Strong Results, High Demand:

A Four-Year Study of Boston's Pilot High Schools

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Center for Collaborative Education

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The views, findings, and opinions of the authors do not necessarily reflect those held by the Boston Public Schools.

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Executive Summary

November 2007

New research from the Center for Collaborative Education finds that students in Boston's Pilot high schools outperform students from other non-exam Boston Public Schools on every standard measure of engagement and performance. This level of achievement holds for every racial, economic, and academic subgroup examined. Pilot high school students show better MCAS scores, higher attendance rates, higher promotion rates—and the four-year graduation rate for 2006 was more than 23 percentage points higher than the rate for BPS students, 75.7% as compared with 52.2% for BPS. ("BPS" in this report refers to non-Pilot, non-exam schools.)

The study found that Pilot high schools reflect the BPS demographics in terms of race, income, and mainstream special needs students. The report also identifies some areas in which Pilot School demographics fall short of the goal of representing the student population of the Boston school district. Pilot high schools have proportionately fewer students designated as Limited English Proficient and fewer students with moderate to severe special needs.

In addition, proportionately fewer students arrive with certain other warning signs of "risk," such as low grade 8 math MCAS scores and poor attendance records in eighth grade. It is not possible to isolate how much differences in populations, in addition to the Pilot features of schools, affected differences in performance outcomes.

However, the news from the report is that Pilot high school students in every category—including students with risk factors—performed better than their counterparts in the Boston school district.

The present study offers a review of Pilot high school student performance over the course of four years, looking at overall outcomes. It then parses the data to identify how different populations of students are being served by the Pilot Schools.

Defining Pilot Schools

Pilot Schools were first created in Boston in 1995 through a unique partnership that included the mayor, the office of the school superintendent, the school committee and the teachers union. An essential characteristic of Pilot Schools is that they are freed from district mandates and union work rules to have greater control over budget, staffing, curriculum, governance, and schedule in order to provide better education for their students. Pilots are designed to serve the

same student population as the district schools, and have several additional defining characteristics:

- **Pilots are accountable:** Pilot Schools and the district have developed a set of consistent benchmarks, against which performance is evaluated every five years.
- **Pilots are small and personalized:** Pilot Schools place great emphasis on creating a nurturing school culture in which teachers can attend closely to each student's learning needs.
- **Pilots are vision driven:** Every Pilot School has created a vision focused on equity and the fundamental belief in each child's potential. Pilot Schools have the power to hire teachers and staff to support the culture and vision of each individual school.

A Summary of the Findings

Among the highlights of the report's findings are results that demonstrate the power of the Pilot School model. These include the following:

- Pilot high schools serve students well on every outcome in a wide range of measurable performance and engagement criteria.
- The four-year Pilot high school graduation rate for the most recent year was 23 percentage points higher for Pilots (75.7%) than for BPS (52.2%).
- Pilot high schools have attracted students that represent the district's racial, economic, and mainstream special education subgroups.
- Pilot high schools enroll a lower percentage of students with risk factors, independent of the student assignment process, suggesting that a disproportionate number of students without risk factors who are seeking high-performing schools choose to apply to Pilot Schools.
- Students with risk factors perform better in Pilot high schools than in district schools.
- Comparisons of the MCAS scores of students in Pilot high schools with those of like students in all subgroups in district schools show stronger performance among Pilot high school students.

Taken together, the student engagement and performance findings show that Pilot high school students are outperforming the district average on a range of indicators of behavior and academics.

Scope of This Study

This is the most comprehensive examination of Pilot high school performance to date, using data provided by the Boston School Department to examine Boston's closely watched Pilot high schools over a four-year period (2001–05).

In addition to aggregate analyses, the report breaks down the numbers to discover who is attending Pilot high schools and how subgroups of the Boston student population are faring in Pilot high schools.

Looking at demographic sub-groups

The report finds that Pilot high school students as a group are doing substantially better on all measures of academic success than their peers in the district. It then breaks down the larger group into subgroups by racial, economic, and academic designations to answer two important questions:

- How comparable is Boston's Pilot high school population to the district high school population?
- How well do the specific subgroups fare in Pilot high schools in comparison to similar groupings in the district as a whole?

The study looks at grade 10 MCAS results for the three larger racial groups—Black, Latino, and White—and finds that for each group over four years the pass rates are substantially higher for Pilot School students than BPS students in both math and English language arts (ELA). Black and Latino Pilot students had higher pass rates in seven out of the eight administered tests, while White Pilot students passed at higher rates in all eight tests.

The achievement gaps—between White and Black students, and between White and Latino students—as measured by MCAS scores continued to be a problem within both Pilot and BPS schools in all four years, on both ELA and math tests. However, there is promising news for Pilot Schools: at the beginning of the period tracked in the study, the gaps were greater in the Pilot Schools; at the end they were smaller in Pilots than in BPS schools.

Looking at economic variables, the study finds comparable enrollment in Pilot and BPS schools: 68.4% of Pilot students and 69.8% of BPS students were eligible for free/reduced-price lunch, a common proxy for low-income students. In each year and on both grade 10 MCAS tests, low-income Pilot School students passed at a higher rate than their BPS counterparts—by more than 20 percentage points on five of the eight tests.

