

Enrollment Projections in D.C. Public Schools: Controls Needed to Ensure Funding Equity

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A report for ODCA by the Center for Research and Reform in Education



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The Hon. David Grosso, Chairman
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1350 Pennsylvania Avenue N.W.
Washington, DC 20004

Dear Councilmembers:

I am pleased to share the following research report entitled ***Enrollment Projections in D.C.'s Public Schools: Controls Are Needed to Ensure Funding Equity*** written by the Center for Research and Reform in Education of the Johns Hopkins School of Education.

The Office of the D.C. Auditor (ODCA) has been engaged in comprehensive education research at the request of the Council of the District of Columbia. In September 2018 ODCA published [A Study of Enrollment Projections for D.C.'s Public Schools: Assuring Accuracy and Transparency](#), which was funded by the D.C. Council at the initiation of Councilmember Mary Cheh. The new report is a deeper dive into the enrollment data provided through the Office of the State Superintendent of Education and MySchoolDC, the enrollment lottery overseen by the Deputy Mayor for Education, with a focus on the impact on subgroups of students. These include students of color, students considered at-risk under D.C. Code provisions, students with disabilities (SWD), and students who are English language learners (ELL).

ODCA presents this research at a time when the legislative and executive branches of the District's government are collaborating to create an education Research Practice Partnership. We hope the new partnership makes good use of the results of ODCA-supported research and fulfills the vision of its legislative sponsors: to contribute to a cycle of continuously improving public education in the nation's capital.

This report, **Enrollment Projections in DC's Public Schools: Controls Are Needed to Ensure Funding Equity**, raises important questions about the long-term impact of the city's robust choice environment and continuing patterns of neighborhood segregation by income and race. The study finds that almost 40% of public-school students attended the school that was closest to their homes. When students did not attend the school that was closest to their homes, they most frequently attended another school within their ward of residence, followed by a school in an adjacent ward.

Two critical takeaways from this study highlight the interconnected nature of public-school enrollment and subsequent resource allocation in the District, explained in much greater detail in the report itself. First, there is a pattern of District families moving away from schools with more students considered at-risk to schools with fewer students considered at-risk. These moves are facilitated by the robust choice model in DC. This pattern impacts schools with high levels of student poverty that subsequently face declining fall enrollment followed by declining resources.

Second, the report confirms a very high degree of school mobility particularly among students of color and students living in Wards 7 and 8. We know from earlier research that school mobility is strongly associated with negative impacts on student outcomes, including achievement, graduation, engagement, attendance, and discipline. Again, both year-to-year and mid-year moves are facilitated by our robust choice model combined with scant publicly available information regarding the unintended consequences associated with school moves particularly for students considered at-risk. Further, the patterns in mid-year moves show a net loss in enrollment in the charter sector and a net gain in DCPS schools that is largely unaccounted for by a funding model that does not re-allocate resources mid-year. This raises the question of whether resources based on enrollment should account for mobility itself, and/or should consider a multiplier effect when schools serve increasing proportions of student who are at-risk, ELL and SWD.

These and other points raised in this research merit additional study. We conclude by presenting three major recommendations for District policymakers to improve the accuracy of enrollment projections, better align funding with actual enrollment, in large part due to mid-year entries concentrated in certain schools, and ensure equitable funding for schools serving higher concentrations of students deemed at-risk.

The principal author of the report is Rebecca Wolf, Assistant Research Scientist with the Center for Research and Reform in Education at Johns Hopkins School of Education. Her co-authors on this report are Clayton Armstrong, Research Data Analyst, and Steven Ross, Senior Research Scientist with CRRE. We thank them for their excellent analysis.

In addition, ODCA thanks Deputy Mayor for Education Paul Kihn and State Superintendent of Education Hanseul Kang and their respective teams for their considerable assistance in sharing the data on which the report is based. ODCA will follow up on the recommendations in this report and we hope it is of significant value to District policymakers and others committed to the academic achievement of all of the District's children.

Sincerely yours,



Kathleen Patterson
District of Columbia Auditor

Enrollment Projections in D.C. Public Schools: Controls Needed to Ensure Funding Equity

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**Center for Research and
Reform in Education**

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Executive Summary

Enrollment Projections in D.C. Public Schools: Controls Needed to Ensure Funding Equity

The Office of the District of Columbia Auditor (ODCA) contracted with the Center for Research and Reform in Education (CRRE) at Johns Hopkins University (JHU) to study the effects of errors in enrollment projections in D.C. public schools, and whether and how available data can better inform those projections. CRRE is a research center affiliated with JHU's School of Education that specializes in K–12 education program evaluations.

A recent report commissioned by ODCA examined the accuracy of enrollment projections by District of Columbia Public Schools (DCPS) and by charter local educational agencies (LEAs).¹ While the report found that enrollment projections were fairly consistent with LEA level enrollment, based on a sum of October-audited school enrollments, the report found inaccuracies in school-level enrollment projections. More specifically, less than 40% of school-level enrollment projections were within two percentage points above or below the projection. Importantly, the report found that errors in school-level enrollment projections were greater in certain wards, in transition grades, and in schools with more student mobility or “churn.”

The prior report did not look comprehensively at how factors such as student mobility and school demand—both of which affect a school's enrollment and therefore its funding—related to the accuracy of enrollment projections. In addition, the prior report did not address the accuracy of enrollment projections for specific student subgroups that receive additional funding in the District's Uniform Per Student Funding Formula (UPSFF).

This study provides a more robust investigation into the relationship between enrollment projection accuracy and factors that likely influence the accuracy of projections. Additionally, this study seeks to better understand the accuracy of enrollment projections for specific student subgroups that receive additional funding: special education, ELL, and students considered to be at-risk. In the District, the at-risk classification includes students in families qualifying for the Supplemental Nutrition Assistance Program (SNAP) or Temporary Assistance for Needy Families (TANF) program and students who are homeless, in foster care, or over-age for their grade in high school.² Findings and recommendations from this study are summarized in the following sections.

¹ Office of the D.C. Auditor, [A Study of Enrollment Projections for D.C.'s Public Schools: Assuring Accuracy and Transparency](#), September 28, 2018.

² D.C. Code § 38–2901(2A).

Findings

Findings from this study have implications for enrollment projection methodology as well as the allocation of resources among DC's schools:

- In most cases enrollments declined over time for schools serving very large percentages of at-risk students. Declining enrollments mean fewer resources each year for schools serving the largest percentages of at-risk students.
- Schools serving greater proportions of at-risk and black students experienced higher year-to-year student mobility than schools serving lower proportions of at-risk and black students, and this was true in both sectors. Schools with highly mobile student populations may need more resources to support students, both academically and in terms of social-emotional development.
- Mid-year mobility is important to consider to accurately project local education agency and school enrollments in order to adequately fund schools. Virtually all charter schools experienced a net loss of students mid-year. For DCPS, the net change for most schools was positive and was largest for schools serving large proportions of at-risk students.
- DCPS schools with declining enrollments, greater proportions of at-risk students, and decreasing neighborhood demand (defined as change in the in-boundary capture rate) were more likely to be over-projected for October enrollment, meaning that the enrollment predicted and used as a basis for funding was higher than the actual enrollment in the school as of October.
- Conversely, DCPS schools with increasing enrollments, lower proportions of at-risk students, and increasing neighborhood demand were more likely to be under-projected for enrollment.
- Charter schools with greater proportions of students who were categorized as both "at-risk" and special education were more likely to be over-projected for enrollment.
- New schools in both sectors were more likely to be over-projected for enrollment, and in some cases, new schools' enrollments were over-projected by more than 150%.
- Projection errors for the special education and ELL student subgroups corresponded with changes over time in these populations within each school. The percentage of ELLs in particular has increased in the vast majority of DCPS schools with corresponding under-projections of ELLs in DCPS schools.
- There was no demonstrable relationship between the opening of new schools and nearby schools' enrollment projection errors in the year in which the new schools opened. This finding defines proximity based on the straight-line distance between schools and did not account for student travel times or schools' accessibility by public transportation. When a school closed and a new school opened in the same location,

however, the majority of students who attended the newly opened school transferred from the previous school at the same location.

- Approximately 40% of students attended either their in-boundary DCPS school or another school that was closer to their homes and this percentage has remained stable over time. In addition, the highest proportion of students who did not attend their in-boundary schools attended another school located within their ward of residence, followed by schools located in a ward adjacent to their residence.
- Within each city ward, increases in the percentage of students attending schools in one sector appeared to correspond with decreases in the percentage of students attending schools in the other sector.
- Among students who did not attend their in-boundary schools, all student subgroups selected out-of-boundary or charter schools that served lower average percentages of at-risk students than their neighborhood schools.
- Across all schools, 13% of students changed schools from one year to the next for reasons other than matriculation. This percentage was 17% for at-risk students, 16% for students attending schools in Ward 7, and 18% for students attending schools in Ward 8.
- Approximately one-third of year-to-year student mobility in non-transition years also coincided with a change in student home address, indicating that about one-third of school moves may have been driven by a residential move rather than the desire for a new school. For at-risk students, about 40% of year-to-year student mobility in non-transition years coincided with a change in student residence.
- The most frequently observed school-to-school transitions were made within local education agencies through “feeder” patterns for middle and high schools, and this was true in both sectors. This finding indicates that feeder patterns are a mechanism through which LEAs can retain students as they matriculate from one school to the next.

Recommendations

Based on these findings and other factors influencing school enrollments over time, we outline three recommendations.

1. The Mayor should add demographic trends and enrollment patterns over time to current enrollment projection methodology to better align funding with actual enrollment.

Currently, enrollment projections for each LEA and school are largely based on historical enrollments. However, student populations and therefore patterns in enrollment may change over time. One example is that the population of ELLs in public schools in D.C. is increasing, and the use of historical enrollments alone will not accurately predict the number of EL students in D.C. schools. Another example is that the number of kindergarten students attending their in-boundary schools is increasing in some neighborhoods, leading to under-projections in enrollments in those schools. Instead of basing enrollment projections largely on historical enrollments, a predictive model could be used to determine the expected increase in the number of students based on demographic shifts over time. Enrollment projections could be adjusted to reflect a combination of both historical enrollments and forecasted changes in the population over time with funding commensurate with population.

It is also worth considering the geographic location of existing schools and feeder patterns in determining projections. Nearly 40% of public-school students attended the school that was closest to their homes. When students did not attend the school that was closest to their homes, students most frequently attended another school within their ward of residence, followed by a school in an adjacent ward. Similarly, feeder patterns also appeared to explain frequently observed school-to-school enrollment patterns. In summary, enrollment projection methodology could be strengthened by making use of a broader range of available data and information.

2. The Mayor and D.C. Council should adjust enrollment projection methodology to accommodate mid-year student mobility.

Findings indicate that some schools that were initially over-projected for enrollment as of October were actually under-projected for the net number of students served by May in the school year. In contrast, some schools that were initially under-projected for enrollment as of October were dramatically over-projected for the net number of students served by May. Moreover, the schools that took in the greatest share of students mid-year and after the October enrollment audit were DCPS schools serving the largest percentages of at-risk students. More research is needed to determine whether DCPS was adequately compensated for mid-year student mobility, and whether individual schools within DCPS were appropriately funded given the net number of students served throughout the school year. More research is also needed to understand what enrollment metric best represents the level of LEA funding needed to adequately fund schools for the students they serve.

3. The Mayor and D.C. Council should ensure equitable funding for schools serving the largest percentages of students classified by the District as at-risk and those experiencing high levels of student mobility.

Enrollments declined over time for most schools serving the largest percentages of at-risk students because many families chose to opt out of these schools. Whether in terms of demand for schools in the My School DC Lottery, the percentages of students attending their in-boundary DCPS schools, and distances traveled to attend schools, a recurring theme in this report is that D.C. families systematically select away from schools serving large percentages of at-risk students. Additional investments in schools serving large percentages of at-risk students may be needed, given tendencies of the larger system to place these schools at a resource disadvantage through school choice. Declining enrollments mean fewer resources (relatively speaking) each year for schools serving the largest percentages of at-risk students.

Yet schools serving the largest percentages of at-risk students may conceivably need more, not fewer, resources to meet the needs of their students. Importantly, students in these schools experience the highest rates of student mobility compared with students in other schools. Across all schools, 13% of students changed schools from one year to the next for reasons other than matriculation. This percentage was 17% for at-risk students, 16% for students attending schools in Ward 7, and 18% for students attending schools in Ward 8. Prior research has linked high rates of student mobility with negative outcomes, such as lower graduation rates, test scores, grades, attendance rates, and level of student engagement. More research is needed to determine the appropriate level of supplemental funding needed for schools serving students who may be affected by greater school or residential mobility.

Additional policies are needed to address the inequities that can result from longstanding patterns of residential segregation and the more recent pattern of families selecting away from schools serving the largest concentrations of at-risk students. If families perceive differences in school quality for schools serving large percentages of at-risk students, why is that the case? Prior research has pointed to a number of potential factors that may decrease demand for schools serving large proportions of low-income students, including higher rates of teacher and principal attrition, inadequate facilities, lack of materials and supplies, and poor school climate. On the other hand, prior research has also highlighted the barriers for underserved families to take advantage of school choice options to the same extent as middle- and upper-income white families, even in choice-rich contexts. Future research could explore to what extent schools with larger at-risk populations suffer from a lack of investment or are further disadvantaged in D.C.'s current school choice system, and how policy levers could be used to help ensure a high-quality education for all students in the District.

Study of Enrollment Projections for D.C.'s Public Schools: Demand, Mobility, & Other Factors Relating to Projection Accuracy

Introduction and purpose

The Office of the District of Columbia Auditor (ODCA) contracted with the Center for Research and Reform in Education (CRRE) at the Johns Hopkins University (JHU) to conduct a study of the errors in enrollment projections for D.C. public schools and their impact and to explore whether and how available data can better inform enrollment projections. CRRE is a research center affiliated with JHU's School of Education that specializes in K-12 program evaluations.

A recent report commissioned by the Office of the District of Columbia Auditor (ODCA) examined the accuracy of enrollment projections by the District of Columbia Public Schools (DCPS) and by charter local educational agencies (LEAs).³ While the report found that enrollment projections were somewhat consistent with actual school enrollments, the report also found that errors in enrollment projections were greater in certain wards, in transition grades, and in schools with more student mobility or "churn." The report addressed only minimally how factors such as school demand, mobility, and closures and openings related to the accuracy of enrollment projections. In addition, the report did not address the accuracy of enrollment projections for specific student subgroups.

The primary purposes of this follow-up study were to:

- Identify factors related to enrollment projection errors for D.C. public schools, including errors for specific student subgroups (e.g., special education, ELL, and at risk).
- Explore factors related to school mobility and demand, both of which may affect a school's enrollment, and the resulting impact.

Why are enrollment projections important?

The District of Columbia determines funding for DCPS and charter LEAs using a formula that is based on the next-year enrollment projections. The formula allocates a per-pupil dollar amount to LEAs for each projected student, as well as for each student classification. Charter LEAs receive an additional per pupil facilities allotment based on next-year enrollment projections. Therefore, enrollment projections determine the operating budgets of DCPS and charter LEAs.

If charter LEAs' projections for the school year differ from the audited student enrollment on October 5, charter LEAs funding will be adjusted accordingly. This is possible because charter LEAs are funded in quarterly installments. There is currently no similar process to adjust DCPS funding if projections differ from audited enrollment. Therefore, enrollment projections are very consequential for DCPS.

Today LEAs and schools are not funded to serve all of their students if students enter after the October enrollment audit. This may be a problem particularly for schools that take in the

³ Office of the D.C. Auditor, [A Study of Enrollment Projections for D.C.'s Public Schools: Assuring Accuracy and Transparency](#), September 28, 2018.

greatest number of students after the October enrollment audit. As explained in the previous report, DCPS typically receives an additional 2% increase in its operating budget over the per-student allotment because students have historically disproportionately entered DCPS schools after October 5 relative to charter schools.⁴ For example, by May in the 2017–18 school year, DCPS had gained about 1% of its initial student population, and charter LEAs collectively lost about 3% of their population.⁵ Yet it is still unclear whether the 2% additional funding for DCPS was adequate per the Uniform Per Student Funding Formula (UPSFF) funding levels for the mid-year mobile students, especially if students were considered at-risk, or had special education or English language needs. This report does not determine exactly how much it would cost to offset mid-year student mobility because mid-year mobility at the individual student level was not available in the data, and such information would be needed to calculate the percentage increase necessary to ensure adequate funds per UPSFF levels.⁶

Accurately projecting school enrollment in the District is challenging due to a number of factors.⁷ In addition to student mid-year mobility, there can be multiple school closures and openings in a given school year, with disproportionate impacts on underserved student groups. Students may also attend schools other than their in-boundary DCPS schools, including out-of-boundary or no-boundary DCPS schools and charter schools. Better understanding patterns in student mobility and school demand may inform how to improve enrollment projections. Finally, enrollment projections are accurate only to the extent that school enrollment is stable over time. Therefore, modeling changes in school enrollment over time may also help improve the accuracy of enrollment projections.

Methodology

The primary purpose of this study is to describe the enrollment patterns and identify correlates of errors in enrollment projections. As such, this study is descriptive in nature. While findings show trends in school demand and mobility and associations among variables, the findings should not be interpreted as being causal, or indicating that one thing caused another. Other factors not observed in this study may be the causes. Nevertheless, descriptive research can identify “socially important phenomena” and “point toward causal understanding and to the mechanisms behind causal relationships.”⁸

⁴ 1. Office of the D.C. Auditor, [A Study of Enrollment Projections for D.C.'s Public Schools: Assuring Accuracy and Transparency](#), September 28, 2018. 2. Office of the State Superintendent of Education (OSSE), [Mid-Year Student Movement in DC](#), July, 2015.

⁵ This calculation was based on UPSFF counts for the two sectors and mid-year mobility data from OSSE included in the [School Report Card and STAR Framework Data](#) for the 2017–18 school year.

⁶ [2017-18 UPSFF](#).

⁷ See [A Study of Enrollment Projections for D.C.'s Public Schools: Assuring Accuracy and Transparency](#) for more details on how enrollment projections are determined.

⁸ Institute of Education Sciences, U.S. Department of Education, [Descriptive analysis in education: A guide for researchers](#), 2017, p. i.

Data sources

Multiple data sources were compiled for this study:

- **Office of the State Superintendent of Education (OSSE) student-level enrollment and boundary data.** These files included student, school, grade level, demographic characteristics, home address, and in-boundary school information.
- **My School DC Lottery data.** These files contained the lottery applications for all students who entered the first round of the My School DC Lottery. The data were missing student identifiers and could not be linked with the student enrollment data. The files also included school-level summaries, such as school lottery preferences (e.g., sibling), waitlist lengths and the number of offers made, and the number of seats made available in the lottery.
- **School-level enrollment projections.** These files contained enrollment projections for all schools, by grade and for specific subgroups (e.g., special education).
- **School-level characteristics.** This data file contained school characteristics, such as demographics, location, grade levels, and enrollment.
- **OSSE publicly available data.** Information on the extent of mid-year mobility for each school was taken from the OSSE school report card data, which is publicly available and included school data from the 2017–18 school year.⁹ Other data used for this study included OSSE enrollment audit and equity report data.

Most of the data files were available from the 2014–15 through 2017–18 school years, with the exception of the school-level enrollment projections. The school-level enrollment projections were available for the 2016–17 and 2017–18 school years, and the projections for specific subgroups (e.g., special education) were available only for both DCPS and charter LEAs in the 2017–18 school year.

Sample

Student enrollment data. Students were retained in the sample if they were in grades PK–12 and enrolled in a public school in D.C. Students who were enrolled in juvenile detention centers or special education schools located outside of D.C. were not included in the study.

Table 1 displays the sample sizes and characteristics of the student sample and contrasts this sample with the publicly available student demographics for D.C. public schools. The sample for this study is nearly identical to the overall public-school student sample as identified by OSSE. One slight difference in the samples, however, is that this study does not include adult students or students in atypical grades, which explains the slight differences in percentages across the two samples.

D.C. public schools served a predominantly black student population. In the 2017–18 school year, around 71% of public-school students in D.C. in grades PK–12 were black, 16% were Latino, and 11% were both white and non-Latino. The percentage of white students is not consistent across school years or samples due to differences in how race/ethnicity variables

⁹ OSSE, [School Report Card and STAR Framework Data](#), 2018.

were constructed each year. In the study sample for the 2015–16 school year, students were identified as being only one race or ethnicity, but in other school years, students could have been classified as more than one race or ethnicity.¹⁰ In the publicly available citywide data, students were identified as being only one race or ethnicity.

Table 1: Sample characteristics for student enrollment data

	Study Sample				Public School Students in DC ¹¹			
	2014– 15	2015– 16	2016– 17	2017– 18	2014– 15	2015– 16	2016– 17	2017– 18
DCPS	57.7%	57.5%	56.1%	55.0%	55.7%	55.5%	53.9%	52.5%
Charter	42.3%	42.5%	43.9%	45.0%	44.3%	44.5%	46.1%	47.5%
Special ed.	13.1%	13.4%	13.7%	14.1%	13.1%	13.1%	13.4%	13.8%
ELL	8.9%	9.0%	9.5%	11.2%	8.8%	9.0%	9.4%	11.1%
At-risk	49.3%	48.6%	46.3%	46.2%	46.5%	45.9%	43.7%	43.7%
Black	76.1%	71.0%	72.1%	70.9%	71.0%	69.8%	68.1%	67.0%
White ¹²	21.5%	10.3%	21.5%	22.0%	9.0%	9.7%	10.0%	10.0%
Latino	14.7%	15.1%	16.1%	16.4%	17.0%	17.0%	18.1%	19.0%
Other ¹³	1.8%	3.6%	3.7%	4.1%	3.0%	3.5%	3.8%	4.0%
Grade PK3	6.8%	6.5%	6.6%	6.6%	6.3%	6.1%	6.2%	6.2%
Grade PK4	8.3%	8.5%	8.2%	8.2%	7.8%	8.0%	7.7%	7.7%
Grade K	9.1%	8.9%	8.9%	8.7%	8.5%	8.4%	8.4%	8.2%
Grade 1	8.8%	8.6%	8.4%	8.4%	8.2%	8.1%	7.9%	7.9%
Grade 2	8.3%	8.2%	8.0%	7.9%	7.8%	7.7%	7.6%	7.4%
Grade 3	7.3%	7.8%	7.7%	7.6%	6.8%	7.4%	7.3%	7.2%
Grade 4	6.5%	6.9%	7.4%	7.3%	6.2%	6.5%	6.9%	6.9%
Grade 5	6.0%	6.3%	6.5%	7.1%	5.6%	6.0%	6.1%	6.7%
Grade 6	5.7%	5.7%	5.9%	6.1%	5.4%	5.3%	5.5%	5.7%
Grade 7	5.5%	5.5%	5.4%	5.7%	5.2%	5.2%	5.1%	5.4%
Grade 8	5.7%	5.3%	5.3%	5.2%	5.3%	5.0%	5.0%	4.9%
Grade 9	7.7%	7.5%	7.3%	6.8%	6.8%	6.6%	6.4%	5.9%
Grade 10	5.2%	5.2%	5.3%	5.3%	4.7%	4.6%	4.7%	4.7%
Grade 11	4.8%	4.8%	4.7%	4.8%	4.2%	4.2%	4.1%	4.2%
Grade 12	4.2%	4.4%	4.2%	4.4%	3.7%	3.7%	3.7%	3.9%
TOTAL	79,725	82,322	84,898	86,179	85,403	87,344	90,001	91,322

¹⁰ Race and ethnicity were not mutually exclusive in all study years except for 2015–16. As a result, 49% of white students were also coded as “Hispanic/Latino” and 4% of black students were also coded as “Hispanic/Latino.” Students who were coded as “Hispanic/Latino” were also coded white (68%) and black (17%). In the 2015–16, students were coded as being only one race or ethnicity. So, for example, percent white in the 2015–16 school year represented percent white and non-Latino.

¹¹ OSSE, [Enrollment Audit Data](#), [Equity Reports](#), and [School Report Card and STAR Framework Data](#). Student race/ethnicity were coded as mutually exclusive categories in publicly available data.

¹² In 2015–16, the white category represented white and non-Latino. In all other school years, the white category included students that also identified as Latino or black.

¹³ We constructed this variable to indicate students who were not black, white, or Latino.

NOTES—1. Special ed.=special education and ELL=English language learner. 2. In the study sample, student race and ethnicity variables were not mutually exclusive, except for in the 2015–16 school year. In the publicly available data, student race and ethnicity variables were reported in mutually exclusive categories.

Student lottery data. The My School DC Lottery is the online application that must be completed for students to attend:¹⁴

- Public charter schools
- Out-of-boundary or “citywide” DCPS schools (schools without zoned boundaries)
- PK3 or PK4 in any school, including the in-boundary DCPS school
- DCPS selective high schools

Students need not apply in the lottery if they are:

- Attending their in-boundary DCPS school for grades K–12
- Re-enrolling in a school¹⁵
- Matriculating to another school that is considered to be part of the feeder pattern for their previous school

All DCPS schools and the majority of D.C. public charter schools participate in the My School DC Lottery. There are a few public charter schools that do not participate in the My School DC Lottery and determine their admissions separately via their own lotteries.

The My School DC Lottery previously offered two rounds.¹⁶ In the first round, interested students may list and rank up to 12 schools. Interested students are then matched with available seats using an algorithm that takes into account lottery preferences (e.g., in-boundary for zoned DCPS schools, sibling attending school, etc.). If students are not matched with their most preferred schools, students are placed on the waiting lists of these schools, even if they are matched with another school of lower ranking. In the second round of the lottery, students may re-apply for seats that are still available. Note that the most sought-after schools no longer have seats available during the second round of the lottery.

The lottery study sample included all PK–12 students who applied in the first round of the My School DC Lottery. Because linkages between student lottery and OSSE data were not available, we could not link lottery preferences with student demographic characteristics or school enrollment. Therefore, this study examines only lottery demand for specific schools by grade level.

Table 2 outlines the grade-level characteristics for the lottery applicants. Nearly 25% of lottery applicants were applying for a spot in PK3, and just under 40% of the lottery applicants were

¹⁴ My School DC Lottery, [About My School DC](#).

¹⁵ The only exception is for students who attended their in-boundary DCPS school and then moved their residence out-of-boundary the following year. The students must re-apply to the DCPS school via the My School DC Lottery as an out-of-boundary applicant.

¹⁶ My School DC Lottery, [FAQ](#).

applying for a spot in either PK3 or PK4. As previously mentioned, all students entering PK for the first time must apply in the lottery. While there is some overlap in the student lottery and enrollment samples in this study, not all lottery applicants ultimately enrolled in a D.C. public school. A recent report found that in the 2016–17 and 2017–18 school years, approximately 14% of lottery applicants did not enroll in any D.C. public school.¹⁷ Further, not all public-school students enter the lottery. According to the same report, 69% of public-school students did not enter the lottery in the 2017–18 school year.

Table 2: Sample characteristics for student lottery data by grade and year

Grade	2014–15	2015–16	2016–17	2017–18
PK3	24.5%	24.2%	24.5%	23.4%
PK4	14.5%	14.7%	14.2%	13.5%
K	9.1%	8.9%	8.9%	9.1%
1	5.6%	6.1%	5.9%	5.4%
2	4.6%	4.8%	4.8%	4.3%
3	3.9%	4.4%	4.4%	4.2%
4	3.5%	3.9%	4.2%	4.1%
5	4.4%	4.1%	4.9%	4.7%
6	6.3%	6.8%	7.2%	8.5%
7	2.5%	2.4%	2.6%	3.0%
8	2.1%	2.0%	1.9%	2.1%
9	15.6%	13.5%	12.7%	13.8%
10	1.9%	2.3%	2.1%	2.0%
11	1.1%	1.3%	1.2%	1.3%
12	0.4%	0.5%	0.4%	0.5%
TOTAL	17,332	20,349	21,208	22,050

NOTE—This sample includes first-round lottery applicants only.

A maximum of 12 schools may be listed in each student's lottery application in the first round of the lottery. Although 12 schools may be listed for each student, an average of between 3–6 schools were listed for each student, depending on grade level. PK3 students listed more schools on average (5–6) than students in other grades, and high school students were the most selective, listing an average of between 3–4 schools, depending on grade level and year. Table 3 outlines the average number of schools included in each student's lottery application by grade level.

¹⁷ American Institutes for Research, My School DC Lottery Program Evaluation of School Year 2017–18, May 2018.

Table 3: Average number of schools included in each student's lottery application by grade and year

Grade	2014–15	2015–16	2016–17	2017–18
PK3	5	5	6	6
PK4	5	5	5	5
K	5	5	5	5
1	5	5	5	5
2	5	5	4	5
3	4	5	4	4
4	4	4	4	4
5	3	3	4	4
6	4	4	4	4
7	4	4	4	4
8	4	4	4	4
9	4	4	4	3
10	4	3	3	3
11	4	4	3	3
12	3	4	3	3

NOTE—This sample includes first-round lottery applicants only.

Findings

Part 1: Factors Relating to Enrollment Projection Errors

Because enrollment projections are determined using historical enrollment data, errors in enrollment projections are largely due to changes in school enrollment patterns over time. We therefore examined the relationship between projection errors and factors that may have related to shifts in school enrollments over time. These factors examined included:

- School mobility: To what extent were enrollment projection errors related to student mobility?
- Student demographics: Were schools with certain characteristics more or less likely to be under- or over-projected for enrollment? Did changes in student demographics over time relate to enrollment projection errors?
- School demand: To what extent did changes in school demand (defined in multiple ways) relate to errors in enrollment projections?
- School openings and closures: Did the opening or closing of a nearby school affect enrollment at existing schools and thus result in greater errors in enrollment projections?
- Distance to school: Did distance from home to school relate to enrollment projection errors?
- Grade-level retention: Did changes in grade-level retention rates over time relate to enrollment projection errors?
- In-boundary demand for kindergarten: Did changes in the patterns of students transferring back to their in-boundary DCPS school for kindergarten after attending

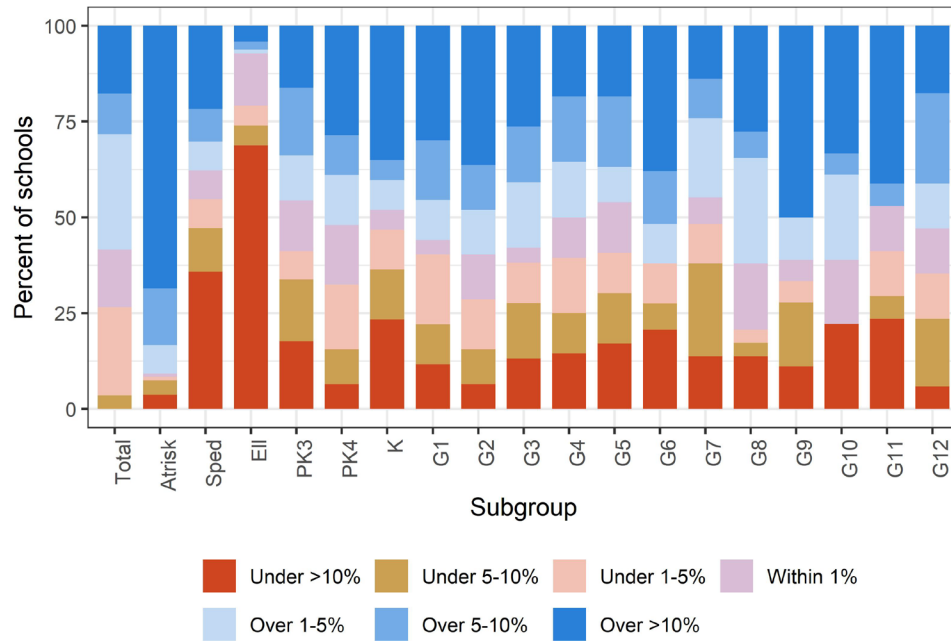
preschool in a different school relate to enrollment projection errors? This question can be addressed only for zoned DCPS schools.

To identify correlates of enrollment projection errors, we descriptively examined relationships between each factor and school-level enrollment projection errors. Then, we used statistical analyses to determine which factors (or interactions thereof) were the most important in explaining the variation in the enrollment projection errors. In the subsequent sections, we first discuss each potential correlate of projection errors and present descriptive findings. In the last section, we present the findings from the statistical analyses that determined which factors were the most predictive of the projection errors, controlling for everything else.

