SCHOOL FACILITY INVESTMENTS IN THE WASHINGTON METROPOLITAN AREA

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EXECUTIVE SUMMARY

The quality of a school building plays a critical role in student academic achievement as well as teacher retention (Schneider 2002; Buckley, Schneider, and Yi 2004a). Yet, the majority of U.S. public schools are in poor physical condition, and nearly one-quarter are overcrowded, pressuring school systems to invest in both improving existing facilities and adding new facilities to accommodate growing student enrollments (GAO 1996; Lewis et al. 2000). Regional population growth mandates new school construction, while the condition of central-city schools and schools serving minority and low-income students creates the greatest need for upgrade and repair (GAO 1996).

This brief analyzes patterns of investment for public school construction in the Washington, D.C., metropolitan area from 1995 to 2004. It considers the geographic distribution of investments, the allocation of resources for new construction versus renovation, changes in spending over time, and differences in investment for schools with differing student income levels and differing racial/ethnic compositions.

The most substantial outlays across the region were for new school construction in the burgeoning outlying suburbs, where rapidly growing student enrollment mandated an expansion of school capacity. Spending in the District of Columbia and the suburbs immediately surrounding the District was directed more toward school renovation. School construction investment increased over time throughout the region, with the most dramatic increase occurring within the District, which in 2000 began the widespread renovation of old schools.

Both population growth pressures and the need to improve aging schools influenced spending patterns across the Washington metropolitan area. However, local policy priorities and budget constraints also shape decisions about where to invest, helping to explain wide disparities in school construction spending across jurisdictions. From 1995 to 1999, investment in schools where more than 40 percent of students qualify for free or reduced-price lunch was below the regional average. However, starting in 2000, spending at schools where more than 75 percent of students qualify for free or reduced-price lunch increased sharply, largely reflecting increased expenditures within the District of Columbia. Construction was also below average for schools attended primarily by minority students (less than 15 percent white) and for schools where African-Americans are the dominant minority group, though these schools also saw small increases in investment over time. Schools with racially and ethnically diverse or a majority white student population garnered the greatest school construction resources.

Unfortunately, data are not available to directly assess the extent to which school construction investments addressed problems of poor facility quality. However, the disparities in construction spending across the region are consistent with national studies showing that during the 1990s, schools serving high proportions of low-income and minority students were more likely to have inadequate facilities (GAO 1996). Furthermore, despite increased spending in the District of Columbia, as recently as 2002 more than 40 percent of teachers in the D.C. public school system rated their school facilities as educationally inadequate (Buckley, Schneider, and Yi 2004b).

INTRODUCTION

Numerous studies have documented the role of building quality in student academic achievement and teacher retention. Small, well-maintained schools that provide clean air, good light, and a comfortable temperature for students and teachers improve student performance Schneider (2002). Similarly, teachers cite the physical condition of their school as a critical factor in their ability to teach effectively (Buckley, Schneider, and Yi 2004b).

Despite the benefits of high-quality school facilities, an alarming proportion of U.S. public schools have failed to expand capacity and maintain infrastructure to meet the challenge of growing enrollments. A 1999 national survey of public schools found that nearly one-quarter of public schools were overcrowded, having failed to keep up with student enrollment growth from the baby-boom echo and immigration and migration patterns Lewis et. al. (2000).[1] At the same time, a 1995 study found that years of deferred maintenance had left nearly 60 percent of schools across the country in need of major repair or replacement. The authors estimated that $112 billion was needed nationwide to bring existing public school facilities to a good overall condition (GAO 1995). Schools within central cities were more likely to need upgrade or repair, as were schools serving higher proportions of minority students or students eligible for free or reduced-price lunch. Public schools in the District of Columbia were no exception, with 91 percent of schools reporting some type of building inadequacy. This proportion was lower in Maryland (67 percent) and Virginia (60 percent) but nevertheless indicated substantial need (GAO 1996).

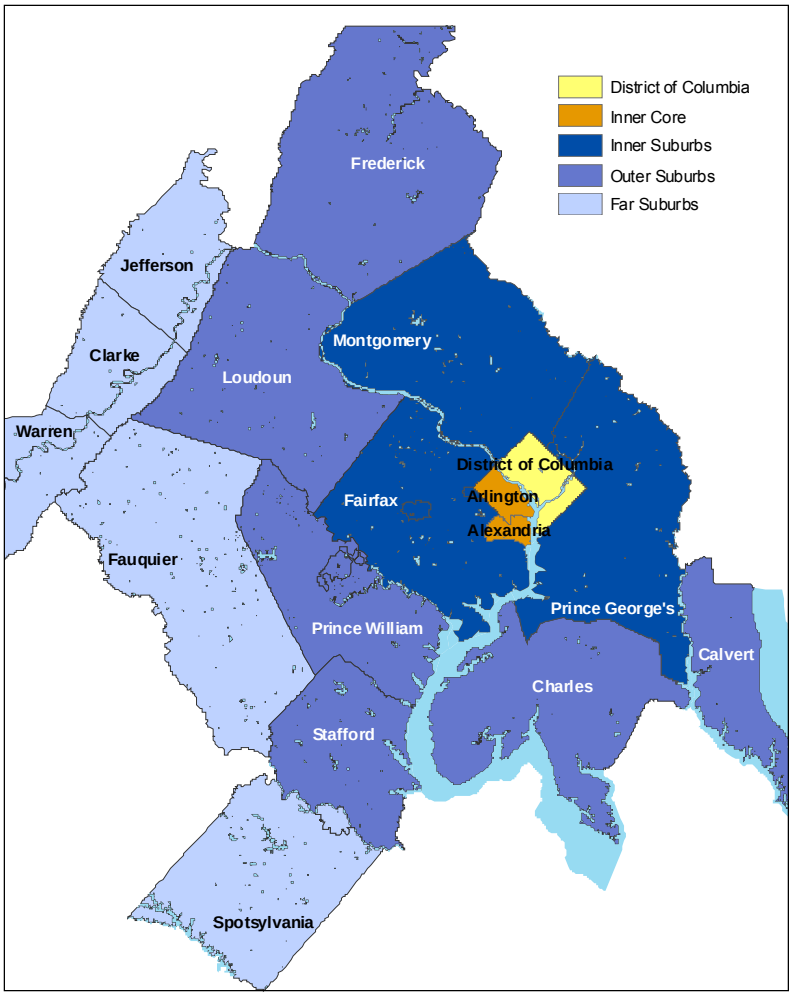
This regional study of investments for public school construction in the Washington metropolitan area[2] parallels work by 21st Century School Fund and their Building Educational Success Together partners to understand the scale, scope, and distribution of school construction investment in the United States (21st Century Fund 2006). First, we present an overview of construction spending across sub-regions within the metropolitan area and over time. (See map 1 for definitions of subregions within the Washington metropolitan area.) We also analyze the distribution of school construction investment from 1995 to 2004 across schools with different racial/ethnic compositions and different eligibility rates for free or reduced-price lunch. Finally, we focus in greater detail on facility investments within the District of Columbia, discussing spending trends and patterns across the city.

