nearest schools by roadway distance—regardless of cluster boundaries—to examine the question: do cluster boundaries make schools more dissimilar from one another than they would otherwise be?

District Overview

Figure 2.3.39, below, examines the racial dissimilarity of elementary schools to the overall racial demographics of their cluster. The black dots represent schools where there is only one racial group representing more than 15% of the school's population.

■ 3 - 7%	■ 7 - 13%	■ 13 - 18%	■ 18 - 23%	○ Schools with one dominant racial group (>15%)
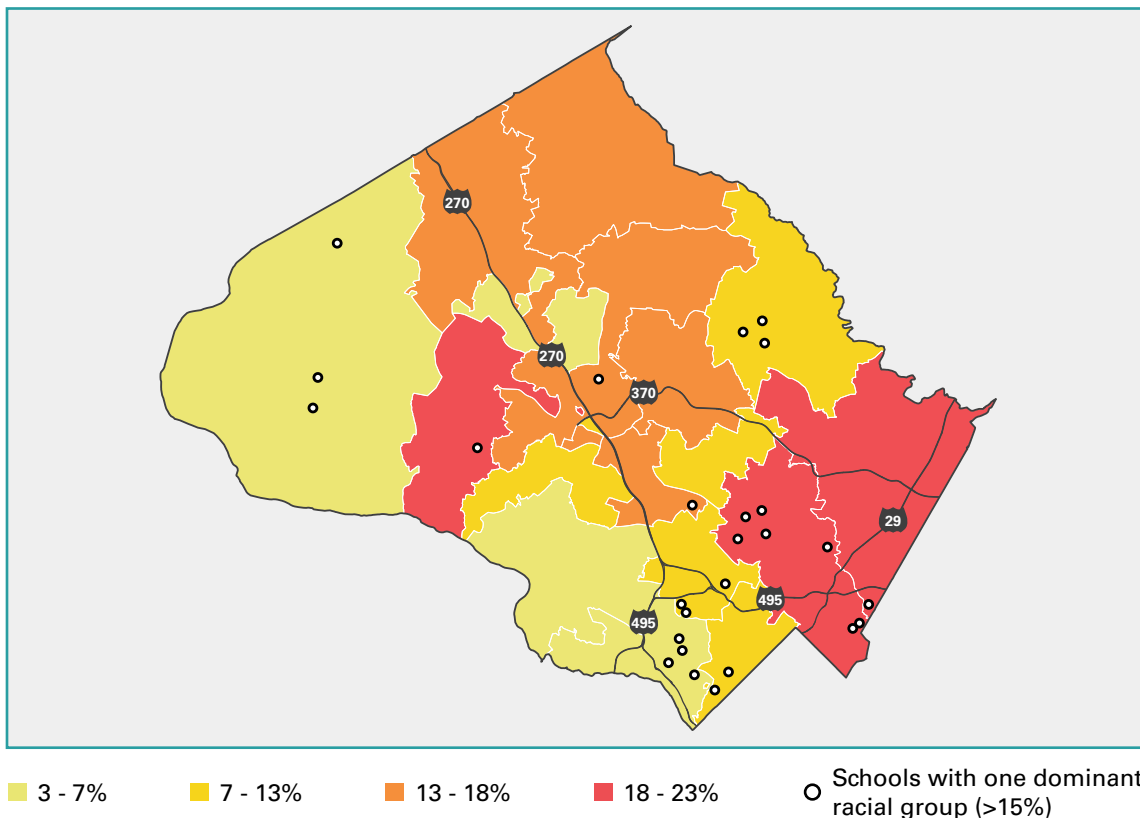
Figure 2.3.39 *Average Elementary School Racial Dissimilarity to the Overall ES Population of Their Cluster*

Figure 2.3.39 indicates that clusters where elementary schools are either highly similar or dissimilar from their clusters overall are more likely to have schools with a single dominant racial group.

This raises the question of whether current cluster boundaries are isolating certain demographic groups, or whether they simply reflect the demographic distribution of students across MCPS. The two examples that follow illustrate how cluster boundaries can divide communities that otherwise might have schools with more similar, or even, racial and socio-economic make-ups.

Examples of Dissimilarity Near Complex Cluster Boundaries

Diamond Elementary School is highly racially dissimilar from its nearest schools, Brown Station ES, Marshall ES, and Carson ES. It has a racial dissimilarity rate of 36% compared to its nearest schools. In fact, it is the elementary school most dissimilar from its nearest schools when those nearest schools are all in a different cluster. Diamond ES is in the Northwest Cluster, while its three nearest schools are all in the Quince Orchard Cluster. Clusters are indicated with the thick dark grey line in the map below.
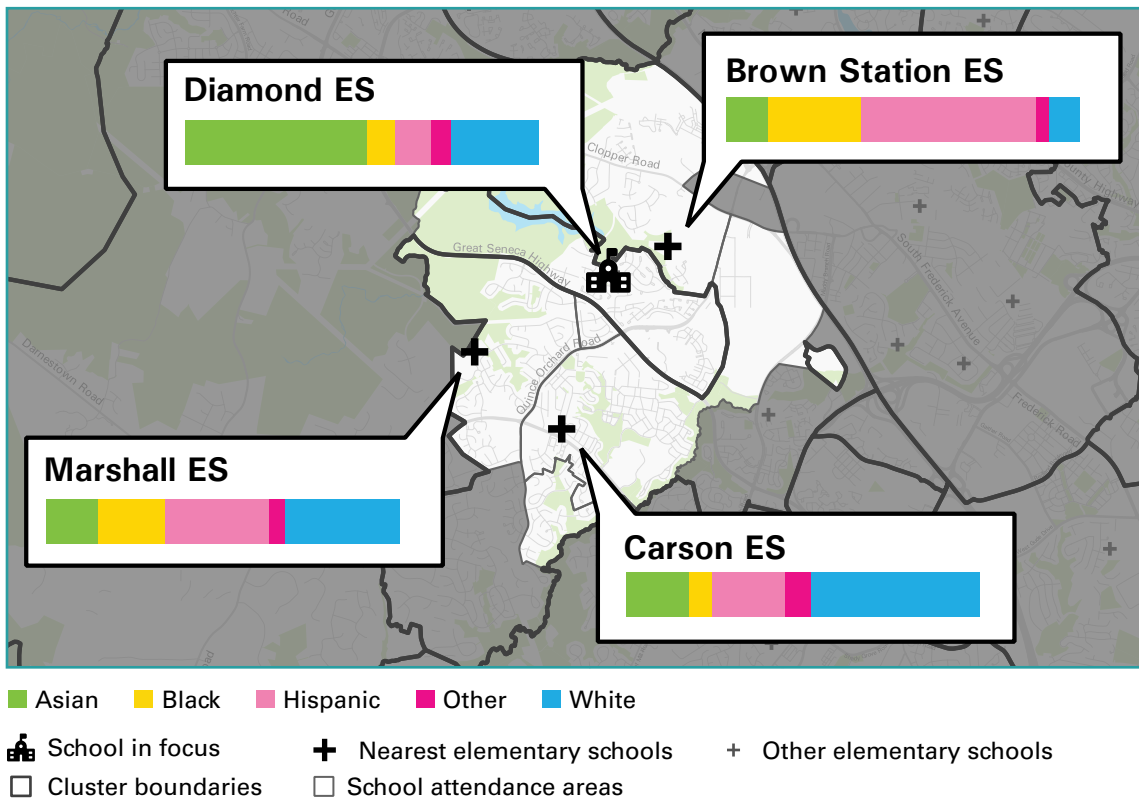
Figure 2.3.40 *Diamond ES Racial Dissimilarity from Nearest Schools*

School	Grades	Asian	Black	Hispanic	Other	White	Dissimilarity to Nearest Schools	Dissimilarity to Diamond
Diamond	K-5	52%	8%	10%	6%	25%	36%	NA
Brown Station	HS-5	12%	26%	49%	4%	9%	20%	58%
Carson	HS-5	18%	6%	21%	8%	48%	23%	35%
Marshall	K-5	15%	19%	30%	4%	32%	22%	38%

Figure 2.3.41 *Diamond ES Racial Dissimilarity from Nearest Schools*

This is an example of a school isolated from its nearest schools and racially dissimilar from those nearest schools. This alone, however, does not necessarily mean that the Northwest and Quince Orchard Cluster boundaries create more dissimilar schools. We will address this question later in the section.

Strawberry Knolls ES, in the Gaithersburg Cluster, is an example of an elementary school that is highly socio-economically dissimilar from its nearest schools. Of all elementary schools whose nearest schools are all in a different cluster, Strawberry Knolls is the most socio-economically dissimilar to its nearest schools. Its nearest schools are Whetstone and South Lake ES – both in the Watkins Mill Cluster – and Flower Hill ES, which is in the Magruder Cluster.