Visualizing enrollment projection errors. Prior to examining potential correlations of enrollment projection errors, we present graphs showing the degree of error in enrollment projections by student subgroup and sector. Enrollment projections were calculated for each subgroup as *percent error* = $\frac{\text{projected} - \text{actual}}{\text{actual}} * 100$. Thus, positive percentages reflect over-projections, and negative percentages reflect under-projections.

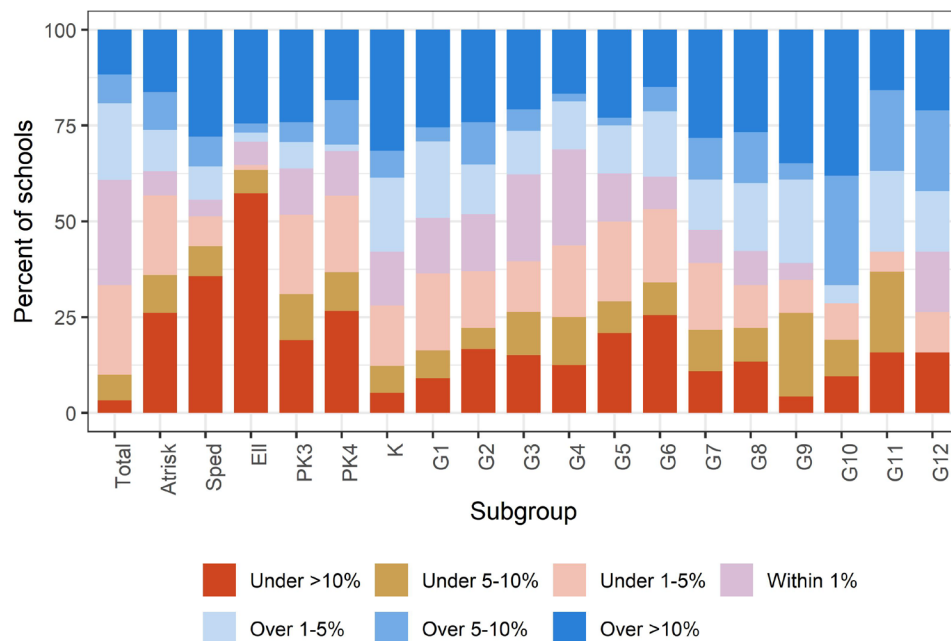
Projection errors by student subgroup. The following Figures 1–4 display what percent of DCPS and charter schools had over- or under-projections for each student subgroup in the 2017–18 and 2016–17 school years, starting with the most recent year first. Across the two school years, DCPS and charter LEAs were more likely to over-project enrollment in high school grades than in younger grades. In addition, the majority of DCPS and charter schools were under-projected for their numbers of special education and ELL students in the 2017–18 school year. Also, in the 2017–18 school year, the majority of DCPS schools were over-projected for their numbers of at-risk students, and the majority of charter schools were under-projected for their numbers of at-risk students.

Figure 1: Projection errors for DCPS schools in 2017–18 by student subgroup

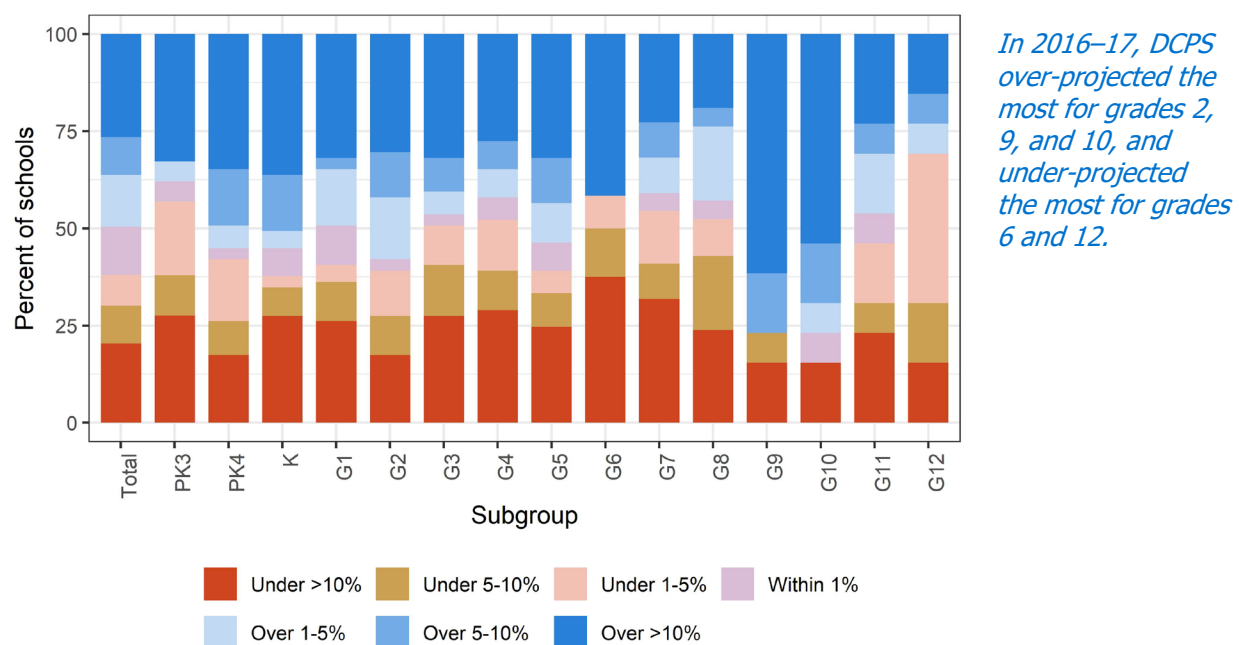
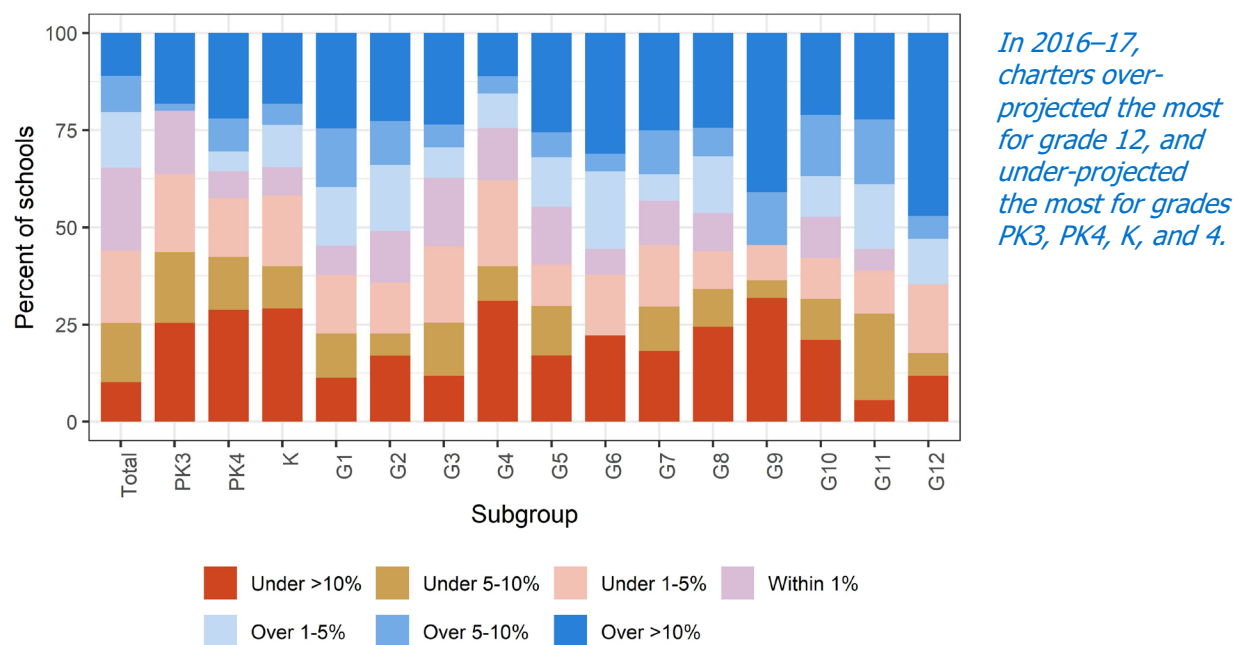


In 2017–18, DCPS over-projected overall and at-risk students, and under-projected special education and ELL students. DCPS over-projected the most for grades 2, 3, 6, 8, 9, and 10.

Figure 2: Projection errors for charter schools in 2017–18 by student subgroup



In 2017–18, charters under-projected at-risk, special education, and ELL students. Charters over-projected the most for grades K, 8, 9, 10, 11, and 12.

Figure 3: Projection errors for DCPS schools in 2016–17 by student grade*Figure 4: Projection errors for charter schools in 2016–17 by student grade*

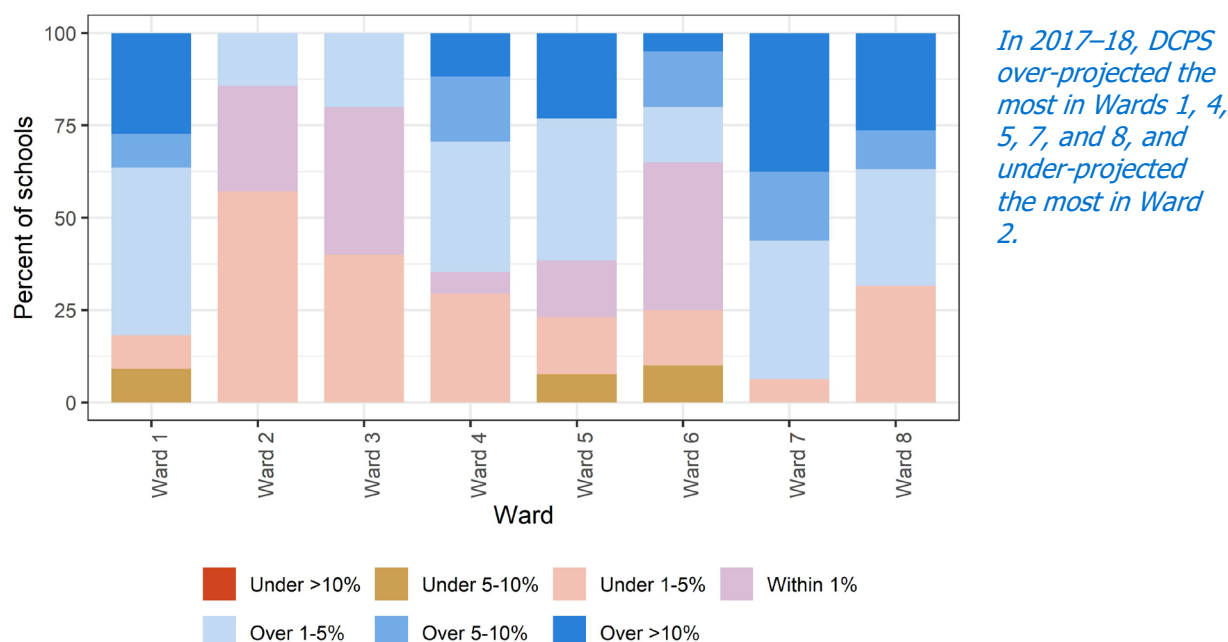
NOTE—Projections for specific subgroups (i.e., at-risk, ELL, and special education) were not available for charter LEAs in the 2016–17 school year.

Projection errors by ward. Next, Figures 5–8 show what percent of schools were over- or under-projected for enrollment in the 2017–18 and 2016–17 school years, by school ward and sector. For DCPS schools, enrollment projections were the most accurate for a greater percentage of schools in Wards 2, 3, and 6, as reflected in Figure 5. Enrollment projections were the most accurate when enrollments remained relatively stable over time, which occurred the most frequently in schools serving lower percentages of at-risk students. DCPS schools in Wards 2 and 3 served relatively low percentages of at-risk students, and DCPS schools in Ward 6 served percentages of at-risk students ranging from 2% to 78%.

There were no charter schools in Ward 3 and only two charter schools in Ward 2, as shown in Figure 6. Enrollment projections were the most accurate for a greater percentage of charter schools in Wards 5, 7, and 8. There was more variability in the accuracy of enrollment projections for schools in other wards, depending on school year and sector. Charter schools in Wards 4 and 5 served the lowest percentages of at-risk students, ranging from 6–58% for charter schools in Ward 4 and 4–66% for charter schools in Ward 5. Charter schools in Wards 7 and 8 served the greater percentages of at-risk students, ranging from 43–76% for charter schools in Ward 7 and 52–80% for charter schools in Ward 8.

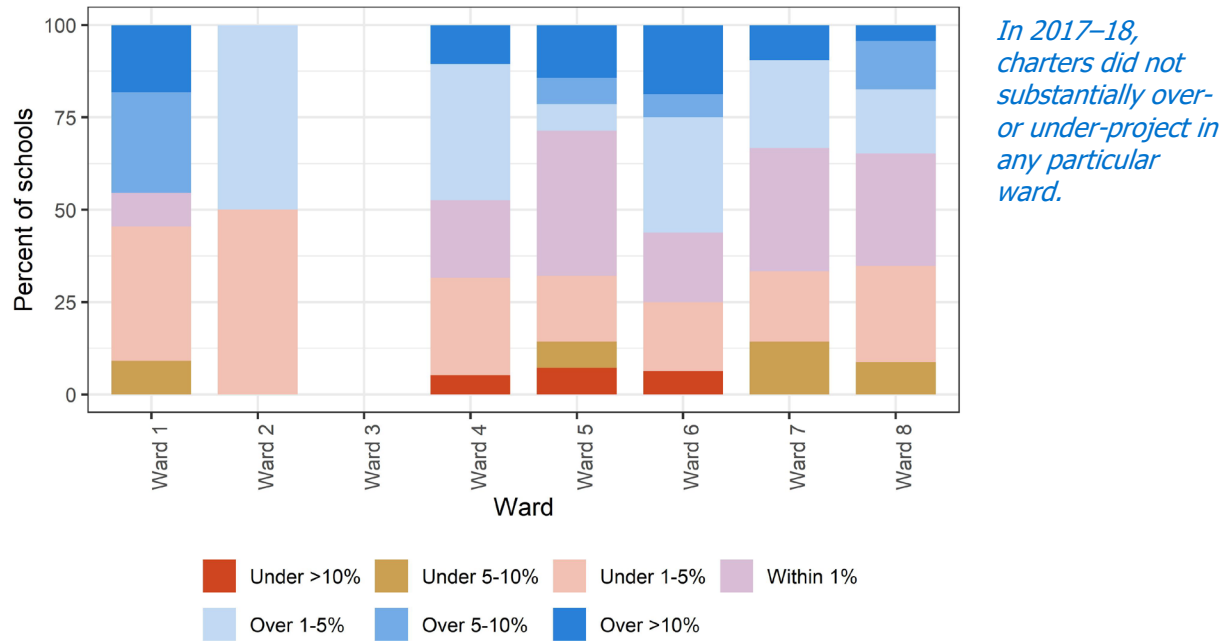
These findings by ward are mostly consistent with those identified in the earlier report.¹⁸ Differences in findings can be partly explained by the previous report's aggregation of errors across multiple years, whereas this report displays errors for each school year separately.

Figure 5: Projection errors for DCPS schools in 2017–18 by school ward



¹⁸ Office of the D.C. Auditor, [A Study of Enrollment Projections for D.C.'s Public Schools: Assuring Accuracy and Transparency](#), September 28, 2018.

Figure 6: Projection errors for charter schools in 2017–18 by school ward



NOTE—There were no charter schools in Ward 3.

Figure 7: Projection errors for DCPS schools in 2016–17 by school ward

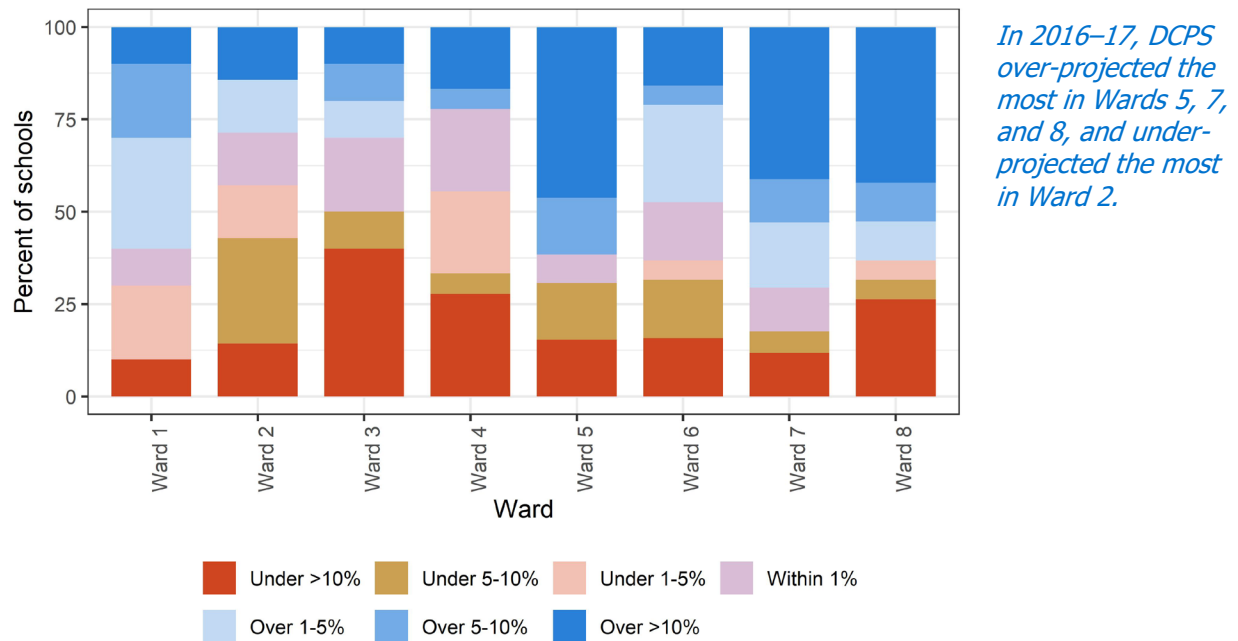
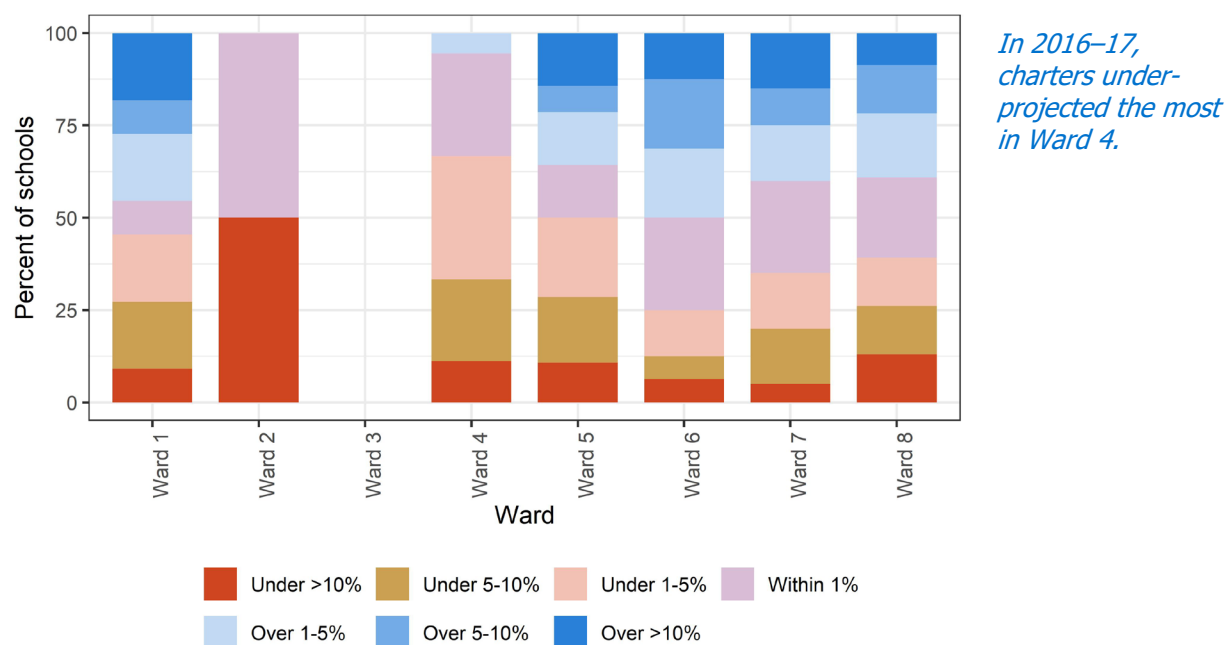
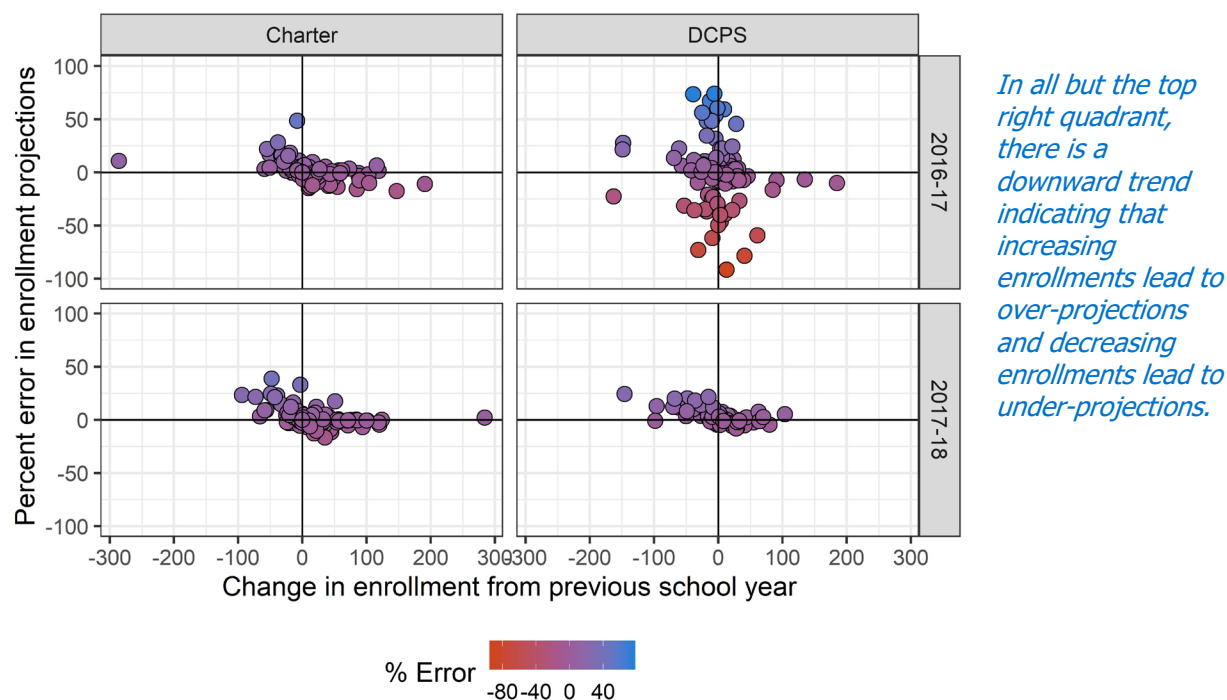


Figure 8: Projection errors for charter schools in 2016–17 by school ward

NOTE—There were no charter schools in Ward 3.

Projection errors and changes in school enrollments over time. Enrollment projections are largely determined based on enrollment trends in past school years. Therefore, any changes in school enrollments over time should yield errors in enrollment projections.

Figure 9 shows that most schools with declining enrollments were over-projected for enrollment in the following school year (top left quadrant), and most schools with increasing enrollments were under-projected for enrollment (bottom right quadrant). The one exception was that enrollment projections for DCPS schools in the 2016–17 school year did not appear to follow this pattern. Some DCPS schools in 2016–17 were over-projected for enrollment despite increasing enrollment over time (top right quadrant), and some DCPS schools were under-projected for enrollment despite decreasing enrollment over time (bottom left quadrant). Notwithstanding this exception, factors that relate to increases or decreases in school enrollments over time may also relate to errors in enrollment projections.

Figure 9: Projection errors and changes in enrollments by school year and sector

NOTE—Schools with enrollment projection errors greater than 100% were outliers and excluded from the figure. These included five DCPS schools in 2016-17, two charter schools in 2017-18, and one DCPS school in 2017-18.

Summary of Findings

- DCPS and charter high schools were more likely to be over-projected for enrollment compared with elementary and middle schools.
- Enrollment projections were the most accurate for DCPS schools in Wards 3 and 6. DCPS schools in Ward 2 were the most under-projected for enrollment. DCPS schools in Wards 5, 7, and 8 were the most over-projected for enrollment.
- The majority of DCPS and charter schools were under-projected for their numbers of special education and ELL students.
- The majority of DCPS schools were over-projected for their numbers of at-risk students, while the majority of charter schools were under-projected for their numbers of at-risk students.
- Changes in school enrollment over time, i.e. a lack of stability in enrollment, related to errors in school enrollment projections.

Student mobility. Another potential factor explaining errors in enrollment projections is student mobility. On this point, the previous report found that student mobility was the most important predictor of enrollment projection errors for DCPS schools.¹⁹ In this report, we further

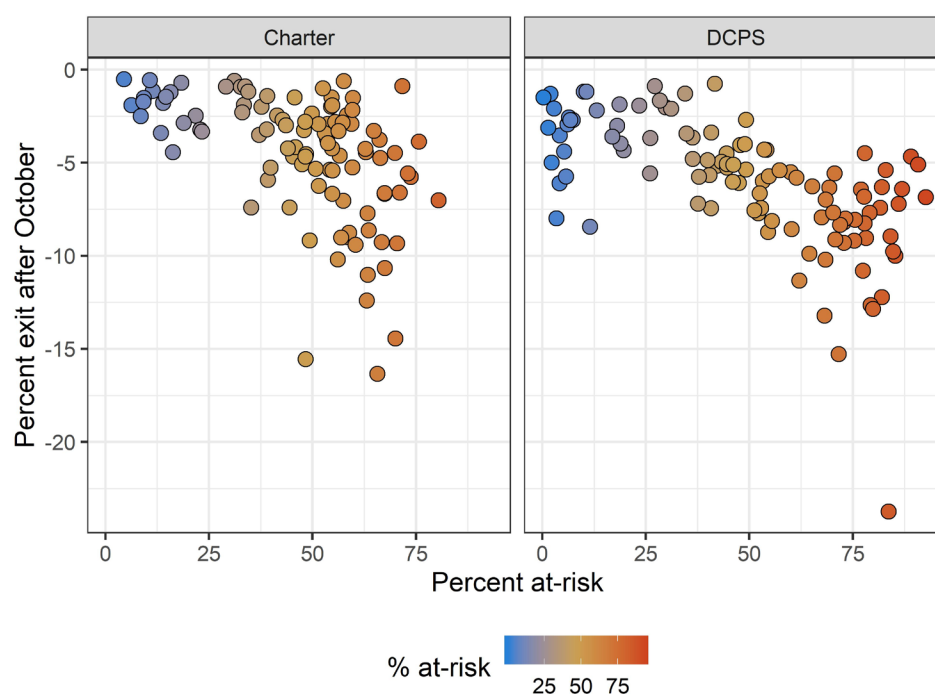
¹⁹ Office of the D.C. Auditor, [A Study of Enrollment Projections for D.C.'s Public Schools: Assuring Accuracy and Transparency](#), September 28, 2018.

explore both mid-year and year-to-year mobility as possible correlates of enrollment projection errors. We used the following metrics of student mobility:

- Mid-year exit rate: Using the data in the OSSE school report card data, the number of students who exited the school from October to May (represented by a negative number) divided by the enrollment in October, multiplied by 100.
- Mid-year entry rate: Also using data from the OSSE school report card data, the number of students who entered the school from October to May divided by the enrollment in October, multiplied by 100.
- Mid-year net rate: A combination of the two previous variables, the net number of students gained or lost by May divided by the enrollment in October, times 100.
- Year-to-year mobility: Defined as the sum of the number of students who left or entered the school in non-entry and non-matriculating grades divided by the number of students who remained in the school from one year to the next, times 100. The non-entry and non-matriculating grades were first determined for each school; the minimum grade was the entry grade, and the maximum grade was the matriculating grade.

Mid-year mobility. We first examine the relationships between mid-year student mobility metrics and school characteristics. Mid-year student mobility in terms of students exiting the school after the October enrollment was greater in schools serving larger percentages of at-risk students, and this was true in both sectors. Figure 10 shows the percentage of students who left their schools after the October enrollment audit in the 2017–18 school year. Recall that the exit rate is a negative number.

Figure 10: Relationship between mid-year exit rates and percentage at-risk in 2017–18 by sector

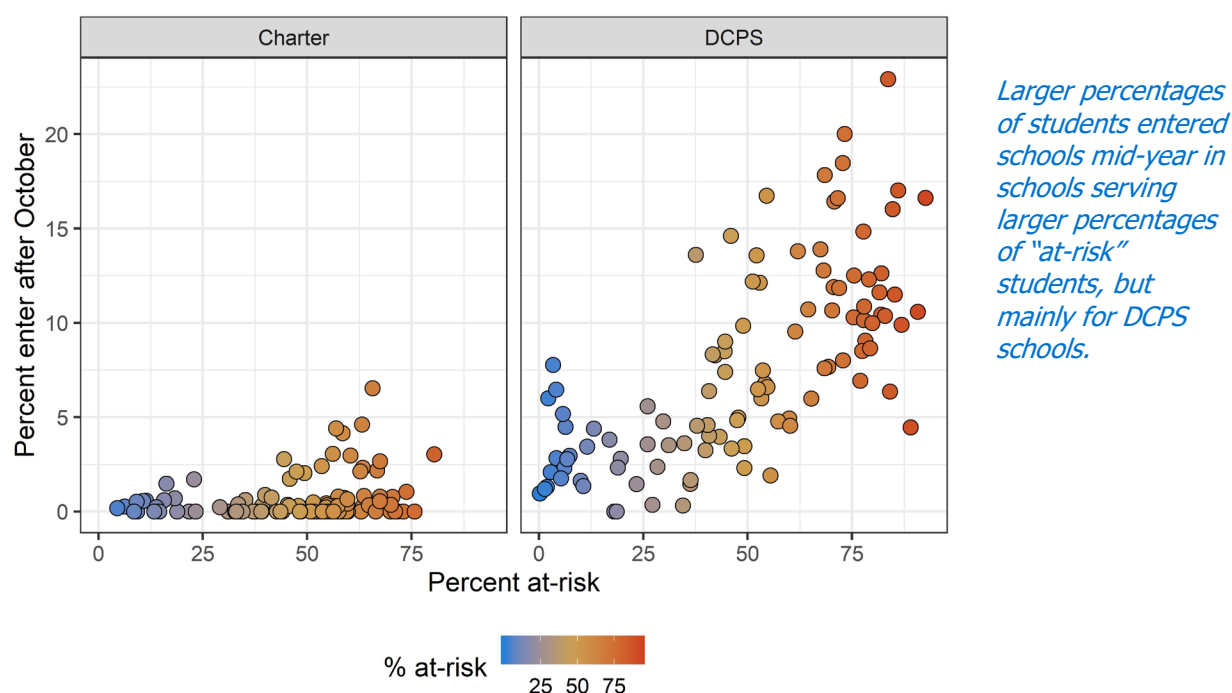


Larger percentages of students left schools mid-year in schools serving larger percentages of "at-risk" students.

NOTES—1. The mid-year exit rate was correlated with the percentage of at-risk students at $-.46$ ($p < .001$).
 2. Goodwill Excel Center was excluded from the graph because it was an outlier with an exit rate of -71.5% .

There were sector differences, however, in terms of mid-year entry, or the percentages of students entering the school after the October enrollment audit, as shown in Figure 11. DCPS schools enrolled substantially larger percentages of students after the October enrollment audit, relative to charter schools. One explanation for this is that zoned DCPS schools must accept in-boundary students regardless of when during the school year the students decide to enroll. Moreover, DCPS schools serving greater proportions of at-risk students had a greater influx of students entering the school after the October enrollment than schools serving lower proportions of at-risk students.