School Facility Investments in the Washington Metropolitan Area

As the Washington metropolitan area population spread into the Outer and Far Suburbs, expanding school enrollment in these outlying jurisdictions drove massive investments in new school construction. Between 1995 and 2004, school facilities spending increased in almost every jurisdiction, but increased most dramatically in the Outer Suburbs and the District of Columbia. Spending for the renovation and improvement of existing schools was greatest in the Inner Core and District of Columbia,

the latter of which began spending large sums after 2000 to replace dilapidated and obsolete school facilities.

Map 1: Washington, D.C., Metropolitan Area



Source: Office of Management and Budget, 2005

Expanding Public School Enrollment

In the past 10 years, the Washington metropolitan area has experienced remarkable economic and population growth, which has driven extensive suburban development far into the counties surrounding the District of Columbia. From 2000 to 2004, employment in the region grew 1.1 percent annually to 2.72 million, while the unemployment rate averaged just 3.5 percent, indicating remarkable health relative to the overall U.S. economy. The strong economy fueled population growth and a booming regional housing market. Population in the metropolitan area reached 5.2 million in 2004, having grown at an average annual rate of 1.7 percent since 2000, notably higher than the average rate of 1.5 percent during the 1990s. The fastest population growth within the region occurred in the Outer and Far Suburbs, which from 2000 to 2004 experienced

average annual growth of 4.5 percent and 3.6 percent, respectively. Together, these outlying suburbs accounted for roughly two-thirds of the region's total population growth during this period.[3]

The region's growing population included many families with public school children. In the 2003–2004 school year, total public school enrollment in the Washington metropolitan area was just over 820,000 students, having grown at a 2.2 percent average annual rate since 1995–1996.[4] While the Inner Suburbs were home to more than half (54 percent) of the region's public school children, enrollment growth during the period was highest in the Outer and Far Suburbs. Specifically, enrollment in Outer Suburb schools grew at an average annual rate of 4.2 percent, compared to a small decline in the District of Columbia, and growth rates between 1 and 2 percent in the Inner Core and Inner Suburbs. Further, while enrollment growth slowed after 2000 in the Inner Core and Inner Suburbs, it increased in the Outer and Far Suburbs, consistent with trends in overall population growth.

School Construction Spending

To accommodate expanding school enrollment and improve existing school facilities, Washington-area school districts spent $5.4 billion[5] on construction of new schools, modernization of existing schools, and major capital improvements from 1995 to 2004. These totals are derived from school-level records of public school construction contracts, which include such major facility upgrades as the replacement of boilers and roofs as well as the construction of new schools and the complete renovation of existing schools. These data were captured at the point of construction contract bids and therefore reflect only "hard" expenditures associated with capital investments and not "soft" spending on site acquisition, design, project management, and the temporary relocation of classes during improvements.[6] Soft spending typically accounts for 20 to 45 percent of total school facility development expenditures, depending on the jurisdiction and market within which the project is undertaken. As a result, the totals reported here are substantially lower than total school facility bonds issued by jurisdictions in the Washington region.

School districts across the Washington, D.C., region invested an annual average of $716 per student[7] for hard expenditures on school construction, driven by high levels of spending in the fast-growing Outer and Far Suburbs, where annual per-student spending averaged $985 and $831, respectively. These averages reflect massive outlays in the fastest growing areas, such as Loudoun County, where enrollment more than doubled from the 1995–1996 to 2003–2004 school years, and school construction spending totaled $641 million, or $2,045 annually per student. In contrast, spending was notably lower in the slower growing Inner Suburbs and District of Columbia, averaging only $591 and $584 per student annually in each jurisdiction, respectively.

These differences in annual expenditures are even starker if we consider differences in construction costs across the metropolitan area. According to data from

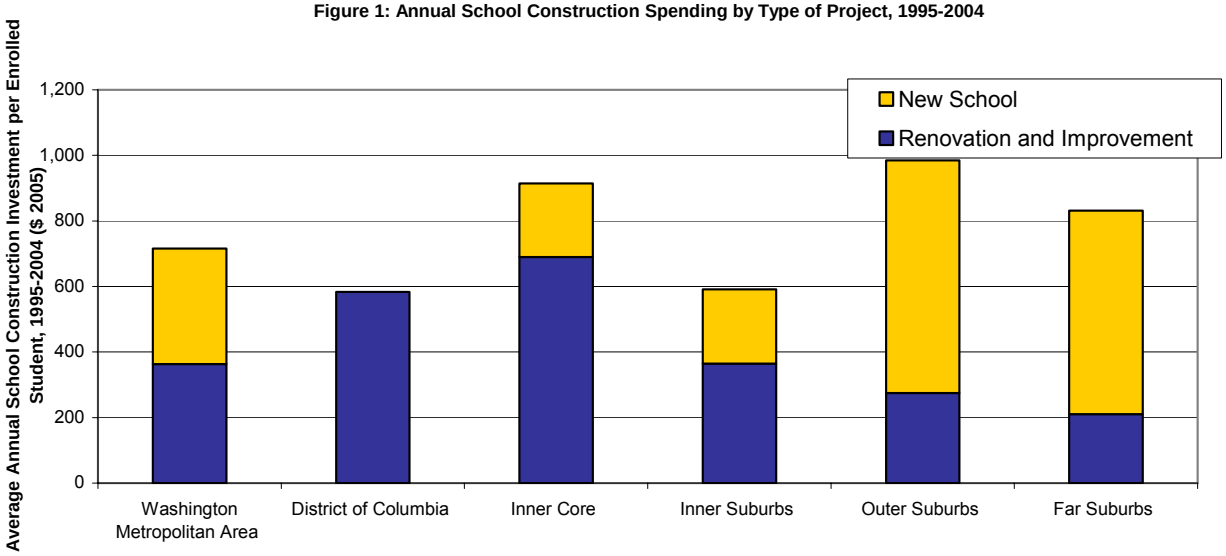
RS Means Construction, a commercial construction cost information firm, 2004 construction costs were highest in the District of Columbia and generally declined with distance from the city.[8] Cost differentials ranged from 5.5 percent lower in Prince George's County and parts of Montgomery County to 18.1 percent lower in Clarke and Warren counties. Thus, higher absolute levels of spending in the outlying suburbs represent an even greater investment when the lower cost of construction in those jurisdictions is taken into account.

School construction spending picked up throughout the region over time, with nearly 60 percent of total (inflation-adjusted) expenditures occurring since 2000.[9] This trend was especially pronounced in the Outer Suburbs and the District of Columbia. Per-student spending reached 1.5 times the metro average in the Outer Suburbs after 2000, compared with a ratio of 1.3 prior to 2000. From 1995 to 1999 District spending was among the lowest in region at $262 annually per student, but it more than tripled after 2000 to surpass the metro average for that period. In contrast, school construction investment in the Inner Suburbs increased only slightly over time and did not keep pace with the metrowide average.