The study examines the academic history of Pilot students to see whether students with risk factors—namely, low eighth-grade attendance rates; having received a warning grade on their grade 8 math MCAS exam; or being over-age first-time ninth graders—are represented proportionately to BPS schools, and

how such students fare in Pilot high schools. The data show that, while there are substantial numbers of students with risk factors entering Pilot high schools, the proportion is lower than in BPS schools. However, Pilot ninth graders who received a warning on their grade 8 math MCAS performed substantially better than corresponding BPS ninth graders. They had higher ninth-grade attendance rates, higher promotion rates to tenth grade, and higher passing rates on both grade 10 MCAS exams.

The study also finds that, while Pilot high schools serve similar percentages of mainstream special education students to BPS schools, they serve proportionately fewer students designated as Limited English Proficient and students who have moderate to severe special needs, although the gap has been closing in recent years for the special needs population. While the numbers for these Pilot populations were too small to analyze comparative results, the study found that the aggregate differences in MCAS pass rates between Pilot and BPS schools were not affected by the disproportionate representation of these students.

Impact of admissions policies on Pilot high school enrollment

The ten Pilot high schools have a variety of admissions processes that often differ from BPS schools. Two admit strictly by lottery (like district schools); two accept only over-age students; one is a performing arts school with academically blind auditions; one is a pathway school that admits students from its feeder school; one is a Horace Mann School with a state-mandated lottery and application process; and three ask students to complete an application to evaluate the match between student and school.

The study finds that Pilot Schools with different kinds of admissions processes, including both application and lottery processes, end up with a lower percentage of students with risk factors than are found in BPS schools. Even though in the first year studied lottery schools had students with some risk factors in proportions that were equivalent to BPS schools, as demand shifted, the percentages of students with risk factors decreased each succeeding year. The study

concludes that good schools attract the interest of a disproportionately high number of college-bound students, which would suggest a correspondingly smaller proportion of students with risk factors.

Key policy recommendations

Analysis of the data in this four-year study supports the following courses of action:

- **Create more Pilot Schools.** Pilot Schools are more effective for students from all backgrounds and of all levels of achievement and are being chosen by more students than they can currently serve. While the Boston Public Schools' student population has been declining, the demand for enrollment in Pilot high schools has remained beyond capacity.
- **Revisit and strengthen the Boston Public Schools student assignment process to encourage informed choices of high schools by all students.** Students need information about the schools they are choosing so they can make informed, intentional choices. Informed students will lead to increased positive matches between students and schools. A likely outcome will be increased engagement and performance across the district's high schools.
- **Enroll representative proportions of students who are designated Limited English Proficient, as well as students with moderate to severe special needs, in Pilot Schools.** As much as possible, these schools should represent the BPS population.
- **Share the lessons of Pilot Schools.** This has always been the intent of the Pilot program—to help Boston improve education throughout the district.

As district public schools that were created to serve as laboratories of innovation, Pilot high schools are in high demand and have strong results. They are achieving the goals of equity and excellence within the public school district. The experiment in innovation that the Boston Public Schools and the Boston Teachers Union created 12 years ago has demonstrated results that suggest that the Boston Public Schools need look no further than their own Pilot Schools for examples of high-performing high schools. Families across race and income lines, and students with risk factors all seek high-performing schools. The logic presented in the creation of Boston's Pilot Schools in 1995 still holds. Demand for quality high schools exceeds supply. The challenge of the district and the teachers union is to respond by working together to create more quality school choices for Boston families.

Introduction

Until 2006, Boston Public Schools was the only district in the country with Pilot Schools, which were granted autonomy over school design and were created to serve as research and development sites for the district. Because Pilot Schools have innovative practices and have demonstrated a capacity to improve student learning, the public and the education community look with interest upon these schools as models for urban school reform. For the first time, available data allow an in-depth longitudinal examination of Pilot School student performance. Because of the recent national and district attention to high school reform, this paper focuses on Boston's ten Pilot high schools. Through examination of multiple subgroups and cohorts of students from 2001 through 2005, the report seeks to understand the enrollment patterns and outcomes of Boston students in Pilot high schools in comparison to other district high schools.

Boston Pilot Schools, currently a network of 20 schools within the Boston Public School district, were created in 1994 through an agreement among the city's mayor, school committee, and teachers union.[1] At that time, the district was concerned about the potential loss of Boston students to newly opening charter schools, and proactively created the Pilot model. Through this agreement, Pilot Schools were granted autonomy over five key areas of school design and operations:

- Budget
- Staffing
- Governance
- Curriculum, instruction, and assessment
- Schedule

In addition to being autonomous, Pilot Schools place high priority on being:

- *Accountable:* Pilot Schools are held to high standards of performance through a high-stakes school quality review process every five years, using a set of benchmarks that articulate the criteria for high-performing schools.
- *Small:* Pilot Schools enroll 450 students or fewer, enabling adults to know students well. Every school places great emphasis on creating a nurturing school culture in which staff pay close attention to each student's learning needs.
- *Vision driven:* Every Pilot School has an articulated vision of educating all of its students, with teaching and learning at the vision's core. Pilot Schools have the latitude to hire staff members who are committed to fulfilling the school's vision.
- *Focused on equity:* Pilot Schools embrace as a core belief the potential of every student to achieve academic success and graduate from college, regardless of his or her background and past educational experience.