Figure 11: Relationship between mid-year entry rates and percentage at-risk in 2017–18 by sector

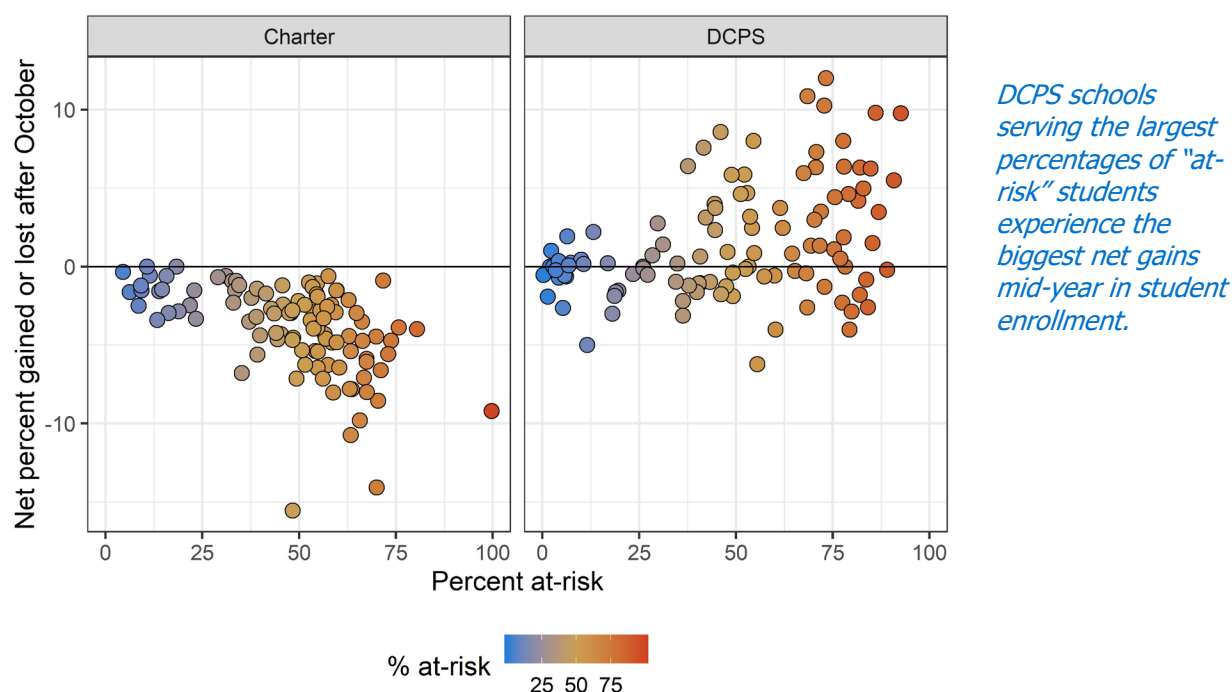


NOTES—1. The correlation between mid-year entry rates and the percentage at-risk was $.70$ ($p < .001$) for DCPS schools and $.31$ for charter schools ($p < .01$). 2. Goodwill Excel Center was excluded from the graph because it was an outlier with an entry rate of 62.3% .

Figure 12 shows the net change in students entering and exiting schools after the October enrollment audit. For charter schools, the net change was negative for the majority of schools, particularly for charter schools serving large proportions of at-risk students. This finding indicates that while charter schools both gained and lost students mid-year, virtually all charter schools experienced a net loss of students mid-year. For DCPS schools, the net change for most schools was positive and largest for schools serving large proportions of at-risk students. This finding is consequential for these DCPS schools, given that their school budgets (and therefore staffing levels) are largely based on projected October enrollment. Again, student-level data on mid-year mobility would be needed to determine if the students entering and exiting mid-year

were more likely to be considered at-risk themselves or have special education needs. However, DCPS schools receiving greater percentages of students mid-year were more likely to have higher concentrations of at-risk students.

Figure 12: Relationship between mid-year net rates and percentage at-risk in 2017–18 by sector



To what extent did LEAs receive adequate funding for the students that they ultimately served? We cannot determine exactly how much it would cost to offset mid-year mobility because we cannot track mid-year mobility at the individual student level in the data, and such information would be needed to calculate the percentage increase necessary to ensure adequate funds per UPSFF levels.²⁰

However, for the 2017–18 school year, DCPS schools were over-projected for enrollment by 3.1% when considering October enrollment, yet were over-projected by 2.3% when considering May enrollment. Charter schools collectively were over-projected for enrollment by 2.2% in terms of October enrollment, but were over-projected by 5.5% in terms of May enrollment. In terms of numbers of students, this means that DCPS was over projected by 1,495 students relative to October enrollment but had gained a net total of 357 additional students at the time of May enrollment. Charter schools were over-projected by 968 students relative to October enrollment but had lost 1,343 students at the time of May enrollment. Note, however, that these numbers were aggregated across all DCPS and charter schools, and that individual schools had varying rates of projection errors. In addition, as these are net differences, they are not reflective of the total number of students served, particularly in DCPS schools in which some students had multiple exits and entries during a single school year. This finding about net

²⁰ [2017-18 UPSFF](#).

differences between May enrollment and October projections, however, underscores the importance of considering mid-year mobility in LEA enrollment projections. Table 4 shows the projected and actual enrollments by sector.

Table 4: Projected versus actual enrollments as of October and May in the 2017–18 school year by sector

Sector	Projected	Actual as of October	Actual as of May
DCPS	49,538	48,043	48,262
Charter LEAs	44,361	43,393	36,968

When examining enrollment projections for each school based on May, as opposed to October, enrollment, we found that some schools were under-projected for the net number of students they served in the 2017–18 school year. This finding implies that even more schools were likely under-projected for the total number of students they served during the school year. As shown in Table 5 below, some schools that were over-projected for their October enrollment were under-projected based on their May enrollment, and vice versa. Schools that were over-projected according to October enrollment and under-projected according to May enrollment were all DCPS schools, except for Kingsman Academy. To the extent that LEAs fund individual schools according to their October enrollments, care and accuracy are needed to ensure that schools are each funded appropriately to support all students they serve during the school year.

Table 5: Schools with differences in over versus under projections based on October versus May enrollment in 2017–18

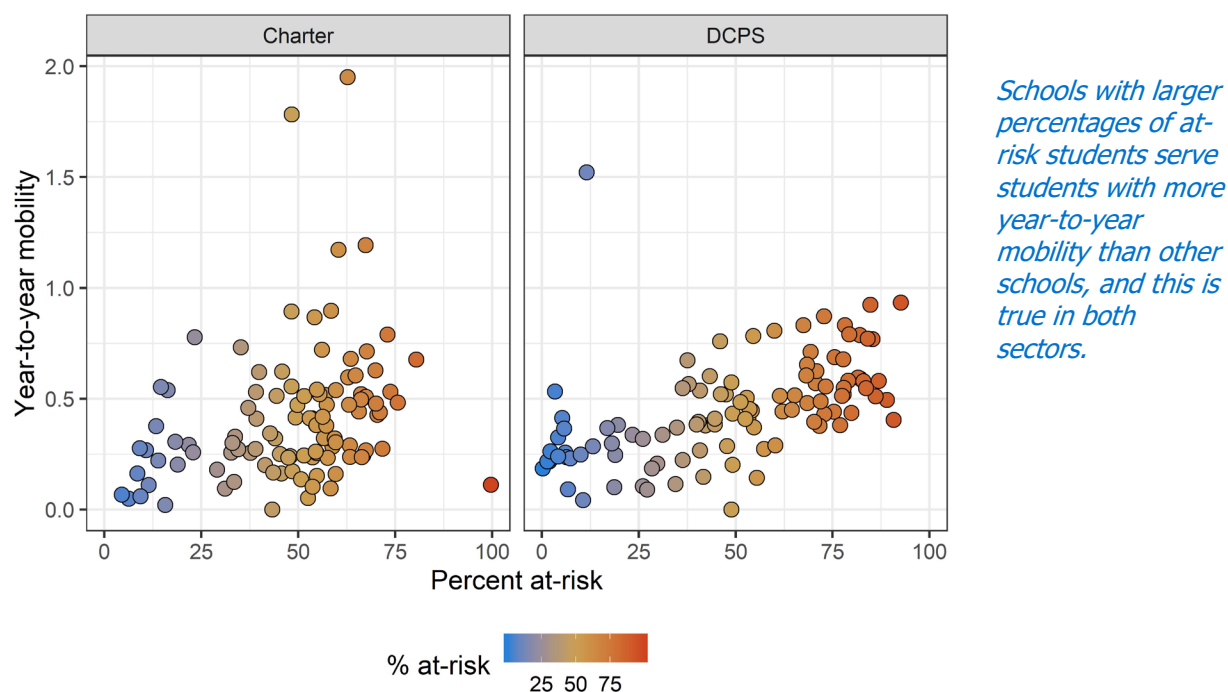
School	% over/under-projected based on Oct. enrollment	% under/over-projected based on May enrollment
Payne Elementary	+1	-7
Kingsman Academy	+5	-6
Garrison Elementary	+1	-5
Langley Elementary	+3	-4
Malcolm X Elementary	+2	-4
Kramer Middle	+6	-3
Whittier Education Campus	+2	-3
Smothers Elementary	+3	-3
Ballou STAY	-2	+50
SEED	-2	+10
Goodwill Excel	-2	+8
AppleTree Columbia Heights	-1	+6
Cesar Chavez Parkside	-3	+6
Friendship Tech Prep Middle	-1	+5
Cesar Chavez Public Policy	-3	+4
KIPP College Prep	-3	+3
Center City Congress Heights	-4	+3
Creative Minds	-1	+3

School	% over/under-projected based on Oct. enrollment	% under/over-projected based on May enrollment
DC Scholars	-1	+3
Children's Guild	-2	+3

NOTE—Only schools that differed in terms of being over- or under-projected based on their October and May enrollments were included in this table. Additionally, only schools that were under or over-projected by more than three percent according to their May enrollment were included in this table.

Year-to-year mobility. In both sectors, year-to-year mobility was related with school demographics, specifically the percentages of black students and students classified as at-risk in the school, as shown in Figure 13. The pattern appeared to be that schools serving greater proportions of black and at-risk students experienced higher year-to-year mobility than schools serving lower proportions. Additionally, a few charter schools and one DCPS school had particularly high year-to-year mobility, but there did not appear to be any pattern in terms of ward or grade levels served for these schools with very high student mobility.

Figure 13: Relationship between year-to-year-mobility from 2016–17 to 2017–18 and percentage at-risk in the school in 2017–18 by sector



NOTE—The correlation between year-to-year mobility and the percentage of black students in the school was .30 ($p < .001$), and .39 ($p < .001$) for the percentage of at-risk students in the 2016–17 and 2017–18 school years.

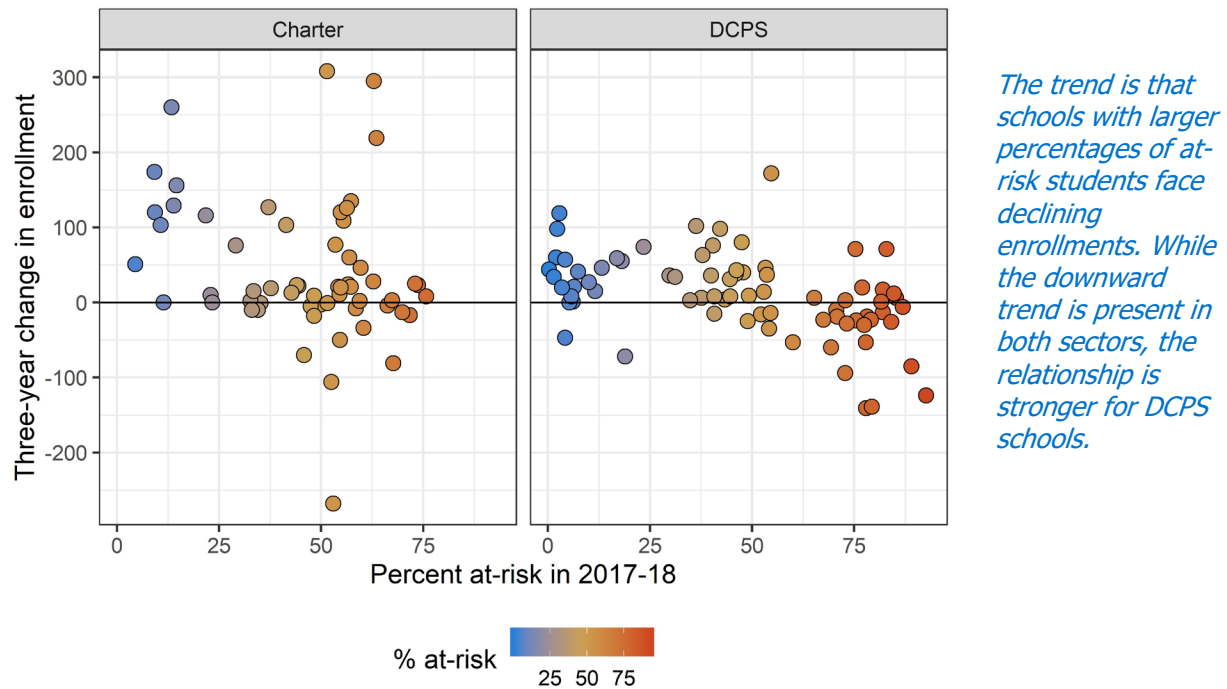
We replicated the previous report's finding that year-to-year mobility was related to enrollment projection errors for DCPS schools—as determined by October enrollments—yet the correlation was small at .22 ($p < .05$). The direction of the correlation indicates that DCPS schools with higher year-to-year mobility were slightly more likely to be over-projected for enrollment. When

we further explored this association, we found that one reason for the small correlation is that it represented an underlying relationship between high year-to-year mobility and the percentage of at-risk students in the school. That is, DCPS schools with high year-to-year mobility were also those serving the largest proportions of at-risk students, and enrollments in these schools largely declined over time, resulting in greater enrollment projection errors (see Figures 14–16). We did not find a relationship between year-to-year mobility and errors in enrollment projections for charter schools, which is consistent with the previous report's findings. One implication of this finding is that schools with declining enrollments may receive fewer and fewer resources each year, yet in some cases, student populations at these schools are constantly changing due to greater student mobility. Schools with highly mobile student populations may need more resources to support students, both academically and socially emotionally.²¹

Figures 14–16 show that in general, enrollments declined over time for schools serving very large percentages of at-risk students in most cases. The relationship between enrollment over time and percentage at-risk was stronger in DCPS schools than in charter schools. However, the fact that nearly all schools serving at least 75% at-risk students were DCPS schools likely drives this difference in the strength of this relationship in the charter sector versus DCPS. The majority (64%) of schools serving at least 75% at-risk students declined in enrollment over time, while 95% of schools serving 25% at-risk students or fewer increased in enrollment over time. For schools that served between 25–75% at-risk students, 58% increased in enrollment over time and 42% experienced declining enrollments over time. Declining enrollments mean fewer resources each year for schools serving the largest percentages of at-risk students.

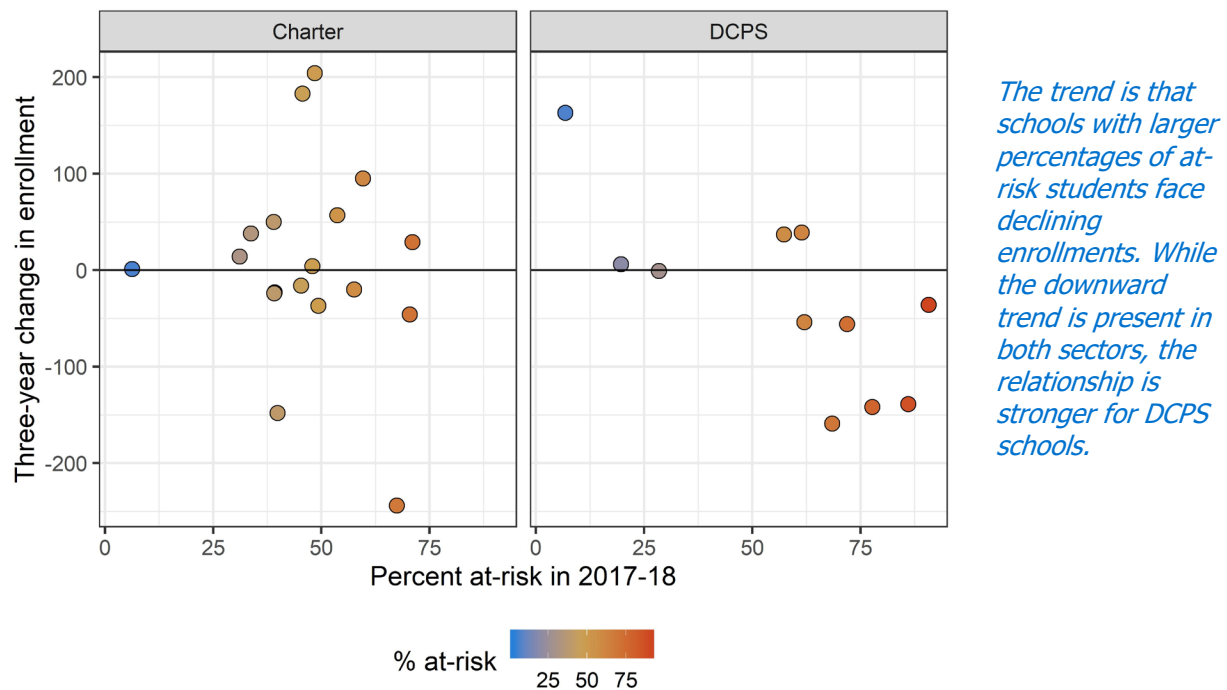
²¹ 1. Center for Research on the Education of Students Placed At Risk, Johns Hopkins University, [Patterns of Urban Student Mobility and Local School Reform](#), October, 1996. 2. Gasper, DeLuca, and Estacion, [Switching Schools: Revisiting the Relationship Between School Mobility and High School Dropout](#), *American Educational Research Journal*, 2012. 3. Lleras and McKillip, [When children move: Behavior and achievement outcomes during elementary school](#), *Journal of Educational Research*, 2017. 4. Workshop on the Impact of Mobility and Change on the Lives of Young Children, Schools, and Neighborhoods, [School Mobility in the Early Elementary Grades: Frequency and Impact From Nationally-Representative Data](#), June, 2009.

Figure 14: Change in enrollment from 2017–18 to 2014–15 for elementary schools by sector

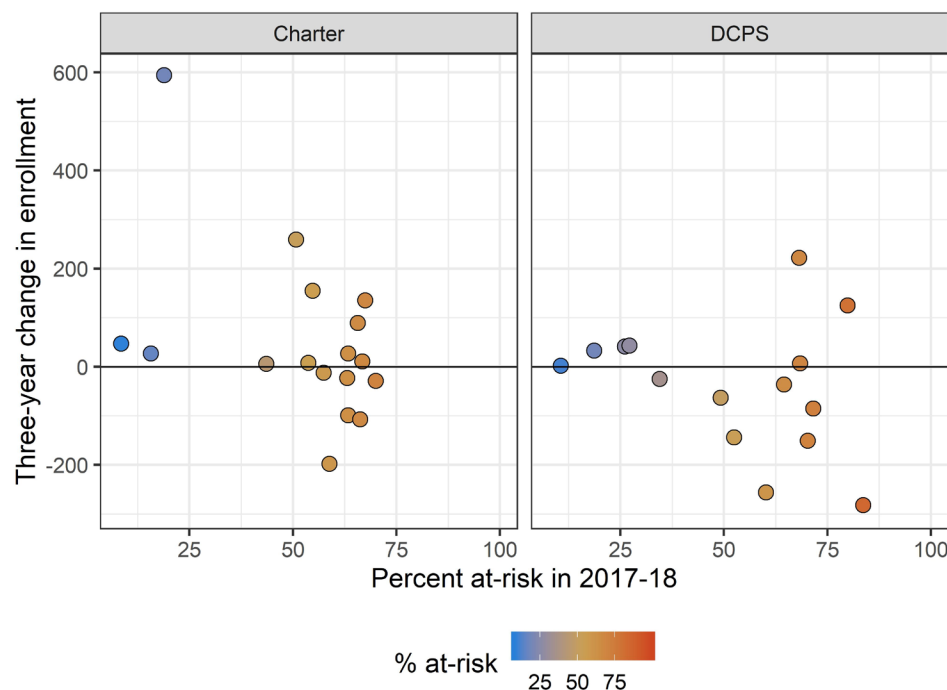


NOTE—The correlation between the three-year change in enrollment and percent at-risk for elementary schools was $-.25$ ($p < .10$) in charter schools and $-.45$ ($p < .001$) in DCPS schools.

Figure 15: Change in enrollment from 2017–18 to 2014–15 for middle schools by sector



NOTE—The correlation between the three-year change in enrollment and percent at-risk for middle schools was $-.14$ (not significant) in charter schools and $-.73$ ($p < .05$) in DCPS schools.

Figure 16: Change in enrollment from 2017–18 to 2014–15 for high schools by sector

The trend is that schools with larger percentages of at-risk students face declining enrollments. While the downward trend is present in both sectors, the relationship is stronger for DCPS schools.

NOTE—The correlation between the three-year change in enrollment and percent at-risk for high schools was -0.44 ($p < .10$) in charter schools and -0.26 (not significant) in DCPS schools. The non-statistical significance of the p-value for the correlation for DCPS high schools is largely due to the small sample size.

Summary of Findings

- Enrollments declined over time for schools serving very large percentages of at-risk students in most cases. Declining enrollments mean fewer resources each year for schools serving the largest percentages of at-risk students.
- Yet schools serving greater proportions of at-risk and black students experienced higher year-to-year student mobility than schools serving lower proportions, and this was true in both sectors. Schools with highly mobile student populations may need more resources to support students, both academically and socially emotionally.
- Mid-year mobility may be important to consider to accurately project LEA and school enrollments as well as to adequately fund schools. Virtually all charter schools experienced a net loss of students mid-year. For DCPS, the net change for most schools was positive and largest for schools serving large proportions of at-risk students.

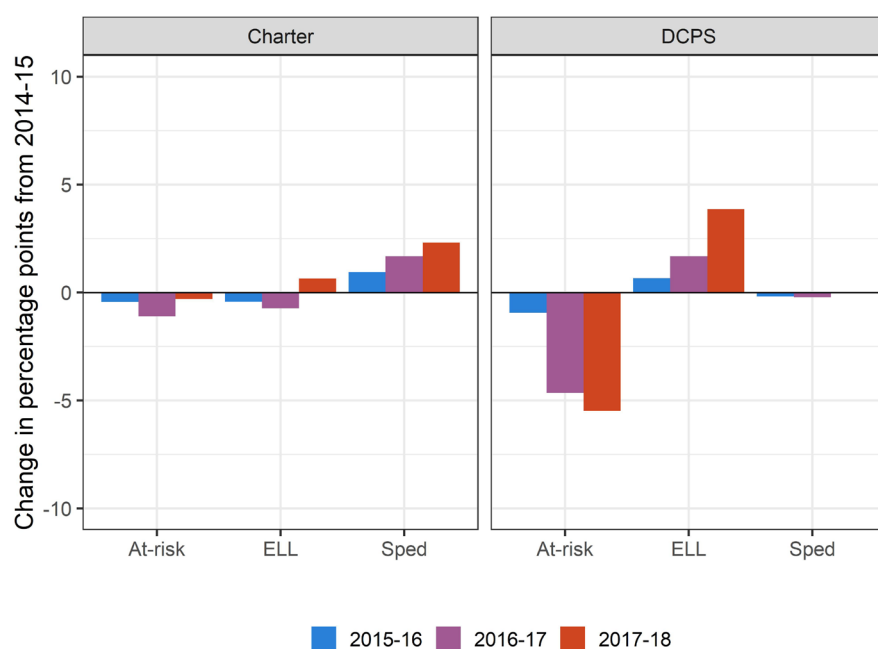
School demographics. As discussed in the previous section, schools serving large proportions of at-risk students faced declining enrollments. We now explore to what extent other school characteristics related to projection errors:

- **Percent special education:** The percentage of students in the school who received special education services and had individualized education plans (IEPs).

- Percent ELL: The percentage of students in the school who were classified as being a non-native English speaker and an ELL.
- Percent at-risk and special education: The percentage of students in the school who were flagged as both at-risk and special education.
- Percent at-risk and ELL: The percentage of students in the school who were flagged as both at-risk and ELL.
- Percent special education and ELL: The percentage of students in the school who were flagged as both special education and ELL.

Changes in student demographics over time. We examined student demographic changes over time and whether these changes related to projection errors using October enrollment audit data. From 2014–15 to 2017–18, the largest demographic changes over time were the reduction of at-risk students by 5.5 percentage points in DCPS, the increase in ELL students by 3.9 percentage points in DCPS, and the increase in special education students in the charter sector by 2.3 percentage points. The charter sector remained more stable over time than DCPS in the percentage at-risk and ELL, and DCPS remained more stable over time than the charter sector in percentage special education. Moreover, according to October enrollment audit data, the at-risk student population largely remained the same over time for D.C., but the number of at-risk students in DCPS declined from 22,795 in 2014–15 to 20,901 in 2017–18, while the number of at-risk students in charter schools increased from 16,519 in 2014–15 to 18,922 in 2017–18. Figure 17 shows the sector-wide changes in student demographics over time, although there was more variation among schools within each sector.

Figure 17: Student demographic changes over time from the 2014–15 to 2017–18 school years by sector



NOTES—1. Sped=special education. 2. OSSE revised the identification process for ELL students prior to the 2017–18 school year, which may have contributed to shifts in system demographics between the 2016–17 and 2017–18 school year.²²

In terms of how these student characteristics related to student race or ethnicity in D.C., in the 2017–18 school year, at-risk students were predominantly black (87%), with smaller percentages of at-risk students identifying as Latino (14%) or white (9%).²³ ELL students were predominantly identified as Latino (76%), and 23% were also identified as black and 58% as white. Eighty percent of special education students were identified as black, 19% Latino, and 19% white.

Total projection errors and student demographics. Of all the student demographics examined, the percentage at-risk was the most strongly correlated with enrollment projection errors for DCPS schools. Consistent with the findings from the previous section, the percentage at-risk in a DCPS school was positively correlated with enrollment projection errors, indicating that DCPS schools serving large proportions of at-risk students were more likely to be over-projected for enrollment, whereas DCPS schools with small proportions of at-risk students were more likely to be under-projected.²⁴ There was no statistically significant correlation between percentage at-risk and overall enrollment projection errors in charter schools, yet the schools serving the largest proportions of at-risk students were DCPS schools. Even though the DCPS and charter sector had relatively similar percentages of at-risk students overall (46.2% for DCPS and 43.7% for charter), 24 out of the 27 schools serving 75% at-risk students or more were DCPS schools, and three were charter schools, when excluding students in atypical (e.g., adult) grades.

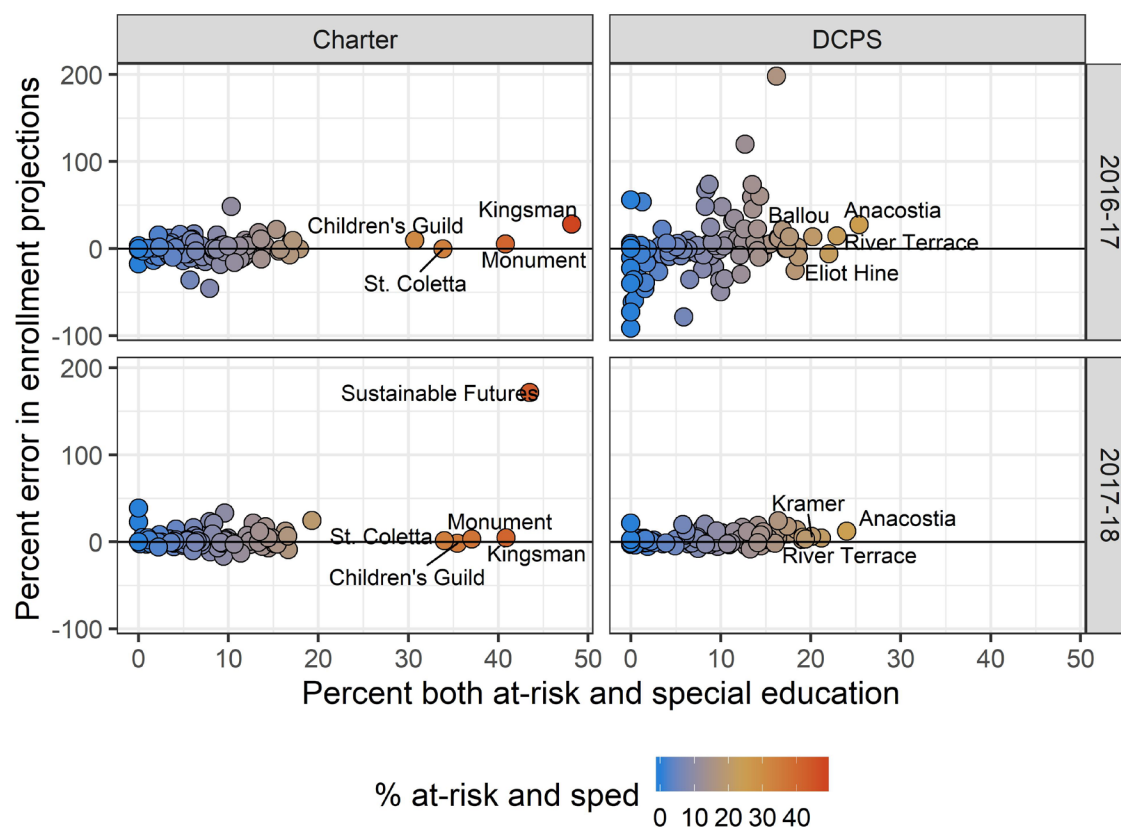
For charter schools, the percentage of students who were both at-risk and special education was related to enrollment projection errors, however. The correlation appeared to be driven by outlier charter schools serving large proportions of at-risk and special education students. When these five schools were removed, there was no longer a statistically significant correlation between percent at-risk and special education and projection errors. In other words, charter schools serving large proportions of both at-risk and special education students were generally over-projected for enrollment. The percentage of both at-risk and special education was also positively correlated with enrollment projection errors for DCPS when outliers were removed, but the correlations were not as large as those with percentage at-risk only. Figure 18 shows the relationship between projection errors and percent at-risk and special education, with the schools serving greater than 20% both at-risk and special education in each school year demarked.

²² Public Charter Enrollment Projection Methodology presented at the Public Charter School Board meeting in January of 2018. Approximately 400 charter students and 500 DCPS students were identified as ELL in 2017–18 who were not identified as ELL in 2016–17. This was an increase from previous years, when about 200 students in the charter sector and 350 students in DCPS went from non-ELL to ELL in consecutive years.

²³ The race categories were not mutually exclusive as some students were coded with more than one race or ethnicity. Fifty-one percent of white students were not “Hispanic/Latino” and 96% of black students were not “Hispanic/Latino.”

²⁴ The correlation between percentage “at-risk” and projection errors was .23 ($p < .05$) in 2016–17 and .41 ($p < .001$) in 2017–18 for DCPS schools.