New School Construction

As might be expected, the proportion of total spending dedicated to new school construction[10] increased steadily with distance from the District of Columbia, reflecting more rapid population growth in the region's outlying counties (figure 1). The District of Columbia did not build any new schools between 1995 and 2004, although 12 schools were completely replaced during the period (see the Washington, D.C., section, below). And while only 38 percent of construction dollars went for new schools in the Inner Suburbs, almost three-quarters of spending in the Outer and Far Suburbs was dedicated to new schools.

Figure 1: Annual School Construction Spending by Type of Project, 1995-2004



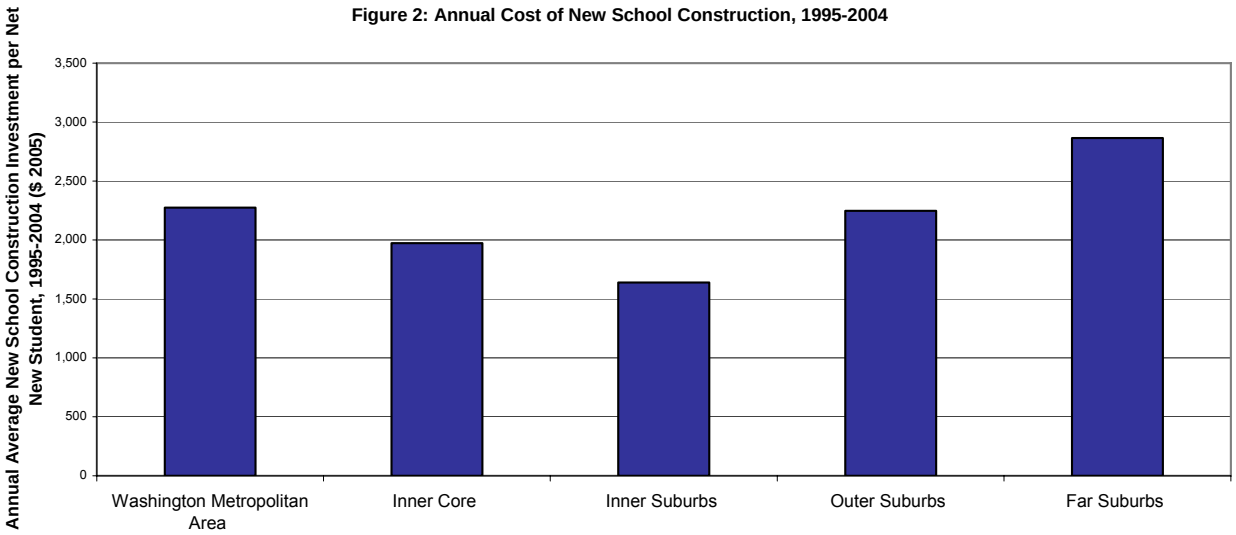
Source: Date from McGraw-Hill Construction and 21st Century School Fund.
Note: Data do not include public charter schools in the District of Columbia.

Further, just as population growth accelerated after 2000, the percentage of spending devoted to new school construction increased in nearly every subregion over time as well. Overall in the region, 44.9 percent of total facility investment from 1995 to 1999 went for new school construction, while from 2000 to 2004 this proportion increased to 52.5 percent and reached as high as 81.6 percent of total facility investment in the Far Suburbs after 2000.

Rapidly expanding enrollment in the Outer and Far Suburbs appears to have driven spending for new schools. But how does the cost of accommodating a new student vary across jurisdictions? To control for student enrollment growth, we compare spending for new construction per *net new* student from 1995 to 2004. This provides an indicator of spending on new school capacity for each additional public school student enrolled during the period.

Even after controlling for student enrollment growth, spending was highest in the Outer and Far Suburbs. Compared to the metropolitan-area annual average expenditure of $2,276 per net new student, school districts in the Far Suburbs spent substantially more on new facilities ($2,864) than did districts in the Inner Core ($1,972) and Inner Suburbs ($1,640) (see figure 2). Spending in the Outer Suburbs ($2,248 annually per net new student) was close to the regional average. The higher levels of spending by faster growing jurisdictions may be explained in part by the anticipation of continued growth in student enrollments.

Figure 2: Annual Cost of New School Construction, 1995-2004



Source: Data from McGraw-Hill Construction and 21st Century School Fund.
Note: The District of Columbia did not build any new schools from 1995-2004.

School Renovation and Modernization Investment Uneven

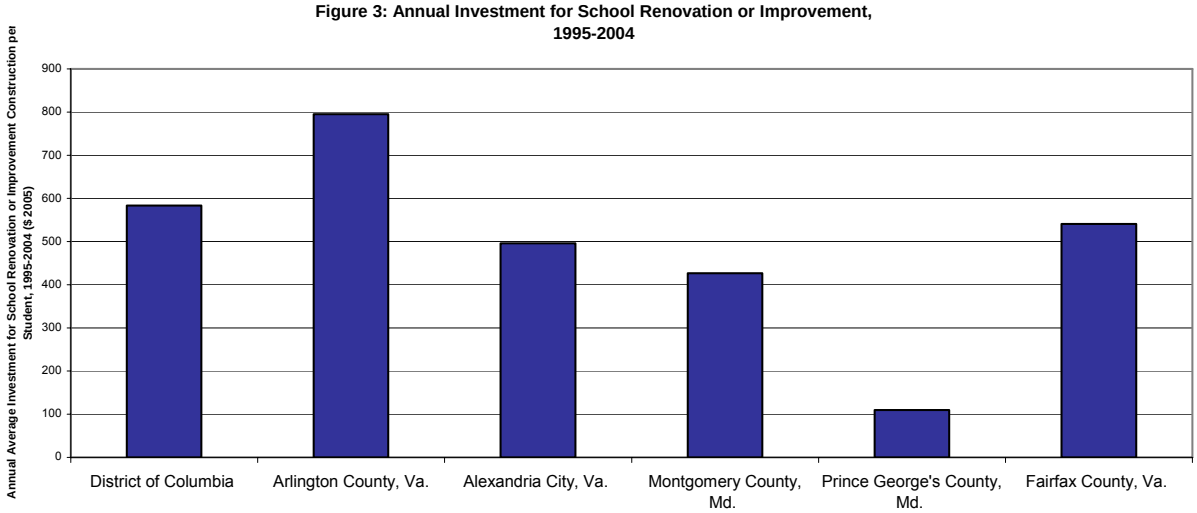
With large outlays for new school construction in the Outer and Far Suburbs, it is perhaps not surprising that other school construction spending was lower in these areas relative to the metrowide average. Schools in these rapidly growing jurisdictions are

more likely to be new and less likely to need repairs or modernization. A comparison of spending for renovation and improvement[11] is more relevant for the Inner Suburbs, Inner Core, and District of Columbia, where school enrollments are growing slowly or not at all and school facilities are older on average. As illustrated in figure 3, spending for school renovation and improvement was highest in Arlington County ($795 per student per year), followed by Washington, D.C., ($584 per student per year). Among jurisdictions in the Inner Suburbs, renovation and improvement spending totaled only $110 per student per year in Prince George's County, notably lower than other jurisdictions such as Montgomery County, which invested $427 per student annually to upgrade or modernize schools.