FARMS ■ **Previously FARMS** ■ **Never-FARMS**

School in focus   ✚ Nearest elementary schools   ✛ Other elementary schools
☐ Cluster boundaries   ☐ School attendance areas
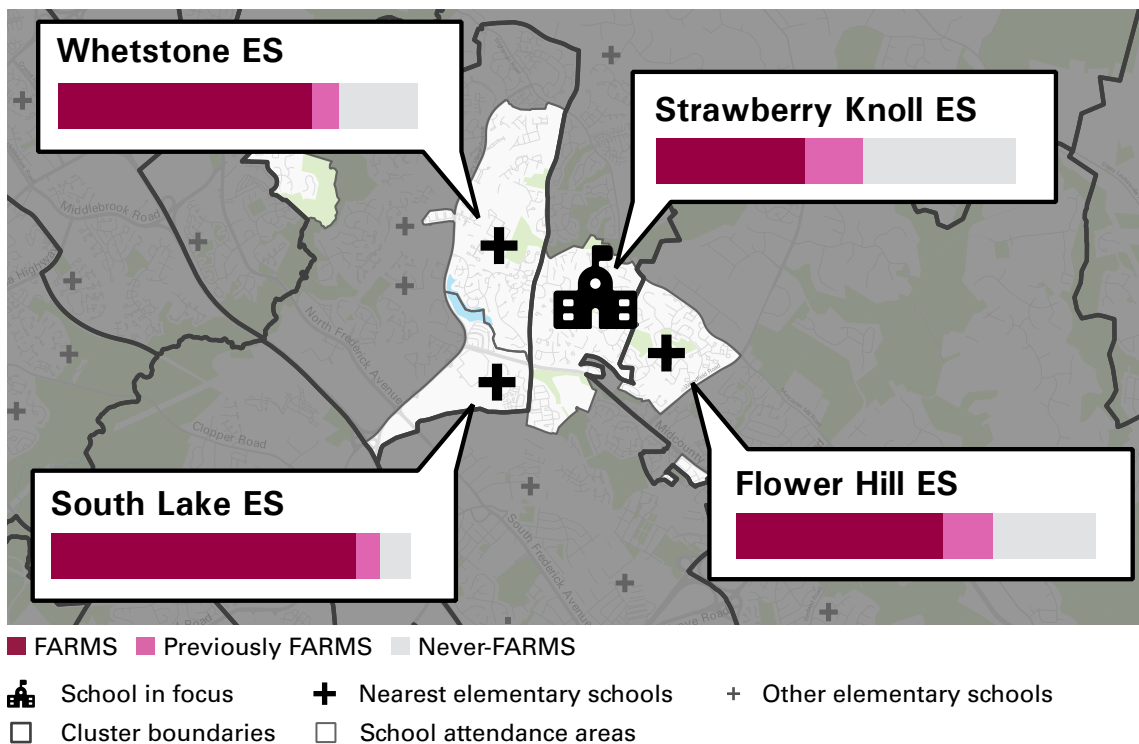
Figure 2.3.42 *Sligo Creek ES: Most Socio-economically Dissimilar from Three Nearest Schools*

School	Grades	FARMS	Previous FARMS	Never FARMS	Dissimilarity to Nearest Schools	Dissimilarity to Strawberry Knoll
Strawberry Knoll	HS-5	41%	16%	42%	33%	NA
Flower Hill	HS-5	58%	14%	29%	9%	16%
Whetstone	HS-5	71%	7%	22%	13%	29%
South Lake	HS-5	85%	7%	8%	17%	43%

Figure 2.3.43 *Strawberry Knoll ES Socio-economic Dissimilarity from Nearest Schools*

Once again, this is an example of a school isolated from its nearest schools and socio-economically dissimilar from those nearest schools. Are schools in this configuration more likely on average to be racially dissimilar from their nearest schools than schools whose neighbors are in the same cluster?

The Overall Effect of Clusters on Dissimilarity

Figure 2.3.44, below left, suggests that schools that have two or three nearest schools in different clusters are more likely to be racially dissimilar from their three nearest schools.

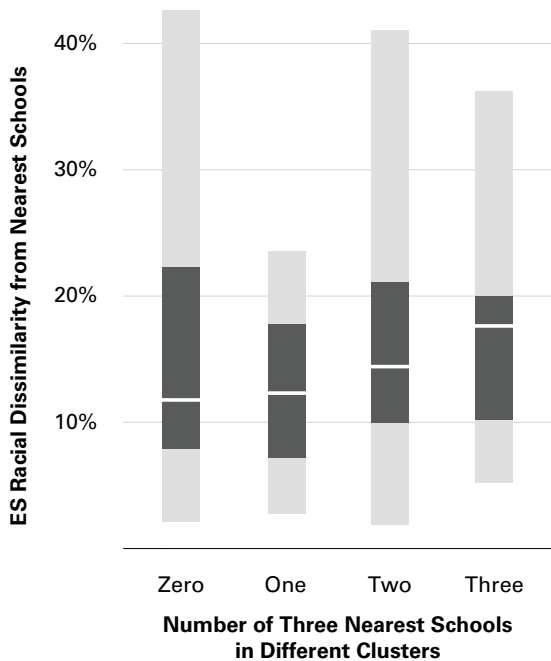**Figure 2.3.44** *Elementary School Racial Dissimilarity to Nearest Schools by Number of Nearest Schools in Different Clusters*
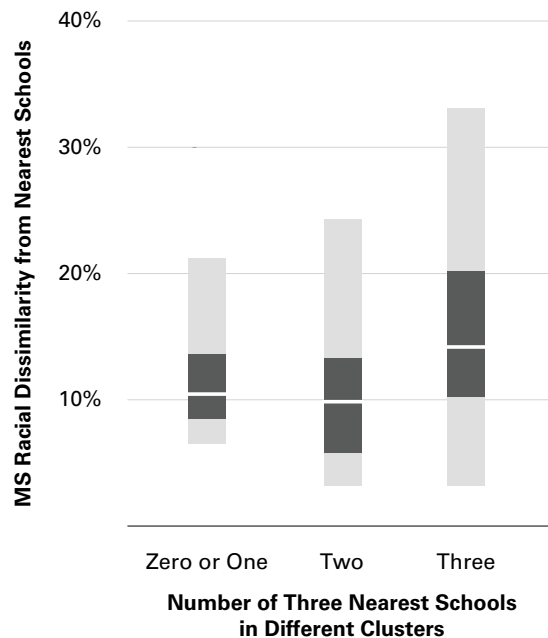
Figure 2.3.45 *Middle School Racial Dissimilarity to Nearest Schools by Number of Nearest Schools in Different Clusters*
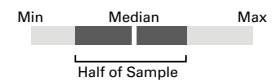
Schools with only one of their three nearest schools in different clusters have a median racial dissimilarity of 12%. By contrast, schools with two or three of their nearest three schools in different clusters have median racial dissimilarity rates of 15% and 18% respectively. Recall that in MCPS the median racial dissimilarity rate for elementary schools is 13%. Finally, note that the minimum of the inter-quartile range, representing half of all elementary schools in the bars shown above (this is the dark grey bar), is two to three percentage points higher for schools with two or three nearest schools in different clusters, than for schools with only zero or one nearest schools in their cluster.

This suggests that elementary schools are more likely to be dissimilar from their nearest schools if their nearest schools are in a different cluster. Cluster boundaries may be isolating communities from one another that otherwise might look more similar.

Now, a few qualifying statements must be made. The racial dissimilarities of elementary schools compared to their nearest schools range from 2% to 43%. This is a broad range. **Figure 2.3.44** indicates that the minimum and maximum

dissimilarities of schools in the four categories range broadly. In other words, many schools are outliers and must be examined on a case-by-case basis. There may be individual cases where cluster boundaries improve racial dissimilarities in elementary schools, even though the overall trend suggests otherwise.

Nevertheless, a difference of three to six percentage points in racial dissimilarities, when looking at all elementary schools together, is a significant amount.

We see a similar pattern for middle schools in MCPS, though the effect size seen for elementary schools is less significant. The median middle schools with three of three of its nearest schools in different clusters has a racial dissimilarity index of about 15%, compared to only 10% for middle schools that only have zero to two of their nearest schools in different clusters. This may in part be due to the greater use of split articulations and island assignments in middle schools. This is a space for future inquiry.

The Geography of Dissimilarities and Clusters

Figure 2.3.46, below, indicates elementary school attendance areas where all three of their nearest three schools are in the same cluster as them. The racial dissimilarity indices of these schools are represented by the different color hues.

■ 0 - 10%   ■ 10 - 20%   ■ 20 - 30%   ■ 30 - 40%   ■ 40 - 50%   □ Cluster

Figure 2.3.46 *Elementary School Racial Dissimilarity to Nearest Schools for Schools Where Nearest Schools are in the Same Cluster*