Figure 18: Relationship between enrollment projection errors and percentage both at-risk and special education by year and sector



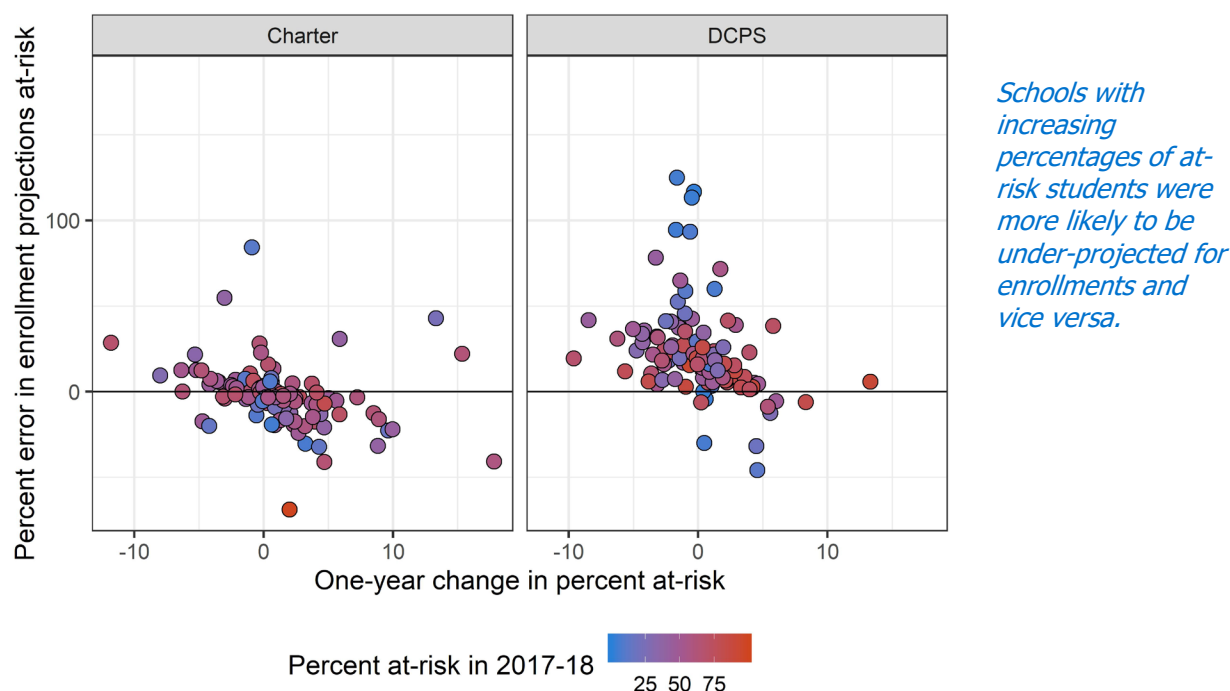
NOTE—McKinley MS, MacFarland, and Kramer were excluded from the 2016–17 graph, and Rocketship Legacy Prep and CHOICE Academy were excluded from the 2017–18 graph because they had projection errors greater than 200 percent. These schools did not serve student populations where greater than 20% were classified as both at-risk and special education.

Projection errors for at-risk subgroup only. LEAs also provide projections for specific student subgroups, including “at-risk,” special education, and ELL students because the funding formula allocates additional weights for these student subgroups. Examining the projection errors for the at-risk student subgroup only, approximately 38% of charter schools and 91% of DCPS schools over-projected their at-risk enrollment for the 2017–18 school year, while 8% of DCPS schools and 59% of charter schools under-projected their enrollment of at-risk students. For charter schools, percent both at-risk and special education most strongly predicted the projection errors for the at-risk subgroup, but the correlation appeared to be driven by the few charter schools that served large proportions of both at-risk and special education students that were also over-projected for enrollment.

For DCPS schools, percent at-risk most strongly predicted the projection errors for the at-risk subgroup. Yet DCPS schools with few at-risk students were more likely to have both under- and over-projections of at-risk, and at-risk projections for DCPS schools serving larger proportions of at-risk students appeared to be more accurate. This phenomenon can be explained by changes over time in the at-risk student populations in these schools, as schools with declining at-risk

populations had over-projections and schools with increasing at-risk populations had under-projections of at-risk students. Figure 19 shows the relationship between the change in the percentage of at-risk students over time and projection errors for the at-risk subgroup only. This finding suggests that enrollment projections for particular subgroups may be more accurate if recent demographic changes at the school level are taken into account.

Figure 19: Relationship between enrollment projection errors for the at-risk subgroup in 2017–18 and change in percentage at-risk from 2017–18 to 2016–17 by sector

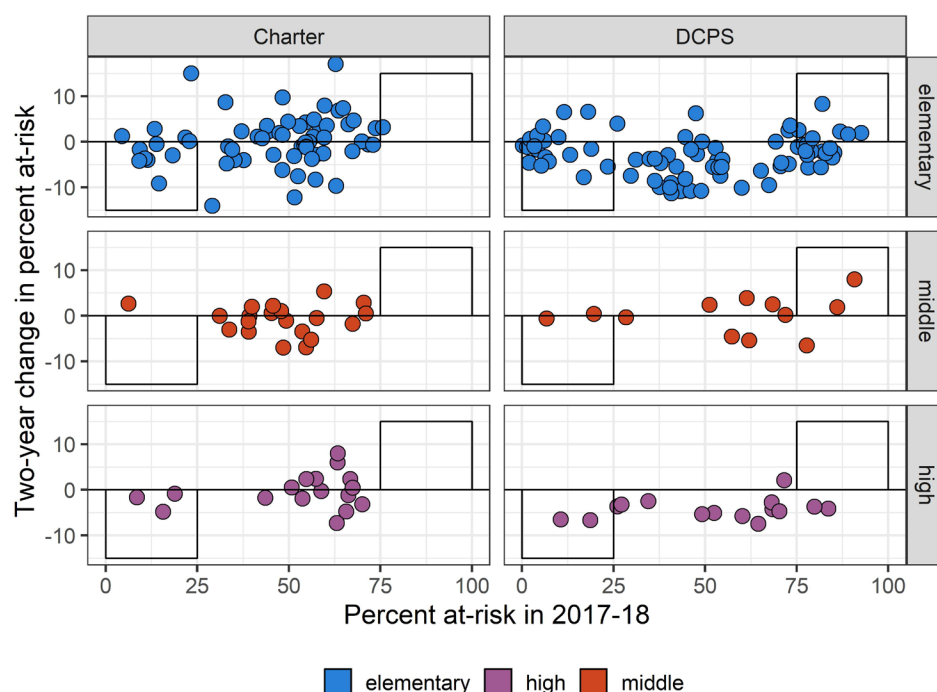


NOTES—1. School-Within-a-School and Janney Elementary School were excluded from the graph because they had projection errors greater than 200 percent. 2. The projection errors for the at-risk subgroup were correlated with the one-year change in percent at-risk at $-.32$ ($p < .001$) for charter schools and at $-.15$ (not significant) for DCPS schools.

The next set of analyses examined patterns in which schools became more or less socio-economically diverse (in terms of percentage at-risk) over time. The majority of elementary and high schools with less than 25% at-risk students in 2017–18 had decreased in socio-economic diversity over time, and this was true in both sectors. In fact, there was not a single high school serving less than 25% at-risk students in 2017–18 that increased in socio-economic diversity over time. On the other end of the spectrum, the majority of DCPS schools serving more than 75% at-risk students in 2017–18 experienced slight gains in socio-economic diversity over time and had small reductions in the proportion of at-risk students. However, there were some DCPS elementary and middle schools serving more than 75% at-risk students in 2017–18 that increased in the proportion of at-risk students over time, and a couple of schools increased in percentage at-risk by eight percentage points over the two-year period. Figure 20 displays these data, and the black boxes highlight the schools that either served few at-risk students, relatively speaking, and decreased in the percentage of at-risk students, or the schools that served many at-risk students and increased in the percentage of at-risk students over time.

Taken together, these patterns indicate that most schools serving few at-risk students are becoming increasingly segregated in terms of socio-economic status over time. On the other hand, most schools serving the largest proportions of at-risk students have become increasingly integrated in terms of socio-economic status over time.

Figure 20: Relationship between change in percentage at-risk from 2017–18 to 2015–16 and percentage at-risk in 2017–18 by sector and school type

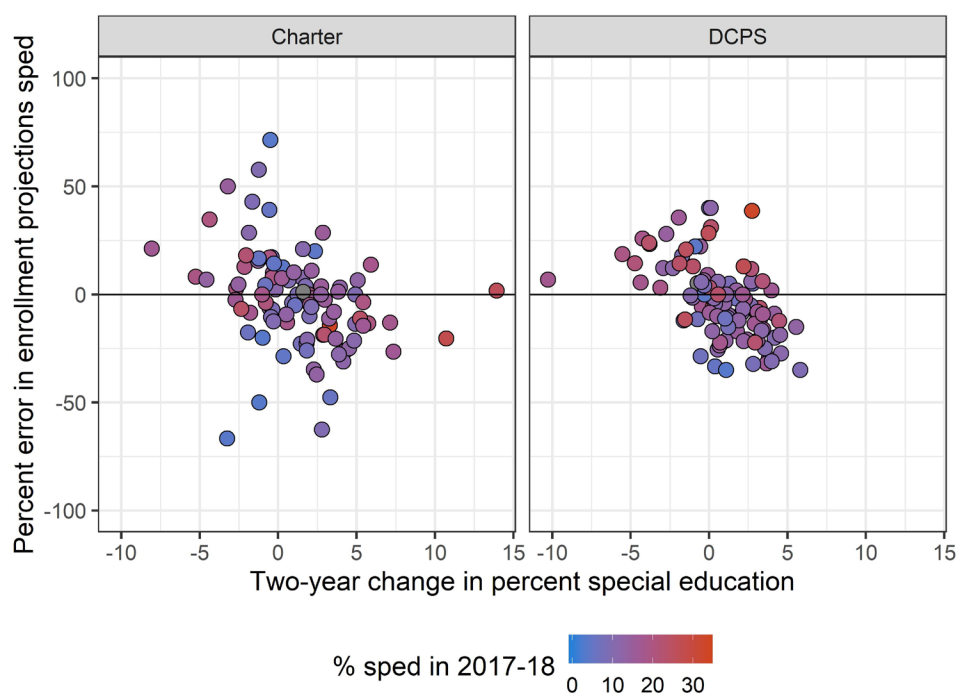


Schools serving low percentages of at-risk students mostly became increasingly segregated socio-economically over time.

Projection errors for special education subgroup only. Thirty-eight percent of DCPS schools and 44% of charter schools over-projected the number of special education students for the 2017–18 school year, and 59% of DCPS schools and 51% of charter schools under-projected enrollment for special education students. Changes in the percentage of special education students over time were related to projection errors for the special education subgroup. Not surprisingly, in both DCPS and charter schools, schools that increased in their percentage of special education students were under-projected for the number of special education students, whereas schools that decreased in their percentage of special education students were over-projected. Similar to the finding above, schools that increased in their percentage of special education students over time were more likely to be under-projected for numbers of special education students, and schools that decreased in their percentage of special education students over time were more likely to be over-projected. This finding indicates that enrollment projections for particular subgroups should be adjusted for recent demographic shifts at the school level to improve accuracy. Moreover, there did not appear to be any pattern in which schools either increased or decreased in their percentage of special education over time. Yet there were more dramatic changes in the percentages of special education students over time in charter schools compared with DCPS schools and therefore also greater projection errors of special education students for charter schools. Figure 21 shows the

relationship between enrollment projection errors for the special education subgroup and the two-year change in percentage of special education.

Figure 21: Relationship between enrollment projection errors for the special education subgroup in 2017–18 and change in percentage of special education from 2017–18 to 2015–16 by sector

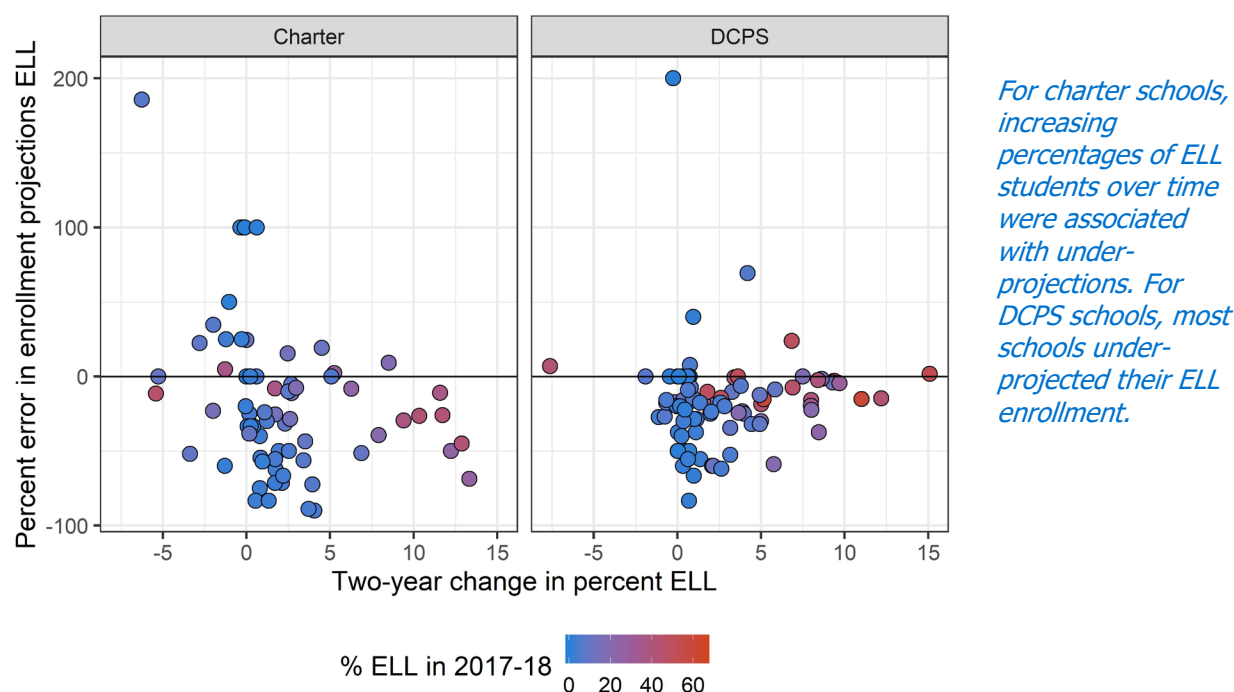


Schools with increasing percentages of special education students were more likely to be under-projected for enrollments and vice versa.

NOTES—1. AppleTree Early Learning Center Southwest, The Next Step, Rocketship DC Legacy Prep, and School Without Walls High School were excluded from the graph because they had projection errors greater than 200 percent. 2. The two-year change in the percentage of special education students from 2017–18 to 2015–16 was correlated with projection errors at $-.33$ ($p < .01$) in charter schools and $-.30$ in DCPS schools ($p < .01$).

Projection errors for ELL subgroup only. Eighty percent of DCPS and 65% of charter schools under-projected their enrollment of ELL students, and 7% of DCPS schools and 29% of charter schools over-projected their enrollment of ELL students. As with the special education subgroup, changes over time in a school's ELL population were related to projection errors for the ELL subgroup, but only for charter schools. Charter schools followed the expected pattern in which schools with increasing percentages of ELL students over time were under-projected for ELL enrollment, whereas schools with decreasing percentages of ELL students over time were over-projected, as shown in Figure 22. There was less of a linear relationship between changes in percentage ELL and enrollment projection errors for the ELL subgroup in DCPS schools than in charter schools. One reason for this is that the numbers of ELLs were under-projected in the vast majority of DCPS schools. DCPS schools that served low percentages of ELL students were particularly likely to be under-projected for their numbers of ELL students.

Figure 22: Relationship between enrollment projection errors for the ELL subgroup in 2017–18 and change in percentage ELL from 2017–18 to 2015–16 by sector



NOTES—1. Washington Global and Sustainable Futures were excluded from the graph because they had projection errors greater than 200 percent. 2. The correlation between the two-year change in percentage ELL and projection errors for the ELL subgroup only was $-.31$ ($p < .01$) for charter schools and $-.20$ ($p < .01$) for DCPS schools.

Summary of Findings

- Enrollments for DCPS schools serving large percentages of at-risk students and charter schools serving relatively large percentages of both at-risk and special education students were more likely to be over-projected.
- Enrollment projections for the at-risk student subgroup were the most stable for DCPS schools serving large proportions of at-risk students. DCPS schools serving lower proportions of at-risk students were both over- and under-projected for at-risk enrollment, as the percentage of at-risk changed over time in some schools.
- Enrollment projections for the special education subgroup were under-projected in 59% of DCPS schools and 51% of charter schools for the 2017–18 school year. Projection errors were related to changes in the percentage of special education students over time at the school level.
- Enrollment projections for the ELL subgroup were under-projected in 80% of DCPS schools and 65% of charter schools. Projection errors were related to changes in the percentage of ELL students over time at the school level. DCPS schools were generally under-projected for their ELL enrollment, and the vast majority of DCPS schools increased in their percentage of ELL students over time.

School demand. Another pertinent question in understanding enrollment projections is whether changes in school demand over time relate to projection errors. Given D.C.'s school lottery and open enrollment system, My School DC Lottery data can be used to understand one aspect of school demand because the data contain the numbers of students who applied to attend a particular school. There are limitations to using lottery data to understand school demand, however. One, families may list up to 12 schools per child in the school lottery each year. Therefore, lottery numbers may count students more than once. Two, there are constraints in the lottery process, namely the number of seats offered in the lottery by a particular school, as well as lottery preferences, such as the sibling preference or the in-boundary preference for zoned DCPS schools. Some families may decide not to apply in the lottery for schools in which they have little to no chance of being admitted. Third, students who are in-boundary for DCPS schools in grades K–12 do not need to enter the lottery to enroll. Fourth, by simply entering the lottery, families are not committing to attend any of the schools they may be matched with and therefore may apply for schools that they ultimately do not choose to attend. Finally, students who have already gained admittance into a DCPS or charter school do not have to re-apply for the same school the following year. In fact, in the 2017–18 school year, 69% of public-school students enrolled in a school without entering the lottery.²⁵ Therefore, for zoned DCPS schools in particular, other metrics may be more appropriate for understanding school demand. Below are the school demand metrics explored in this study:

- By grade and school, the number of students who applied to a particular school in the My School DC Lottery.
- By grade and school, the number of students who listed the school as one of their top three choices in their lottery application.
- By grade and school, the number of students who were on the waitlist after applying in the lottery and not receiving a match with the school or any school ranked higher.
- By grade and school and for DCPS zoned schools only, the in-boundary capture rate or the percentage of students who attended the school out of all public school students who lived within the school's boundary.

Relationships among multiple measures of school demand. The number of students who listed the school as one of their top three choices in the lottery was strongly correlated with the total number of unique students who applied to the school via the lottery. This was true in both sectors and across all grade levels. In addition, the number of students on the waiting list was a reasonable proxy for the total number of students who applied to the school in the lottery in both sectors, with the exception of grade 9. For both sectors, the waiting lists for grade 9 were relatively short in some schools with large numbers of lottery applicants, and this was particularly true for DCPS selective high schools. These findings are expected, with the exception of relatively shorter waitlists for DCPS selective high schools.

For DCPS zoned schools, the number of lottery applicants may not accurately reflect high in-boundary demand, as defined by the in-boundary capture rate. Some schools with high in-boundary demand had relatively low numbers of students applying to them in the lottery. This was especially true in non-preschool and non-transition grades. One explanation for this pattern

²⁵ American Institutes for Research, My School DC Lottery Program Evaluation of School Year 2017–18, May, 2018.

is that students in grades K–12 are guaranteed admission in their zoned DCPS schools and do not need to apply to these schools in the lottery. Therefore, even though a zoned DCPS school may be desirable by those who live within its boundary, it may not necessarily have a long waiting list after the lottery. The in-boundary capture rate across all zoned DCPS schools ranged from 9.8% at Anacostia High School to 97.1% at Mann Elementary in 2017–18.

Variation in the number of lottery applicants was correlated with in-boundary capture rates for zoned DCPS schools, however.²⁶ Put differently, while the number of lottery applicants was related to DCPS schools' in-boundary capture rates, high in-boundary demand was not well captured with raw numbers of lottery applicants in most grade levels. We therefore used multiple measures when examining whether errors in enrollment projections were related to changes in school demand over time using multiple measures. For all schools, we used the total number of lottery applicants as one proxy for school demand. Additionally, for zoned DCPS schools, we also used the in-boundary capture rate as an additional metric of school demand.

Projection errors and changes in school demand over time. Change in total number of lottery applicants over time was not related to enrollment projection errors, with the exception of grade 9 for charter schools only. Enrollment projection errors for grade 9 students in charter schools were correlated with the one- and two-year change in the number of lottery applicants in the 2016–17 and 2017–18 school years.²⁷ These correlations indicate that some charter schools with a loss in ninth grade lottery demand over time over-projected enrollment, whereas some charter schools with an increase in ninth grade lottery demand under-projected enrollment. Change in lottery demand over time for zoned DCPS schools was not correlated with enrollment projection errors. Patterns were not dissimilar for DCPS and charter schools, but the relationship between change in lottery demand and projection errors was less linear for DCPS schools, resulting in the lack of a statistically significant correlation.

For zoned DCPS schools in grade 9, the change in the in-boundary capture rate over time was related to enrollment projection errors. Enrollment projection errors were negatively correlated with the one- and two-year change in the in-boundary capture rate in the 2016–17 and 2017–18 school years.²⁸ In other words, when a smaller proportion of ninth grade students in the school's boundary attended the school than in prior years, some schools had over-projected enrollment. These similar findings for DCPS and charter schools indicate that changes in school demand over time was related to enrollment projection errors in grade 9, and that change in demand for DCPS and charter schools may be best captured using multiple measures.

One question is why declining demand was related to enrollment projection errors for ninth grade but not other grades. One plausible explanation is that while the demand for some

²⁶ The correlations ranged from .91 in K ($p < .001$) to .56 in grade 7 ($p < .001$). Therefore, the number of student lottery applicants explained 31–82% of the variation in in-boundary capture rates, depending on the grade.

²⁷ Enrollment projection errors for grade 9 students in charter schools were correlated with the one-year change in the number of lottery applicants at $-.36$ ($p < .05$) and the two-year change in the number of lottery applicants at $-.52$ ($p < .01$). The change was calculated by (latest year – initial year).

²⁸ Enrollment projection errors were correlated with the one-year change in the in-boundary capture rate for grade 9 at $-.40$ ($p < .10$) and the two-year change at $-.62$ ($p < .01$). Change was calculated by (latest year – initial year).

schools declined in other grades, schools were still able to maintain a stable enrollment, while schools with declining demand in grade 9 did not have enough students for the available seats to maintain a stable enrollment. Lottery and enrollment data for grade 9 in charter schools provides some support for this explanation. Charter schools offered more seats in grade 9 than they could fill, relative to most other grades. A similar phenomenon could have occurred in DCPS zoned schools as well. A recent report also indicated that there were many empty seats in some middle and high schools in D.C.²⁹ Moreover, while the total number of public school students has increased over time, the number of public school students in grade 9 decreased over time from 5,818 students in 2014–15 to 5,365 students in 2017–18.³⁰ These are possible reasons why change in demand over time related to projection errors in grade 9, but there may be other explanations as well.

Summary of Findings

- A school's waitlist length was a reasonable proxy for the number of unique students who included the school in their lottery application. However, the number of students who apply to a school in the lottery is limited in explaining demand for all schools and especially so for zoned DCPS schools because students in grades K–12 do not need to apply in the lottery to attend their in-boundary schools.
- Change in demand for a particular school over time was not strongly related to the school's enrollment projection errors, except in grade 9. DCPS and charter schools with declining demand for grade 9 were more likely to be over-projected, and schools with increasing demand for grade 9 were more likely to be under-projected.

School closures and openings. Another unanswered question is the extent to which the opening or closing of schools affects enrollment at nearby schools, therefore producing greater errors in their enrollment projections. To address this question, we examined where students went when their previous school was closed. For new schools, we examined the schools from which they transferred.

What was the effect when schools are closed and new schools are opened?

The following animations show that students did not necessarily attend nearby schools when transferring from closed schools or moving to new schools. Conversely, many students also remained at the same location from one year to the next when that was an option. Table 6 shows the percentages of students who remained from one year to the next when their school was closed and a new school was opened at the same location.

Animation 1:

[Where students attended school after school closures in 2014](#)

Animation 2:

[Where students attended school after school closures in 2015](#)

²⁹ Office of the Deputy Mayor for Education, [School System Capacity Assessment](#), May 15, 2019.

³⁰ The number of ninth grade students by year was collected from [OSSE Enrollment Data](#). Recall that the study sample slightly differs from the OSSE data. See the [sample section](#) for more details.

Animation 3:

[Previous school for students
who attended new schools in
2015](#)

Animation 4:

[Previous school for students
who attended new schools in
2016](#)

Table 6: Percent of students who remained at same location with school closure

Closed School				New School			
School Name	Sector	% Remained at current location in next school year	% at-risk in school	School Name	Sector	% Students in new school who remained at same location	% at-risk in school
Brookland	DCPS	48.5	48.0	Bunker Hill	DCPS	81.3	55.1
Community Academy Amos I	Charter	65.1	49.4	Dorothy Height	DCPS	94.4	40.0
Options	Charter	90.3	81.3	Kingsman Academy	Charter	72.0	86.2

NOTE—These schools closed after the 2014-15 school year, and new schools were opened in the same locations in the 2015-16 school year.

Table 6 shows that when schools were closed and new schools opened at the same location, the majority of students who attended the closed school decided to attend the newly opened school. There was a range across schools from 49% to 90% of students who decided to attend the new school at the same location. Notably, this percentage was the highest (90%) for the closing school that served the highest percentage of at-risk students (81%). Conversely, when a school opened at a location where a previous school had closed, the majority of students attending the new school came from the closed school. The range across schools was 72% to 81%. Therefore, when a new school opens at the same location as a closed school, the new school retains the majority of students who had attended the closed school at the same location.

Projection errors and distance to newly opened school. For schools with the same grade levels, we examined the relationship between distance from a new school and enrollment projection errors in other schools. There was no systematic relationship between proximity of new schools and other schools' projection errors in the year in which the new schools opened. There were few school closures in the available data, and therefore the data were too sparse to determine if there was a systematic relationship between proximity of school closures and enrollment projection errors for other schools.

A limitation of this finding, however, was that distance from new or closed schools to other schools was calculated “as the crow flies.” Therefore, distance in this study did not reflect commuting times, which have been shown to relate to school attended in DC.³¹ Importantly, actual distance may understate travel times, particularly for students who rely on public transportation to get to school, including families living under the poverty line who are less likely to have access to a car.³²

Table 7 provides summary statistics outlining how far students traveled to their next school when their school was closed, assuming they did not remain at the same location. The table also shows for students attending a new school that had just opened how far away their previous school was, also assuming that they did not remain at the same location.

Table 7: Percentiles of distance traveled for students who moved from closed schools or to new schools

School Type	Distance from closed schools in miles			Distance to new schools in miles		
	50 th Percentile	75 th Percentile	90 th Percentile	50 th Percentile	75 th Percentile	90 th Percentile
Elementary	1.5	2.6	5.1	2.1	3.4	5.0
Middle	1.2	2.2	3.2	0.9	1.9	3.5
High	2.9	4.0	4.0	3.1	4.4	5.9

NOTE—Students who remained in the same location from one year to the next were not included in the calculation.

Table 7 shows that 50% of students who left closed schools and went to a school at another location attended schools that were within 1.5 (elementary), 1.2 (middle), and 2.9 (high) miles from their previous school. Similarly, 50% of students who attended newly opened schools transferred from schools that were within 2.1 (elementary), 0.9 (middle), and 3.1 miles (high) from their previous school. More research is needed, however, to understand the relationship between these moves and actual commute times for different subgroups of students.

While there was no systematic relationship between the proximity of a closed or new school and projection errors at other schools, it is important to note that four out of the eight new schools were over-projected for enrollment by more than 150%. One implication of this finding is that enrollment projection methodology for new schools may need to be adjusted to produce more accurate enrollment projections.

Summary of Findings

- When a school closed and a new school opened in the same location, the majority of students who attended the newly opened school had previously attended the closed school.

³¹ Urban Institute, [The Road to School](#), March, 2018.

³² Urban Institute, [The Road to School](#), March, 2018.

- There was no systematic relationship between the opening of new schools and nearby schools' enrollment projection errors in the year in which the new schools opened. This finding was based on the straight-line distance between schools and did not account for student travel times or schools' accessibility by public transportation.
- Four out of the eight new schools were severely over-projected for their enrollments by 150% or more.
- There were not enough closed schools in the data to examine the systematic relationship between school closures and effects on nearby schools' enrollment projection errors.

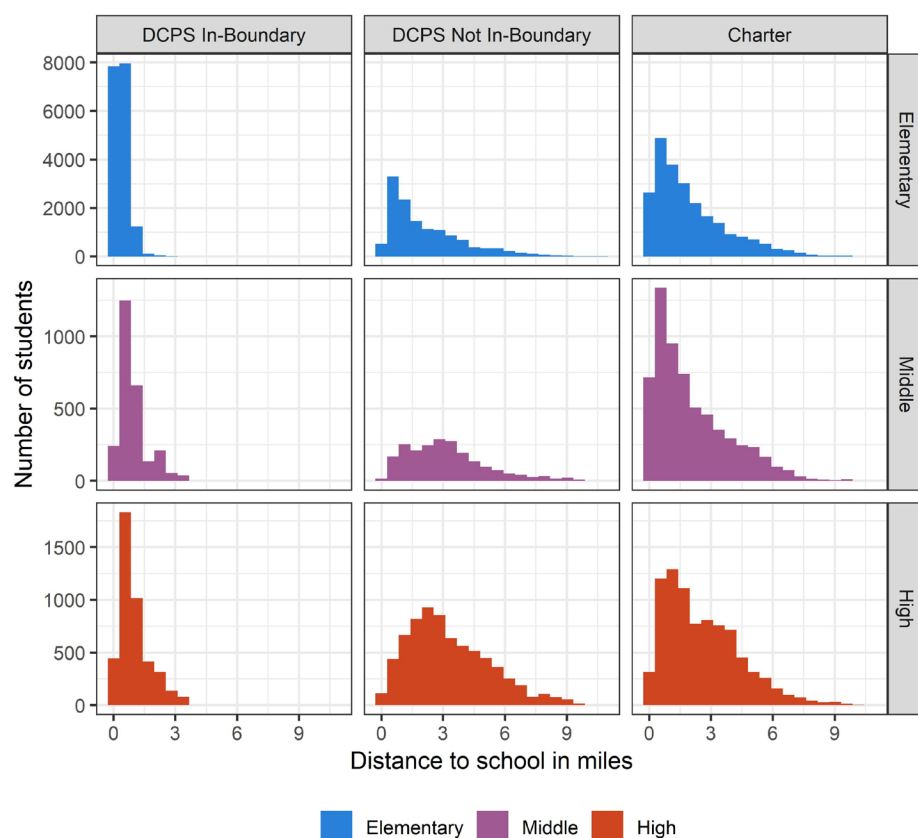
Distance to school. In this section, we examine whether the average distance from student homes to schools was related to enrollment projection errors. In theory, schools that require greater travel could have higher rates of student mobility and therefore greater projection errors. Alternatively, schools for which students travel the farthest could be the most desirable schools with lower projection errors. We first calculated the distance from home to school for each student as the straight-line distance. Then, for each school, we calculated the average distance from home to school. Again, distance in this study may not accurately reflect commuting times, particularly when using public transportation, and commuting times have been shown to relate to schools attended.³³ Nevertheless, the straight-line distance allowed us to determine if projection errors were related to the proximity of home to school.

Average distance from home to school. When students did not attend their in-boundary DCPS schools, the average distance from students' homes to schools in 2017–18 averaged 2.31 miles. For students who attended their in-boundary DCPS schools, the average distance from home to school in 2017–18 averaged 0.55 miles. As expected, students who attended their zoned DCPS schools lived closer to their schools than students who attended other DCPS or charter schools. The distributions of distance from home to school were similar for students who attended out-of-boundary or citywide DCPS schools and students who attended charter schools, as shown in Figure 23.³⁴ However, in 2017–18, students attending charter schools lived closer to their schools by 0.43 miles ($p < .001$) than students attending out-of-boundary or citywide DCPS schools, on average and controlling for school type.

³³ Urban Institute, [The Road to School](#), March, 2018.

³⁴ Citywide DCPS schools do not have boundaries, and admission is determined via the My School DC Lottery, similar to charter schools.

Figure 23: Distributions of distance from home to school in miles in 2017–18 by school type and DCPS in-boundary, DCPS out-of-boundary, and charter school



There has been little change since 2014–15 in the average distances between home and school in either sector. These estimates remained stable over time, as shown in Table 8. These findings are consistent with other studies that have found proximity from home to school to be an important factor in school selection in D.C.³⁵

³⁵ 1. Glazerman and Dotter, [Market Signals: Evidence on the Determinants and Consequences of School Choice From a Citywide Lottery](#), *Educational Evaluation and Policy Analysis*, 2017. 2. Schneider and Buckley, What Do Parents Want from Schools? Evidence from the Internet, *Educational Evaluation and Policy Analysis*, 2002. 3. Urban Institute, [The Road to School](#), March, 2018. This study found that 43% of public school students were driven to school.