Pilot Schools belong to a Network convened by the Center for Collaborative Education, a nonprofit education organization that provides coaching, professional development,

[1] Two of the 20—Boston Day and Evening Academy and Health Careers Academy—are Horace Mann charter schools in addition to being part of the Pilot School Network. Horace Mann charters are granted autonomy by the state department of education while also remaining part of the district and the teachers union.

advocacy, and research for the schools. Together, they commit to Network principles of high expectations, personalized teaching and learning, and family involvement (Appendix 1).

Since their inception, Pilot Schools have received increasing attention for their innovative practices and strong outcomes (CCE, 2001a; CCE, 2004a; Tung, Ouimette, and Rugen, 2006). This paper focuses on the ten Boston Pilot and Horace Mann high schools within the Network, which served about 13.5% of Boston public high school students in 2004–05. The ten Pilot high schools are diverse by mission, theme, and instructional focus. They are listed in the following table (additional information in Appendix 2).

Table 1: Boston's Pilot High Schools

School Name	Grades Served	Enrollment in 2005	How Became Pilot	School Focus
Another Course to College	9 to 12	248	Conversion from a program	College prep
Boston Arts Academy	9 to 12	406	Start-up	College prep, visual and performing arts focus
Boston Community Leadership Academy	9 to 12	442	Conversion from regular status	College prep, leadership focus
Boston Day and Evening Academy (Horace Mann Charter)	ungraded	392	Start-up	Over-age, college prep
Fenway High School	9 to 12	275	Conversion from a program	College prep
Greater Egleston Community High School	10 to 12	104	Conversion from a program	Over-age, college prep
Health Careers Academy (Horace Mann Charter)	9 to 12	209	Start-up	College prep, health focus
Josiah Quincy Upper School	6 to 12	433	Start-up	College prep, feeder K–5 school
New Mission High School	9 to 12	244	Start-up	College prep
TechBoston Academy	9 to 12	236	Start-up	College prep, technology focus

Subsequent to the creation of Pilot Schools, the Boston Public School (BPS) district has instituted several other significant changes in the choices offered to Boston high-school-age residents. In 2001, in addition to the Pilot high schools, BPS had 9 large, comprehensive high schools, 3 exam schools, 1 career and technical school, and 2 small schools. Over the course of several years, 4 of the 9 large, comprehensive high schools have been transformed into 12 small schools in educational complexes. The remaining

5 large, comprehensive high schools each contain multiple small learning communities. Four other large high schools remain: 3 examination schools and 1 career and technical education school. Thus, BPS's high school reform strategy evolved to embrace a "managed portfolio" approach that allows students and families to choose from the following different types of public high schools:

- Large, comprehensive high school with small learning communities (5)
- Examination school (3)
- Career and technical education school (1)
- Small school housed in education complex (12)
- Small free-standing school (2)
- Pilot School (10)

School choice has been a policy that many urban districts have adopted in recent years with mixed support and mixed results (Goldhaber, 1999; Powers and Cookson, 1999). Given that Boston high school students have the multiple public school choice options listed above, the public and the district may ask about the outcomes and consequences of the choice policy: *Does choice lead to better educational outcomes for students, and if so, for which school types?*

With the recent changes in high school offerings and increased availability of student-level data, questions about Pilot high school outcomes in engagement and performance in comparison with the district's non-Pilot schools may be answered in more depth than in the past. This paper expands on results reported in an earlier one-year study (Tung, Ouimette, and Rugen, 2006), using a four-year, student-level database (2001–02 to 2004–05) to understand outcomes across Boston's high schools. Specifically, the following research questions guide an analysis of educational outcomes and student enrollment in Pilot high schools as compared with other BPS high schools:

I. How do Pilot high school students perform in comparison with other district high schools across a range of engagement and performance indicators?

II. Whom do Pilot high schools serve?

III. How are students with risk factors performing in Pilot high schools?

IV. How are students in different demographic subgroups performing in Pilot high schools?

V. How does lottery assignment or application for admission affect Pilot high school enrollment?

Data Collection and Methods

The data analyzed in this paper were obtained from the Boston Public Schools (BPS) and represent all students enrolled at any point in time in BPS high schools, grades 9–12, for each of the four school years: 2001–02, 2002–03, 2003–04, and 2004–05. The indicators that BPS provided to the Center for Collaborative Education (CCE) are the same that it provides to the Massachusetts Department of Education's Student Information Management System (SIMS) database. BPS also provided the Massachusetts Comprehensive Assessment System (MCAS) results that were obtained from the Massachusetts Department of Education.