Keeping Pace with Enrollment Growth

Were the region's investments in school construction between 1995 and 2004 sufficient to keep pace with student enrollment growth? While direct measures of school capacity are not available, average school enrollment provides a rough indicator of the adequacy of construction investments: increasing average enrollments would suggest that capacity grew more slowly than enrollment, while shrinking average enrollments would suggest that capacity grew more rapidly than enrollment. Note that using average enrollment in this way assumes that new school construction was intended to maintain the existing average school size.

Figure 3: Annual Investment for School Renovation or Improvement, 1995-2004



Source: Data from McGraw-Hill Construction and 21st Century School Fund.
Note: Data do not include public charter schools in the District of Columbia.

Although the average number of students per school in the region has risen since 1995–1996, the large outlays for new school construction and school improvement appear to have slowed that growth. Between 1995 and 2004, 132 net new schools opened, leaving the average school enrollment in the region at 662, 6.3 percent above the 1995–1996 average. Nearly all the growth in average enrollment occurred before

2000, by which time the average school enrolled 659 students. After 2000, while enrollments continued to expand, increases in spending and the opening of new schools appear to have held the average school enrollment steady.

Growth in the average school enrollment occurred at all school levels (primary, middle, and high school) and was greatest in the Outer Suburbs (an increase of 9.7 percent in average student enrollment between 1995–1996 and 2003–2004, followed by the Inner Suburbs (8.4 percent growth), areas that also had the highest average overall enrollments (744 and 726 students, respectively). The Far Suburbs, which, as discussed earlier, invested heavily in expanding capacity for new students, saw average enrollment increase by a more modest 5.9 percent between 1995–1996 and 2003–2004, reaching an average of 625 students by the end of the period. The exception to growing enrollment was the District of Columbia, which as discussed earlier, saw declining enrollment in the traditional public school system and the opening of public charter schools, leading to an 11.8 percent decline in average school enrollment over the period.

Disparities in School Construction Investments

National research shows that schools serving higher proportions of minority students and students from low-income families are more likely to have inadequate facilities than schools serving mostly white and more affluent students (GAO 1996). Although we don't have data on facility adequacy, we can assess differences in school facility investments across Washington-area schools serving different types of students. We classify area public schools based on the share of students eligible for free or reduced-price lunch and the mix of different racial and ethnic groups.[12] Not surprisingly, the distribution of schools across these categories varies dramatically by sub-region. For example, most of the region's predominantly black schools are located in the District of Columbia and Prince George's County, while most of the predominantly white and high-income schools are located in the Outer and Far Suburbs. As a consequence, the pattern of expenditures by school type reflects different levels of expenditures by jurisdiction and sub-region. However, by focusing on patterns of spending at the school level, this analysis more directly tests for differences in school construction investment by school income level and racial/ethnic composition.

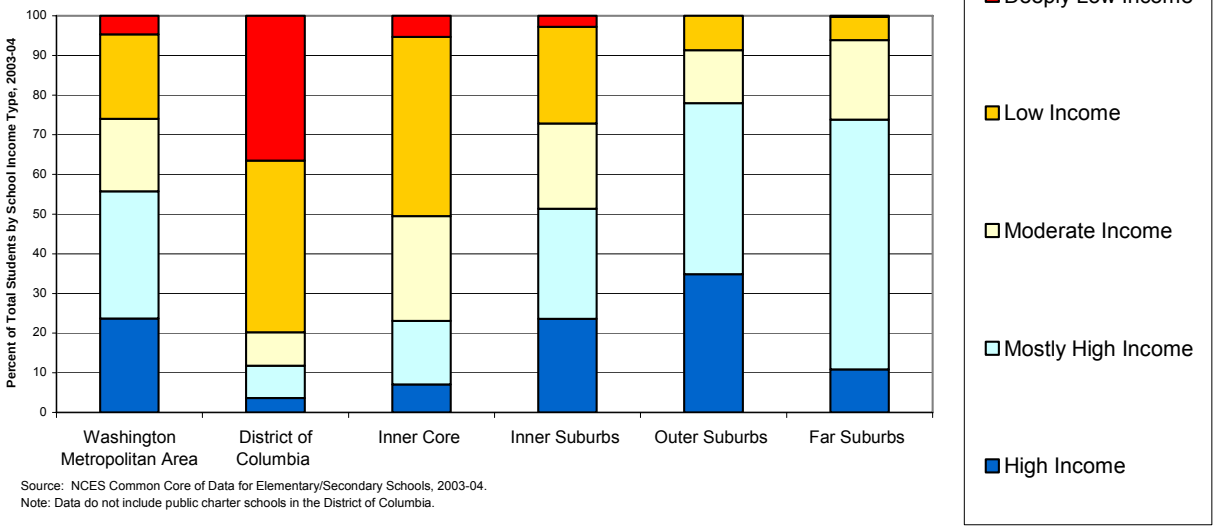
Increasing Spending at Deeply Low-Income Schools

Schools throughout the metropolitan region were classified in terms of the proportion of students eligible for free or reduced-price lunch. Qualification for the federal free or reduced-price lunch program is based on family income, and thus serves as a proxy for the income level of students attending the school.[13] For this analysis, we grouped schools into five categories based on the percentage of enrolled students eligible in 2003–2004. We aimed for an even distribution of schools across types, but opted to create a fifth (deeply low income) category that is relatively small to test for disparities at the low end of the distribution:

1. *High income*: Less than 10 percent eligible
2. *Mostly high income*: 10–25 percent eligible
3. *Moderate income*: 25–40 percent eligible
4. *Low income*: 40–75 percent eligible
5. *Deeply low income*: More than 75 percent eligible

As figure 4 illustrates, 23.7 percent of the region's students attend a high-income school, while 21.3 percent attend a low-income school and 4.7 percent attend a deeply low-income school. School income levels generally increase with distance from the District, peaking in the Outer Suburbs. Nearly two-thirds of the region's deeply low-income schools are located in the District of Columbia, and a quarter (25.5 percent) are in Prince George's county. Within the District of Columbia, 36.5 percent of students attend a deeply low-income school, while in the Outer and Far Suburbs there is only one deeply low-income school. In contrast, 77.9 percent of students in the Outer Suburbs and 73.8 percent of students in the Far Suburbs attend a high or mostly high-income school, compared to 11.7 percent of students in the District of Columbia and just 19.0 percent of students in Prince George's County. However, not every school in the Outer and Far Suburbs is high-income. For instance, 21.7 percent of Prince William County students and 16.6 percent of Jefferson County students attend low-income schools.