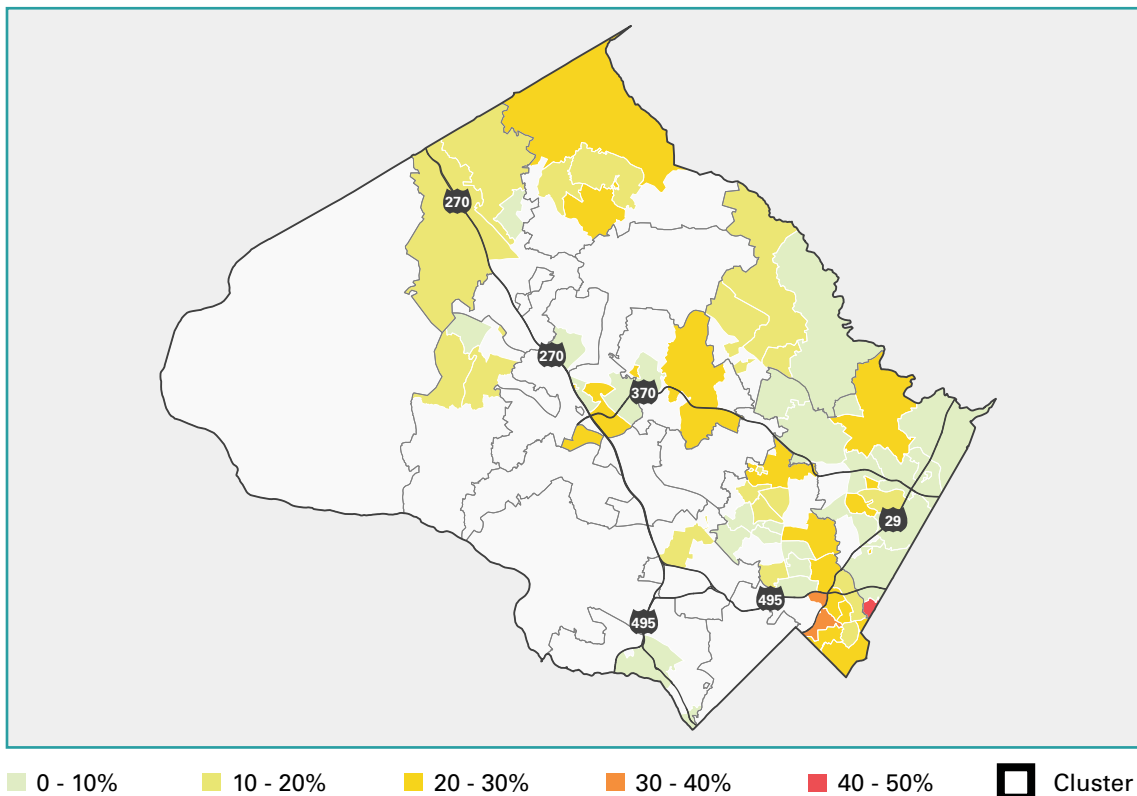With the exception of a number of schools in the Downcounty Consortium, most elementary schools who's nearest three schools are in the same cluster have low racial dissimilarity indices, most under 20%. While 20% is greater than the districtwide median racial dissimilarity of school's to their nearest three schools, 20% is far from the outlying dissimilarity indices we see for some schools. Here, we focus on outliers, particularly those schools with dissimilarity indices to their nearest three schools over 25%.

Figure 2.3.47, below, indicates elementary school attendance areas for schools with one, two, or three of three of their nearest schools in a different cluster. The attendance areas are colored by their racial dissimilarity indices.

| ▢ 0 - 10% | ▢ 10 - 20% | ▢ 20 - 30% | ▢ 30 - 40% | ▢ 40 - 50% | ▢ Cluster |
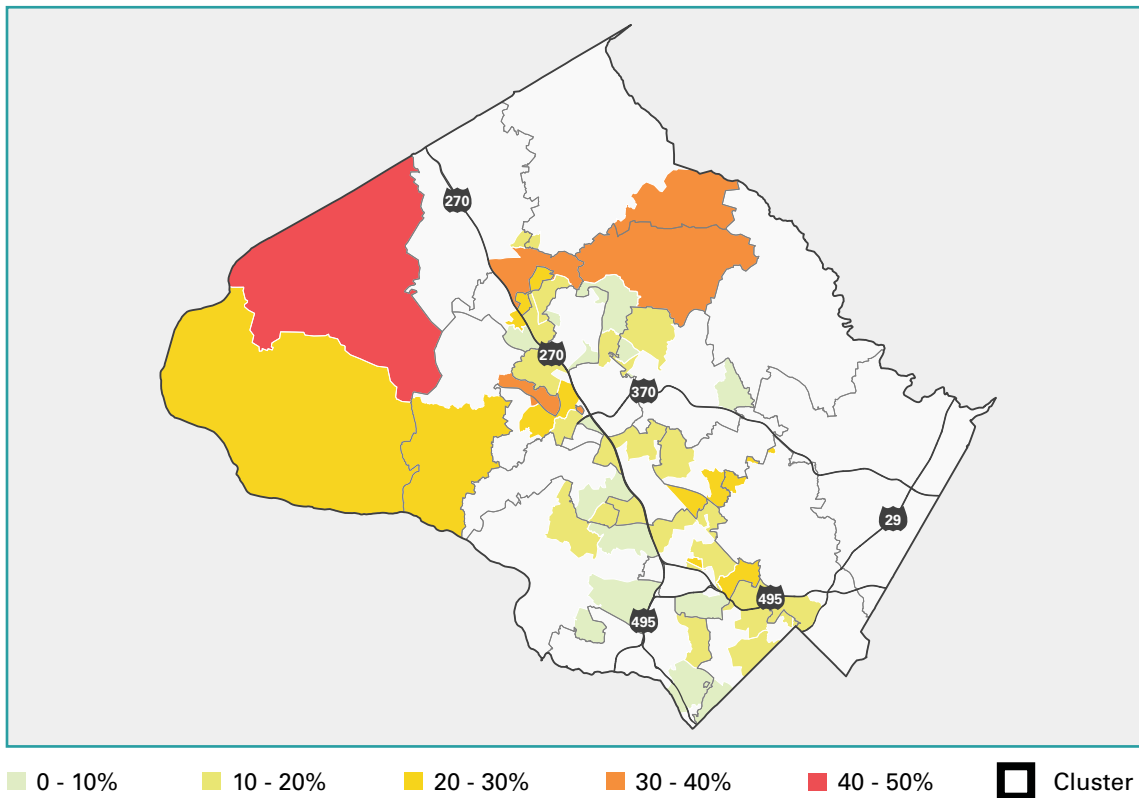
Figure 2.3.47 *Elementary School Racial Dissimilarity to Nearest Schools for Schools Where More Than One Nearest Schools are in a Different Cluster*

Figure 2.3.47 suggests that there are relatively few elementary schools with dissimilarities under 10% that have one or more of their nearest schools in a different cluster. Where they exist, they are mainly clustered in Walt Whitman and Winston Churchill Clusters in the southwest corner of Montgomery County.

A large number of elementary schools, mostly in midcounty along I-270 and north of I-495 in the Clarksburg, Quince Orchard, Walter Johnson, and Richard Montgomery Clusters are nearest to more than one elementary school in a different cluster. These elementary schools have racial dissimilarity indices between 10% and 30%, for the most part.

Finally, elementary schools in less densely populated areas such as Poolesville and the northern side of the Damascus Cluster, appear most racially dissimilar from their nearest schools. These schools are relatively far from their nearest schools, so we might expect to see these kinds of dissimilarities. John Poole Middle School illustrates this, as seen in **Figure 2.3.48**.
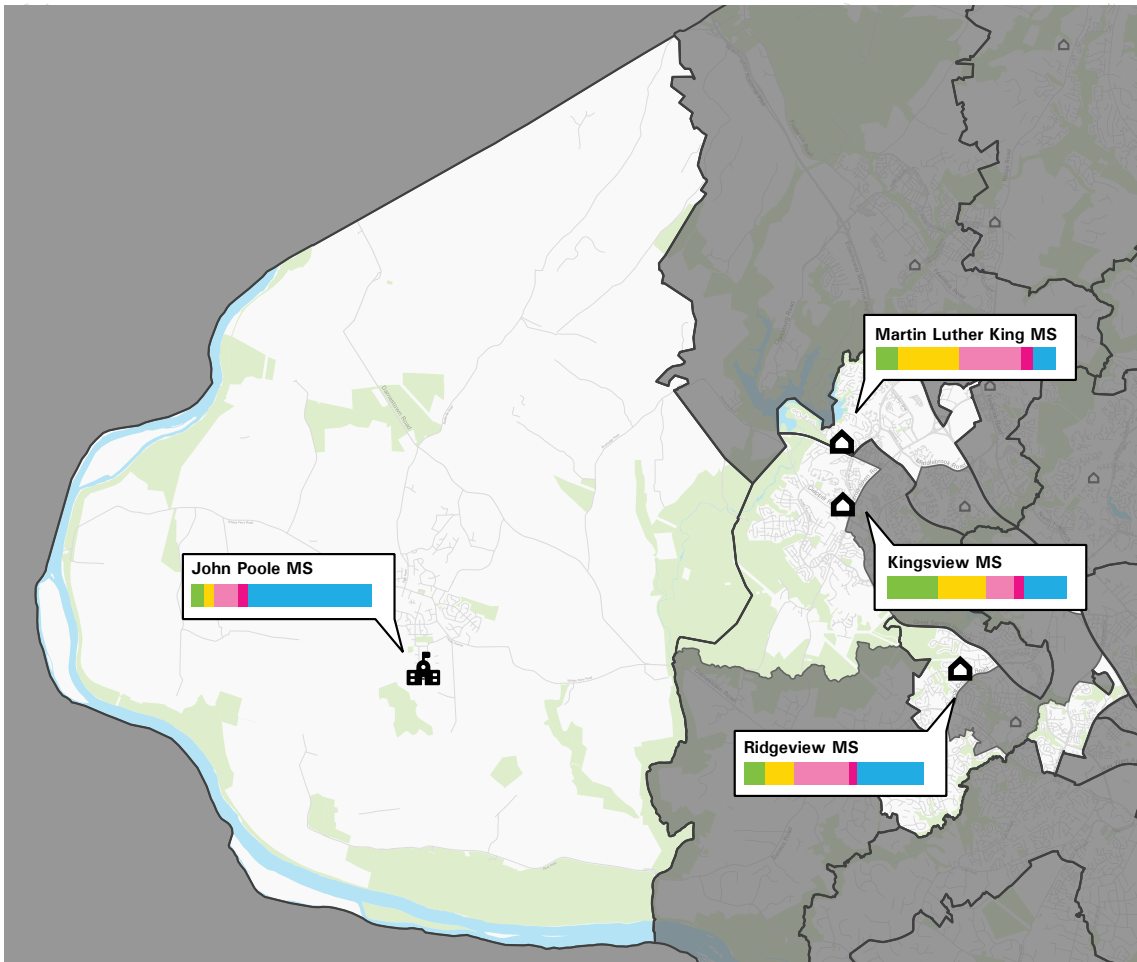
Figure 2.3.48 *An Example of Dissimilarity to Nearby Schools: Farquhar Middle School*