All data were received at the individual student level. All four years of SIMS and MCAS data files were cleaned of duplicate lines of data, inconsistent data was reconciled and new variables were created as needed, without loss of any raw data. Each year's files were then merged into one database. Analyses were performed using both SPSS and Excel. Each analysis excluded students who were enrolled in the district for only one day and/or attended zero days in a year as well as students attending schools serving special populations.[2] Students were aggregated into three school types:

- Boston Public Schools (BPS): all high school students enrolled in Boston Public Schools who attended schools that did not have Pilot or exam status.
- BPS Pilot high schools: all high school students enrolled in Boston Public Schools that have been granted Pilot status by the district.
- Exam schools: all high school students enrolled in the three Boston high schools that admit students based on entrance examination results and prior academic achievement.

In addition to the schools mentioned above, schools predominantly or exclusively serving over-age students[3] were excluded from the analysis of grade-level retentions, grade-level promotions, and the four-year graduation rate.

Because admissions processes differ by school type, experimental methods could not be used to study Pilot high schools (Betts and Hill, 2006). Of the nonexperimental, observational methods suggested by Betts and Hill (2006), this paper uses student-level analyses of trends in outcomes over time that control for certain individual student characteristics, such as race, socioeconomic level, and being a member of a risk factor group. The three first-time-ninth-grader risk factors studied in this paper are: low attendance in eighth grade, warning on grade 8 math MCAS exam, and being more than two years over age.

All indicators, except for attendance rates, represent the proportion of students within each school type who reflect that measure. For example, in terms of out-of-school suspensions, the numbers represent the percentage of students within each school type

[2] Students attending the following BPS schools were excluded from the analysis: Carter Center, Community Academy, Expulsion Alternative Program, Horace Mann, McKinley Schools, Middle School Academy, and Young Adult Center.
[3] The following schools serve over-age students: Boston Adult Technical Academy (BPS), Boston Day and Evening Academy (Pilot), and Greater Egleston Community High School (Pilot).

who were suspended in each school year. Median attendance rates were calculated as the days students attended divided by days of membership for each school type each year.

Pilot School group sizes are smaller than BPS and exam schools (Appendix 3 contains group sizes for each analysis). Therefore, small changes in the data could result in large fluctuations by proportion. Multiple hypotheses were tested to understand fluctuations from year to year in Pilot School outcomes, including school openings and closings, school size changes, feeder patterns, etc.

Because the database includes the entire population (students in Boston Public Schools from 2001–2005) rather than a random, representative sample, sampling error is eliminated and statistical significance testing is not appropriate. Statistical significance refers to how certain one can be that a difference seen in a sample can be generalized to a population. We use a series of non-parametric tests to make comparisons between school types. In addition, in order to determine the strength of the relationship or magnitude of difference between the variables in each analysis, effect sizes using the Pearson *r* family of values are reported. Effect sizes can range from -1.0 to +1.0. The interpretation of effect sizes in the Pearson *r* family used the general guidelines of 0.10 as small, 0.30 as medium, and 0.50 as large (Cohen, 1988). Any effect size is statistically meaningful, whether small, medium, or large.

The Mann-Whitney *U* test was used to compare BPS and Pilot high schools when the dependent variable was ordinal or nonnormally distributed, such as attendance rates, out-of-school suspensions, and MCAS exam pass rates. Effect sizes were calculated using the formula $r = z/\sqrt{N}$. Chi square was used to compare BPS and Pilot high schools when the variables were both nominal, such as retention rates, promotion rates, and proportion of students with the risk factor of warning on grade 8 math MCAS exam. When chi square was used, phi or Cramer's *V* provided information about effect sizes.

More specific methods and descriptions of each indicator, as well as some limitations of the study, are included in Appendix 4.

Findings

I. How Are Boston Pilot High School Students Faring?

Over four years, Pilot high school students on the whole outperform the district average on all indicators of student engagement and achievement.

Because no one indicator can accurately describe a school's effectiveness, data on school and student outcomes cover a range of indicators of student engagement and performance. For every indicator examined, Pilot high school outcomes are higher on average than non-Pilot, non-exam school outcomes, and differences are statistically meaningful. For brevity and clarity, the non-Pilot, non-exam school type is referred to as "BPS" throughout this paper. The analyses in this paper build on those reported previously (Tung, Ouimette, and Rugen, 2006) and add new indicators made possible by multiple years of data.

Student Engagement

Student engagement in high school is reflected in multiple ways, both in academics and in behavior (Janosz et al., 2000). Several indicators available for analysis of student engagement include:

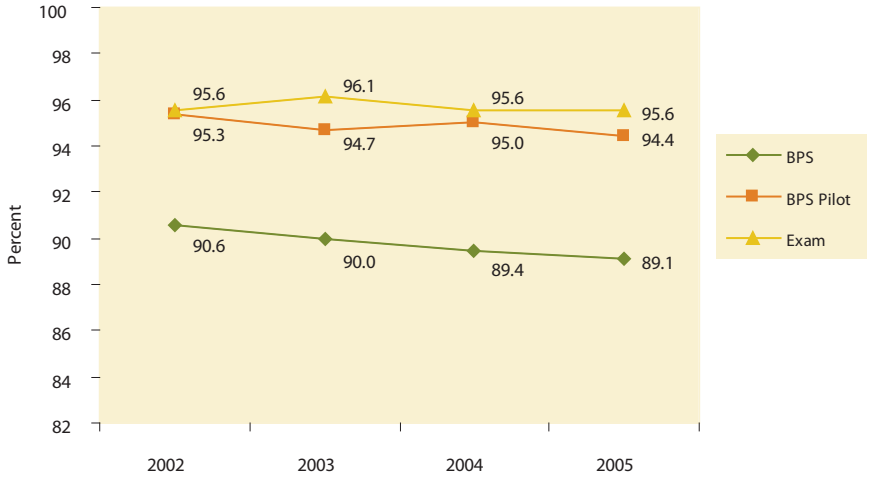
- Attendance rate
- Out-of-school suspension rate
- Rate of transfers out of the school to another school in the district
- Rate of transfers out of the school to another district
- Annual drop-out rate