Figure 4: Public School Students by School Income Type, 2003/04

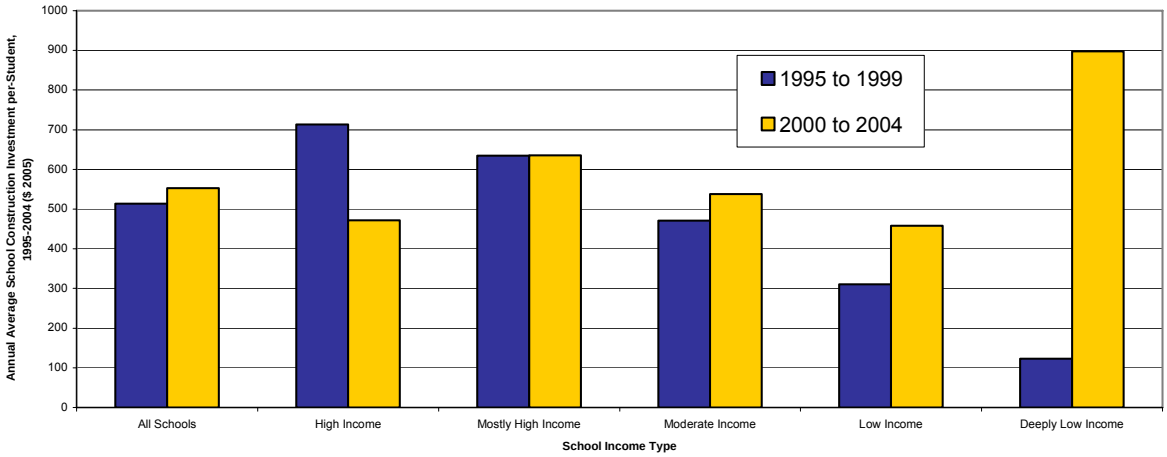


Source: NCES Common Core of Data for Elementary/Secondary Schools, 2003-04.
Note: Data do not include public charter schools in the District of Columbia.

High and mostly high-income schools received more construction spending per student from 1995 to 2004 than average, while low-income schools spent considerably less than the regional per-student average (figure 5). However, most spending at higher

income schools results from new school construction in the outlying suburbs, indicating that above-average spending for these schools is used to build new schools rather than to renovate existing schools. While spending at high-income schools appears to decline after 2000, this result may be biased by the fact that the most recently constructed schools do not yet appear in NCES data and were therefore excluded from this analysis. In addition, spending for deeply low-income schools rose dramatically over the 1995-2004 period, driven largely by increased investments at District of Columbia schools. Most of this investment was for renovations and improvements, for which spending increased from just $109 per-student per year from 1995 to 2000 to $769 from 2000 to 2004. Yet, while investment increased at low-income schools, it remained 17.2 percent below the metro average after 2000. Although the recent allocation of construction investment reflects some shifting of resources to schools with more economically disadvantaged students, lower levels of spending for low-income schools persist.

Figure 5: Annual School Construction Investment by Income of Student Population, 1995-2004



Source: Data from McGraw-Hill Construction and 21st Century School Fund.
Note: Data do not include public charter schools in the District of Columbia.

Spending Highest at Diverse Schools

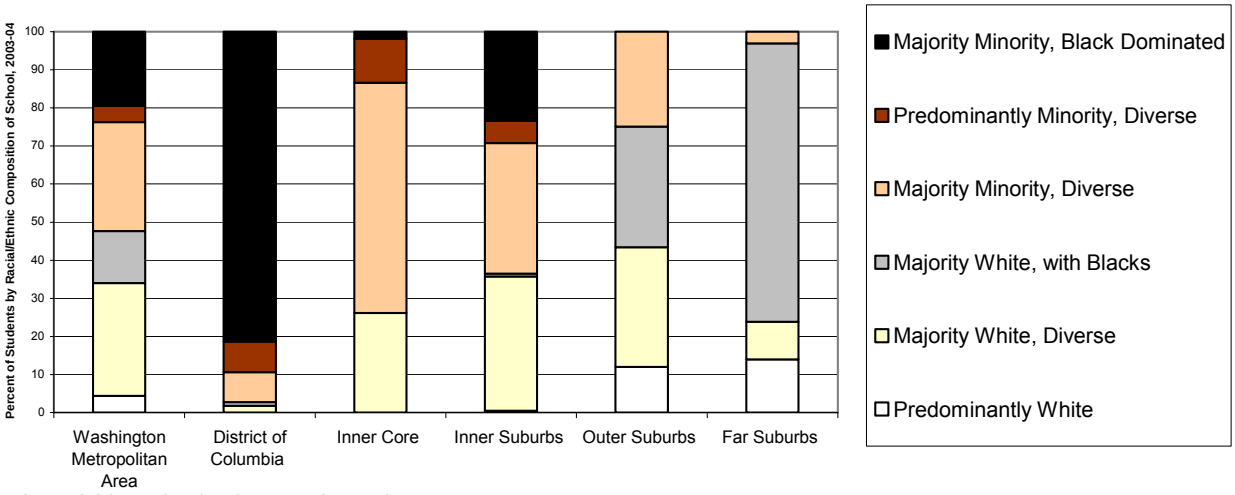
We classified metro-area schools into six categories, based on the racial and ethnic composition of student enrollment[14]:

1. *Predominantly white*: more than 90 percent white.
2. *Majority white, diverse*: 50–90 percent white with no minority group more than 60 percent of the minority students.
3. *Majority white, with blacks:* 50–90 percent white, blacks more than 60 percent of the minority students.
4. *Majority minority, diverse*: 15–50 percent white, no minority more than 60 percent of the minority students.

5. *Majority minority, black dominated*: less than 50 percent white, blacks more than 60 percent of minority students.
6. *Predominantly minority, diverse*: less than 15 percent white, no minority more than 60 percent of the minority students.

More than 85 percent of students in the District of Columbia and Prince George's County attend a school that is majority minority and black-dominated, or predominantly minority but with diverse mix of racial/ethnic groups. In contrast, predominantly white schools appear almost exclusively in the Outer and Far Suburbs, areas that are also notable for their complete lack of majority minority, black-dominated or predominantly minority, diverse schools (figure 6). Excluding Prince George's County, the vast majority of students in the Inner Core and Inner Suburbs attend schools that are between 15 and 90 percent white with a diverse minority population. In contrast, more than seven in 10 students in the Far Suburbs attend a majority white school at which blacks are the main minority group. In the Outer Suburbs, most schools are also majority white, but half of these have a minority student population that is mostly black. In addition, one in four Outer Suburb students attends a school that is majority minority, with no single group dominating the minority population.