School	Grades	Asian	Black	Hispanic	Other	White	Dissimilarity to Nearest Schools	Dissimilarity to Poole
Poole	6-8	7%	6%	13%	5%	69%	44%	NA
Kingsview	6-8	28%	27%	15%	6%	24%	28%	45%
Ridgeview	6-8	11%	16%	31%	4%	37%	16%	33%
King	6-8	13%	34%	35%	6%	13%	8%	56%

Figure 2.3.49 *John Poole MS Racial Dissimilarity from Nearest Schools*

Addressing racial and socio-economic dissimilarities in schools like John Poole may be more challenging than in other parts of the county, where schools tend to be geographically closer to one another.

C.2 Diversity by School Level

This analysis examines how our indicators of diversity change by school level.

FARMS and Ever-FARMS by School Level

The share of schools with high FARMS rates is highest at the elementary school level and lowest at the high school level (**Figure 2.3.50)**. Adjusting for students who have ever been eligible for FARMS, called Ever-FARMS, we see the same pattern (**Figure 2.3.51**).

	<20%	20-40%	40-60%	60-80%	>80%
ES	47	31	23	26	8
MS	11	10	15		4
HS	9	9	7		
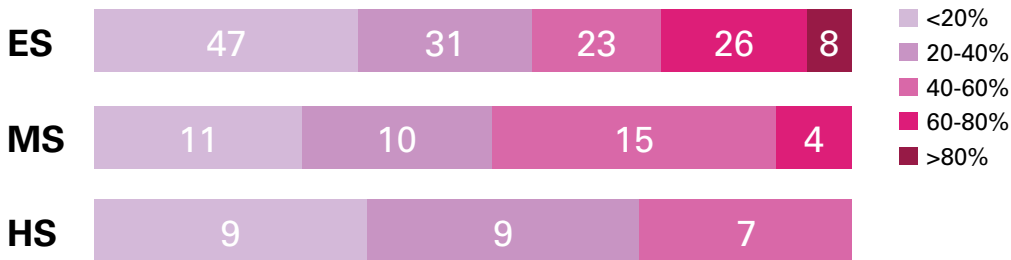
Figure 2.3.50 Number of Schools by FARMS Rate and School Level

Ever-FARMS rates by school are more evenly distributed between schools at the high school level than at the middle school level, which is still more evenly distributed than Ever-FARMS rates at the elementary school level. Seven out of 25 high schools (31%) have Ever-FARMS rates between 40 and 60%. The range of ever-FARMS rates found in these seven high schools is close to the MCPS average of 46%. By contrast, only 18 of 135 elementary schools (13%) fall in that same middle category.

	<20%	20-40%	40-60%	60-80%	>80%
ES	33	38	18	27	19
MS	7	10	7	11	5
HS	5	4	7	7	2
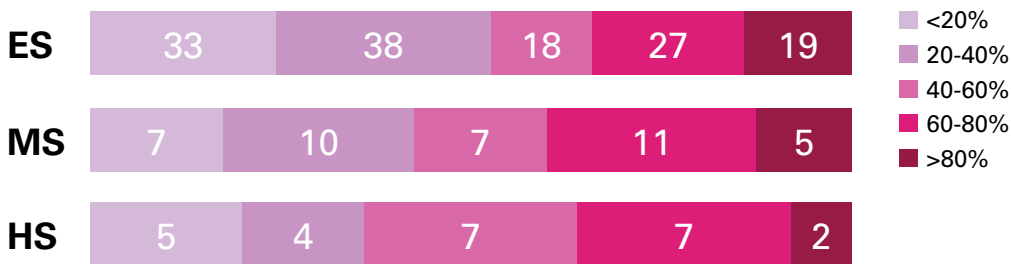
Figure 2.3.51 Number of Schools by Ever-FARMS Rate and School Level

ESOL and Ever-ESOL by School Level

Similar to FARMS and Ever-FARMS, the share of schools with high ESOL rates is greatest at the elementary school level and lowest at the high school level. As noted previously, the ESOL rate decreases sharply between 3rd and 6th grades, from 25% in elementary schools overall to 11% in both middle and high schools.
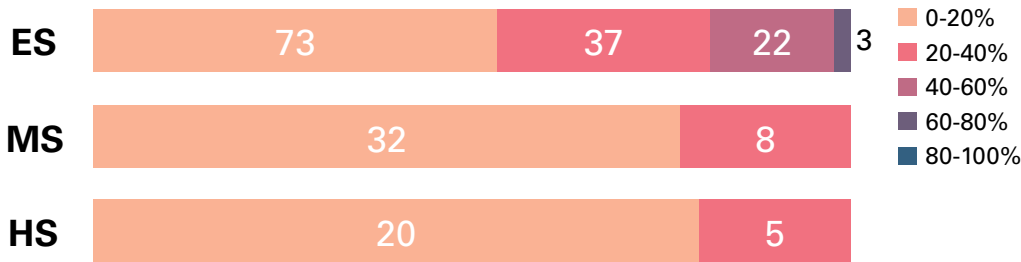
Figure 2.3.52 *ESOL by School Level*
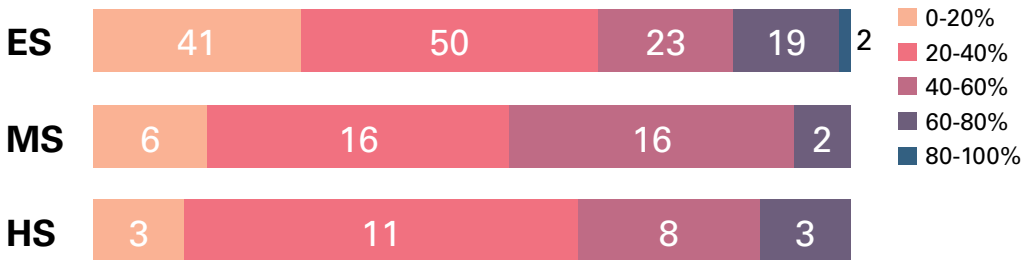
Figure 2.3.53 *Ever-ESOL by School Level*

The Ever-ESOL rate in middle schools and high schools remains quite consistent, representing 37% of students for both school levels. Compare this to the Ever-ESOL rate in elementary schools overall of 35%.

Dissimilarity to Three Nearest Schools by School Level

The following figures examine the racial and socio-economic dissimilarity of schools to their nearest three schools by school level.
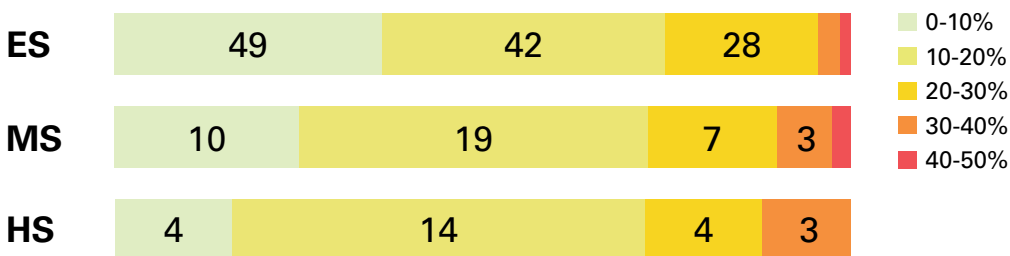
Figure 2.3.54 *Number of Schools by Racial Dissimilarity to Nearest Schools and School Level*

Figure 2.3.54 illustrates that 49 of the 135 elementary schools have very low racial dissimilarity indices (less than 10%). In other words, the students enrolled in these 49 elementary schools have similar racial and ethnic backgrounds as the students in their three nearest schools. What we notice about the racial dissimilarity is a trend towards increased dissimilarity rates at the middle school and high school level when compared to the three nearest schools. While 49 of the elementary schools have very low dissimilarity rates (less than 10%), only 10 middle schools and four high schools have dissimilarity indices less than 10%. We notice the same trend for socio-economic dissimilarity of schools to their nearest three schools: there are fewer and fewer schools with very low dissimilarity indices (less than 10%) at the middle school, then the high school level. In general, dissimilarity indices tend to increase uniformly between ES and MS, and then MS and HS.