Table 8: Means and standard deviations of distance from home to school by in-boundary versus out-of-boundary (or charter) school over time

Year	In-Boundary School		Not In-Boundary School	
	Mean (miles)	Standard deviation (miles)	Mean (miles)	Standard deviation (miles)
2014–15	0.58	0.67	2.27	1.85
2015–16	0.52	0.51	2.27	1.83
2016–17	0.55	0.52	2.28	1.83
2017–18	0.55	0.53	2.31	1.87

Students in both sectors lived the closest to elementary schools, followed by middle schools, and then high schools. Table 9 shows the means and standard deviations of distance from home to school by sector and school type.

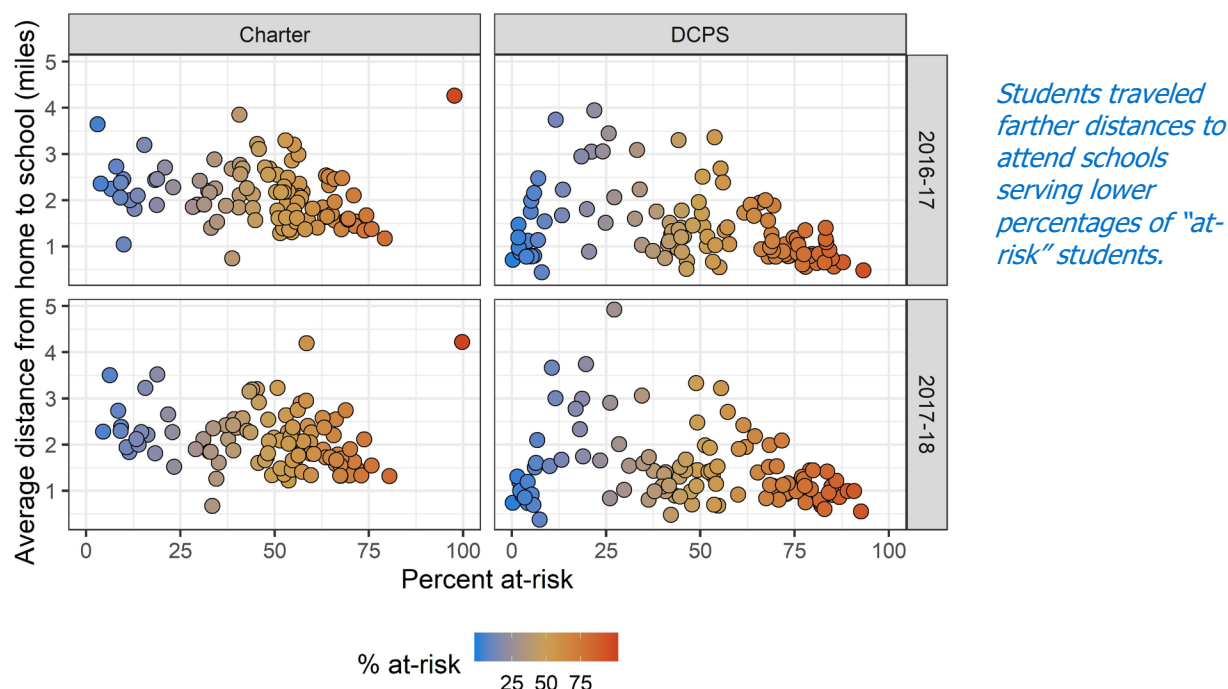
Table 9: Means and standard deviations of distance from home to school in 2017–18 by sector and school type

School Type	DCPS		Charter	
	Mean (miles)	Standard deviation (miles)	Mean (miles)	Standard deviation (miles)
Elementary	1.14	1.49	1.99	1.75
Middle	1.95	1.78	2.05	1.80
High	2.45	1.97	2.58	1.83

NOTES—1. Sector differences in the average distance from home and school were statistically significant at $p < .001$ for elementary and high schools and $p < .01$ for middle schools. 2. Within each sector, average distances between home and school were smaller for elementary schools than for middle schools ($p < .001$ in DCPS and $p < .05$ in charter schools), and smaller for middle schools than for high schools ($p < .001$ in DCPS and charter schools).

Distance from home to school and school demographics. Proximity from home to school was not related to enrollment projection errors for either charter or DCPS schools, but some interesting patterns emerged from the data. More than any other available school characteristic, the percentage of at-risk students was the most predictive factor of the average distance from home to school in both sectors. There was a downward linear trend for charter schools in that students tended to travel farther for schools with low proportions of at-risk students and tended to travel less far for schools with high proportions of at-risk students. The pattern for DCPS schools, however, indicated a non-linear, quadratic pattern. DCPS students attending schools with both very low and high proportions of at-risk students lived closer to their schools, while DCPS students attending more socio-economically diverse schools lived farther away from their schools, on average. Figure 24 shows the relationship between average distance from home to school and school percent at-risk for charter and DCPS schools, respectively.

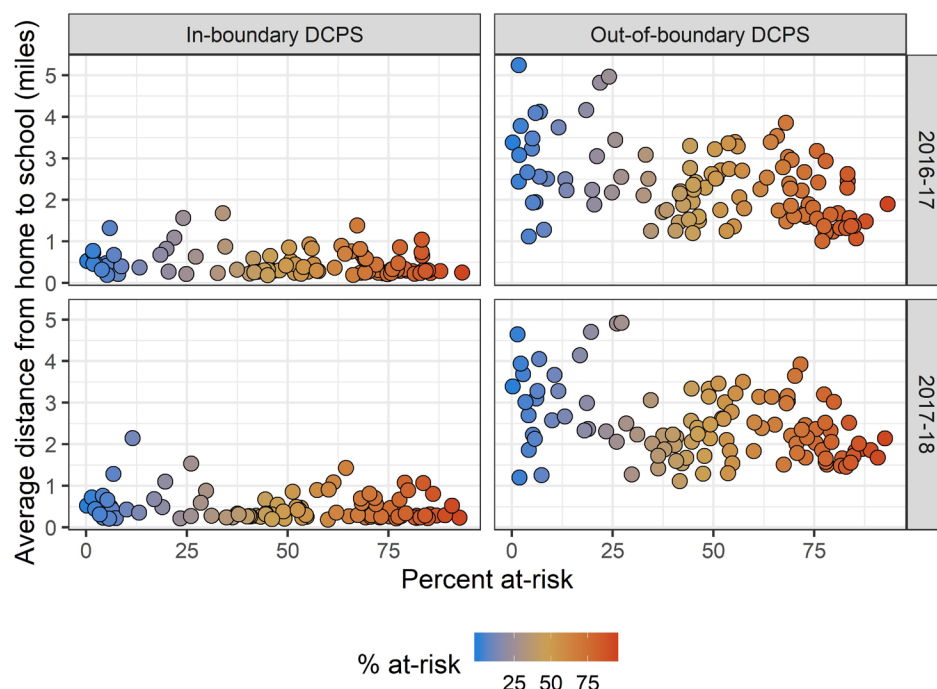
Figure 24: Relationship between average distance from home to school and percentage at-risk by year and sector



NOTE—The correlations between percent at-risk and average distance from home to school were $-.21$ ($p < .05$) for charter schools in 2016–17, $-.35$ ($p < .001$) for DCPS schools in 2016–17, $-.17$ ($p < .10$) for charter schools in 2017–18, and $-.26$ ($p < .01$) for DCPS schools in 2017–18.

We also disentangled the average distances from home to school for DCPS in-boundary versus out-of-boundary students to better understand the quadratic relationship identified above. As Figure 25 shows, patterns for out-of-boundary DCPS students were similar to those for charter students in that students tended to travel farther for schools with low proportions of at-risk students and less far for schools with high proportions of at-risk students, on average. Conversely, the average distance from home to school was more similar for in-boundary students across the range of schools with different proportions of "at-risk." Taken together, these findings indicate that when students were not attending their zoned DCPS schools, students traveled farther on average for schools with low proportions of at-risk students and traveled the least distances on average for schools with high proportions of at-risk students. Moreover, these findings were true for students in all racial groups. Yet differences in distance from home to school were not systematically related to enrollment projection errors.

Figure 25: Relationship between average distance from home to school and percentage at-risk by DCPS in- and out-of-boundary and year



For DCPS out-of-boundary schools, students traveled farther distances to attend schools serving lower percentages of "at-risk" students.

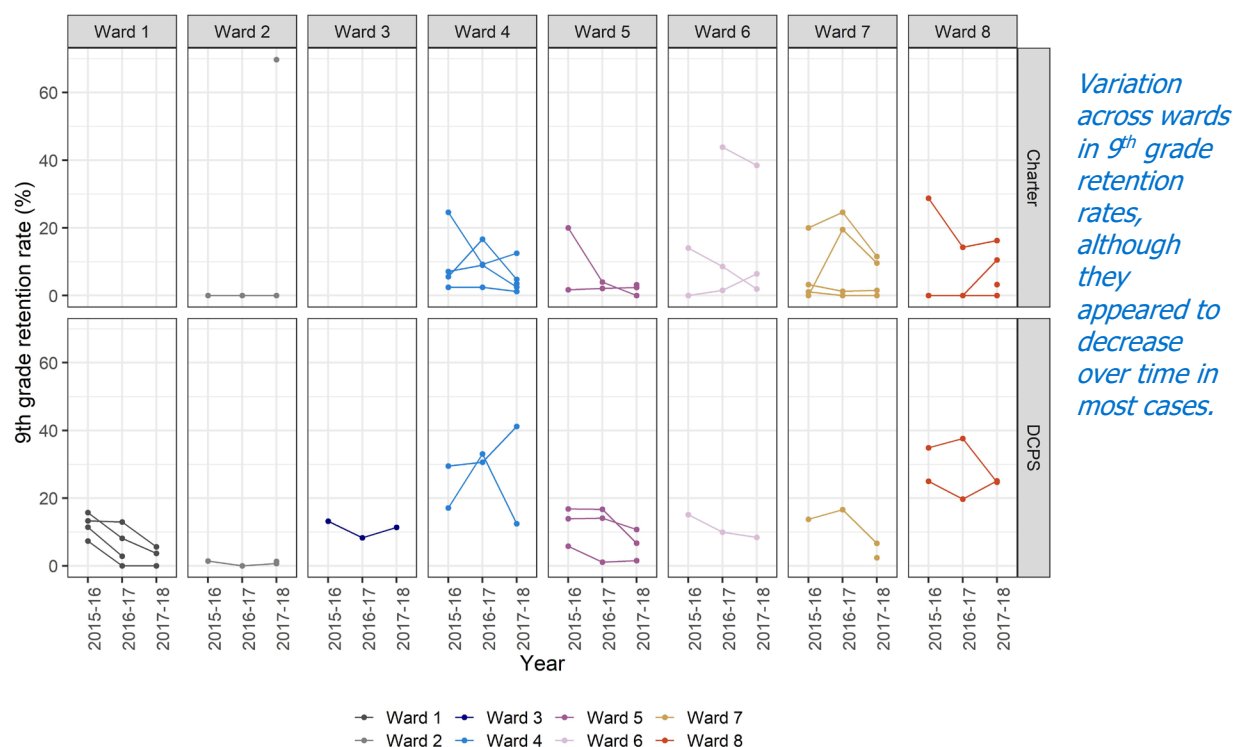
Summary of Findings

- Using the straight-line distance in miles, DCPS students attended a school that averaged 1.5 miles from their homes, and charter students attended a school that averaged 2.1 miles from their homes in the 2017–18 school year. As anticipated, students who attended their zoned DCPS schools lived closer to their schools than students who attended other DCPS or charter schools.
- The average straight-line distance from students' homes to school was not related to projection errors.
- Students traveled distances that were on average farther to attend charter schools and out-of-boundary or citywide DCPS schools that had lower proportions of at-risk students, and this was true for all student racial subgroups.

Grade-level retention. Changes in grade retention practices from one school to the next could affect enrollment and therefore the accuracy of enrollment projections in the following school year. In this section, we examine whether changes in grade retention rates over time related to enrollment projection errors. Very few students were retained in a grade from one year to the next, with the exception of students in grade 9. Between 2015–16 and 2017–18, the average school retained between 9.8 and 11.5 percent of its ninth-grade students. Moreover, five schools retained a quarter of their ninth-grade students each year, although the list of these schools changed from year to year. Grade-level retention may occur when ninth grade students do not meet the core requirements to advance to the tenth grade or when students are recommended to repeat the grade.

Projection errors and ninth grade retention rates. Changes in ninth grade retention rates over time were not related to projection errors for grade 9. One potential reason for the lack of relationship, however, was that ninth-grade retention rates decreased over time for the majority of schools in both sectors, as shown in Figure 26. Because ninth grade retention rates decreased over time for 87% of DCPS schools and 69% of charter schools, there was less variation in changes over time that could relate to projection errors. Ninth grade retention rates were also systematically larger in schools with higher proportions of at-risk or special education students in the ninth grade, which is somewhat reflected by differences in ninth grade retention rates across wards.

Figure 26: Ninth grade retention rates from the 2015–16 to 2017–18 school years by sector and ward



In the 2017–18 school year, Ward 8 schools served the largest proportions of at-risk students in grade 9, followed closely by Wards 6 and 7. Ward 2 schools had the highest average ninth grade retention rates, but this was driven by the outlier school with a very high ninth grade retention rate (see gray dot in Figure 26). After Ward 2, Wards 6 and 8 had the highest average ninth grade retention rates. Findings are largely the same for the relationship between ninth grade retention rates and percentage special education, as percentage at-risk was correlated with the percentage special education in grade 9.³⁶

³⁶ The percentage of “at-risk” was correlated with the percentage special education in grade 9 at .50 ($p < .05$) in charter schools and .84 in DCPS schools ($p < .001$).

Summary of Findings

- Between 2015–16 and 2017–18, the average school retained between 9.8 and 11.5 percent of its ninth-grade students. Very few students were retained in the same grade level from one year to the next in other grades.
- Projection errors were not related to ninth grade retention rates, and ninth grade retention rates decreased for the majority of schools over time.
- Ninth grade retention rates were positively related to the proportions of at-risk and special education students in the schools.

In-boundary demand for kindergarten. Preschool is not guaranteed in all zoned DCPS schools. Students may attend schools other than their in-boundary DCPS school for preschool grades if they get accepted into those schools via lottery, and then in some cases, they may transfer back to their in-boundary school for kindergarten. All students are guaranteed a seat in their in-boundary DCPS school for grades K–12, if they choose to enroll. We examined whether changes over time in the percentage of students transferring back to their in-boundary DCPS school for kindergarten related to enrollment projection errors for grade K. This percentage was calculated as the number of in-boundary students who attended the school for K but did not attend the school for PK4, divided by the K enrollment, according to the October enrollment audit.

Projection errors and transferring to in-boundary school for grade K. Changes in the percentages of students transferring to their in-boundary schools for kindergarten were related to projection errors for grade K in zoned DCPS schools.³⁷ These correlations indicate that DCPS schools with a greater percentage of in-boundary students returning for grade K than in the previous year were more likely to be under-projected for enrollment in grade K, whereas DCPS schools with a lower percentage of in-boundary students returning for grade K were more likely to be over-projected for enrollment. The one-year change in the percentage of in-boundary students returning for grade K was also correlated with student demographics in grade K, including negative correlations with the percentage at-risk and black, and a positive correlation with the percentage white in the 2017–18 school year.³⁸ This finding raises the question of whether changes in the neighborhood population or demand for local schools should be taken into consideration in determining school enrollment projections.

Summary of Findings

- Changes over time in the percentages of students transferring to their in-boundary schools for kindergarten were related to projection errors for grade K in zoned DCPS schools. Schools with increasing neighborhood demand over time for grade K were more likely to be under-projected in enrollment, and schools with decreasing neighborhood demand were more likely to be over-projected.

³⁷ The correlation between the change in percentage points of in-boundary students transferring back to the school and projection errors for grade K was $-.26$ ($p < .05$) in 2016–17 and $-.32$ ($p < .01$) in 2017–18.

³⁸ The one-year change in the percentage of in-boundary students returning for grade K was negatively correlated with the percentage “at-risk” at $-.34$ and the percentage black at $-.34$, and positively correlated with the percentage white at $.34$.

- Increasing neighborhood demand over time for grade K was negatively correlated with the percent black and at-risk in grade K and positively correlated with the percent white in grade K.

Which factors were the most predictive of errors in enrollment projections?

Given the multiple factors that descriptively related to projection errors, we determined which were the most predictive of projection errors and should therefore be prioritized in attempting to improve the accuracy of enrollment projections.³⁹ Projection errors were calculated as previously described:

$$\text{percent error} = \frac{\text{projected} - \text{actual}}{\text{actual}} * 100$$

In other words, we identified which factors were the most important in explaining the variation in projection errors, controlling for other factors.⁴⁰ Because factors were often correlated with one another, the exclusion of a factor from the model does not imply that the factor was not related to projection errors. We ran the analyses separately by year and sector, given the differences identified in previous sections when examining descriptive trends across years and sectors. Full results are available in Appendix C.

For DCPS schools, the most consistent factor predicting school-level enrollment projections was the percentage of at-risk students in the school. In the 2016–17 and 2017–18 school years, a DCPS school serving more at-risk students by 10 percentage points was on average over-projected for enrollment by 0.6 to 4.6 percentage points across the two years. Declining school enrollment also predicted projection errors in 2017–18. A decline in enrollment by 25 students was associated with average over-projections in enrollment by 1.3 percentage points. For zoned DCPS schools and in 2017–18 only, a 10 percentage point decline in the in-boundary participation rate from the previous year was associated with over-projections of 3.7 percentage points, on average. In 2016–17, new or re-opened schools—MacFarland Middle School and Ron Brown College Preparatory High School—were dramatically over-projected for enrollment. There were no new DCPS schools in the 2017–18 school year.

For charter schools, there were differences across the two years in which factors were the most predictive of enrollment projections. In the 2017–18 school year, charter schools that opened that year were dramatically over-projected for enrollment. Conversely, in the 2016–17 school year, new charter schools were under-projected for enrollment.⁴¹ In addition, the percentage

³⁹ Given that projection errors for specific student subgroups (e.g., “at-risk,” special education, and ELL) were at least partially explained by changing school demographics, we focused exclusively on predicting total errors in school projections in these analyses.

⁴⁰ We used multiple linear regression and a backwards elimination process to identify the most parsimonious model with the best model fit—see Lattin, Carroll, & Green, 2003. *Analyzing multivariate data*. Belmont, CA: Brooks/Cole, Cengage Learning. We also used a machine learning (lasso) analytic approach to explore interactions of factors that might be important in explaining variation in the projection errors. Machine learning is useful for model selection when there are a large number of potential covariates to include in the model. Ultimately, interactions among factors were not included because they did not improve model fit above and beyond the main covariates.

⁴¹ Friendship Technology Preparatory Academy High School was not flagged as a new school in the 2016–17 school year because it opened at the same location of Friendship Technology Preparatory Academy Middle School.

both at-risk and special education in the school was related to average over-projections in the 2016–17 school year. A school serving more at-risk and special education students by 10 percentage points was on average over-projected for enrollment by 3.4 percentage points.

Taken together, these findings indicate that the accuracy of school enrollment projections could be improved by making adjustments to projections on the basis of changes in enrollment or student demographics over time. In addition, new schools were often severely over-projected for enrollment in their opening year.

Summary of Findings

- DCPS schools with declining enrollments, greater proportions of at-risk students, and decreasing neighborhood demand defined as change in the in-boundary capture rate were more likely to be over-projected for enrollment. Conversely, DCPS schools with increasing enrollments, lower proportions of at-risk students, and increasing neighborhood demand were more likely to be under-projected for enrollment.
- Charter schools with greater proportions of students who were both at-risk and special education were more likely to be over-projected for enrollment.
- New schools in both sectors were more likely to be over-projected for enrollment.

Part 2: Factors Relating to Patterns in School Mobility

The first section of this report explores whether the degree of student mobility at a particular school was related to the school's enrollment projection error. In this second section of the report, we further explore student mobility among D.C.'s students to better understand mobility patterns in order to inform future enrollment projections.

Prior research has linked school-to-school mobility with slower academic growth, less engagement in school, and higher likelihoods of dropping out of high school.⁴² In addition, studies have consistently found greater school mobility for black and low-income students than for white and affluent students, in part due to higher rates of residential mobility. Yet relatively little is known about the main drivers of and patterns in student mobility in D.C.⁴³

The section addresses the following research questions:

- Across multiple school years, how many students switched back and forth between sectors? How many schools did students attend?
- To what extent did residential changes also occur when students changed schools?
- What were the patterns in school-to-school mobility of students in D.C.?

⁴² 1. Center for Research on the Education of Students Placed At Risk, Johns Hopkins University, [Patterns of Urban Student Mobility and Local School Reform](#), October, 1996. 2. Gasper, DeLuca, and Estacion, [Switching Schools: Revisiting the Relationship Between School Mobility and High School Dropout](#), *American Educational Research Journal*, 2012. 3. Lleras and McKillip, [When children move: Behavior and achievement outcomes during elementary school](#), *Journal of Educational Research*, 2017. 4. Workshop on the Impact of Mobility and Change on the Lives of Young Children, Schools, and Neighborhoods, [School Mobility in the Early Elementary Grades: Frequency and Impact From Nationally-Representative Data](#), June, 2009.

⁴³ Division of Data, Accountability, and Research at OSSE, [Mid-Year Student Movement in DC](#), July, 2015.

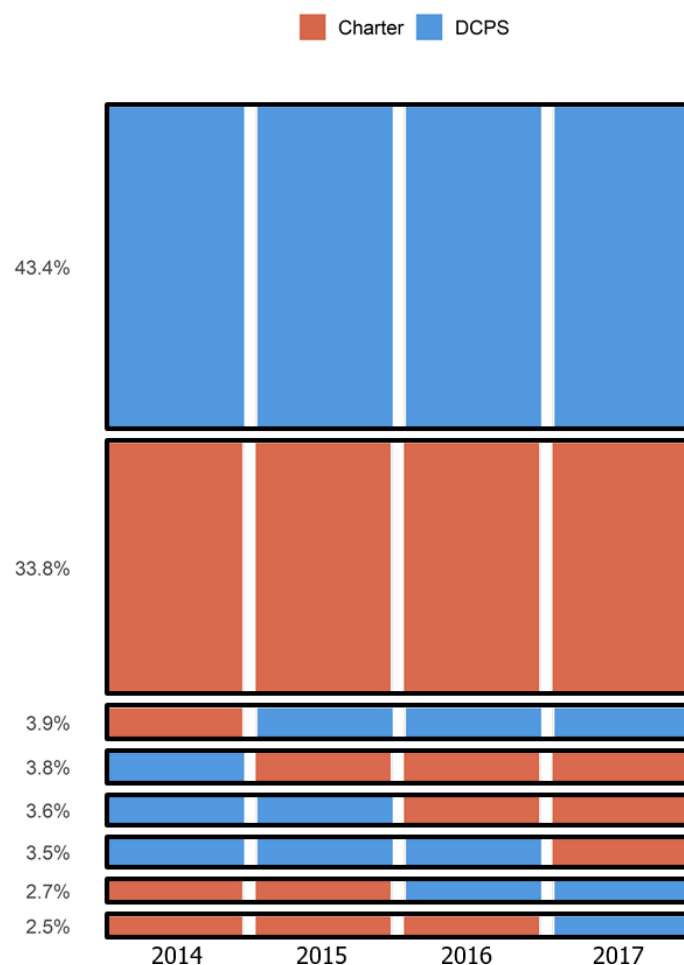
The data allowed for the analysis of student mobility between school years only and did not include sufficient information to track mid-year student mobility. The following sections summarize the findings.

Numbers of sector and school switches over multiple school years. We examined how many sector and school switches were made for students who were enrolled in the public-school system for all four years from 2014–15 to 2017–18. This analysis does not provide insights on mobility patterns for students who moved in and out of the District during this period.

Just under one-quarter of D.C.'s public school students attended schools in both sectors from the 2014–15 through 2017–18 school years. Seventy-seven percent of students who remained in the public-school system from the 2014–15 through 2017–18 school years attended schools in only one sector (33.8% in charter schools and 43.4% in DCPS schools). The remaining 22.8% of students switched between sectors during the 4-year period.

Figure 27 shows all of the patterns in sector switches over the 4-year period. About 10% of students who were in charter schools in the 2014–15 school year switched to a DCPS school in a subsequent school year, and about 12% of students who were in DCPS schools in 2014–15 switched to a charter school in a subsequent school year. Patterns for at-risk and special education subgroups were similar to the overall findings, while ELL students were more likely to attend a DCPS school for all four years (57.3%) compared with a charter school for all four years (22.2%).

Figure 27: Percent of students per sector pattern of enrollment from the 2014–15 to 2017–18 school years



NOTE—Sector patterns representing less than 1% of students were excluded from this graph.

We also examined how many different schools students attended over the 4-year period and found that some student subgroups were more likely to switch schools than others. We analyzed student mobility for all students and for students in non-matriculating grades only, as school changes from elementary to middle schools or from middle to high schools are to be expected. When excluding students who matriculated from one school to another, 62.5% of students attended one school, 30.0% attended two schools, 6.7% attended three schools, and fewer than 1% attended four schools during the 4-year period. There were differences across student subgroups, however. Black students had more school switches than Latino or white students across the 4-year period, as shown in Figure 28.

At-risk and special education students had more school switches than all other students, and non-at-risk and ELL students had fewer school switches than all students, as shown in Figure 28.

Figure 2: Number of schools attended from the 2014–15 to 2017–18 school years by student race/ethnicity

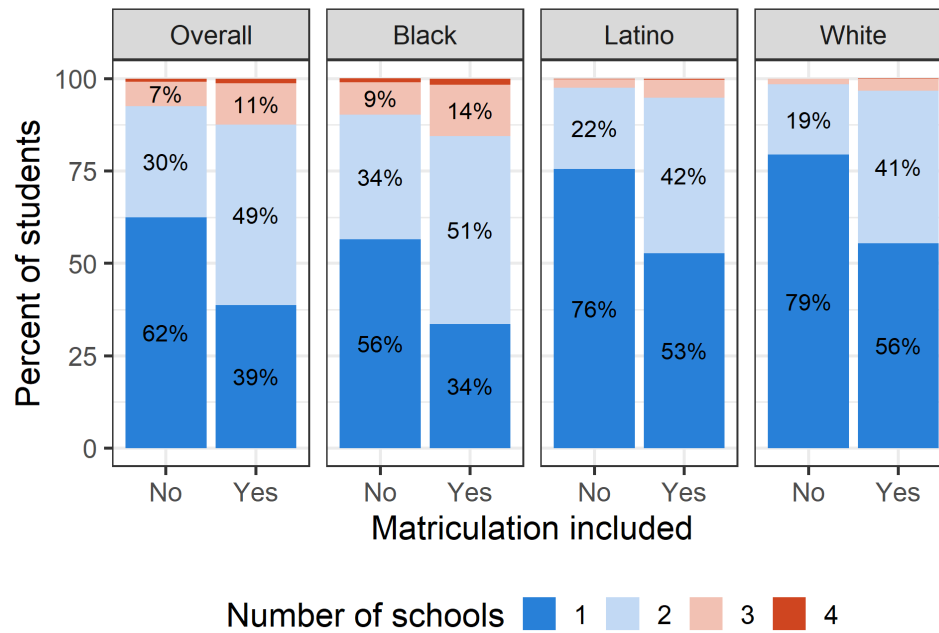
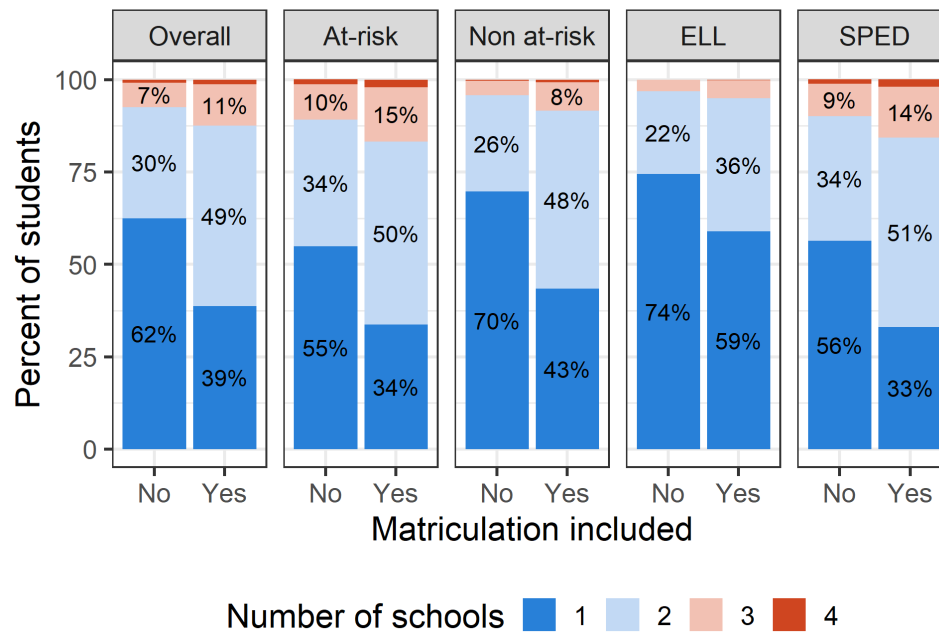


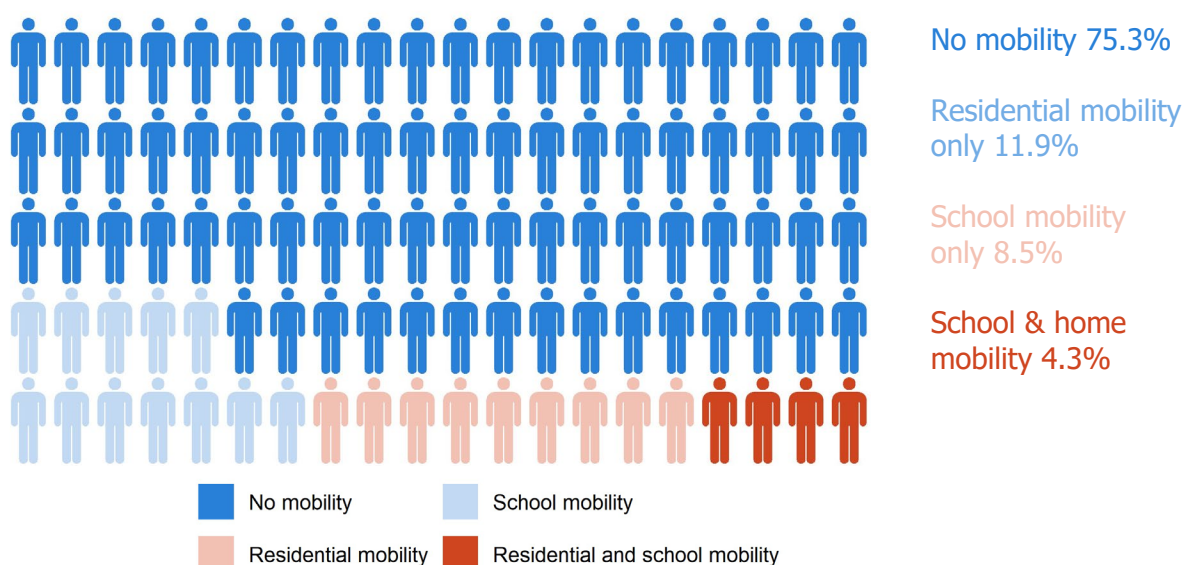
Figure 29: Number of schools attended from the 2014–15 to 2017–18 school years by student subgroup



Student residential mobility and school mobility. We now explore to what extent school mobility occurred simultaneously with residential mobility. In other words, if students switched schools, did their home residences also change, or was school mobility unrelated to changes in home residences? We addressed this question for non-matriculating students only. In other words, if students transferred from an elementary to middle school or from a middle to high school, they were not included in this analysis.⁴⁴

As shown in Figure 30, about 75% of students did not change either school or home address between the 2016–17 and 2017–18 school years, 11.9% of students changed home address and remained at the same school, 8.5% of students changed schools but did not change home address, and 4.3% of students changed both schools and home addresses. Therefore, approximately one-third of school mobility for non-matriculating students also coincided with a change in student home address, indicating that about one-third of school moves may have been driven by a residential move rather than the desire for a new school.⁴⁵ This estimate appears to be similar in other consecutive school years from 2014–15 through 2016–17.