Figure 6: Public School Students by Racial/Ethnic Composition of School, 2003-2004

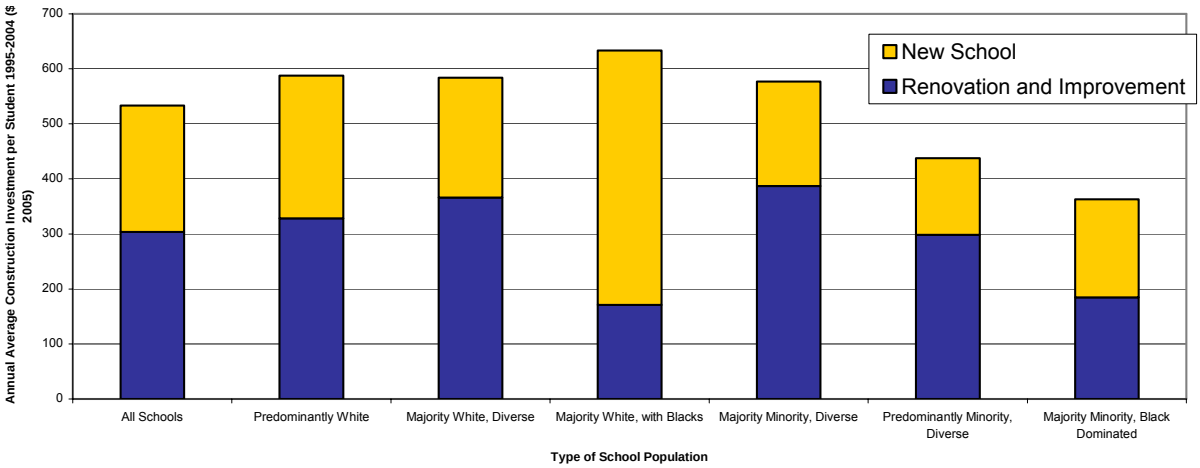


Source: NCES Common Core of Data for Elementary/Secondary Schools, 2003-04.
Note: Data do not include public charter schools in the District of Columbia.

Majority minority, black-dominated and predominantly minority, diverse schools received below average school construction expenditures, while schools that were majority white with blacks received the most per student (see figure 7). While annual per-student spending increased at majority minority black-dominated schools by an average of 71.5 percent after 2000, it remained below the regionwide average. However,

average spending at predominantly minority, diverse schools more than tripled after 2000, far surpassing the regional average. Only one-third of spending was for new school construction at majority minority, diverse schools and predominantly minority, diverse schools, while nearly three in four dollars at schools that were majority white with blacks went toward new school construction.

Figure 7: Annual School Construction Spending by Racial/Ethnic Composition of School Population, 1995-2004



Source: Data from McGraw-Hill and 21st Century School Fund.
Note: Data do not include public charter schools in the District of Columbia.

Arlington County and Prince George's County Stand Out

Two counties in the Washington suburbs stand out for their exceptional school construction spending patterns: Arlington County for its above-average outlays, and Prince George's County for its below-average investment. Arlington County (in the Inner Core) invested large sums for public school construction—most of which was used to replace or renovate existing schools—despite only modest enrollment increases. The county's public schools are notable for their diversity, in terms of race, ethnicity, and student income. There are no predominantly white or majority minority, black-dominated schools in the county, and nearly all the students attend a school that is either majority minority, diverse (52.0 percent) or a school that is majority white, diverse (38.4 percent). The remaining 9.6 percent of students attend a predominantly minority, diverse school. Similarly, fewer than one in five students attends either a high-income or deeply low-income school.

While Arlington County enrollment expanded at an annual average rate of 1.2 percent from 1995–1996 through 2003–2004—the slowest rate in the region outside the District of Columbia—annual per-student school construction spending stood at $1,091, among the highest levels in the metropolitan area. Spending for Arlington County public schools appears to be best explained by the county's strong commitment to public education: While fewer than 15 percent of households have a school-aged child, nearly

80 percent of voters approved a $79 million school-improvement bond in 2002 (Washington Area Boards of Education 2003). Beginning in 1988, the Arlington Public School District began a long-term plan to renovate or rebuild every school in the system. Today, plans call for this goal to be reached by 2010 (Washington Area Boards of Education 2005).

In contrast, Prince George's County provides an example of below-average construction spending in the metro area. Enrollment in Prince George's County schools grew slowly compared to neighboring jurisdictions, expanding at an annual average rate of 1.4 percent. And while fewer than 10 percent of county students attend either a high-income or a deeply low-income school, nearly half attend a low-income school, a substantially higher proportion than in Arlington County, where just over one-third attend low-income schools. Further, in stark contrast to the racial and ethnic diversity of Arlington schools, three-quarters of Prince George's students attend a majority minority, black-dominated school, and the rest attend schools that are majority minority, diverse or predominantly minority, diverse.

Between 1995 and 2004, per-student construction spending for Prince George's County schools was roughly a third of spending in Arlington County schools (and only half that of Montgomery and Fairfax Counties, also in the Inner Suburbs). The difference in construction investment is accounted for by lower investment in school renovation or upgrades. Although Prince George's schools kept pace with the rest of the region on new school construction, spending for the improvement of existing schools averaged just $110 per student annually, compared with $427 in Montgomery County and $541 in Fairfax County.

Facility Investments in the District of Columbia

In 1995, District of Columbia public schools were 50-years-old on average and suffered from years of deferred maintenance. Nearly every school (96.6 percent) reported a need for some facility investment and more than a quarter (26.7 percent) reported five or more unsatisfactory environmental conditions. School officials estimated that $460 million was needed for repairs to existing facilities to bring schools to good overall condition (GAO 1995).[15]

Between 1995-96 and 2003-04, total public school enrollment in the District fell slightly, from 79,784 to 77,893. However, starting with the introduction of public charter schools in 1996-97, enrollment in traditional District of Columbia Public Schools (DCPS) steadily declined.[16] From 1995–1996 to 2003–2004, DCPS saw an 18.6 percent decline in its overall student enrollment. DCPS schools are overwhelmingly comprised of low-income and minority (mostly black) students. In 2003–2004, 81.4 percent of students attended a majority minority, black-dominated school, and nearly all the rest were in predominantly minority, diverse or majority minority, diverse schools. 36.5 percent of students attended a deeply low-income school, and another 43.4 percent attended low-income schools.

Data on school construction for public charter schools in the District of Columbia are incomplete and unreliable. As a result, the numbers reported here are for DCPS school construction investments only. However, according to Rivlin (2005), public charter schools in Washington, D.C., have spent an estimated $75.4 million on total development costs for school construction projects (including soft costs) through Spring 2004. Assuming that soft costs account for about 30 percent of development expenditures, this represents 13.1 percent of DCPS spending from 1995 to 2004, and 17.3 percent of DCPS spending since 2000. By comparison, in 2003–2004, public charter schools accounted for 16.6 percent of the District's public school enrollment. Under the Education Reform Act of 1995, which created the authority for public charter schools, the District must uniformly fund public charter schools with a per-student facilities allocation. In terms of major capital investments, the preceding comparisons suggest a proportionate fiscal allocation across the two school systems.