					Legend
ES	73	35	18	7	0-10%
MS	18	14	5	3	10-20% / 20-30%
HS	9	10	4	2	30-40% / 40-50%
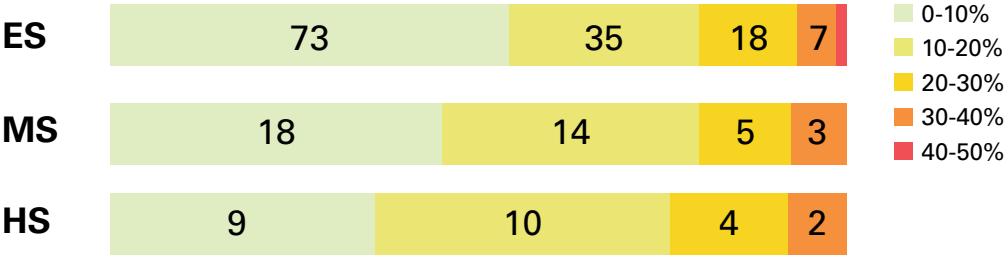
Figure 2.3.55 *Number of Schools by Socio-economic Dissimilarity to Nearest Schools and School Level*

The exception to this last observation is that there appear to be fewer schools with very high racial and socio-economic dissimilarities (greater than 40%) to their three nearest schools in high schools, than in middle or elementary schools. Two elementary schools have very high dissimilarity (40-50%) indices when compared to their three nearest elementary schools, but this comparison at middle school and high school level does not result in any dissimilarity indices greater than 40%.

2.3 Data Analysis
Diversity

D. Special Conditions

In this final set of analyses, we consider how special conditions in MCPS may impact the three measures of diversity considered in this report. First we analyze non-contiguous school attendance areas (or island assignments) with relation to diversity. Then we look at school choice programs to see if these impact diversity across school levels.

Questions:

How is student diversity impacted (or not) by non-contiguous school attendance areas, known as island assignments?
Where are most schools with non-contiguous attendance areas and what do their attendance areas look like?
How is diversity impacted at schools with special programs?
Is the impact – if any – of special programs on diversity different across school levels?

Analyses:

D.1 Diversity and Island Assignments
D.2 Diversity and School Choice Programs

Insights

1. One of the special conditions we analyze in this section are non-contiguous school attendance areas—or island assignments. On the whole, schools with island assignments are more racially and socio-economically diverse than schools without island assignments.

Many island assignments significantly change the overall socio-economic and racial/ethnic background of their schools' student bodies. We find numerous examples of "islands" that are highly dissimilar from one another and their attendance area bodies (the part of the attendance area where the school is located).

2. The overall populations at schools with island assignments tend to be more socio-economically and racially/ethnically dissimilar to the students residing in their own islands than to their nearest schools.

To analyze this, we compare the dissimilarity scores of islands and attendance area bodies, to those between nearby schools. On average, there is more dissimilarity (or diversity) between the pieces of island assignments than there is between neighboring schools in MCPS.

3. We also look at regional choice programs (special programs accessible to students across multiple attendance areas) in this section, to understand whether these programs impact diversity at the schools that house them. Historically, school choice programs have been one strategy for voluntary integration of schools in MCPS. So, it is instructive to ask the question of how diversity may be impacted by these programs, and how these programs may impact diversity across MCPS. The clearest trend is at the middle school level, where regional choice programs correspond with lower dissimilarity:

Middle schools with special programs accessible to students across multiple attendance areas (called regional programs) have lower socio-economic and racial/ethnic dissimilarity to their nearest schools. In other words, special programs at the middle school level seem to contribute to more even distribution of racial/ethnic and socio-economic groups, on average.

Elementary and high schools with regional special programs do not show strongly significant patterns (positive or negative) in socio-economic or racial/ethnic dissimilarity compared to their nearest neighbors and other schools. The relationship is not as clear regarding how these programs impact diversity at the elementary and high school levels.

D.1 Diversity and Island Assignments

"Island assignments" are attendance areas that include non-contiguous areas in their geographies. MCPS has 33 elementary schools, 15 middle schools, and seven high schools with island assignments. Island assignments are no longer created very frequently – there has been one new island assignment (Seven Locks ES in Winston Churchill cluster) created in the last 10 years, and one other island assignment (Rosemary Hills in Bethesda-Chevy Chase cluster) that was modified in the last 10 years.

Examples of Diversity and Dissimilarity in Island Assignments

In this section we examine the effects of island assignments on the socio-economic and racial diversity of their schools. Figures 2.3.56 and 2.3.58 are examples of schools with island assignments, Marshall Elementary School (two islands) and Sequoyah Elementary School (one island). In these examples we examine the socio-economic and racial backgrounds of students living the island assignments to the socio-economic and racial make-up of the school overall.
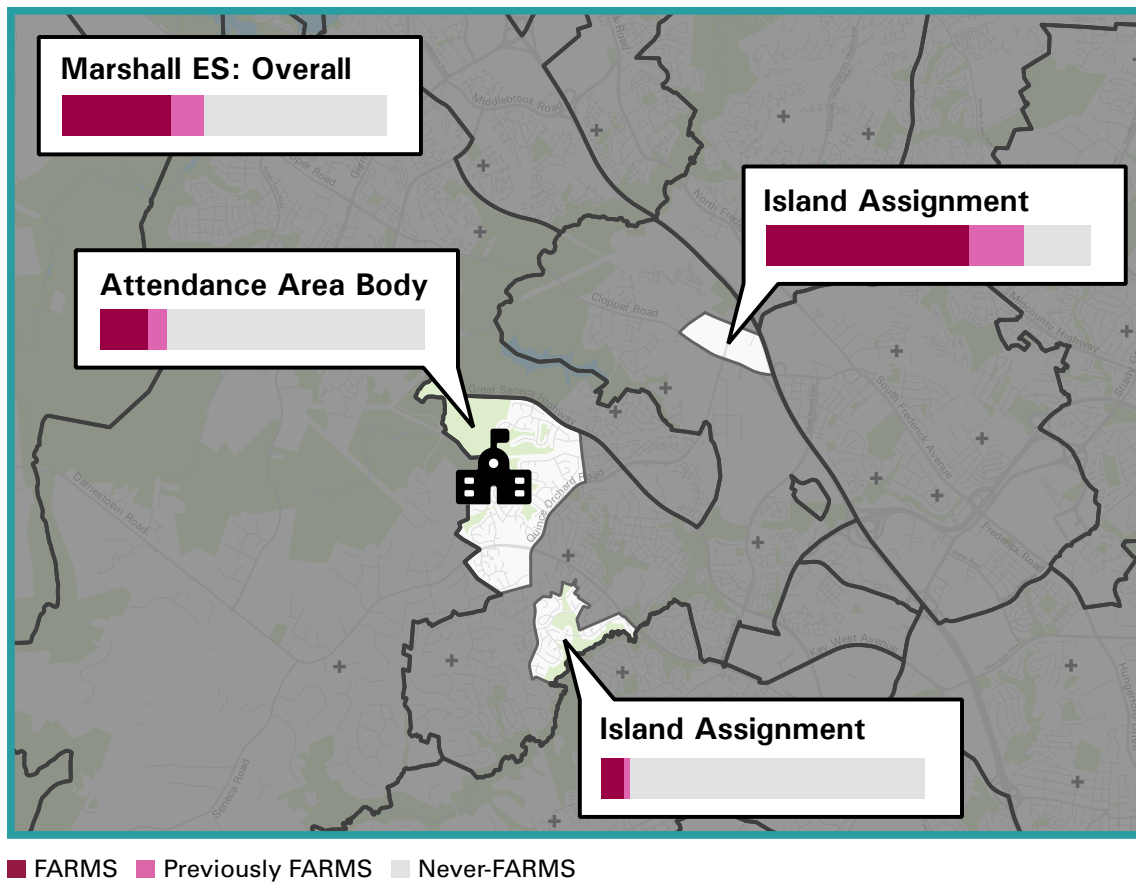

■ FARMS ■ Previously FARMS ☐ Never-FARMS

🏫 School in focus   ☐ Cluster boundaries   ☐ School attendance area

Figure 2.3.56 *Example of Elementary School with Socio-economically Dissimilar Islands: Marshall ES*

In the case of Marshall Elementary School, we notice that neither the school's attendance area body – the piece of the attendance area where the school is located – nor any of its island assignments are very socio-economically similar to the school overall. Marshall ES has an overall FARMS rate of 34%, while its attendance area body has a FARMS rate of 15%, and its island assignments have FARMS rates of 7% and 63%, respectively. Accordingly, the socio-economic dissimilarity indices of the attendance area body and island assignments to the school overall are relatively high (see Figure 2.3.57).

School	FARMS	Previous FARMS	Never-FARMS	Dissimilarity to School Overall
Marshall ES Overall	34%	10%	56%	NA
Attendance Area Body	15%	6%	79%	23%
Island Assignment 1	7%	2%	91%	35%
Island Assignment 2	63%	17%	20%	36%

Figure 2.3.57 *Example of Elementary School with Socio-economically Dissimilar Islands: Marshall ES*

In particular, we notice the dissimilarity indices of Marshall ES's island assignments are significantly more dissimilar – a difference of more than ten points – to the school overall than the attendance area body. We find similar patterns for schools with island assignments, where the attendance area body is often relatively more similar to the school overall than its island(s) are to the school overall.

We find that island assignments tend to have significantly higher FARMS rates than attendance area bodies – the part of the attendance area where the school is located. Across school levels, the FARMS rate of students living in island assignments is 42%, compared to only 32% in attendance area bodies. These figures are weighted by population, since some islands do not have large populations.