Figure 3: School and residential mobility between the 2016–17 and 2017–18 school years



Although 87.2% of non-matriculating students did not change schools from one year to the next, 12.8% switched schools between the 2016–17 and 2017–18 school years, as shown in Table 10. In addition, some student subgroups experienced both greater residential and school mobility than others. Students classified as “at-risk,” special education students, and black students had the highest incidences of school mobility. Seventeen percent of at-risk students,

⁴⁴ To do this, we removed students from the analysis if they had reached the maximum grade in their school in the subsequent school year or entered a school in the earliest grade in the following school year.

⁴⁵ We did not examine how far away students moved if they changed home address. Therefore, this statistic may be an over-estimate if many students changed home addresses but continued to reside nearby their previous home addresses.

15% of special education students, and 15% of black students, as well as 16% and 18% of students attending schools in Wards 7 and 8, respectively, switched schools in non-matriculating grades. Importantly, residential mobility also coincided with school mobility for 40% of students classified as “at-risk.” For other student subgroups, residential mobility coincided with school mobility for between 23–36% of the students who switched schools, depending on subgroup.

Table 10: School and residential mobility between the 2016–17 and 2017–18 school years by student subgroup

Subgroup	No Mobility	Residential Mobility Only	School Mobility Only	School & Residential Mobility
Overall	75.3%	11.9%	8.5%	4.3%
At-risk	69.4%	13.9%	10.0%	6.7%
Non-at-risk	80.6%	10.1%	7.1%	2.2%
Special education	73.1%	11.9%	10.1%	4.8%
ELL	77.8%	14.2%	5.8%	2.2%
Black	72.3%	12.4%	9.8%	5.5%
Latino	79.1%	13.2%	5.6%	2.1%
White	82.8%	10.5%	5.1%	1.5%
School Ward 1	75.0%	13.2%	8.7%	3.0%
School Ward 2	78.6%	10.6%	8.7%	2.1%
School Ward 3	87.6%	9.7%	1.9%	0.7%
School Ward 4	79.0%	10.9%	7.1%	2.9%
School Ward 5	75.8%	11.6%	8.2%	4.5%
School Ward 6	74.8%	12.2%	9.5%	3.6%
School Ward 7	72.7%	11.2%	9.7%	6.3%
School Ward 8	67.5%	14.0%	11.2%	7.3%
Elementary School	74.0%	12.3%	8.8%	4.9%
Middle School	77.7%	11.1%	7.9%	3.2%
High School	77.4%	11.0%	8.3%	3.3%

Schools in certain geographic areas of the District serve students with higher rates of school and residential mobility than schools in other areas. For example, higher percentages of students in schools in Wards 7 and 8 switched schools and changed home residences during the 4-year period than students in schools in other wards. One implication of this finding is that schools serving students with higher rates of mobility may face additional challenges not faced by schools serving students with less mobility.⁴⁶ Finally, students in elementary schools had slightly higher rates of school and residential mobility than students in middle and high schools.

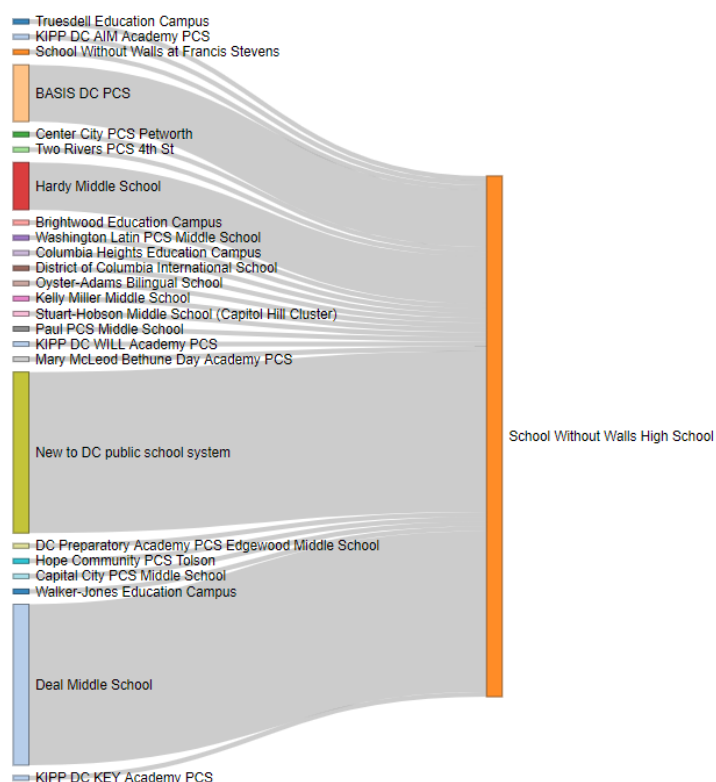
⁴⁶ Rumberger (2003), The causes and consequences of student mobility. *Journal of Negro Education*, p. 6-21.

Patterns in school-to-school mobility. In addition to examining systematic trends in student mobility, we also documented, for each school in the District, where students attended school prior to attending that school, and where students attended school after transferring from that school. Data on all school-to-school transitions for students from the 2014–15 through 2017–18 school years are available in a [dashboard](#). We also report in Table 11 the most frequently observed school-to-school transitions, or those with 50 or more students in the pattern. Note, however, that the most frequently observed school-to-school transitions were dependent on the geographic location of the schools and the number of students who lived nearby, as well as the enrollment capacity for charter schools.

Figure 31: Example of one school's patterns available in the dashboard

DC Student Mobility Patterns

Students in matriculating grades entering School Without Walls High School from 2016-17 to 2017-18



These data are made available under the Open Data Commons Attribution License. You may use, share, and adapt the data so long as you agree to acknowledge this project as the source of these data. Please cite the data as: Wolf, R., & Armstrong, C. (2019). D.C. Enrollment Project Data Archive (Version 1.0).

As shown in Table 11, the most frequently observed school-to-school transitions were nearly all made within LEAs through “feeder” patterns for middle and high schools. For schools within a DCPS feeder pattern, students are guaranteed enrollment at the subsequent feeder school.⁴⁷ For charter schools, there were some guaranteed feeder patterns and some pathways where students were given a “transfer preference” in the My School DC Lottery at the subsequent

⁴⁷ See [SY17-18 DCPS School Feeder Patterns](#).

school.⁴⁸ Findings imply that feeder patterns represent one mechanism that successfully retains students within the same LEA as they matriculate from one school to the next.

Table 11: Most popular school-to-school patterns between the 2014–15 and 2017–18 school years

School-to-school pattern	Number of students in pattern			Feeder or transfer?
	2014–15 to 2015–16	2015–16 to 2016–17	2016–17 to 2017–18	
Within KIPP LEA	855	946	1,020	Transfer
DCPS feeders to Wilson HS	412	354	414	Feeder
DCPS feeders to Deal MS	377	444	396	Feeder
Within Friendship LEA	256	472	343	Feeder
DCPS Capitol Hill Cluster to Stuart-Hobson MS	133	139	135	Feeder
Within D.C. Preparatory Academy LEA	127	123	123	Feeder
Within E.L. Haynes LEA	121	103	110	Feeder
Within Capital City LEA	101	96	107	Feeder
Within Cesar Chavez LEA	89	93	72	Feeder
DCPS feeders to Ballou HS	101	81	66	Feeder
Within Washington Latin LEA	70	78	66	Feeder
Within Achievement Prep LEA	38	36	51	Feeder
Within Paul LEA	83	53	50	Feeder
DCPS feeders to Woodson HS	66	51	51	Feeder
D.C. Bilingual LEA to District of Columbia International LEA	54	29	24	Transfer
DCPS Deal MS to School Without Walls HS	50	32	34	None

NOTES—1. MS=Middle school. HS=High school. 2. This table contains only the school-to-school

⁴⁸ See [My School DC Public Charter Schools 2018-19 School Feeder Patterns](#) and [My School DC Transfer Preference](#). No information was available for charter school feeders and transfer preferences for the 2017–18 school year. This study used feeders and preferences from the 2018–19 school year.

transitions made by 50 or more students in a given school year. See the [dashboard](#) for all school-to-school transitions made by D.C. students from the 2014–15 through 2017–18 school years. 3. Schools that were closed were not included in this table.

It should also be noted that feeder patterns not displayed in Table 11 generally showed few students in the pattern. While we are unable to explain why some feeder patterns were more prevalent than others, we observe that feeder patterns are relevant in understanding school-to-school transitions in D.C. Factors that may affect numbers of students within each feeder pattern include marketing, academic programming, school demographics, school openings and/or expanded enrollments at existing schools, adjustments to feeder patterns, geographic location of schools, the neighborhood school-aged population. It is also important to note that informal networks may also play a role in determining school-to-school transitions made by students, as evidenced by the informal feeder pattern from Deal MS to School Without Walls HS.

Summary of Findings

- About one-quarter of D.C.'s public school students attended schools in both sectors from the 2014–15 through 2017–18 school years.
- Black students made more school changes on average than Latino or white students, and special education students made more school changes on average than all other students.
- Students attending schools in Wards 7 and 8 made more school changes on average than students attending schools in other wards. One implication of this finding is that schools serving students with higher rates of mobility may face additional challenges not faced by schools serving students with less mobility.
- Approximately one-third of year-to-year school mobility also coincided with a change in student home address. For at-risk students, it was 40%.
- Data on all school-to-school transitions for students from the 2014–15 through 2017–18 school years are available in a [dashboard](#).
- The most frequently observed school-to-school transitions were nearly all made within LEAs through “feeder” patterns for middle and high schools. This finding implies that feeder patterns are one mechanism that successfully retain students within the same LEA as they matriculate from one school to the next.

Part 3: Factors Relating to Demand for D.C. Schools

In the first section of this report, we found that various indicators of school “demand” related to enrollment projection errors. In this third and final section of the report, we look more deeply at demand for D.C. schools. A preference for particular types of schools may lead to increasing enrollments at some schools and unstable or declining enrollments at other schools, which may in turn, result in greater projection errors. We ask the following research questions to look for patterns in school choice in the District:

- To what extent did students attend the schools that were closest to their homes?
- What were the patterns in school enrollments when students did not attend their in-boundary DCPS school?

- What were the patterns in school enrollments when students transferred from one school to another with the same grade levels?
- To what extent were grade-level demographics at a school related to demand?

A limitation of this study is that we do not have full information on all factors that have been shown to relate to school demand, such as academic programming, extracurricular activities, school accessibility using public transportation, and after-school care.⁴⁹ We also could not examine demand at the program level (e.g., dual language) because school enrollments are not disaggregated by program. Instead, we examine the relationships between grade-level demand for schools and demographics at the grade level. Given these limitations, we cannot make any definitive conclusions about *why* families chose specific schools for their children, but we present systematic patterns that could be observed in the data.

This study builds on earlier research documenting parental and guardian preferences for D.C. schools. A prior study found that parents ranked their choices for schools in the My School DC Lottery based on availability of public transportation to the school, proximity from home to school, academic performance in terms of test scores, and school demographics in terms of race and socio-economic status. Yet the study also found variation in preferences across different subgroups.⁵⁰ Another study analyzing website analytic data for D.C. schools found that website visitors viewed school demographic data more often than other information, such as location, test scores, and programming.⁵¹ When the data were disaggregated for visitors with and without college experience, visitors with college experience were disproportionately more likely to view school demographics (e.g., student race and ethnicity, free and reduced-price lunch, special education, and ELL), while visitors with no college experience were more interested in school location and programming than school demographics. These prior studies point to the potential importance of school demographics in explaining school demand, at least for some subgroups. While these prior studies inform school preferences in D.C., this study goes one step further in showing patterns of schools actually attended by students.

Proximity of home to school. In this section, we explore the extent to which students attended the school closest to their homes. As previously discussed, we used a straight-line distance from home to school, but this distance does not fully account for commuting times, either by driving or using public transportation.⁵²

In the 2017–18 school year, 39.3% of public-school students attended either their in-boundary DCPS school or another school that was closer to their homes. This percentage declined slightly

⁴⁹ 1. Education Research Alliance for New Orleans, [What Schools Do Families Want \(And Why\)?](#), July, 2015. 2. Center for Analysis of Longitudinal Data in Education Research, [Choosing Charter Schools in North Carolina: What do Parents Value?](#), June, 2018. 3. Glazerman and Dotter, [Market Signals: Evidence on the Determinants and Consequences of School Choice From a Citywide Lottery](#), *Educational Evaluation and Policy Analysis*, 2017.

⁵⁰ Glazerman and Dotter, [Market Signals: Evidence on the Determinants and Consequences of School Choice From a Citywide Lottery](#), *Educational Evaluation and Policy Analysis*, 2017.

⁵¹ Schneider and Buckley, What Do Parents Want from Schools? Evidence from the Internet, *Educational Evaluation and Policy Analysis*, 2002.

⁵² Urban Institute, [The Road to School](#), March, 2018. This study found that 43% of public school students were driven to school.

over time from 42.0% in the 2014–15 school year. As shown in Figure 32, in the 2017–18 school year,

- 37.1% of students attended a charter school that was further from their homes than their in-boundary school,
- 28.7% of students attended their in-boundary DCPS school,
- 23.5% of students attended a DCPS school that was further from their homes than their in-boundary school,
- 8.0% of students attended a charter school that was closer to their homes than their in-boundary school, and
- 2.6% of students attended a DCPS school that was closer to their homes than their in-boundary school.

Figure 4: Percentages of students attending DCPS and charter schools by proximity to home and student subgroup in the 2017–18 school year

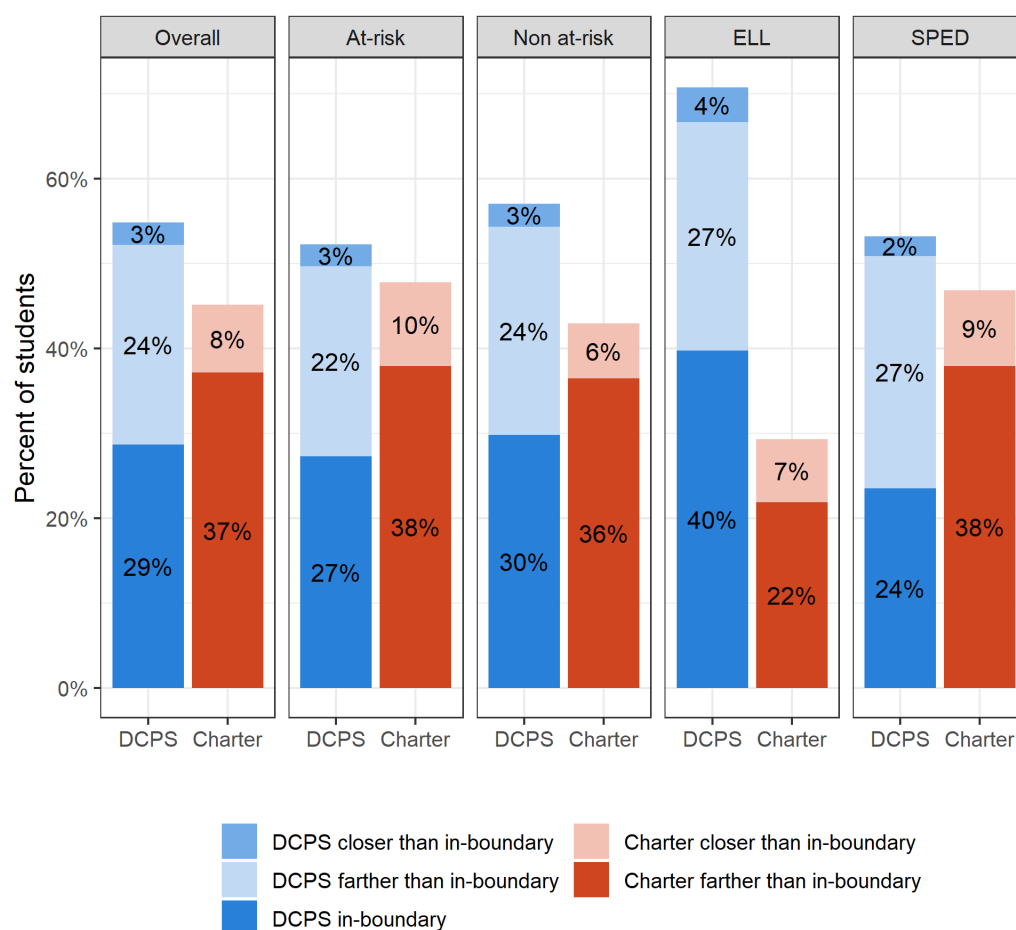
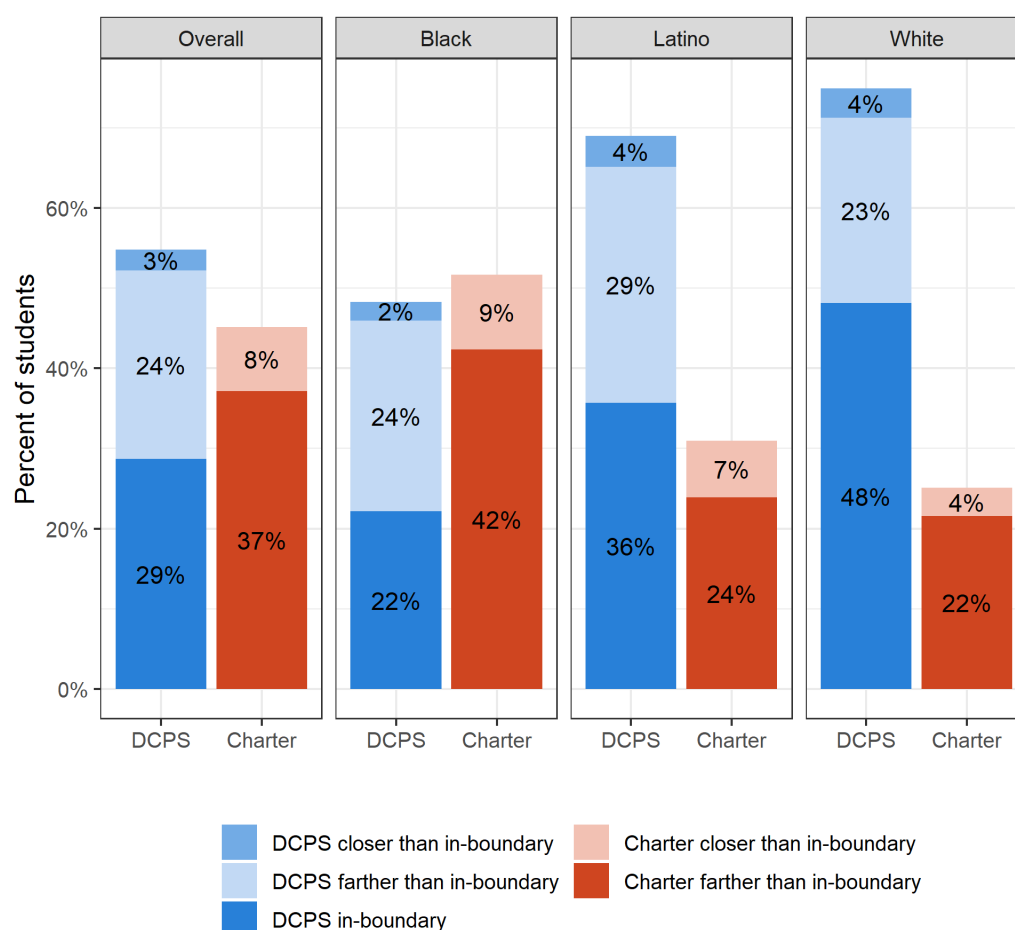


Figure 33 indicates some differences in these percentages across student subgroups, however. ELLs were more likely to attend their DCPS in-boundary schools and less likely to attend charter schools further from their homes, relative to all students. There were more subtle differences

among “at-risk,” non-at-risk, and special education students, relative to the overall percentages in sector and proximity to school attended.

Figure 33 shows the differences in these percentages for students of different race/ethnicity. Notably, black students were the least likely to attend their in-boundary DCPS schools, while white students were the most likely. Additionally, larger proportions of black students attended charter schools that were closer to their homes than their in-boundary schools than white or Latino students. These findings are largely explained by residential segregation and the geographic placement of charter schools in the District.

Figure 33: Percentages of students attending DCPS and charter schools by proximity to home and student race/ethnicity in the 2017–18 school year



As shown in Table 12, for example, black students were the most concentrated residentially in Wards 7 and 8, and the majority of schools in Wards 7 and 8 were charter schools. Moreover,

34 shows that 15% of students attending schools in Ward 7 attended charter schools that were closer to their homes than any other school. White students were the most concentrated residentially in Wards 2 and 3, and the majority of schools in Ward 2 were DCPS schools, and there were no charter schools in Ward 3. Latino students were the most concentrated residentially in Wards 1 and 4, and the majority of schools in Ward 1 were DCPS schools and the majority of schools in Ward 4 were charter schools. Table 12 shows that students attended schools within their ward of residence to a greater extent than schools in other wards. Therefore, neighborhood demographics mostly resembled the demographics of students in the schools by ward, as shown in Table 13. The greatest divergences occurred from white and Latino students disproportionately attending schools in Ward 3, and black students disproportionately attending schools in Wards 5 and 6, relative to the wards in which they lived. For example, only 9% of public-school students living in Ward 6 were black, but black students comprised 14% of the student population in Ward 6 schools. This 14%, however, is an average across all students in Ward 6. Individual schools in Ward 6 ranged in percentage black from 14% to 100% in the 2017–18 school year.

Table 12: Ward of residence versus ward of school in the 2017–18 school year

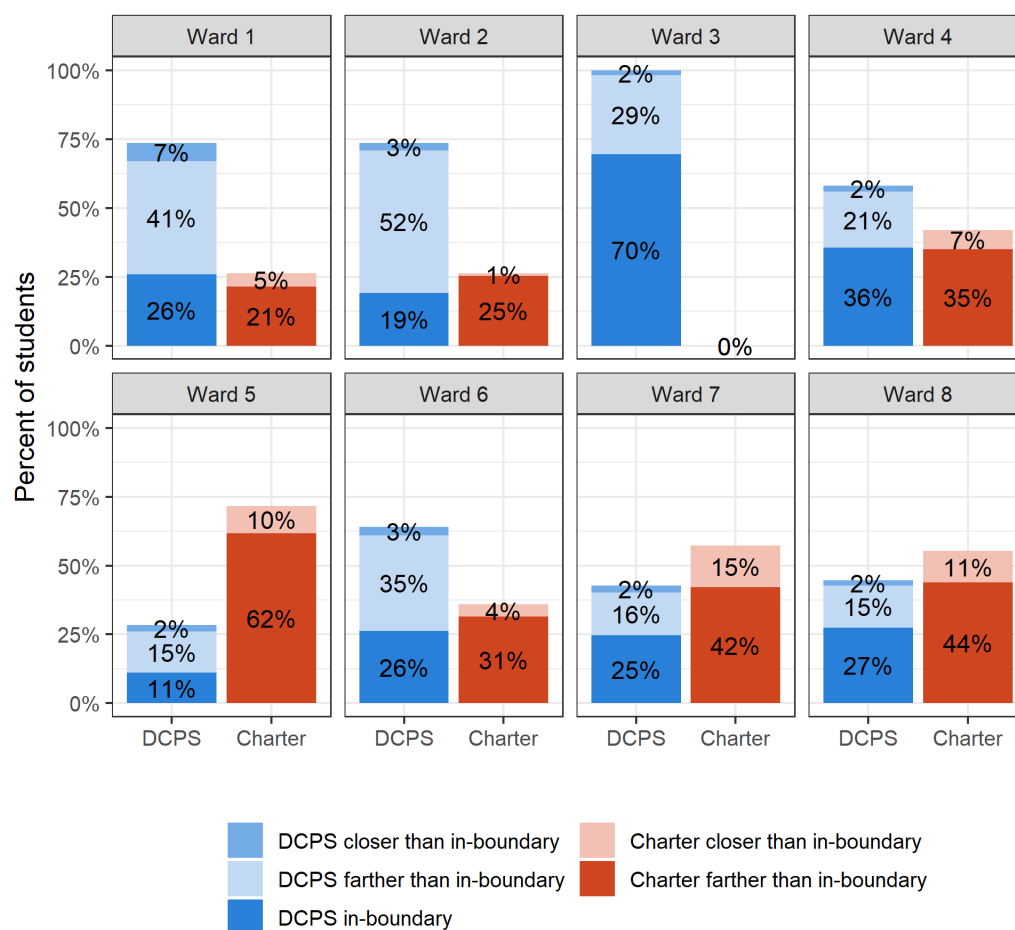
Ward of Home	Ward of School							
	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
Ward 1	39%	5%	10%	28%	12%	4%	2%	1%
Ward 2	20%	42%	12%	6%	6%	11%	2%	1%
Ward 3	1%	7%	83%	7%	2%	0%	*	*
Ward 4	10%	3%	10%	61%	13%	2%	1%	1%
Ward 5	7%	4%	2%	16%	50%	11%	6%	3%
Ward 6	5%	7%	2%	6%	15%	56%	5%	4%
Ward 7	3%	3%	1%	5%	14%	15%	48%	10%
Ward 8	3%	2%	1%	3%	9%	10%	9%	63%

NOTES—1. * means N<10 and the percentage was not calculated. 2. The denominators for the percentages were the number of students living in the ward. As such, each row should sum to 100%, minus rounding error.

Table 13: Ward of residence versus ward of school by student race/ethnicity in the 2017–18 school year

Where students lived				Where students attended school			
Ward of Residence	Black %	Latino %	White %	Black %	Latino %	White %	Ward of School
Ward 1	5	25	17	6	23	14	Ward 1
Ward 2	1	4	4	3	4	6	Ward 2
Ward 3	1	5	20	3	10	25	Ward 3
Ward 4	10	39	30	11	42	30	Ward 4
Ward 5	15	15	11	19	11	12	Ward 5
Ward 6	9	4	14	14	5	11	Ward 6
Ward 7	26	5	3	18	2	1	Ward 7
Ward 8	33	3	2	26	2	1	Ward 8

Figure 34: Percentages of students attending DCPS and charter schools by proximity to home and school ward in the 2017–18 school year



While the overall percentage of students attending the schools closest to their homes remained relatively stable over time from 2014–15 to 2017–18, there were more noticeable changes over time when disaggregating by ward. As shown in Figure 35, substantial increases in the percentage of students attending charter schools in a particular ward corresponded with decreases in the percentage of students attending their DCPS in-boundary schools in the ward:

- A nine-percentage point increase in students attending charter schools in Ward 5, along with a five-percentage point decline in students attending their in-boundary DCPS schools in Ward 5.
- An eight-percentage point decline in students attending their in-boundary DCPS schools in Ward 8, along with an increase of seven percentage points of students attending charter schools in Ward 8.
- A six-percentage point decline in students attending their in-boundary DCPS schools in Ward 7, along with an increase of six percentage points of students attending charter schools in Ward 7.

- A seven-percentage point increase in students attending charter schools in Ward 2, along with a three-percentage point decline in students attending their in-boundary DCPS schools in Ward 2.
- A six-percentage point decline in students attending charter schools in Ward 1, along with a two-percentage point increase in students attending their in-boundary DCPS schools in Ward 1.

Figure 35: Percentages of students attending DCPS and charter schools by proximity to home and school ward from the 2014–15 to 2017–18 school years

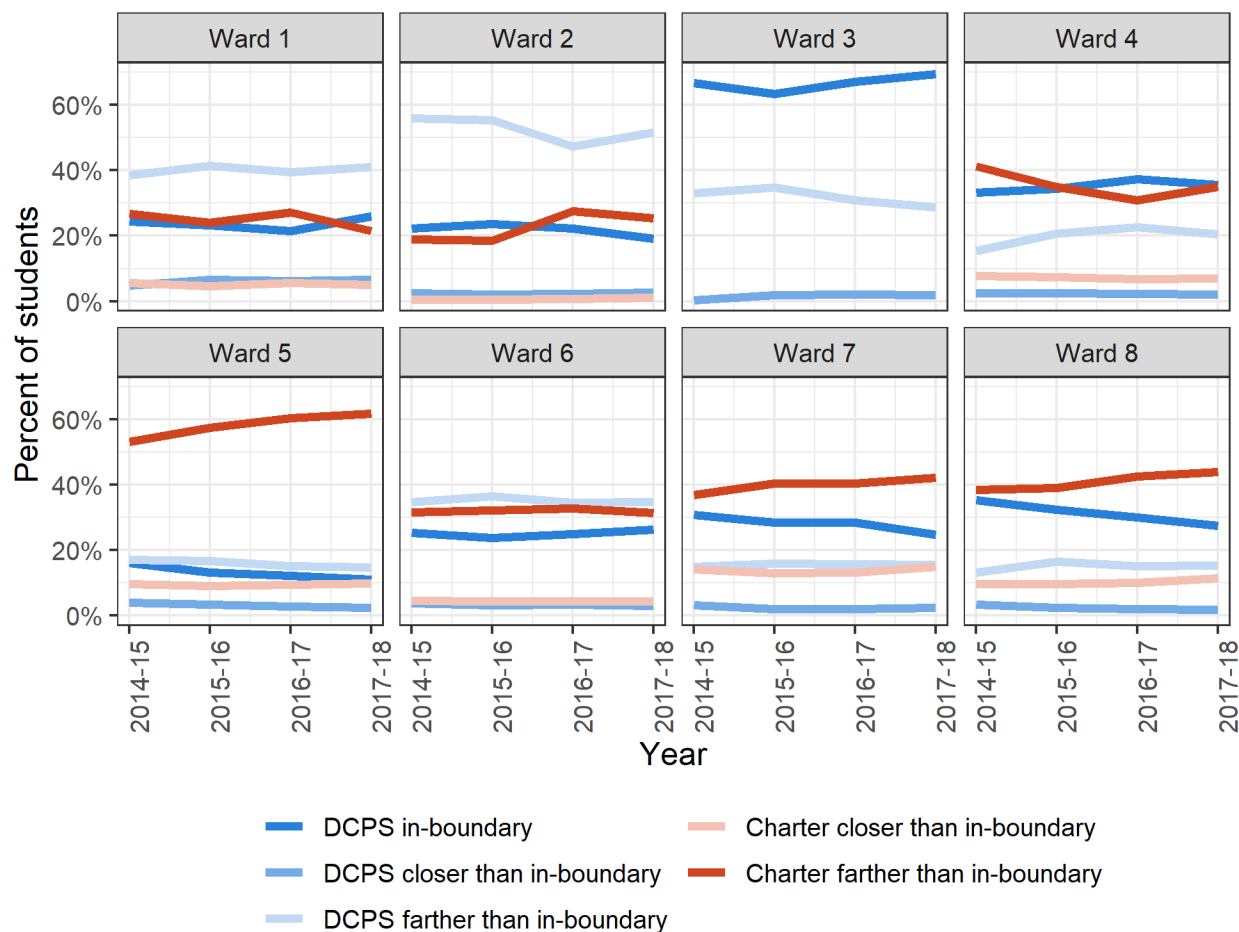


Table 14 shows that greatest increases in the share of students attending charter schools in the ward largely coincided with the opening of new charter schools. The public school population also increased in each ward during this time, but population changes did not explain the changes in the share of students attending either sector. The public school student population increased from 2014–15 to 2017–18 by 5% for students who lived in Ward 1, 6% in Ward 2, 18% in Ward 3, 11% in Ward 4, 8% in Ward 5, 10% in Ward 6, 7% in Ward 7, and 9% in Ward 8.

Table 14: Changes in the number of schools and public school population over time by ward

School Ward	Number of schools in 2014–15	Change in number of schools (including 2014–15)			
		Charter Openings	Charter Closures	DCPS Openings	DCPS Closures
Ward 1	21	+2	-1	0	0
Ward 2	8	+1	0	0	0
Ward 3	10	0	0	0	0
Ward 4	33	+2	-1	+1	-1
Ward 5	37	+8	-4	+2	-2
Ward 6	32	+4	-1	+1	0
Ward 7	32	+5	0	+1	0
Ward 8	37	+4	0	0	0

Patterns in attending out-of-boundary or charter schools. We also examined the patterns in schools attended for students who did not attend their in-boundary DCPS schools. In other words, for students who did not attend their in-boundary DCPS schools, how did the schools in which they were enrolled compare to their in-boundary schools? It is important to keep in mind, however, that these patterns represent systematic choices of families in the District (e.g., averages) and do not represent all individual choices made by all families.