Attendance

Attendance rates are an indicator of school effectiveness and correlate with high school completion rates (Binkley and Hooper, 1989; Bryk and Thum, 1989; Sween et al., 1987). Pilot high school students have consistently high median attendance rates over the four years studied, around 94%. The difference between Pilot and BPS attendance rates in 2004–05 corresponds to almost two weeks of school. Mann-Whitney *U* tests were performed to compare school types. In all four years, Pilot high schools had higher attendance rates than BPS schools, with *r* ranging from 0.11 to 0.19.[4]

[4] Where difference or association has been established through statistical testing, the effect size gives an indication of the magnitude of the difference (or association) between variables, in this case, school type and median attendance rates. Throughout this study, the interpretation of effect sizes in the Pearson *r* family uses the general guidelines of 0.10 as small, 0.30 as medium, and 0.50 as large (Cohen, 1988). Any effect size is statistically meaningful, whether small, medium, or large.

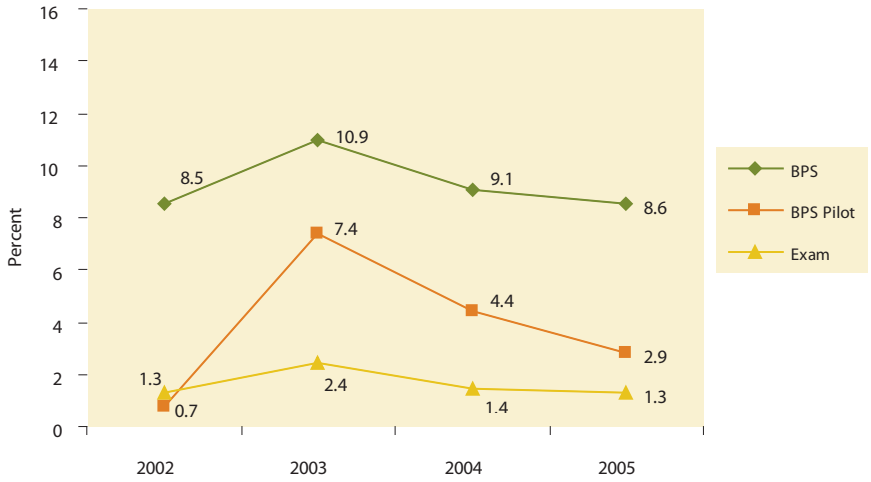
Figure 1: Median Attendance Rates by School Type (in percent)[5]



Out-of-School Suspensions

Out-of-school suspensions result when students' behaviors are considered to be disruptive. One result of this form of discipline is that the students who are suspended are excluded from learning (Cotton, 1995; Pinnell, 1985). Low out-of-school suspension rates indicate higher student engagement and positive school climate (Cotton, 1990). Over four years, Pilot high schools have had consistently lower suspension rates than BPS schools. These rates have also steadily declined over the past two years. Cramer's *V* tests were performed to compare school types. In all four years, Pilot high schools had lower suspension rates than BPS schools, with effect sizes ranging from 0.12 to 0.13.

Figure 2: Suspension Rates by School Type (in percent)