Accordingly, we also find that islands have larger socio-economic dissimilarity to their schools than attendance area bodies across school levels. Islands on average have a socio-economic dissimilarity of 20% when compared to their schools' populations overall. By contrast, attendance area bodies – the part of the attendance area where the school is located – have on average a socio-economic dissimilarity of only 8% when compared to their schools overall.
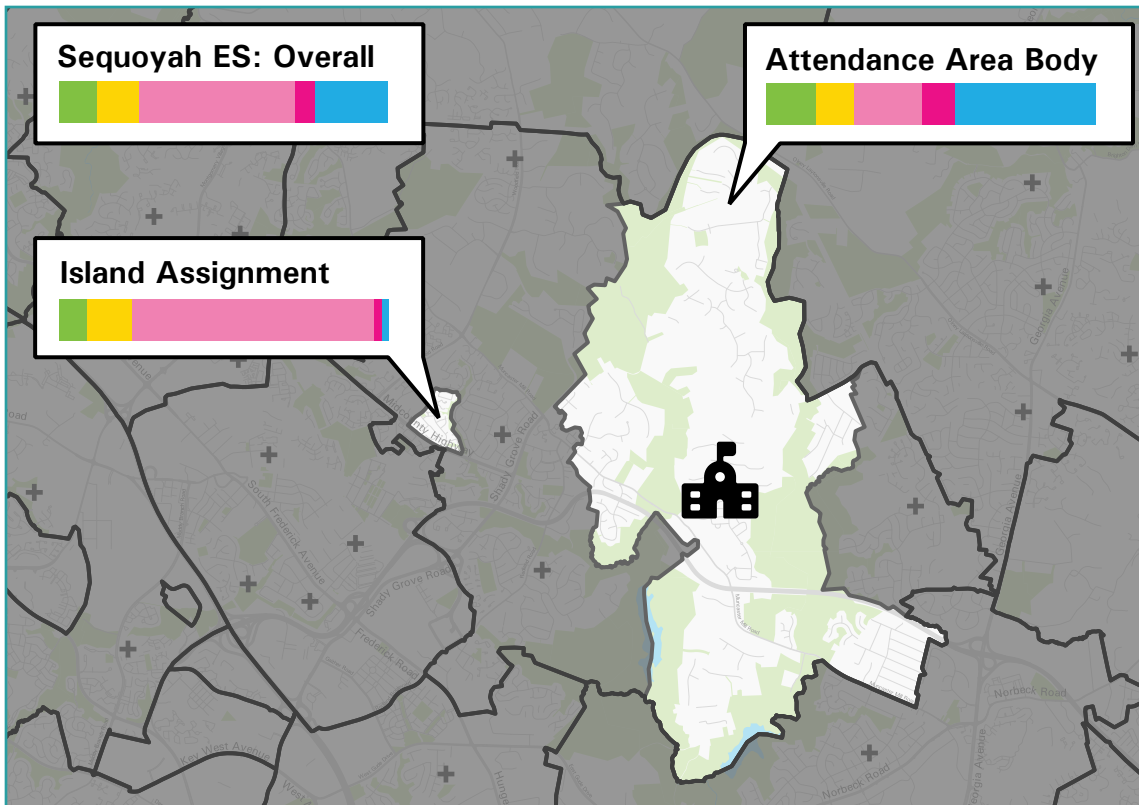
Asian ■ **Black** ■ **Hispanic** ■ **Other** ■ **White**

School in focus ☐ Cluster boundaries ☐ School attendance area

Figure 2.3.58 *Example of Elementary School with Racially Dissimilar Islands: Sequoyah ES*

Examining racial dissimilarity in the case of Sequoyah Elementary School, we find similar patterns to those with Marshall ES. Neither the school's attendance area body nor its island assignment are racially similar to the school's racial composition overall.

School	Asian	Black	Latinx	Other	White	Dissimilarity to School Overall
Sequoyah ES Overall	12%	13%	47%	6%	22%	NA
Attendance Area Body	15%	12%	21%	10%	43%	28%
Island Assignment	8%	14%	73%	3%	2%	27%

Figure 2.3.59 *Example of Elementary School with Racially Dissimilar Islands: Sequoyah ES*

Notably, the proportion of Hispanic and White students is markedly different in the school's attendance area body versus its island assignment: 21% of students in the attendance area body are Hispanic, compared to 73% in the island assignment; 43% of students in the attendance area body are White, compared to 3% in the island assignment. We notice differences in the racial/ethnic composition of Asian, Black, and students of other racial/ethnic backgrounds between the island assignment and attendance area body, but these are less pronounced than for Hispanic and White students.

Sequoyah ES is an example of a school where its island assignment has a similar total population to the attendance area body overall. For this reason, we see that the dissimilarity indices of the two attendance area pieces are similar, 28% and 27% respectively.

Island Assignment Dissimilarities Across the District

The following maps examine the socio-economic and racial dissimilarities of individual island assignments and attendance area bodies to the overall socio-economic and racial make-up of their schools overall. Figure 2.3.60 looks at racial dissimilarity for elementary schools. Figure 2.3.61 looks at socio-economic dissimilarity for middle schools. Schools without island assignments are not shown.

■ 0 - 10%   ■ 10 - 20%   ■ 20 - 30%   ■ 30 - 40%   ■ 40% or more   □ Cluster
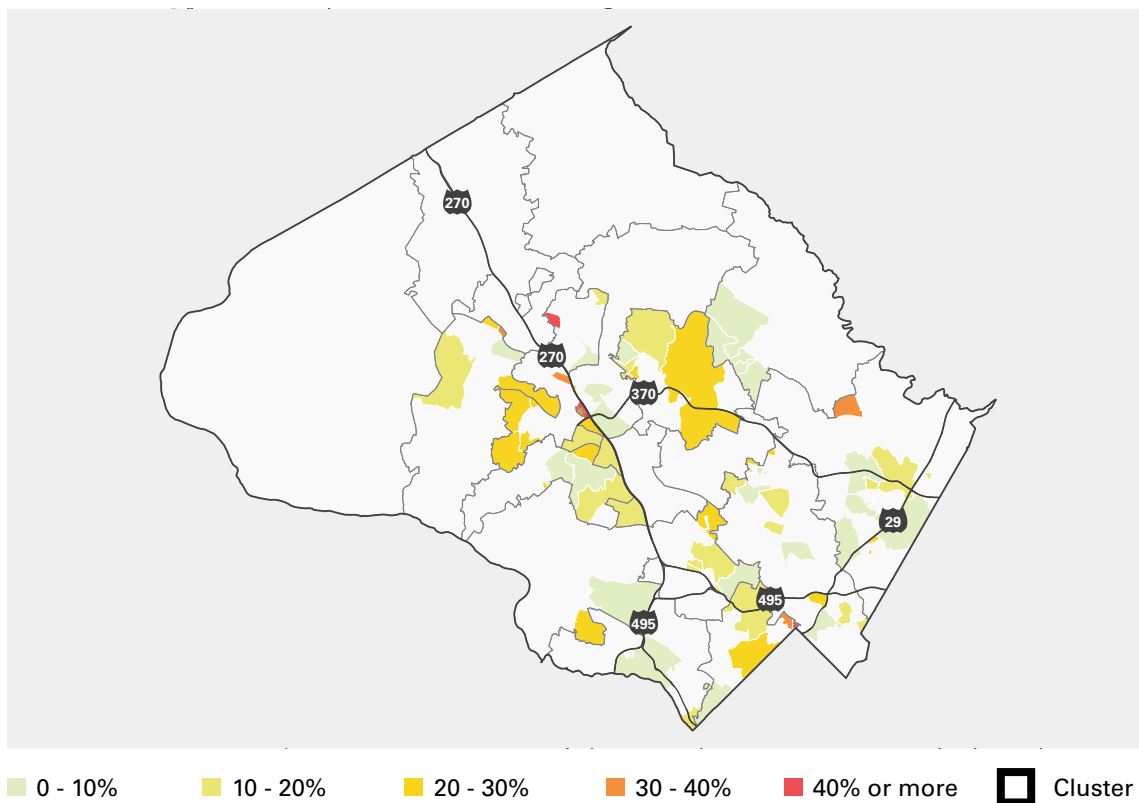
Figure 2.3.60 *Racial Dissimilarity of Elementary School Island Assignments to Their School*

The map above examines the racial dissimilarity of elementary school island assignments and attendance area bodies to the overall racial make-up of their school. First, we notice that elementary schools with island assignments are more common in midcounty and down-county areas.

However, not all elementary schools with island assignments have islands and attendance area bodies that are racially dissimilar from their school overall. Island assignments and attendance area bodies in the Walt Whitman and Sherwood clusters have dissimilarity indices under 10%, with one exception at 11%.

Elementary schools with island assignments and attendance area bodies most racially dissimilar from their schools overall are clustered in the Quince Orchard, Northwest, Watkins Mill, and Magruder clusters.