As seen in the previous section, the majority of students attending schools in both sectors did not attend their in-boundary DCPS schools. The only exceptions were the majority of public-school students living in Ward 3 who attended their in-boundary schools. A third of all white/non-Latino students in the public schools lived in Ward 3 and a majority (55%) also attended their in-boundary schools.⁵³

The largest proportion of students who did not attend their in-boundary DCPS schools attended another school located within their ward of residence, followed by those who attended schools located in a ward adjacent to their residence. This finding indicates that proximity from home to school was important for many D.C. families in deciding where to send their children to school. Table 15 shows where students attended school, relative to where they lived.

⁵³ Because the student race categories were not mutually exclusive, and about half of white students were also classified as "Hispanic/Latino," we examined patterns of schools attended for students who were black, Latino, and both white and non-Latino. For this reason, the percentages reported here will differ slightly from those reported in Table 13.

Table 15: Ward of home versus ward of school by student race/ethnicity for students not attending their in-boundary DCPS schools only in the 2017–18 school year

Ward of Home	Ward of School							
	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
<i>Black students</i>								
Ward 1	30%	5%	4%	23%	18%	11%	5%	4%
Ward 2	16%	17%	8%	14%	14%	16%	9%	6%
Ward 3	*	20%	27%	21%	11%	*	*	*
Ward 4	12%	5%	9%	45%	19%	6%	3%	2%
Ward 5	7%	4%	3%	14%	45%	13%	9%	5%
Ward 6	6%	5%	2%	6%	24%	35%	12%	9%
Ward 7	3%	3%	1%	5%	18%	18%	40%	12%
Ward 8	3%	2%	1%	3%	12%	12%	12%	55%
<i>Latino students</i>								
Ward 1	39%	4%	8%	35%	11%	2%	1%	*
Ward 2	29%	16%	12%	13%	9%	21%	0%	0%
Ward 3	*	20%	40%	17%	15%	*	0%	0%
Ward 4	22%	2%	6%	58%	11%	2%	0%	*
Ward 5	23%	4%	4%	31%	30%	6%	2%	*
Ward 6	15%	11%	7%	16%	16%	32%	*	*
Ward 7	23%	3%	4%	16%	17%	12%	22%	3%
Ward 8	17%	6%	10%	10%	12%	15%	6%	25%
<i>White/non-Latino students</i>								
Ward 1	13%	13%	15%	22%	35%	*	*	0%
Ward 2	7%	27%	28%	12%	17%	8%	*	0%
Ward 3	3%	34%	32%	22%	7%	*	*	0%
Ward 4	4%	7%	10%	39%	38%	1%	*	0%
Ward 5	2%	5%	2%	17%	62%	11%	*	0%
Ward 6	*	19%	2%	15%	16%	46%	1%	*
Ward 7	*	*	*	*	29%	37%	*	0%
Ward 8	12%	8%	28%	*	7%	24%	*	15%

NOTE—* means N<10 and the percentage was not calculated.

When students did not attend their in-boundary DCPS schools, they tended to attend schools with fewer at-risk students, yet the difference between the percentage of at-risk students at schools attended and in-boundary schools varied across different student subgroups. For example, the differences in percentages at-risk between students' in-boundary schools and schools attended were the largest for white/non-Latino students (24 percentage points) and the smallest for ELL students (11 percentage points). Therefore, when white/non-Latino students did not attend their in-boundary school, the school they attended had, on average, 24 percent fewer at-risk students. To a much lesser extent, all student subgroups on average opted for schools serving slightly lower proportions of special education and ELL students than their in-boundary schools. The one exception was that special education and ELL students opted for schools serving slightly higher average rates of special education and ELL students, respectively. Figures 36 and 37 show the differences in school characteristics between students' in-boundary DCPS schools and schools of enrollment by student subgroup.

Figure 36: Differences in current and in-boundary DCPS schools on school characteristics by student subgroup

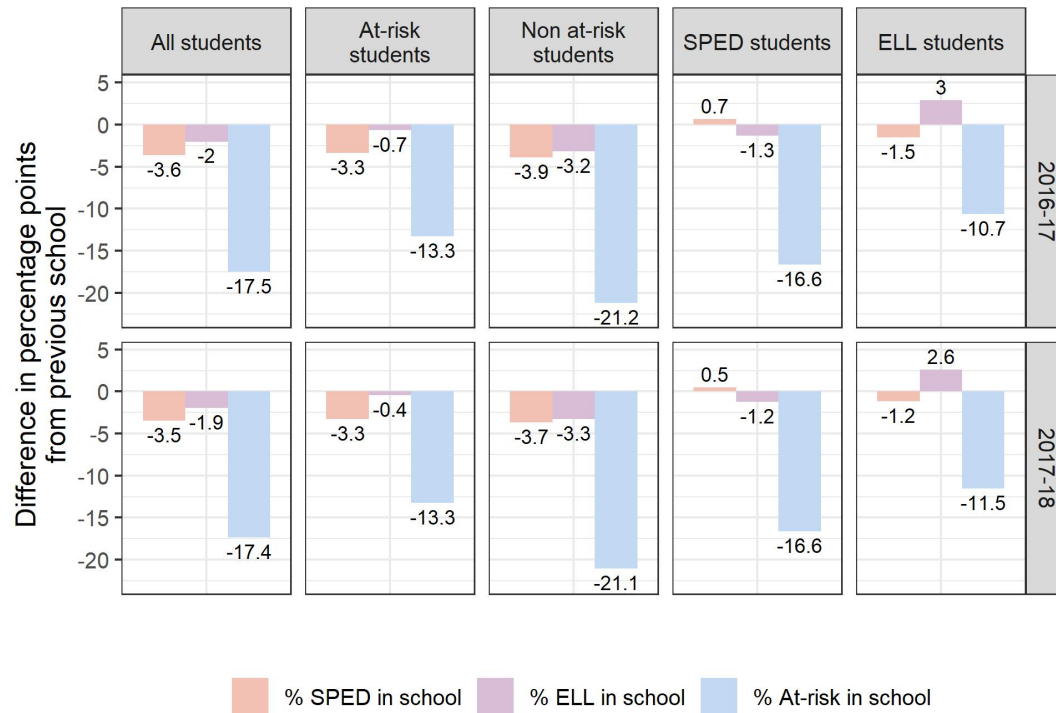
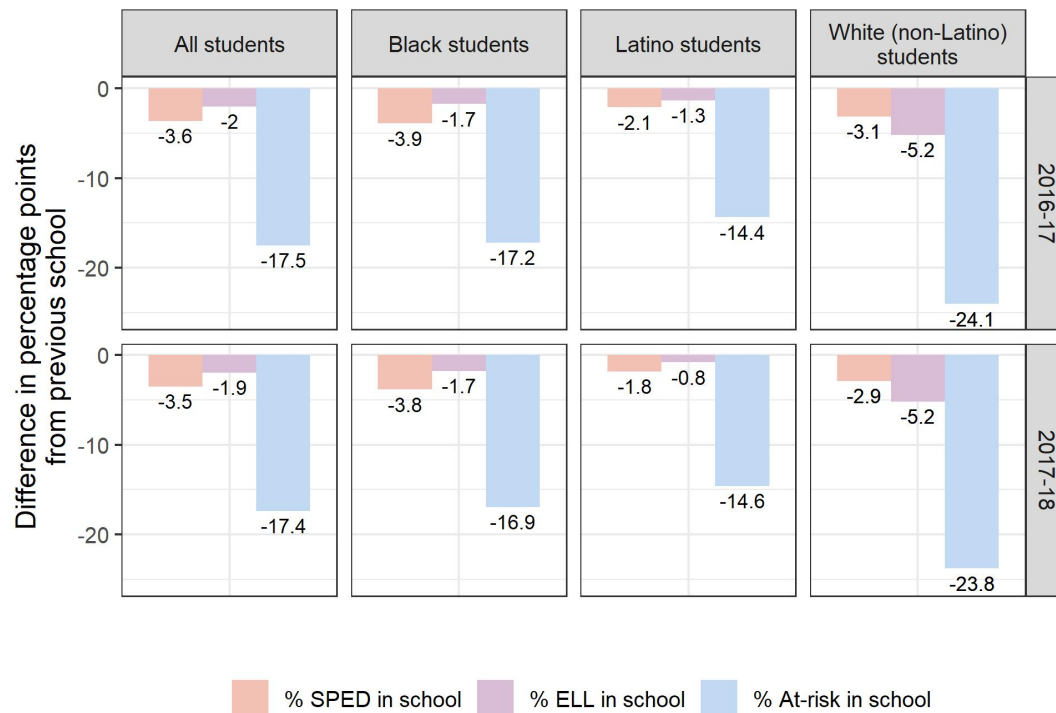
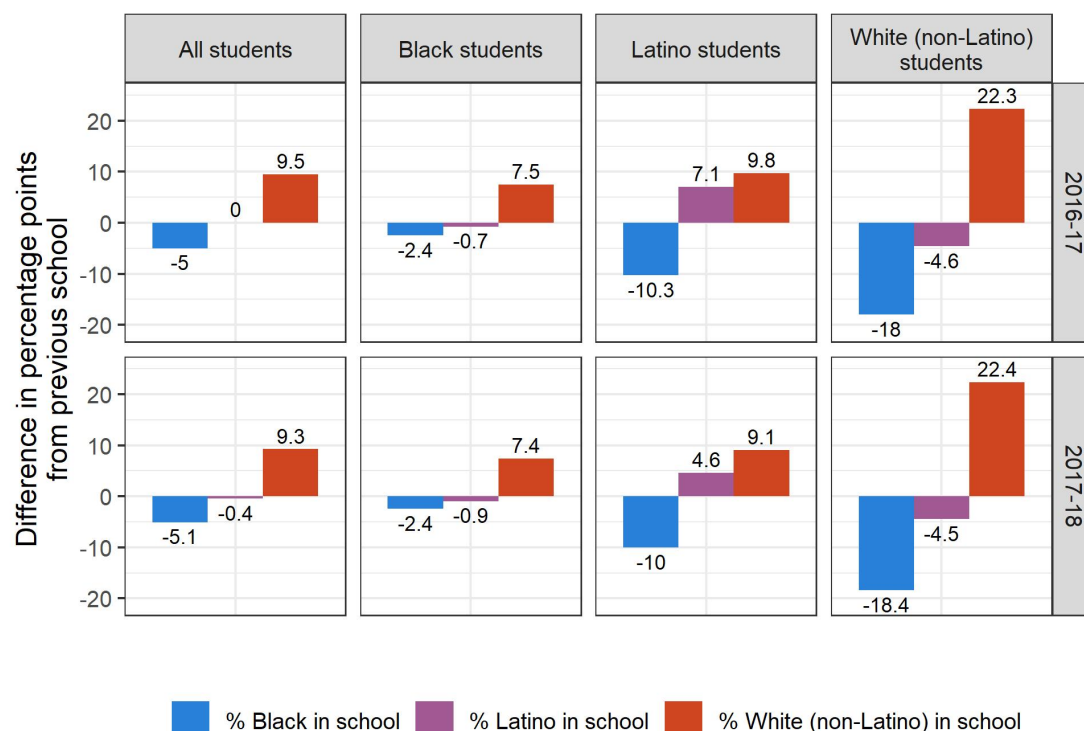


Figure 37: Differences in current and in-boundary DCPS schools on school characteristics by student race/ethnicity



Students of all races who did not attend their in-boundary DCPS schools chose to attend schools with greater percentages of white/non-Latino students and to a lesser extent, schools with lower percentages of black students. Yet the extent to which the schools these students attended differed from their in-boundary schools differed dramatically among students of different races. For example, when white/non-Latino students did not attend their in-boundary schools, they attended schools serving larger percentages of white/non-Latino students by an average of 22 percentage points. On the other end of the spectrum, black students attended schools with larger percentages of white/non-Latino students by an average of 7 percentage points. Latino students fell in the middle and attended schools with larger percentages of white/non-Latino students by an average of 9–10 percentage points. Figure 38 shows the differences in school demographics between students' in-boundary DCPS schools and schools of enrollment by student race or ethnicity.

Figure 38: Differences in current and in-boundary DCPS schools on school racial demographics by race/ethnicity



Black students attended out-of-boundary or charter schools that differed in terms of average percentages of black students by only two percentage points, relative to their in-boundary schools. On the other hand, white/non-Latino and Latino students attended schools serving lower average percentages of black students, by 18 and 10 percentage points, respectively. Latino students attended schools that served higher average rates of Latino students by 5–7 percentage points.

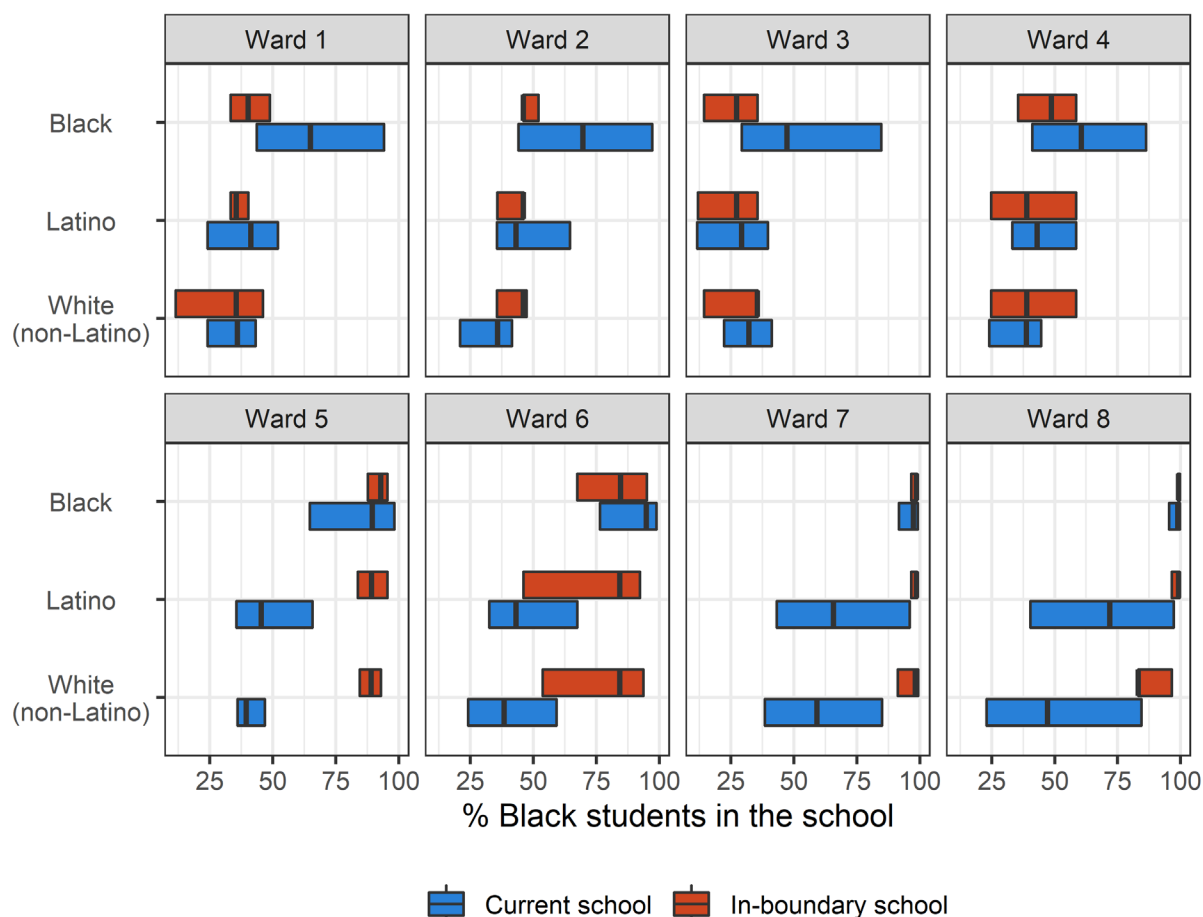
This prompts the question, to what extent were white/non-Latino and Latino families seeking racially diverse schools, versus schools not serving predominantly black students or schools serving predominantly white/non-Latino students? About 70% of students in D.C. were black, and thus school racial diversity was inversely related to the percentage of black students in the school in most cases. Schools serving majority white/non-Latino or Latino students were also not racially diverse, but there were only six schools serving greater than 70% white/non-Latino students and five schools serving greater than 70% Latino students in 2017–18. In contrast, there were 148 schools serving more than 70% black students in 2017–18.

Figure 39 shows the differences in the racial makeup of schools attended versus in-boundary schools for students who did not attend their DCPS in-boundary schools in the 2017–18 school year. DCPS schools in Wards 5, 7, and 8 served predominantly (>80%) black students. DCPS schools in Ward 3 served a minority of black students (7–35%) and a majority (>50%) of white students. DCPS schools in Wards 1, 2, 4, and 6 ranged in terms of serving predominantly (>70%) black students to few (<10%) black students. Schools serving majority (>50%) Latino students were concentrated in Wards 1 and 4.

When black students did not attend their in-boundary DCPS schools, they attended schools with greater percentages of black students relative to their in-boundary schools, and this was generally true across all wards. When white/non-Latino students did not attend their in-boundary DCPS schools, they attended schools serving lower percentages of black students, even in wards in which their in-boundary schools served a diverse mix of students from different racial backgrounds. The exception was that white/non-Latino students living in Wards 1 and 3 who did not attend their DCPS in-boundary schools attended schools with greater percentages of black students than their in-boundary schools; in these cases, white families attended schools with more racial diversity than their in-boundary DCPS schools because their in-boundary schools served few black students.

Similarly, Latino students not attending their majority-black DCPS in-boundary schools opted to attend schools with more racial diversity, i.e. with lower percentages of black students. Compared with white/non-Latino students, however, Latino students attended out-of-boundary schools with greater percentages of black students in all wards except for Ward 3. Again, these patterns represent choices made in the aggregate by families, and not all school choices made by all families in the District.

Figure 39: Interquartile ranges for percent black in current versus in-boundary schools by student racial subgroup in the 2017–18 school year



NOTES—1. Ward is ward in which students resided. 2. The boxes show the interquartile ranges. The left side of each box is where 25% of the students in the subgroup fell, and the right side of each box is where 75% of the students in the subgroup fell. In total, the boxes capture patterns for 50% of students in the subgroup.

Taken together, these findings suggest that families consider both the proximity of school to home as well as school characteristics when selecting out-of-boundary or charter schools. Notably, all student subgroups selected out-of-boundary or charter schools that served lower average percentages of at-risk students than their neighborhood schools. Most white/non-Latino and Latino students opted out of their in-boundary DCPS schools when the schools served predominantly black students, and instead attended schools that were more racially diverse and had fewer black students. In some wards, however, white/non-Latino students attended out-of-boundary or charter schools with lower percentages of black students, even when their in-boundary DCPS schools were racially diverse with a mix of students from different racial backgrounds. The data do not permit us to determine, however, whether families selected schools based on student demographics or for other reasons.

Patterns in school transfers. Next, we examined whether there were systematic differences in school characteristics in those cases when students transferred from one school

to another from one school year to the next. If students systematically left schools for other schools serving the same grade levels, what were the patterns? Only students in non-matriculating and non-entry grades were included in this analysis. In other words, if students were in the first or last grade the school offered, they were not included. As in the previous section, these patterns represent trends in the District and not necessarily the transfer patterns of all individual families.

Approximately 8% of students transferred to a different school in non-matriculating and non-entry grades between the 2016–17 and 2017–18 school years.⁵⁴ School transfers were the most frequent for students going into grades K–3. For Latino students, school transfers were the most frequent for students going into grades K–4. For white/non-Latino students, school transfers were the most frequent for students going into PK–1, with 31% of the school transfers represented by white/non-Latino students making a switch between PK4 and K; 28% of these switches indicated students transferring to their in-boundary DCPS schools for kindergarten.

Student transfer patterns were very similar to those discussed in the previous section for students who did not attend their in-boundary schools. When students transferred to a different school serving the same grade levels, all student subgroups transferred to schools serving fewer at-risk students in both the 2016–17 and 2017–18 school years, but the extent to which they moved to schools with lower percentages of at-risk students varied across subgroups. White/non-Latino students transferred to schools serving lower percentages of at-risk students to a greater extent than other student groups, by an average of 12.2–14.6 percentage points. At-risk students were the least likely to transfer to schools with substantial differences in percentage “at-risk,” with their transfer schools serving fewer at-risk students by an average of only 0.3–2.0 percentage points across the two school years. Other student subgroups fell somewhere in between. Students transferred to schools serving fewer at-risk students by an average of 5–6 percentage points for ELL students, 3–5 percentage points for Latino students, 2–4 percentage points for black students, and 2–3 percentage points for special education students. Special education students also transferred to schools with higher percentages of special education students, by an average of 1.9–2.3 percentage points. Figures 40 and 41 show the differences in previous and transfer schools in the percentage “at-risk,” non-at-risk, special education, and ELL in the school by student subgroup.

⁵⁴ This percentage slightly differs from that provided on student mobility in Part 2: Factors Relating to Patterns in School Mobility because in this analysis, we also removed students in schools’ entry grades.

Figure 40: Differences in school characteristics between previous and transfer schools by student subgroup

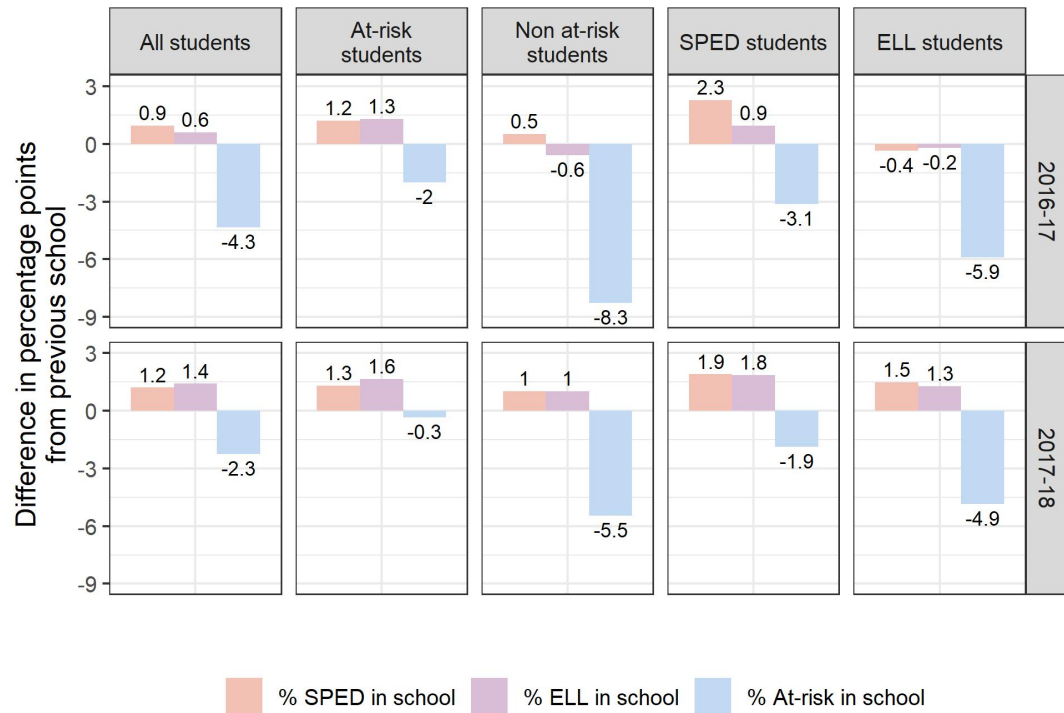
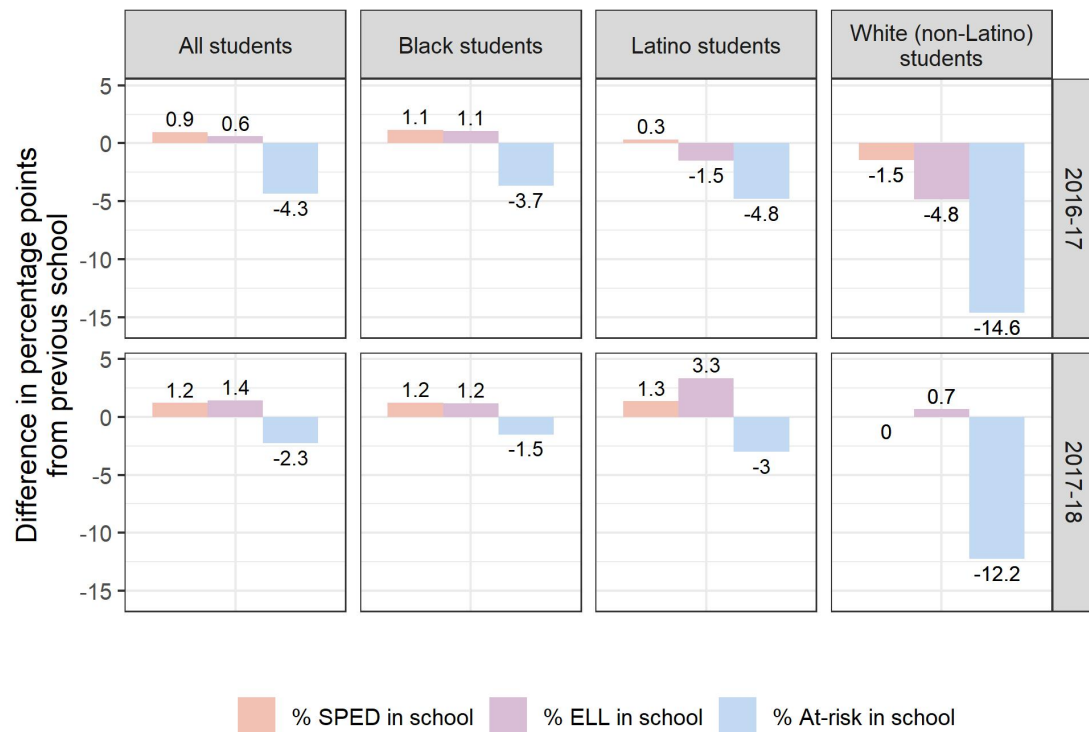
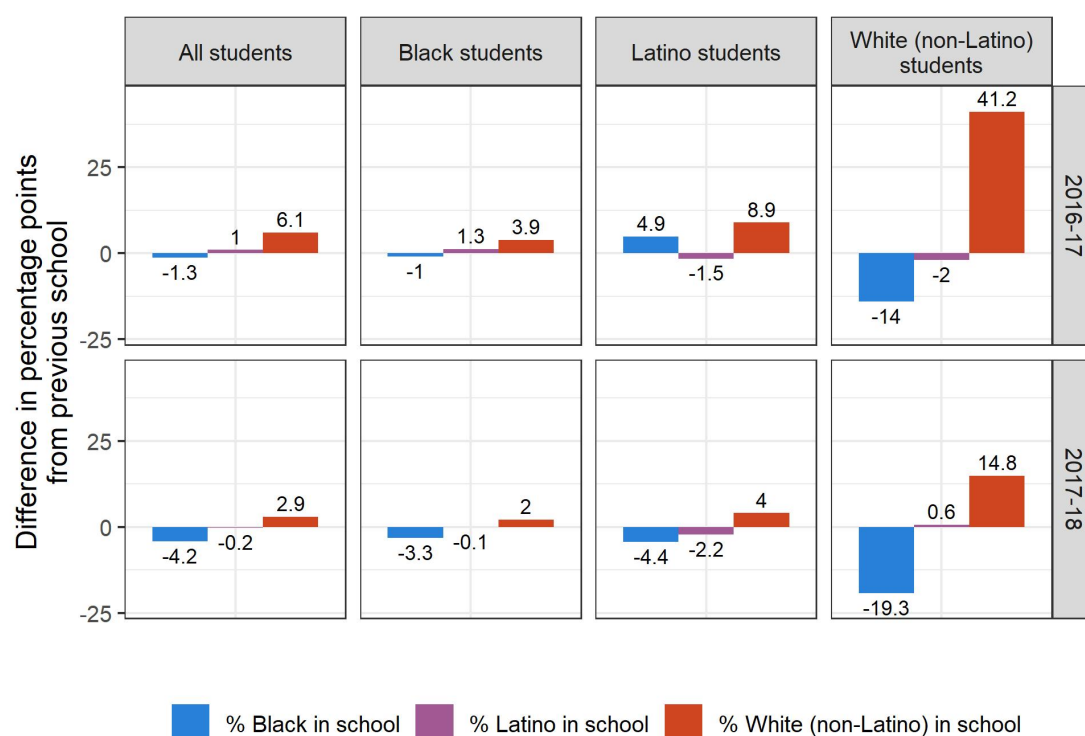


Figure 5: Differences in school characteristics between previous and transfer schools by student race/ethnicity



Transfer patterns in terms of school racial makeup indicate that when students transferred to a different school serving the same grade levels, they tended to move to schools serving larger proportions of white/non-Latino students, but this was particularly true for white/non-Latino students. Across two school years, white/non-Latino students transferred to schools with more white/non-Latino students by an average of 14.8 to 41.2 percentage points more than their previous schools. When removing white/non-Latino students who transferred to their in-boundary schools for kindergarten, white/non-Latino students still transferred to schools serving more white/non-Latino students by 40 percentage points in 2016–17 and 14 percentage points in 2017–18, on average. While there was variation across the two school years, these patterns, depicted in Figure 42, indicate clear patterns of white/non-Latino families sending their children to schools serving larger percentages of white/non-Latino students than their in-boundary schools. In addition to demographics, factors influencing these systematic transfer patterns could include academic programming or perceived differences in school quality.

Figure 42: Differences in school racial demographics between previous and transfer schools by student race/ethnicity



Grade-level demographics versus demand. Finally, we explore to what extent grade-level demand for particular schools related to student demographics in the grade. As explained in Part 1 of this report, we use two indicators of demand:

- By grade and school, the number of students who applied to a particular school in the My School DC Lottery; and

- By grade and school and for in-boundary DCPS schools only, the in-boundary capture rate or the percentage of students in the grade who attended the school out of all public-school students in the same grade who lived within the school's boundary.

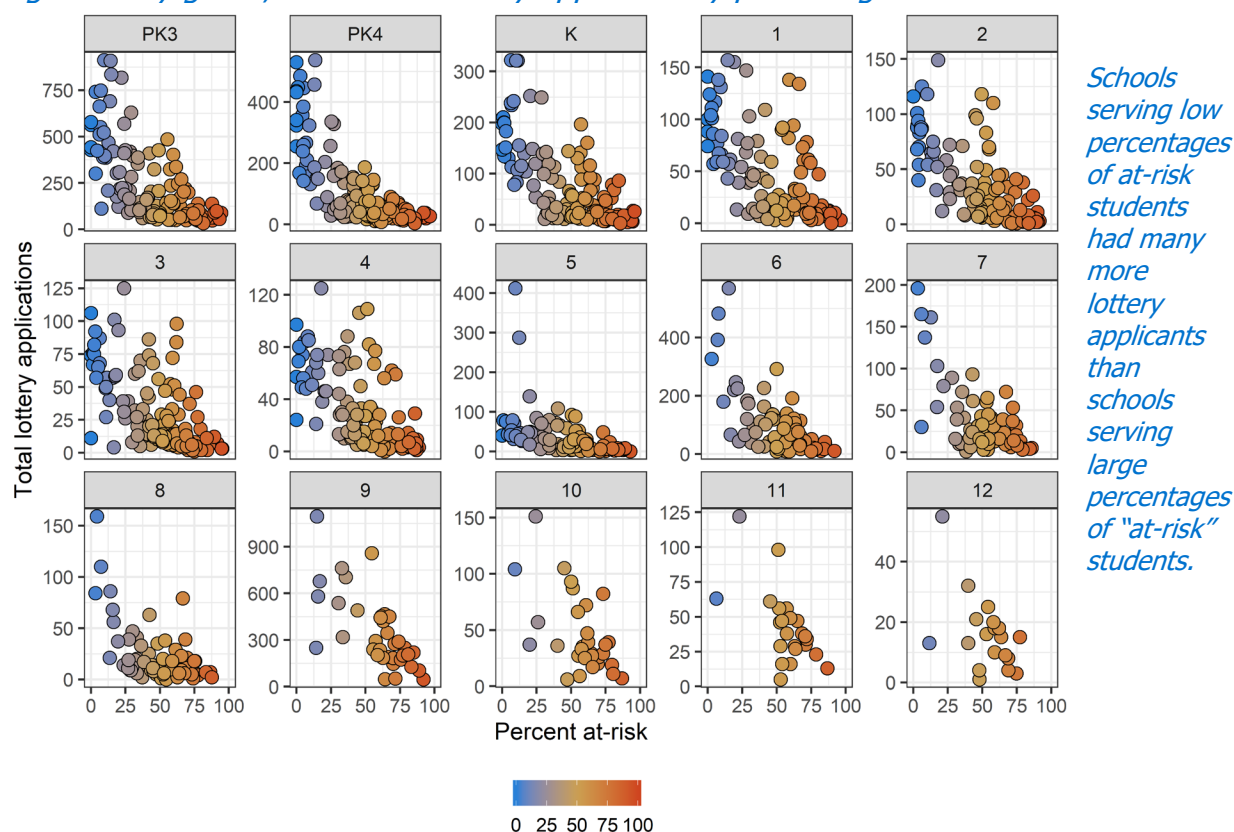
For both measures, demand for a particular grade in a particular school was negatively correlated with the percentage of at-risk and black students in the grade and positively correlated with the percentage of white students in the grade. In some grades, the percentage of special education students in the grade was also negatively related to grade-level demand. Table 16 shows the correlations between grade-level demand indicators and demographics for the 2017–18 school year.