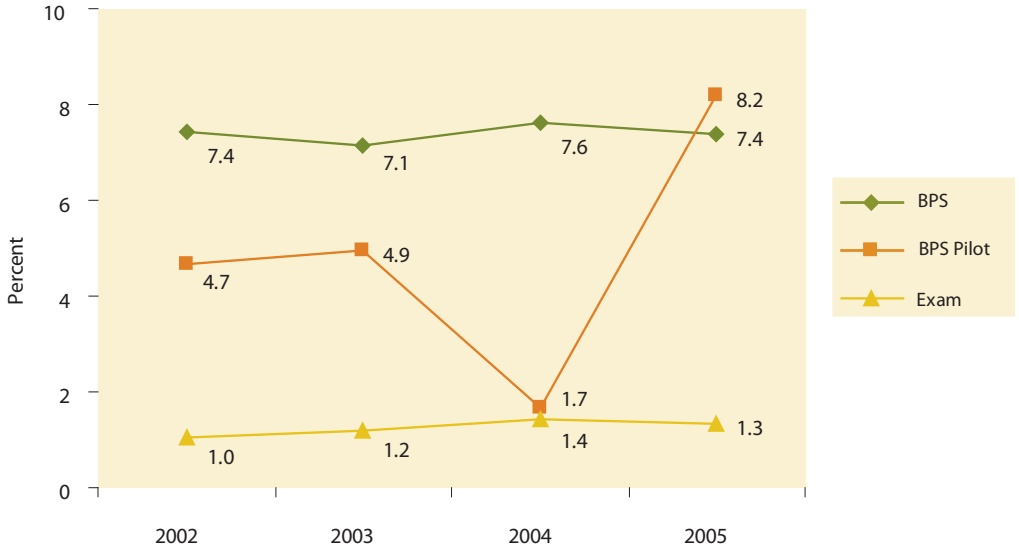


[5]In all figures with these terms, "BPS" denotes high school students enrolled in Boston Public Schools who attended schools that did not have Pilot or exam status; "BPS Pilot" denotes high school students enrolled in Boston Public Schools that have been granted Pilot status by the district; and "Exam" denotes high school students enrolled in the three Boston high schools that admit students based on entrance examination results and prior academic achievement.

Yearly Transfers within the District, Transfers out of the District, and Annual Dropouts

These indicators are proxies for a school's mobility rate. High mobility rates indicate that the schools are not "holding" students (Rumberger and Thomas, 2000; State University of New York, 1992). Students who transfer from a Boston school to a school outside of the district and inform the district of the move are categorized as transfers out. Pilot transfer-out rates were lower than BPS transfer-out rates for the first three years of analysis; however, the rate increased to slightly above BPS rates in the last year of analysis.

Figure 3: Transfer Rates out of District by School Type (in percent)



An analysis of transfers out of one Boston school to another Boston school showed that Pilot high school in-district transfer rates were the same as BPS high schools for the most recent two school years. In-district transfer rates are uniformly low, likely because of the district's voluntary transfer policy, which at the high school level allows only one transfer, except for safety and programmatic reasons, during a student's high school career.

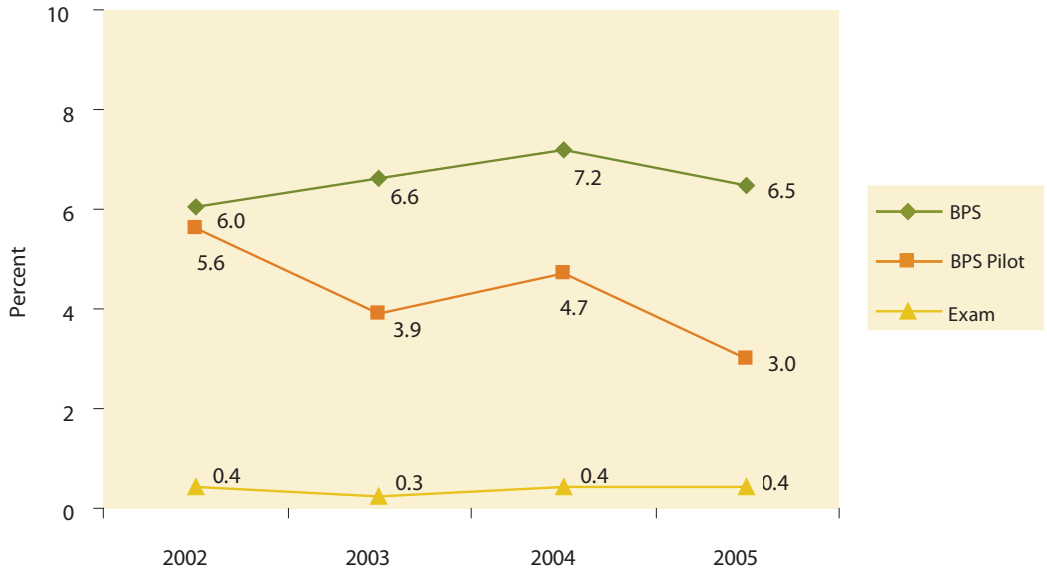
Table 2: In-District Transfer Rates by School Type (in percent)[6]

	2002–03	2003–04	2004–05
BPS	4.3	5.5	5.9
BPS Pilot	6.7	4.6	5.9
Exam	3.2	3.0	3.1

[6]In all tables with these terms, "BPS" denotes high school students enrolled in Boston Public Schools who attended schools that did not have Pilot or exam status; "BPS Pilot" denotes high school students enrolled in Boston Public Schools that have been granted Pilot status by the district; and "Exam" denotes high school students enrolled in the three Boston high schools that admit students based on entrance examination results and prior academic achievement.

Annual drop-out rates are another component of mobility within a student population.[7] The annual drop-out rate is the proportion of students each year who leave the BPS system without transferring and without a diploma. This indicator also includes those students for whom the district does not have information on their reason for leaving. Pilot high schools have lower annual drop-out rates than BPS each year of the study. Cramer's *V* for transfers out of district and annual dropouts for the four years ranged from 0.11 to 0.14.

Figure 4: Annual Drop-Out Rates by School Type (in percent)



When out-of-district transfers, in-district transfers, and annual dropouts are added together, Pilot high schools have lower mobility rates (from 2.0 to 8.5 percentage points lower in each year) and higher holding power than other BPS high schools.