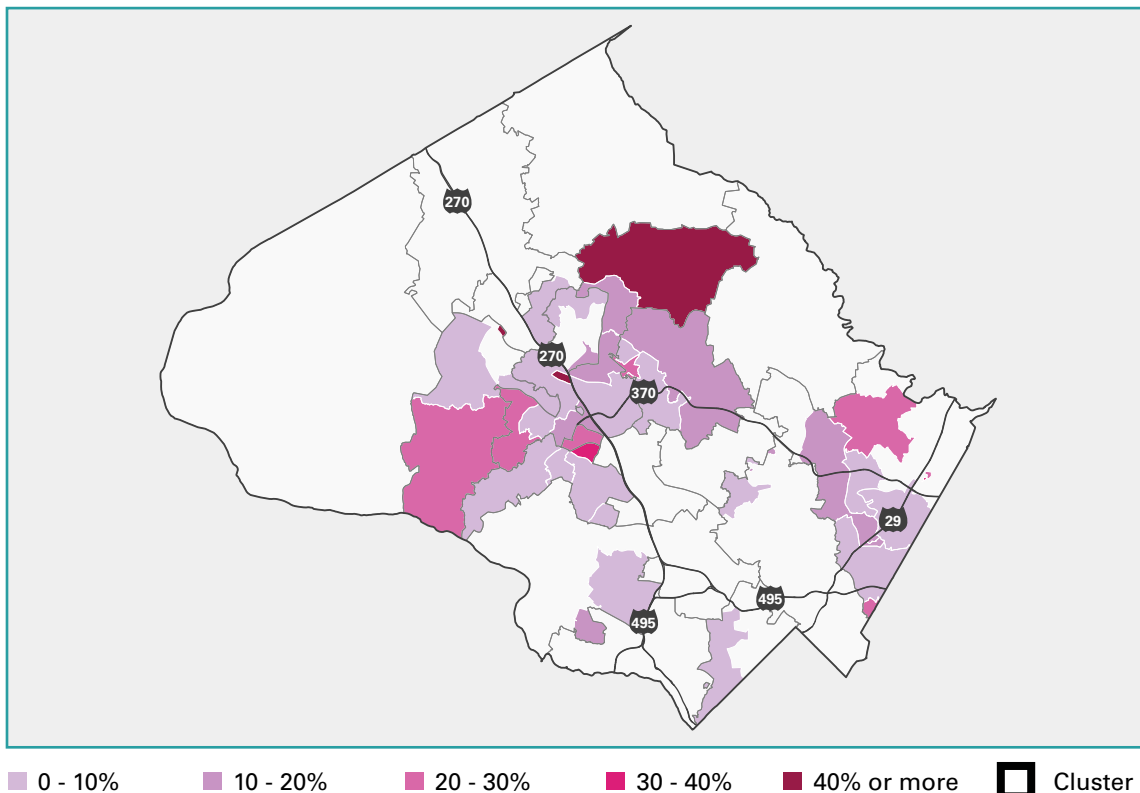0 - 10%   10 - 20%   20 - 30%   30 - 40%   40% or more   ☐ Cluster

Figure 2.3.61 *Socio-economic Dissimilarity of Middle School Island Assignments to Their School*

The map above examines the socio-economic dissimilarity of middle school island assignments and attendance area bodies to the overall socio-economic make-up of their school. Similarly to racial dissimilarity at the elementary school level, we notice that middle schools with island assignments are more common in midcounty and down-county areas (in particular in the Northeast Consortium).

Middle schools whose islands and attendance area bodies are most dissimilar from their overall socio-economic make-up are principally in the Wootton, Northwest, Quince Orchard, Gaithersburg, and Magruder Clusters, as well as in the Downcounty Consortium.

Contextualizing Island Assignment Dissimilarity

Figure 2.3.60 and **Figure 2.3.61** map the dissimilarities between the racial and socio-economic backgrounds of students living in schools with island assignments to the overall racial and socio-economic backgrounds of their schools overall. To better understand these dissimilarity indices, we compare the indices to the socio-economic and racial dissimilarities of schools across the county to their

nearest three schools. These are the same dissimilarity indices explored in detail in subsections 2 and 3. This comparison is not perfect: we are comparing two dissimilarity indices with different scales of analysis. Nevertheless, by examining the overall distribution of dissimilarity indices for the two scales of analysis, we can better understand where we see more socio-economic and racial dissimilarity in schools.

The following set of figures compare the socio-economic and racial dissimilarity of elementary and middle schools to their nearest schools to the socio-economic and racial dissimilarity of island assignments to their schools. Using this method, we are able to see whether, overall, schools are more likely to be similar to their nearest schools or islands to their schools.

Indeed, we find that schools are more likely to be socio-economically and racially similar to their nearest three schools than island assignments are to their own school. This suggests that island assignments are more likely on average to be an effective tool for diversifying schools along socio-economic and racial lines than boundary changes between nearby schools.
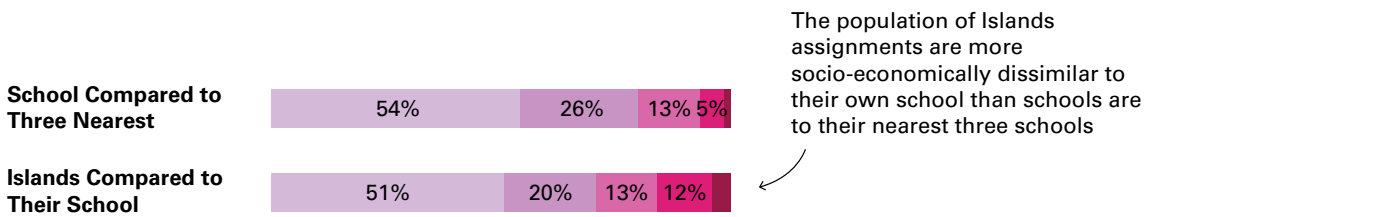
The population of Islands assignments are more socio-economically dissimilar to their own school than schools are to their nearest three schools

School Compared to Three Nearest: 54% | 26% | 13% | 5%

Islands Compared to Their School: 51% | 20% | 13% | 12%

Figure 2.3.62 *Comparing the Socio-economic Dissimilarity of Elementary Schools to Their Nearest Schools to the Dissimilarity of Islands and Their Schools*
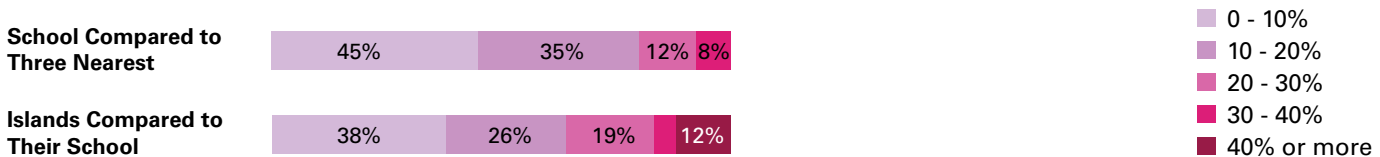
School Compared to Three Nearest: 45% | 35% | 12% | 8%

Islands Compared to Their School: 38% | 26% | 19% | 12%

- 0 - 10%
- 10 - 20%
- 20 - 30%
- 30 - 40%
- 40% or more

Figure 2.3.63 *Middle School Socio-economic Dissimilarity Compared to the Dissimilarity of Islands to Their Schools*

The population of Islands assignments are more racially dissimilar to their own school than schools are to their nearest three schools

School Compared to Three Nearest: 36% | 39% | 21%

Islands Compared to Their School: 29% | 29% | 28% | 8%
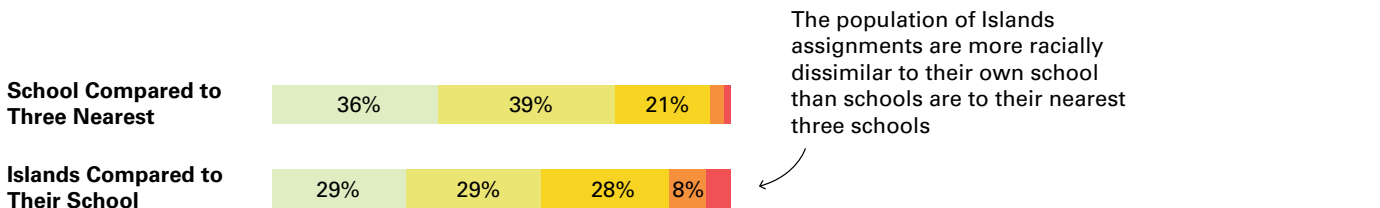
Figure 2.3.64 *Elementary School Racial Dissimilarity Compared to the Dissimilarity of Islands to Their Schools*

School Compared to Three Nearest: 25% | 48% | 18% | 8%

Islands Compared to Their School: 29% | 21% | 24% | 17% | 10%

- 0 - 10%
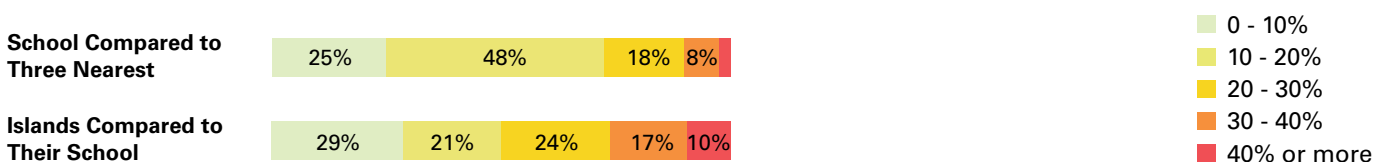- 10 - 20%
- 20 - 30%
- 30 - 40%
- 40% or more

Figure 2.3.65 *Middle School Racial Dissimilarity Compared to the Dissimilarity of Islands to Their Schools*

Examining the figures on the previous page, we notice two patterns. First, socio-economic dissimilarity indices follow a similar distribution to racial dissimilarity indices. This is true for both measures of dissimilarity and both school levels, ES and MS, examined. And second, we find that island assignments are more likely to increase diversity at the middle school level. Further inquiry might examine why this is; we hypothesize that this pattern exists because middle school island assignments are geographically larger and farther apart than at the elementary school level.