Major Investments for School Replacement

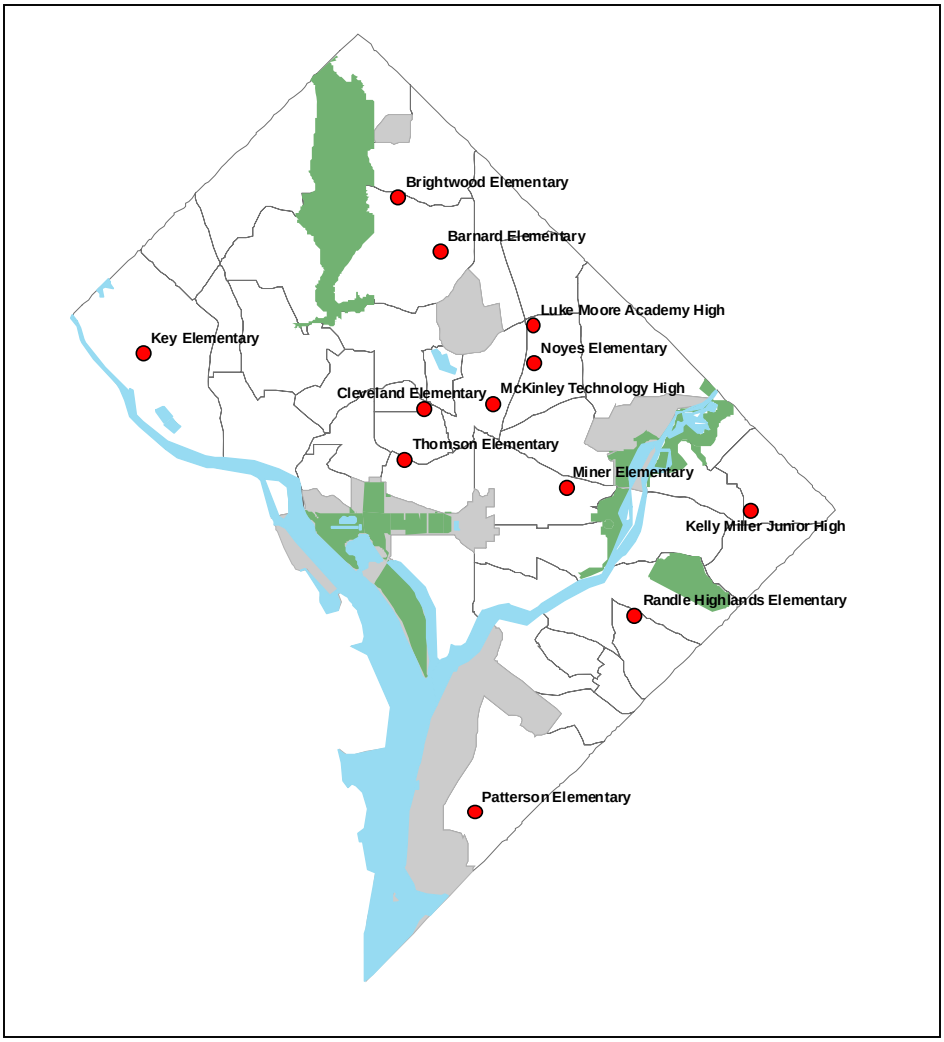
According to the data from McGraw-Hill Construction, between 1995 and 2004 DCPS invested a total of $404 million in hard expenditures to upgrade or replace existing schools, with most of this investment occurring after 2000.[17] This translates to an average annual school facility expenditure of almost $584 per public school student. The majority of construction expenditures were dedicated to major projects focused on replacing or modernizing specific schools, while 20 percent of the investments ($79 million) funded improvements at multiple schools in the DCPS system. Three-quarters of all investments (75.5 percent) came between 2000 and 2004, when average annual facilities spending per student was $905, compared to just $262 in the period from 1995 to 1999. The increased spending after 2000 reflects massive investments to completely replace old school facilities. Since 2000, 76.6 percent of facilities spending ($233 million) was for the replacement of 12 schools, while spending on other upgrades at existing schools fell slightly from an annual per-student average of $256 prior to 2000 to $212 after 2000. The 12 schools that were replaced include nine elementary schools, one middle school, and two high schools (see map 2).[18]

Spending per enrolled student was highest at high schools and lowest for middle schools.[19] Annual average per-student investment at high schools was $693, compared to $484 at primary schools, and just $410 at middle and junior high schools. However, overall, 62.1 percent of facilities expenditures were directed toward primary schools, 25.4 percent to high schools, and 12.5 percent to middle and junior high schools.

As only a small fraction of schools in the DCPS system received major capital improvements, many neighborhoods have yet to benefit from substantial facility investment. In order to demonstrate a commitment to improving school facilities across the city, DCPS chose the first school construction projects by selecting one elementary school in each ward. Subsequent projects were identified through a citywide facility master planning process that included extensive public input. In addition, the full

renovation of McKinley High School—the single most expensive project to date—was identified as a mayoral initiative. To analyze the distribution of school construction investments across the city, we compared per-student school facility investments at the neighborhood cluster level.[20] Because investments for school construction are large and must therefore be focused in only a few clusters (and only a few schools within each cluster), it is not surprising that of the clusters with DCPS schools, 11 received no major school renovations, while five clusters benefited from annual average expenditures of more than $1,000 per student. As a result, most neighborhoods have yet to benefit from major school facility improvements.

Map 2: Replacement Construction at DCPS Schools, 1995-2004



Source: McGraw-Hill Construction and 21st Century School Fund

The Future of Facilities: Consolidation and Continued Investment

As part of an ongoing adjustment to declining enrollment and dilapidated public school facilities, DCPS plans to close several underutilized schools and to continue improving (and in some cases replacing) the remaining open schools. By the 2005–2006 school year, 56.6 percent of DCPS schools were enrolled at less than 75 percent of capacity.21 In September 2006, the DCPS Office of Facilities Planning released its 2006 revised Master Facilities Plan, outlining the plan for "rightsizing" existing schools and investing in the continued improvement of school facilities. By the start of the 2006-07 school year, total capacity was reduced by one million square feet (6.2 percent of previous year's capacity), and plans call for the consolidation of an additional two million square feet to by July 2008. In addition, over the next 15 years, 23 schools will be replaced and 101 will be modernized, funded by $2.3 billion committed toward the implementation of the Master Facilities Plan (DCPS 2006).

CONCLUSION

Between 1995 and 2004, spending for school construction in the Washington, D.C., metropolitan area was driven both by the need to expand capacity for a growing student population and the need to rehabilitate outdated school infrastructure in older jurisdictions. These competing pressures influenced spending in almost every jurisdiction. In the rapidly growing Outer and Far Suburbs, the need to build new schools took clear precedence, accounting for the majority of expenditures. The large amounts invested for new schools in these areas appear to have restrained average school enrollments in the face of substantial growth in the student population. In contrast, older districts directed most investment toward upgrading existing facilities. Spending increased across the region over time, most notably in the District of Columbia, where a new commitment to improving dilapidated public school facilities led to substantial increases in spending after 2000.