In summary, Pilot high school students had engagement outcomes that were consistent and stronger than BPS high school students in attendance, suspensions, and mobility as defined by transfers and yearly dropouts. These positive Pilot high school results suggest that the schools are engaging students well and predict that their academic outcomes will also be positive.

[7]Annual drop-out rates differ from four-year cohort drop-out rates. Four-year cohort drop-out rates are calculated by dividing the number of graduates in a year by the number of ninth graders who entered four years before.

Student Performance

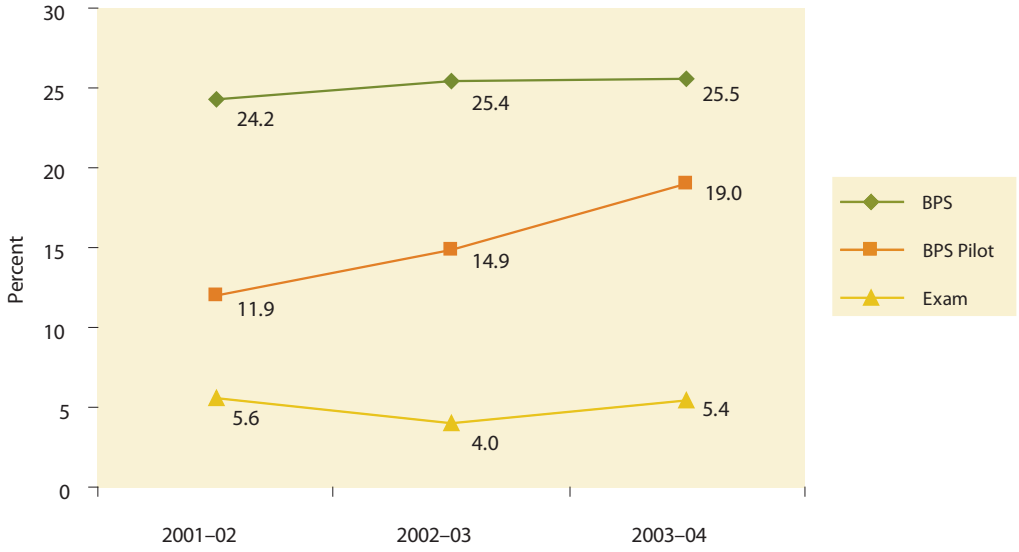
Taken together, student performance indicators provide an explanation of how well students progress on time and meet state standards. These academic outcomes are analyzed by school type for the district and add to the information that the student engagement indicators reveal about high schools in Boston. The indicators described in this section include:

- Grade-level retention rate
- Grade 9 promotion rate
- Pass rate in grade 10 ELA and math MCAS exam
- Changes in math MCAS pass rate from grade 8 to grade 10
- Four-year cohort graduation rate

Grade-Level Retentions

Students who are retained in a grade for an extra school year have an increased risk of continued low achievement and of dropping out of school (Jimerson, Anderson, and Whipple, 2002). While BPS high schools had high levels of grade retentions for grades 9–12 (one in four students), Pilot high schools had lower levels of grade retentions, although those levels rose in 2003–04 and 2004–05.

Figure 5: Grade Level Retention Rates by School Type (in percent)



To investigate whether BPS and Pilot high schools differ on grade-level retentions in grades 9–12, a chi-square statistic was used and differences were found. Effect sizes for BPS and Pilot high schools' grade-level retention rates for all three cohorts ranged from 0.19 to 0.21 (Cohen, 1988).

Grade Nine Promotions

Grade-level promotion is an indicator of the percent of students who are progressing academically at the expected rate. Various studies have shown that many schools are promoting ninth graders at lower rates, possibly due to the increased high-stakes testing in the tenth grade (Haney et al., 2004; Warren and Corl, 2007). Because of these observations, the promotion rates of ninth graders (as opposed to the previous indicator, which combines grades 9–12) were analyzed by school type. Pilot high school ninth-grade promotion rates were consistent at 92% across multiple years, approaching exam school rates, while BPS high school ninth-grade promotion rates were 16–22 percentage points lower. A chi-square statistic was used, and Cramer's *V* ranged between 0.20 and 0.27 for the three cohorts.

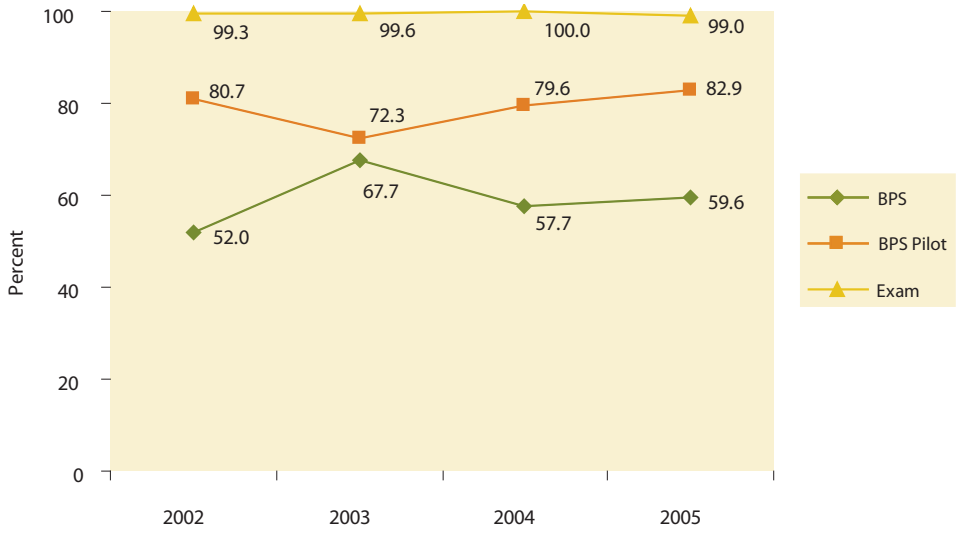
Table 3: Grade 9 Promotion Rates by School Type (in percent)