Table 16: Correlations between grade-level demand indicators and demographics in 2017–18

Grade	Correlations with Number of Lottery Applicants				Correlations with In-Boundary Capture Rates			
	At-risk	Black	White	Sped	At-risk	Black	White	Sped
PK3	-0.67	-0.61	0.61	-0.12	-0.80	-0.73	0.65	-0.31
PK4	-0.74	-0.74	0.74	-0.23	-0.82	-0.77	0.72	-0.43
K	-0.69	-0.61	0.59	-0.20	-0.86	-0.83	0.81	-0.45
1	-0.62	-0.48	0.49	-0.20	-0.81	-0.78	0.78	-0.45
2	-0.69	-0.49	0.47	-0.17	-0.81	-0.84	0.81	-0.41
3	-0.64	-0.49	0.49	-0.16	-0.83	-0.76	0.78	-0.36
4	-0.63	-0.38	0.38	-0.13	-0.80	-0.77	0.76	-0.50
5	-0.46	-0.27	0.27	-0.18	-0.71	-0.74	0.74	-0.19
6	-0.65	-0.43	0.35	-0.25	-0.79	-0.66	0.60	-0.58
7	-0.63	-0.29	0.27	-0.25	-0.72	-0.65	0.64	-0.45
8	-0.56	-0.34	0.35	-0.26	-0.69	-0.72	0.68	-0.58
9	-0.70	-0.30	0.36	-0.64	-0.89	-0.69	0.64	-0.71
10	-0.57	-0.70	0.59	-0.26	-0.84	-0.81	0.74	-0.82
11	-0.61	-0.28	0.24	-0.28	-0.76	-0.74	0.68	-0.79
12	-0.50	-0.20	0.19	-0.06	-0.82	-0.83	0.78	-0.73

NOTE—Sped=special education.

These data suggest that D.C. families were less likely to either apply to schools in the My School DC lottery or attend their in-boundary DCPS schools when the schools served large percentages of at-risk students. While it is possible that families applied for schools on the basis of school demographics alone, it is also plausible that families perceived differences in school quality across schools, and these perceptions related to the percentage of at-risk students in the schools. Figure 43 shows the relationship between the number of students who applied in the lottery and the percentage at-risk by grade. Although the demand indicators were the most strongly correlated with the percentage at-risk in the grade, there also appeared to be greater demand for schools that served larger percentages of white students, smaller percentages of black students, and for DCPS in-boundary schools, smaller percentages of special education students.

Figure 6: By grade, number of lottery applicants by percentage at-risk in 2017–18

We also investigated whether the correlations observed above were partially explained by population densities. For example, if larger numbers of students lived near schools serving lower percentages of at-risk students, we may expect to see higher lottery demand for those schools due to higher population densities alone. We investigated the relationship between the number of public-school students who lived within a DCPS school's boundary and the number of lottery applicants to that school by grade. We observed a negative relationship, meaning that the DCPS schools in areas with greater population densities actually had fewer lottery applicants in both guaranteed and preschool grades. This finding is explained by the fact that the largest populations of public-school students lived in Wards 7 and 8, and schools in Wards 7 and 8 generally served greater percentages of at-risk students and had lower lottery demand. Therefore, we conclude that demand was better explained by school demographics than by population density.

Summary of Findings

- Approximately 40% of students attended either their in-boundary DCPS school or another school that was closer to their homes and this percentage has remained stable over time.
- Larger shares of black students than white or Latino students attended charter schools that were closer to their homes than their in-boundary schools; this finding is partially explained by residential segregation and the geographic location of charter schools in areas with fewer remaining DCPS in-boundary schools.

- Of all students attending charter schools, 82% of black students, 77% of Latino students, and 85% of white students attended a charter school that was further from their homes than their in-boundary schools.
- Within each city ward, increases in the percentage of students attending schools in one sector appeared to correspond with decreases in the percentage of students attending schools in the other sector, and vice versa.
- Of students who did not attend their in-boundary schools, more attended another school located within their ward of residence, followed by schools located in a ward adjacent to their residence.
- When students did not attend their in-boundary schools, all student subgroups selected out-of-boundary or charter schools that served lower percentages of at-risk students than their neighborhood schools.
- Most white/non-Latino and Latino students did not attend their in-boundary DCPS schools when the schools served predominantly black students, and instead attended schools that were more racially diverse and had fewer black students.
- Approximately 8% of students transferred to a different school serving the same grade levels between the 2016–17 and 2017–18 school years. School transfers most frequently occurred for students in grades K–3. When students switched schools, they tended to transfer to schools serving lower percentages of at-risk students.
- Lottery waitlists and the in-boundary capture rates for DCPS schools were the lowest for schools serving the largest percentages of at-risk students. For DCPS in-boundary schools, the percentage of special education students was also negatively related to school demand.

Recommendations

Based on these findings and other factors influencing school enrollments over time, we outline three recommendations.

1. The Mayor should add demographic trends and enrollment patterns over time to current enrollment projection methodology to better align funding with actual enrollment.

Currently, enrollment projections for each local education agency (LEA) and school are largely based on historical enrollments. However, student populations and therefore patterns in enrollment may change over time. One example is that the population of ELLs in public schools in D.C. is increasing and the use of historical enrollment alone will not accurately predict the number of ELL students in D.C. schools. Another example is that the number of kindergarten students attending their in-boundary schools is increasing in some neighborhoods, leading to under-projections in those schools. Instead of basing enrollment projections largely on historical enrollments, a predictive model could also be used to determine the expected increase in the number of students based on demographic shifts over time. Enrollment projections could be adjusted to reflect a combination of both historical enrollments and forecasted changes in the population over time so that funding is commensurate with actual population.

It may also be worth considering the geographic location of existing schools and feeder patterns in determining projections. Nearly 40% of public-school students attended the school that was closest to their homes. When students did not attend the school that was closest to their homes, they most frequently attended another school within their ward of residence, followed by a school in an adjacent ward. Feeder patterns also appeared to explain frequently observed school-to-school enrollment patterns. Enrollment projection methodology could be strengthened by using a broader range of currently available data.

2. The Mayor and Council should adjust enrollment projection methodology to accommodate mid-year student mobility.

We found that some schools that were initially over-projected for enrollment as of October were actually under-projected for the net number of students served by May in the school year. In contrast, some schools saw noticeable decline in the net number of students served between October and May. Moreover, the schools that took in the greatest share of students mid-year and after the October enrollment audit were DCPS schools serving the largest percentages of at-risk students. More research is needed to determine whether DCPS was adequately compensated for mid-year student mobility, and whether individual schools within DCPS were appropriately funded given the net number of students served throughout the school year. More research is also needed to understand what enrollment metric best represents the level of LEA funding needed to adequately fund schools for the students they serve.

3. The Mayor and Council should ensure equitable funding for schools serving the largest percentages of students classified by the District as at-risk and those experiencing high levels of student mobility.

Enrollments declined over time for most schools serving the largest percentages of at-risk students because many families chose to opt out of these schools. Whether in terms of demand for schools in the My School DC Lottery, the percentages of students attending their in-boundary DCPS schools, and distances traveled to attend schools, a recurring theme in this report is that D.C. families systematically select away from schools serving large percentages of at-risk students. Additional investments in schools serving large percentages of at-risk students may be needed, given tendencies of the larger system to place these schools at a resource disadvantage through school choice. Declining enrollments mean fewer resources (relatively speaking) each year for schools serving the largest percentages of at-risk students. Yet schools serving the largest percentages of at-risk students may conceivably need more—not fewer—resources to meet the needs of these students.

In addition, students in these schools experience the highest rates of student mobility compared with students in other schools. Across all schools, 13% of students changed schools from one year to the next for reasons other than matriculation. This percentage was 17% for at-risk students, 16% for students attending schools in Ward 7, and 18% for students attending schools in Ward 8. Prior research has linked high rates of student mobility with negative outcomes, such as lower graduation rates, test scores, grades, attendance rates, and level of student engagement. More research is needed to determine the appropriate level of supplemental funding needed for schools serving students who may be affected by greater school or residential mobility.

As is the case in other urban centers, the District is in need of additional policies to address the inequity created by individual families' residential and school choices and the larger, systematic pattern to select away from schools serving the largest concentrations of at-risk students. If families perceive differences in school quality for schools serving large percentages of at-risk students, why is that the case? Prior research has pointed to a number of potential factors that may decrease demand for schools serving large proportions of low-income students, including higher rates of teacher and principal attrition, inadequate facilities, lack of materials and supplies, and poor school climate. On the other hand, prior research has also highlighted the barriers for under-served families to take advantage of school choice options to the same extent as middle- and upper-income families, even in choice-rich contexts. Future research could explore to what extent schools with large at-risk populations suffer from a lack of investment or are further disadvantaged in DC's current school choice system, and how new policy levers could be used to help ensure a high-quality education for all students in the District.

Summary of Report Recommendations

The recommendations in this report can be implemented without any additional costs to the government while also helping to advance the goals of the Deputy Mayor for Education (DME) and the District of Columbia Public Schools (DCPS).

Recommendation	Is There a Cost to the Agency/ Entity to Implement?	Potential to Generate Revenue or Savings to the District?	Specific Agency/Entity or District-Wide Goal Advanced by Recommendation
The Mayor should add demographic trends and enrollment patterns over time to current enrollment projection methodology to better align funding with actual enrollment.	No	Yes	2019 DME Strategic Initiative: In FY19, DME will release a 10-year Master Facilities Plan. The 10-year MFP will provide an opportunity to inform strategic, long-term planning for DCPS and public charter school facilities. The MFP will include up-to-date school facility conditions, enrollment growth projections, and long-term facilities maintenance plans ⁵⁵ .
The Mayor and Council should adjust enrollment projection methodology to accommodate mid-year student mobility.	No	Yes	2019 DME Strategic Objectives: Enhance equity of programming and outcomes for all learners. Increase coordination across government agencies to improve the

⁵⁵ Office of the Deputy Mayor for Education, FY19 Performance Plan, page 4, available at <https://oca.dc.gov/sites/default/files/dc/sites/oca/publication/attachments/DME19.pdf>

Recommendation	Is There a Cost to the Agency/ Entity to Implement?	Potential to Generate Revenue or Savings to the District?	Specific Agency/Entity or District-Wide Goal Advanced by Recommendation
			delivery, effectiveness, services to schools and students and optimize the use of public resources ⁵⁶
The Mayor and Council should ensure equitable funding for schools serving the largest percentages of students classified by the District as at-risk and those experiencing high levels of student mobility.	No	No	DCPS Strategic Plan Strategic Priorities: Define, understand, and promote equity so that we eliminate opportunity gaps and systematically interrupt institutional bias. • Prioritize budgeting and resources for students who need them most. ⁵⁷

⁵⁶ Office of the Deputy Mayor for Education, FY19 Performance Plan, page 1, available at <https://oca.dc.gov/sites/default/files/dc/sites/oca/publication/attachments/DME19.pdf>

⁵⁷ DCPS Strategic Plan – A Capital Commitment 2017-2022, page 4, available at https://dcps.dc.gov/sites/default/files/dc/sites/dcps/publication/attachments/DCPS%20Strategic%20Plan%20-%20A%20Capital%20Commitment%202017-2022-English_0.pdf

Appendices

The first two appendices provide links to the animations and dashboards referenced in the report. The third appendix provides the regression results. The fourth appendix provides a description of datasets created for the purpose of this project, as well as information on where to access them. The fifth and final appendix briefly outlines decisions made in cleaning the student enrollment data.

Appendix A: List of Public Use Animations

- Animation 1: [Where students transferred after their school was closed in 2014](#)
- Animation 2: [Where students transferred after their school was closed in 2015](#)
- Animation 3: [Previous school for students who attended new schools in 2015](#)
- Animation 4: [Previous school for students who attended new schools in 2016](#)

Appendix B: List of Public Use Dashboards

This [dashboard](#) shows the patterns in how students moved across schools between consecutive school years from the 2014–15 to 2017–18 school years. The data are available for each school and can be disaggregated by students in matriculating or non-matriculating grades. Students were flagged as being in a matriculating grade if they were in the last grade that the school offered in a given school year. Below is an example of what the student mobility patterns look like for one school.

Appendix C: Regression Results

The following tables provide the results from the regression analyses that inform which observed factors and school characteristics were the most predictive of the errors in enrollment projections. Separate analyses were conducted by sector and year.

Table 17: Regression results for projection errors for DCPS schools in 2017–18 and 2016–17

	Estimate	Standard error	P-value	Lower limit 95% confidence interval	Upper limit 95% confidence interval
2017–18 for all DCPS schools					
Percent at-risk	0.06	0.02	0.008	0.02	0.10
Two-year change in enrollment	-0.05	0.01	0.000	-0.07	-0.03
School N	106				
Adj. R Squared	0.30				
2017–18 for zoned DCPS schools only					
Percent at-risk	0.04	0.02	0.052	0.00	0.09
Two-year change in enrollment	-0.04	0.01	0.000	-0.06	-0.02
One-year change in in-boundary capture rate	-0.37	0.16	0.024	-0.69	-0.05
School N	97				
Adj. R Squared	0.33				
2016–17 for all DCPS schools					
New school	224.11	30.49	0.000	163.65	284.56
Percent at-risk	0.46	0.16	0.004	0.15	0.77
School N	108				
Adj. R Squared	0.36				

NOTES—1. For the 2017–18 analysis, the following schools were excluded from the analysis due to missing values on the covariates: MacFarland, Ron Brown, Roosevelt STAY, Ballou STAY, Washington Metropolitan, Luke Moore, and CHOICE Academy. For the 2016–17 analysis, Roosevelt STAY, Ballou STAY, Washington Metropolitan, Luke Moore, and CHOICE Academy were excluded. The majority of the excluded schools were alternative schools. 2. The models also included a constant, which are not reported here.

Table 18: Regression results for projection errors for charter schools in 2017–18 and 2016–17

	Estimate	Standard error	P-value	Lower limit 95% confidence interval	Upper limit 95% confidence interval
2017–18 for charter schools					
New school	196.77	6.30	0.000	184.28	209.25
School N	120				
Adj. R Squared	0.89				
2016–17 for charter schools					
New school	-24.95	4.78	0.000	-34.43	-15.47
Percent both at-risk and special education	0.34	0.12	0.005	0.10	0.58
School N	112				
Adj. R Squared	0.24				

NOTES—1. For the 2016–17 analysis, the following schools were excluded from the analysis due to missing values on the covariates: Youthbuild, Maya Angelou, The Next Step, Community College Preparatory Academy, Academy of Hope, and Carlos Rosario International. All of the excluded schools were alternative schools. 2. The models also included a constant, which are not reported here.

Appendix D: List of Public Use Datasets

To adhere to best practices regarding public access to research, we publish datasets that we created for the purposes of this project. Whenever possible, researchers should provide opportunities for others to “review, confirm, challenge, or extend published findings” and grant the public access to underlying study data.⁵⁸

Only non-personally identifiable and aggregate data are published. Additionally, if the data aggregations resulted in counts or percentages based on less than 10 students, the value was replaced with “N<10.” The following datasets are available [here](#).

Accuracy of enrollment projections

- Accuracy in enrollment projections: By year and school, the percentage of error in enrollment projections overall, by grade, and by student subgroup. Note that subgroup projections were available for charter schools in the 2017–18 school year only.

⁵⁸ Institute for Education Sciences (IES), [IES Policy Regarding Public Access to Research](#), 2016.

School demand

- Lottery system: By year and grade, average number of schools applied to in the lottery, as well as number of students applying in the lottery each year.
- Lottery school: By school and year and grade, number of students who ranked school #1, #2, #3, etc. in the lottery and number of students who listed the school in their lottery application at any rank or listed the school as one of their top three choices. Also includes seats offered, enrollment, waitlist length, and waitlist offers made by June, August, and October, and lottery preferences available for the school.
- In-boundary system: By student subgroup and year, the in-boundary capture rate and DCPS by-right capture rate. Note this file contains only DCPS in-boundary schools. By-right was determined by feeder patterns and enrollment in the school in the previous year.
- In-boundary school: By school and year, the DCPS in-boundary capture rate, the percent of students attending the school who were in-boundary, and the number of students living in the boundary who were in the public-school system. Note this file contains only DCPS in-boundary schools.

School mobility

- School mobility rates: By school and consecutive years, the numbers of students enrolled, matriculated, remained in the school, switched schools, or left the public school system from one year to the next. We also calculated the between-year mobility and retention rates. Additionally, mid-year mobility rates were calculated from OSSE school report card data for the 2017-18 school year only.
- Sector patterns: The sectors of schools attended for students who remained in the public-school system from the 2014–15 to 2017–18 school years, overall and by subgroup.
- Number of school patterns: The number of schools attended for students who remained in the public-school system from the 2014–15 to 2017–18 school years, overall and by subgroup. Includes for all students and students who were not flagged as matriculating from one school to another at any point during the 4-year period.
- Student residential and school mobility: By consecutive years, the numbers of students who changed home address and/or school. Overall and by student subgroup. Includes for all students and for students who did not matriculate only.
- Actual feeder patterns: By school and consecutive years, the counts of students who transferred from one school to the next in the following school year. Disaggregates the data for students in matriculating and non-matriculating grades.

School and system demographics

- School demographics: By school and year, student demographics: percent “at-risk,” ELL, special education, black, white, Latino, female, special education and “at-risk,” special education level 1, special education levels 2/3/4.
- System demographics: By grade, sector, and year, student demographics: percent “at-risk,” ELL, special education, black, white, Latino, female, special education and “at-risk,” special education level 1, special education levels 2/3/4.

Distance from home to school

- Distance home to school: By school and year, the average and standard deviation of the straight-line distance from home to school for students who attended that school. Also includes the average and standard deviation to the nearest in-boundary school for students who attended that school. If a student was in-boundary for more than one school, we selected the minimum distance to any in-boundary school.
- Distance home to school subgroup: By student subgroup and year, the average and standard deviation of the straight-line distance from home to school for public school students, overall and by student subgroup. Also disaggregates the data by students who were attending in-boundary versus charter or out-of-boundary schools.
- Type of school and proximity of school to home: By student subgroup and year, the percentages of students who attended various types of schools (e.g., in-boundary DCPS, out-of-boundary or citywide DCPS, charter), disaggregated by the schools' proximity to the students' homes.

Ninth grade retention rates

- Ninth grade retention: By consecutive years and subgroup, numbers and percentage of ninth grade students who repeated the ninth grade.

Kindergarten students transferring to their in-boundary schools after PK

- Kindergarten transfers: By school and consecutive years, the percentage of kindergarten students who attended preschool elsewhere and returned to their in-boundary school for grade K. Note that this file contains in-boundary DCPS schools only.

Appendix E: Data Cleaning Decisions

Student-level enrollment files contained some inconsistencies on demographic variables and duplicate entries for the same student. We cleaned these data files using the following process.

Exclusions

- We dropped students with missing school identification numbers and grade levels outside PK–12 (e.g., adult, non-grade special education).
- We also dropped private schools, centers, schools located outside of the District of Columbia.

Discrepancies

- If students had conflicting demographic data, we took the maximum value. For example, if a student was coded as participating in special education and not participating in special education, we coded the student as participating in special education.

- Race and ethnicity were coded as two variables in the 2014–15, 2016–17, and 2017–18 files, and combined as one variable in the 2015–16 file. As such, we do not examine trends by race over time across the 2015–16 school year.

Duplicates

- After the processes identified above, we resolved duplicate entries for the same students in the same year by examining school entry and exit dates. As the vast majority of students enrolled in school in the month of August, we took the first enrolled school in or after August for students with duplicate entries.
- For the few remaining students with duplicate entries, we retained the school where the student last attended based on the exit dates.
- The final dataset contained 79,725 students in 2014–15, 82,322 students in 2015–16, 84,898 students in 2016–17, and 86,179 students in 2017–18.

We used the steps outlined above to construct new databases, but whenever possible, we used pre-existing data, such as audited enrollment counts, school demographics, and mid-year mobility rates.

Agency Comments

On November 25, 2019, ODCA sent a draft of this report to the Deputy Mayor for Education (DME) for review and comment. We received a collective response from DME on December 12, 2019.

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Executive Office of Mayor Muriel Bowser



Office of the Deputy Mayor for Education

December 12, 2019

Kathleen Patterson
District of Columbia Auditor
717 14th Street NW, Suite 900
Washington, DC 20005

Dear Ms. Patterson,

We appreciate the opportunity to respond to the recommendations presented in the *Enrollment Projections in D.C.'s Public Schools: Controls Are Needed to Ensure Funding Equity* report. We have limited our feedback to focus on the report's content while we are separately communicating with your office about whether they maintained the appropriate data governance and security processes required for conducting such a study. It is also worth noting that others in the education cluster and I were surprised by the delivery of this report. Unlike your previous audits, you did not provide a formal engagement letter nor did you request an introductory meeting for the contractors and key education agency staff. Your previous studies, in particular the original projection study that concluded in September 2018 called *A Study of Enrollment in D.C. Public Schools: Assuring Accuracy and Transparency*, also included extensive communications between the contractors and key agency staff in order to answer questions and discuss context. This study lacked all of this.

Turning to the report, the authors recommend that the Mayor include demographic and enrollment factors to better align funding with actual enrollment. It is not clear how this could be implemented as recommended as the LEAs are best equipped to conduct the school-level projections. As the Office of the DC Auditor's previous enrollment projection study found, DCPS already uses what the contractors described as a best practice to develop their grade-level projections for each school, a cohort survival method plus adjustments based on expert principal feedback. Additionally, DCPS's enrollment projections are quite accurate. DCPS's total general enrollment projections have been between 97% and 99% accurate compared to DCPS's highest enrollment for FY16 through FY19, and the original study found that for 70% of DCPS schools, projections were either the same as their audited enrollments or the projections were too high or too low by only 1 student per classroom. Another 19% of schools were projected too high by two or more students per classroom. Projecting slightly higher than the audited enrollment ensures that schools are not short-changed the necessary resources and also provides a buffer for additional students that enter the DCPS system mid-year. Should LEAs consider including citywide demographics and enrollment as additional factors, the LEAs can access this information through the Office of the Deputy Mayor for Education's (DME) [EdScape Beta](#), a set of interactive visualizations and downloadable datasets design to inform and support school planning, as well as Office of the State Superintendent of Education's (OSSE) [school report cards](#).



The authors also recommended that the Mayor and Council adjust the enrollment projection methodology to accommodate mid-year student mobility. As described in the original *Study of Enrollment in D.C. Public Schools*, the DCPS sector-wide UPSFF enrollment projections does take mid-year enrollment into account since DCPS is the system of right in the District of Columbia, and they tend to net gain between one and two percent more students during the course of the school year. The DCPS school-level projections are estimated based on the October audited count, and DCPS central office adjusts resources to individual schools if the schools are identified as being under projected later both before and after the start of the year.

Finally, the authors recommended that schools serving large shares of “at risk” students receive equitable funding. The city allocates local funding to DCPS and public charter schools via the Uniform per Student Funding Formula (UPSFF) (D.C. Law 12-207; D.C. Official Code § 38- 2901 et seq.). The funding formula is based on enrollment and sets forth a minimum foundational level required to adequately fund education. The formula also provides funding weights to support additional costs, which includes an “at risk” weight. The UPSFF at risk weight in FY20 is 0.225 and the funding level is \$2,471 per at-risk pupil.

The DME recently authorized an education finance organization to study four particular aspects of UPSFF. The study focuses on at risk funding specifically including 1) the adequacy of the at-risk of academic failure UPSFF weight both in absolute terms and taking into account any interaction between the individual at-risk components, and 2) school-level concentration effects of high numbers of at-risk students. See the DME’s Request for Applications for more information about the study. We expect a final report in early 2020.

Enrollment projections are critical in ensuring that LEAs receive sufficient funding to operate their schools. Accurate budgeting also ensures that the city does not have to face a budget shortfall: if the projections are too low, the District must find contingency funds after the budget has already been approved and committed. We look forward to working with our schools, school communities, and agencies to continue to improve upon our processes and help plan for the future.

Sincerely,



Paul Kihn, Deputy Mayor for Education

ODCA Response to Agency Comments

ODCA appreciates the review of the draft report by Deputy Mayor for Education Paul Kihn and his team. Today with mayoral control of public education in the District of Columbia, the Deputy Mayor for Education (DME) manages the enrollment projections process and all that derives from that process including the allocation of financial resources and staff. It is surprising, therefore, that the administration does not embrace the first recommendation in this report, which is that the District's education leader—the Mayor—make certain that demographic trends and enrollment patterns over time are factored into enrollment projections. We regret that the DME defers, instead, to D.C. Public Schools (DCPS) and public charter schools on what are critically important public policy decisions.

Because the DME oversees the enrollment projections process that office has the authority to adjust the projections that are produced by DCPS and the public charter schools working in collaboration with DCPS, the D.C. Public Charter School Board, the Office of the State Superintendent of Schools (OSSE), and the Office of the Chief Financial Officer.¹ This current report provides clear evidence of the need to use that authority to ensure that demographic trends are appropriately accounted for in the projections. The increasing percentage of English language learner students (ELLs) in the District is a case in point. If these trends are not accurately reflected in what is projected by local education agencies (LEAs), it is the responsibility of leadership to address what the evidence demonstrates.

The DME comments focus on the general accuracy of LEA-level projections but while LEA projections are fairly accurate, that is not the case with regard to *school level* and *subgroup level* projections. At the school level, a 1 student per classroom error margin translates to a projection that is up to 6 percentage points either above or below the October enrollment. To be up to 6 percent off in projections at 70% of schools, while being more inaccurate at the remaining 30%, is inefficient and potentially harmful.

For example, in School Year 2018-19, Patterson Elementary School in Ward 8 was projected to have 363 students but had 386 students enrolled according to the October audited enrollment. This under projection also was not evenly distributed by grade, and 1st, 2nd, and 3rd grades had almost 10 more students each than had been expected. Conversely, Woodrow Wilson High School in Ward 3 was over projected by a net 98 students—largely driven by a 127-student over-projection in 9th grade. These cases prove that a 6% error is an unacceptably wide margin of error for projecting school-level enrollment used to determine school staffing. The gap between Patterson's projected and actual enrollment amounts to \$245,000 under the Uniform Per Student Funding Formula.

We regret that the DME similarly fails to embrace our second recommendation, that the Mayor and Council adjust enrollment projection methodology to account for mid-year student mobility,

¹ Office of the DC Auditor, 2018. A Study of Enrollment Projections for D.C.'s Public Schools: Assuring Accuracy and Transparency, p. 44-45, p. 98-100. Available at: <http://dcauditor.org/report/a-study-of-enrollment-projections-for-d-c-s-public-schools-assuring-accuracy-and-transparency/>
Smith, Ahnna. "DC PCS SY19-20 Enrollment Projections Timeline for FY20 Budget Development." July 31, 2018.

arguing that the current process of reallocation is adequate. As outlined in the report, however, to accurately know if both DCPS as an LEA and each school within DCPS is properly funded to account for mid-year mobility, it is necessary to track individual student movement throughout the year. And the District does not currently take that step. Students are associated with meaningfully different funding levels depending on their additional need—that is, whether they might be at-risk, special education, and/or ELL status. Given the report’s findings that certain subgroups of students are more mobile year-to-year it is important to know whether the same patterns hold for mid-year mobility. The additional 1% to 2% in funding provided today may well not reflect actual student entry into DCPS schools mid-year and especially not for these subgroups. We find no justification for the District’s failure to study this movement given that District education officials have all the data needed to do so. We simply do not know if DCPS is sufficiently funded to address this mobility, but it is a solvable problem and should be researched as soon as possible.

The report’s final recommendation was that the Mayor and Council should ensure that funding for the schools serving the highest proportion of students who are at-risk and those with the highest levels of mobility receive equitable funding. The DME notes that his office recently contracted for a study that will look at related equity funding issues. We are encouraged that the DME is studying particular aspects of the UPSFF and look forward to seeing the results. Importantly, our findings indicate that there continues to be systemic movement away from schools serving more students considered at-risk, and, therefore, these schools continue to be relatively under-resourced in each subsequent year. We hope the DME’s analysis will include a comprehensive review of our findings so that the recommendations that are forthcoming are themselves comprehensive and begin to address the persistence of equity challenges documented here.

Finally, the Deputy Mayor wrote that the draft report came as a surprise because ODCA did not issue a formal engagement letter or host an introductory meeting as is normally the case with ODCA audits including reports produced by contractors. We took neither step because we viewed this work as a continuation of the enrollment audit we undertook at the Council’s direction, resulting in a report published in September 2018. The earlier project included looking at projection errors historically and going forward, and we anticipated supporting analyses, such as the impact of these errors on school budgets and an understanding of subgroup level projection errors to also be included. For example, we anticipated that a subgroup analysis would be included since we have varying funding levels for at-risk students or students with disabilities, for example. The final project did not include a robust assessment of these impacts, so we moved forward with continued analysis to more directly address those issues.

We did not seek additional data from the Executive Branch for the current work. Because this research took the form of further analysis of data already gathered we simply sought extensions of the data sharing agreement we entered into for the earlier enrollment study. In that context we were clear with Executive Branch representatives that we were continuing to work with the enrollment data. In hindsight, however, and in recognition that the audit function itself can feel adversarial to those agencies or programs that are under audit, it would have been better to go through the formal steps of an engagement letter and introductory meeting. Even though the work undertaken by the team of researchers at the Center for Research and Reform in

Education did not require direct interaction with education officials it would have been a professional courtesy for ODCA to provide introductions and a full description of the topics to be covered in the current research. The D.C. Auditor regrets not taking these additional steps in a spirit of partnership with D.C. government colleagues.

Summary of Report Recommendations

The recommendations in this report can be implemented without any additional costs to the government while also helping to advance the goals of the Deputy Mayor for Education (DME) and the District of Columbia Public Schools (DCPS).

Recommendation	Is There a Cost to the Agency/ Entity to Implement?	Potential to Generate Revenue or Savings to the District?	Specific Agency/Entity or District-Wide Goal Advanced by Recommendation
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The Mayor and Council should adjust enrollment projection methodology to accommodate mid-year student mobility.	No	Yes	2019 DME Strategic Objectives: Enhance equity of programming and outcomes for all learners. Increase coordination across government agencies to improve the

⁵⁵ Office of the Deputy Mayor for Education, FY19 Performance Plan, page 4, available at <https://oca.dc.gov/sites/default/files/dc/sites/oca/publication/attachments/DME19.pdf>

Recommendation	Is There a Cost to the Agency/ Entity to Implement?	Potential to Generate Revenue or Savings to the District?	Specific Agency/Entity or District-Wide Goal Advanced by Recommendation
			delivery, effectiveness, services to schools and students and optimize the use of public resources ⁵⁶
The Mayor and Council should ensure equitable funding for schools serving the largest percentages of students classified by the District as at-risk and those experiencing high levels of student mobility.	No	No	DCPS Strategic Plan Strategic Priorities: Define, understand, and promote equity so that we eliminate opportunity gaps and systematically interrupt institutional bias. • Prioritize budgeting and resources for students who need them most. ⁵⁷

⁵⁶ Office of the Deputy Mayor for Education, FY19 Performance Plan, page 1, available at <https://oca.dc.gov/sites/default/files/dc/sites/oca/publication/attachments/DME19.pdf>

⁵⁷ DCPS Strategic Plan – A Capital Commitment 2017-2022, page 4, available at https://dcps.dc.gov/sites/default/files/dc/sites/dcps/publication/attachments/DCPS%20Strategic%20Plan%20-%20A%20Capital%20Commitment%202017-2022-English_0.pdf