D.2 Diversity and School Choice Programs

Historically, school choice programs have been one strategy for voluntary integration of schools in MCPS.[1] So, it is instructive to ask the question of how diversity may be impacted by these programs, and how these programs may impact diversity across MCPS.

In the following analysis, we examine schools with regional special programs only. Many schools in MCPS offer special programs but where enrollment is limited to students living in its attendance area. These are called local school programs and are not included in this analysis. In sum, we examine 17 elementary schools, 11 middle schools, and seven high schools with regional special programs.

The 11 middle schools with special programs are more socio-economically similar to their nearest schools than other middle schools.
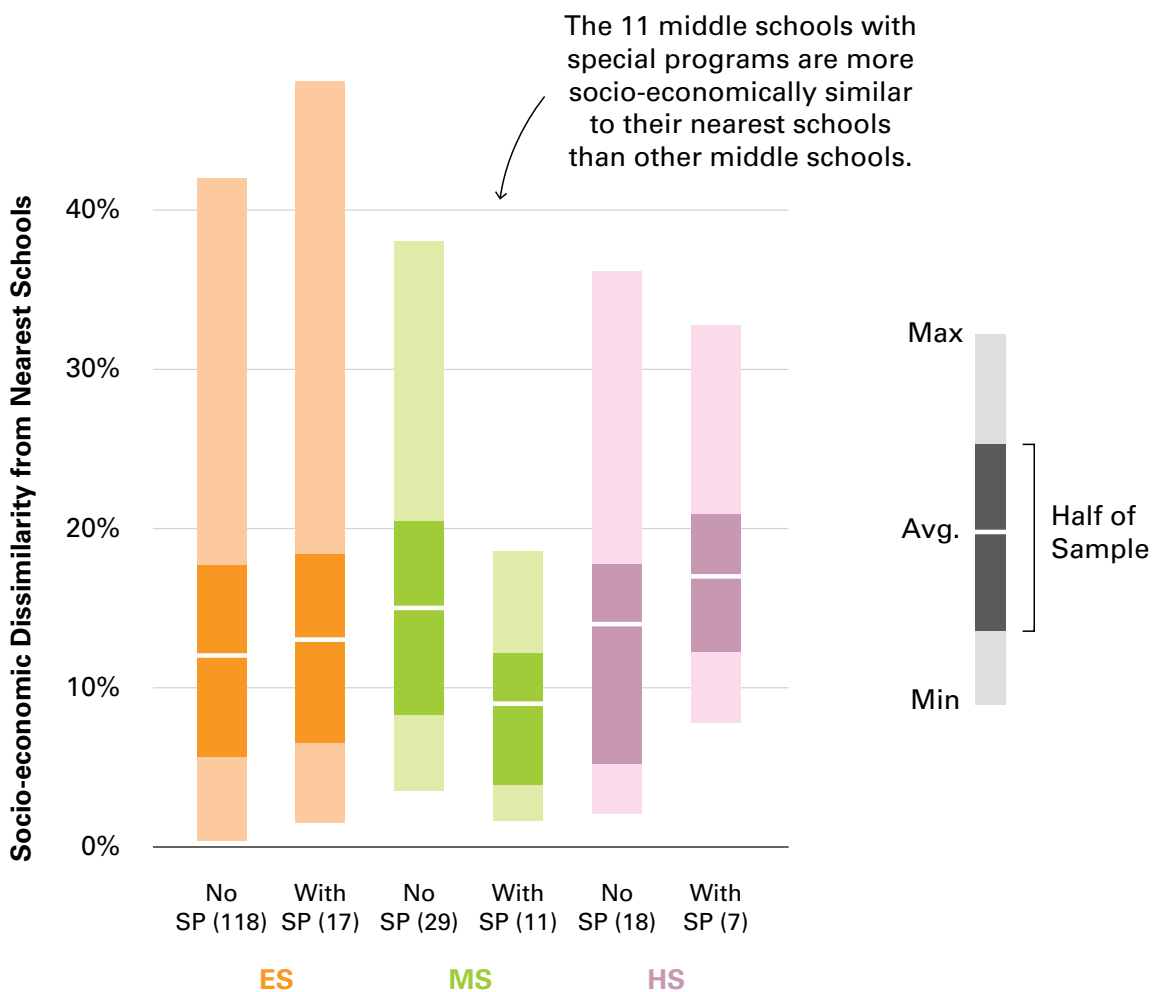
Figure 2.3.66 *Socio-economic Dissimilarity of Schools with and Without Special Programs*

---

1   See "Policy History" in the **Introduction Section, on page 53**, for more discussion of the history of school choice and other MCPS policies

We find that elementary and middle schools with special programs are slightly more likely to be racially and socio-economically similar to their nearest three schools. The seven high schools appear slightly more racially and socio-economically dissimilar from their nearest three schools.

For all three school levels, we notice outliers with dissimilarity indices much larger or smaller than the district average. As we are examining relatively small samples, it is important to keep these cases in mind. While a special program may skew a school to be more or less dissimilar from its nearest three neighbors, the socio-economic and racial/ethnic demographics of every school is unique to its attendance area.

Overall, the average racial dissimilarity indices of the 17 elementary schools with special programs is 14%, compared to 15% for elementary schools without special programs. The average socio-economic dissimilarity indices of the 17 elementary schools with special programs is 13%, compared to 12% for elementary schools without special programs. This is a very small difference (one percentage point in both cases) not likely attributable to the existence of special programs at the schools.

Middle schools with and without special programs, by contrast, show notable differences between racial and socio-economic dissimilarities. Overall, the average racial dissimilarity indices of the 11 middle schools with special programs is 12%, compared to 18% for middle schools without special programs. The average socio-economic dissimilarity indices of the 11 middle schools with special programs is 9%, compared to 15% for middle schools without special programs. Racial and socio-economic dissimilarity indices at the middle school level are both six points lower on average.

The special programs at these 11 middle schools are likely responsible in part for these observed differences in dissimilarity indices. Given that the dissimilarity indices of most schools cluster around the median dissimilarity index at each school level, as seen in Figure 2.3.29 in Section B.1, discrepancies as large as those observed for middle schools are notable. Further, we can be confident that sampling error does not play a large role in these observed differences: the 11 middle schools with special programs represent more than one in four middle schools overall, a substantial share.

School has Special Program(s)	School Level	No. of Schools	Racial Dissimilarity to Nearest Schools				Socio-economic Dissimilarity to Nearest Schools			
			Avg.	Median	Max	Min	Avg.	Median	Max	Min
No	ES	118	15%	13%	43%	2%	12%	9%	42%	0%
	MS	29	18%	16%	44%	4%	15%	13%	38%	4%
	HS	18	17%	13%	37%	2%	14%	12%	36%	2%
Yes	ES	17	14%	12%	34%	3%	13%	8%	48%	2%
	MS	11	12%	11%	28%	5%	9%	8%	19%	2%
		7	19%	16%	38%	13%	17%	15%	33%	8%

Figure 2.3.67 *Racial and Socio-economic Dissimilarity of Schools to their Nearest Three Schools by Existence of Special Program at School*

Finally, high schools with special programs appear slightly more racially and economically dissimilar from their nearest three schools than high schools without special programs. Here, we examine only seven high schools – those with districtwide or regional application programs. Local special programs are excluded, as with elementary and middle schools. Further, we exclude regional career related special programs.

Overall, the average racial dissimilarity indices of the seven high schools with special programs is 19%, compared to 17% for high schools without special programs. The average socio-economic dissimilarity indices of the seven high schools with special programs is 17%, compared to 14% for high schools without special programs.

These discrepancies in dissimilarity indices between high schools with or without special programs are small, but notable. The seven high schools with special programs represent 28% of all high schools – a substantial share. These are small differences (three percentage points or less in both cases) not likely attributable to any large degree to the existence of special programs at the schools.

Further Inquiry

These analyses of diversity reveal several initial insights about the current conditions of school boundaries, assignment patterns, and student demographics in MCPS. There are many possible directions for further inquiry, including but certainly not limited to the list below.

Directions for further inquiry:

- Analysis of historical changes in FARMS rates, racial/ethnic demographics, and ESOL enrollment.

- Relationship of FARMS rates and student performance.

- Relationship of diversity metrics to attendance area sizes and attendance area population densities.

- History of diversity metrics, 2010-2018.

- Comparison of MCPS demographic data to census demographics:

  - Comparison of race categories to county racial demographics for census school-aged-children

  - Comparison of ESOL metrics to foreign-born population.

- Transience of ESOL students in the student body.: how many years of school do these students receive, compared to the average student?

- Detailed analysis of neighborhood dynamics and their effects on school diversity: are middle class communities more likely to live near low income communities than affluent communities? In the case boundary changes, which communities are most likely to be affected by changed reassignments?

- Analysis of island assignments, diversity, and proximity, including a comparison of demographics in different pieces of island assignments as related to distance traveled to school.

- Detailed analysis of student flows to special programs by socio-economic and racial/ethnic background.

In addition to the possible analyses listed above, there is ample opportunity for analysis of the interrelatedness of the key lenses in this report: utilization, diversity, proximity, and assignment stability. Future stages of this comprehensive boundary analysis will focus on interrelatedness.