Despite the large sums dedicated for public school construction, investment was distributed unevenly across jurisdictions and schools of differing income levels and racial/ethnic composition. To some extent, these patterns reflect differences in the need for school construction across the metro area, as the rapidly growing Outer and Far Suburbs faced greater capacity pressures than did older areas and spent large sums for new school construction to meet expanding enrollments. However, schools with higher concentrations of minority and low-income students received less construction investment, despite evidence that these schools are the most likely to need facility improvement. While the lack of good data on school-level building quality limited a truly comprehensive analysis of the distributional equity and effects of construction investment, these topics represent important areas for future research.

ENDNOTES

1. Overcrowding was defined as enrollment greater than 5 percent larger than the intended capacity of the school.

2. We used the 2005 Office of Management and Budget definition of the Washington, D.C., metropolitan area. To simplify the analysis we divided the metropolitan area into five sub-regions according to the typology developed for *Housing in the Nation's Capital* (see Turner et al. 2006): (1) District of Columbia; (2) Inner Core (Arlington County and Alexandria City, Va.); (3) Inner Suburbs (Montgomery County, Md., Fairfax County, Va., Falls Church City, Va., Prince George's County, Md., Fairfax City, Va.); (4) Outer Suburbs (Calvert County, Md., Frederick County, Md., Prince William Country, Va., Manassas City, Va., Charles County, Md., Loudon County, Va., Stafford County, Va., Manassas Park City, Va.; and (5) Far Suburbs (Clarke County, Va., Fauquier County, Va., Spotsylvania County, Va., Fredericksburg City, Va., Jefferson County, W.Va., Warren County, Va.).

3. U.S. Bureau of the Census, decennial census, 1990 and 2000; U.S. Bureau of the Census, Population Division, 2000–04.

4. Data on school enrollment, racial/ethnic composition of student population, and proportion free or reduced-price lunch eligible, are from the Common Core of Data Public Elementary/Secondary School Universe Survey (CCD), compiled by the National Center for Education Statistics (NCES) for the school years 1995–1996 through 2003–2004. NCES data for Washington, D.C., public school enrollment in 1999–2000 undercounts public charter school students by 5,200 (6.7 percent of total Washington, D.C., public school enrollment). Because of this, we replaced the NCES figure for this one year with the total public school enrollment as reported in the D.C. KIDS COUNT Collaborative (2005). Although not consistent across jurisdictions within the NCES data, some local education agencies report programs that are co-located at a single school campus as separate observations. Our use of the term "school" is synonymous with the "programs" recorded in the CCD.

5. All construction investment amounts are in constant 2005 dollars.

6. Data are derived from a data set purchased by 21st Century School Fund/BEST from McGraw-Hill Construction of construction starts 1995–2004 for the United States. Individual data are proprietary to McGraw Hill Construction. Data for public charter schools in the District of Columbia are incomplete. As a result, these schools were removed from all analysis of school construction investment.

7. Where possible, construction projects were matched at the school level to the NCES data, which were geocoded to the address level. To facilitate comparisons across schools and jurisdictions, investments were normalized by the total student enrollment within the unit of analysis (county, neighborhood, or school) during the year in which the investment occurred. Of the 1,958 total projects, 458 (24.0 percent) were construction projects that improved multiple schools within a school system, and thus could not be assigned to a specific school. These projects were geocoded to the county level. Of the remaining 1,500 school-specific projects, 47 (3.1 percent) could not be positively matched to a specific school in the NCES data because the school opened after the latest year of NCES data available. Unmatched schools were also geocoded only to the county level.

8. Robert Snow Means Company (1997–2004). Cost differentials changed very little across the metro area from 1997 (the first year for which data is available) to 2004. RS Means estimates "location factors" for select cities to adjust national construction costs for local market conditions. These location factors are then associated with a geographic area surrounding the city using zip codes. Because the association of city location factors with surrounding geographic areas was of questionable relevance to actual market conditions, we did not use the RS Means data to adjust expenditures for local cost differences.

9. To control for annual fluctuation in expenditures, annual average spending was compared pre- and post-2000.

10. We use "new school construction" to include all entirely newly built schools, excluding the complete replacement or renovation of an existing school.

11. We use "renovation and improvement construction" to encompass all non-new school construction, including the complete replacement or renovation of an existing school.

12. As discussed in endnote 6, because data on construction investments for public charter schools in the District of Columbia were incomplete, these schools were excluded from the analysis.

13. A student whose family earns less than 130 percent of the federal poverty level qualifies for free lunch and a student whose family earns less than 185 percent of the federal poverty level qualifies for reduced-price lunch. For the 2005–2006 school year, students in four-person families earning less than $25,155 were eligible for free meals and those in families earning between $25,156 and $35,798 were eligible for reduced meals. Family income is self-reported and families are not required to apply.

14. The choices on enrollment share cut-offs follows research by Turner and Fenderson (2006) classifying census tracts according to racial and ethnic composition. We adjusted their cut-offs slightly to provide a better distribution of school types within the Washington metropolitan area.

15. In 2005 dollars, the amount would be roughly $590 million.

16. The District of Columbia's public school system includes two types of schools: District of Columbia Public Schools (DCPS) and public charter schools. DCPS is the traditional public school system, headed by a superintendent who is appointed by the District of Columbia Board of Education. Public charter schools first opened in the District in 1996 after passage of the District of Columbia School Reform Act and are publicly funded. For more information, see Turner et al. (2006).

17. The completeness of the McGraw-Hill Construction data raised concern, since the construction costs recorded were substantially lower than total budgeted capital funding. However, there are three factors that we believe provide substantial explanation for these discrepancies. The first is high soft costs—in part for the management of the construction program by the U.S. Army Corps of Engineers, but also such items as transportation to swing space, environmental abatement and other design, construction management, engineering and other consultant costs. Second, subsequent to the original bid recorded by McGraw-Hill, contracts were issued change orders due to problems with project planning, design, and construction management that resulted in DCPS paying considerably more for work than was originally anticipated. Finally, the discrepancy between the authorized and expended amount is largely

because projects have been approved and funded in the capital budget, but DCPS has not had the management capacity to actually implement projects.

18. Because the data are only through 2004, the recent completion of Bell-Lincoln Multicultural Campus was not included. Also, the replacement of Oyster Elementary school was financed through a public-private partnership, and was not included in the McGraw-Hill data.

19. The $79 million invested in system-wide improvements was not included in school-specific analyses.

20. Through consultations with community organizations and residents, the District of Colombia government defined 39 neighborhood clusters.

21. Source: Urban Institute analysis of data obtained from the 21st Century School Fund.

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