	2001–02	2002–03	2003–04
BPS	71.5	69.8	75.5
BPS Pilot	91.7	92.1	91.7
Exam	93.3	96.0	94.2

MCAS Exam Pass Rates

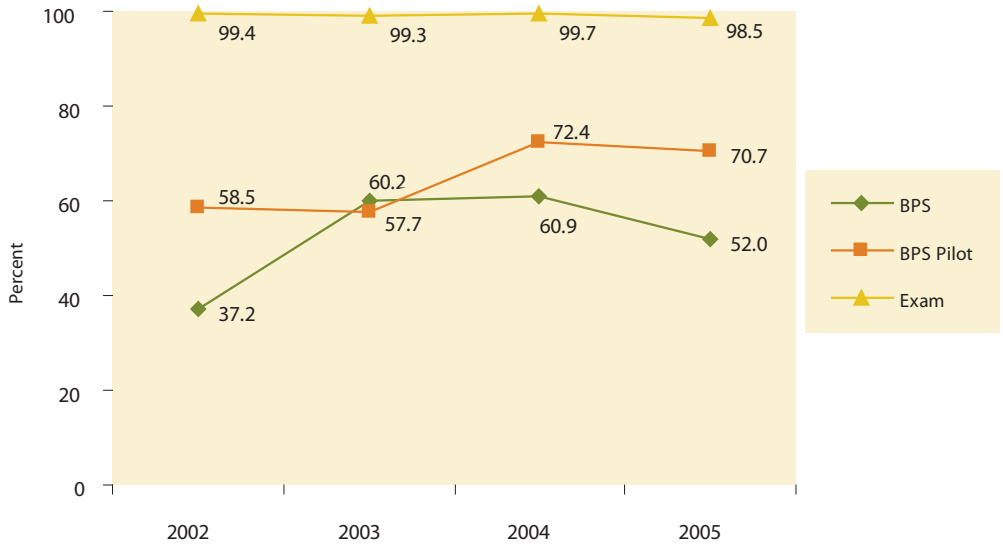
MCAS exam outcomes in English/Language Arts (ELA) and math were analyzed by pass rates (proportion of students performing in advanced, proficient, and needs improvement categories) for four years. In ELA, Pilot students outperformed BPS students in each of the four years studied. Exam school students consistently passed at rates between 99% and 100% each year.

Figure 6: Grade 10 ELA MCAS Exam Pass Rates by School Type (in percent)



In math, Pilot students outperformed BPS students in three of the four years.

Figure 7: Grade 10 Math MCAS Exam Pass Rates by School Type (in percent)



Mann-Whitney *U* tests were performed to compare BPS and Pilot high schools. Pilot high schools had higher pass rates than BPS schools in all four years for ELA and in three out of four years for math. Measures of effect size *r* ranged from 0.19 to 0.22 for ELA and from 0.09 to 0.15 for math.

Changes in Math MCAS Exam Pass Rates

Students currently take the mathematics MCAS in grade 8, at the end of middle school, and grade 10, after two years of high school. Most students change schools from eighth grade to ninth grade, enabling a comparison of tenth-grade MCAS outcomes in one school to eighth-grade MCAS outcomes in the previous school two years before. Since the goal is to attribute the change in pass rates to the second school, schools that span middle and high school were filtered out of this analysis.[8] Using a four-year database, it is possible to complete this analysis by school type for two cohorts. The table below shows the percentage point changes for two cohorts of students. For the first cohort, the change in pass rates from eighth- to tenth-grade tests was higher for Pilot high school students than for BPS high school students. For the second cohort, there were similar changes in pass rates from the eighth-grade to the tenth-grade tests in BPS and Pilot high schools.[9]

[8] Boston schools that span middle and high school grades are: the three examination schools and Josiah Quincy Upper School (Pilot).

[9] An analogous analysis of changes in ELA MCAS exam pass rates was not possible. ELA MCAS exams were administered in grades 7 and 10 during the years of this study, allowing analysis of only one cohort of students. In addition, changes in ELA pass rates could be attributed to the middle school (grade 8) and high school (grades 9 and 10).

Table 4: Changes in Math MCAS Exam Pass Rates from Grade 8 to Grade 10 by School Type (in percentage points)

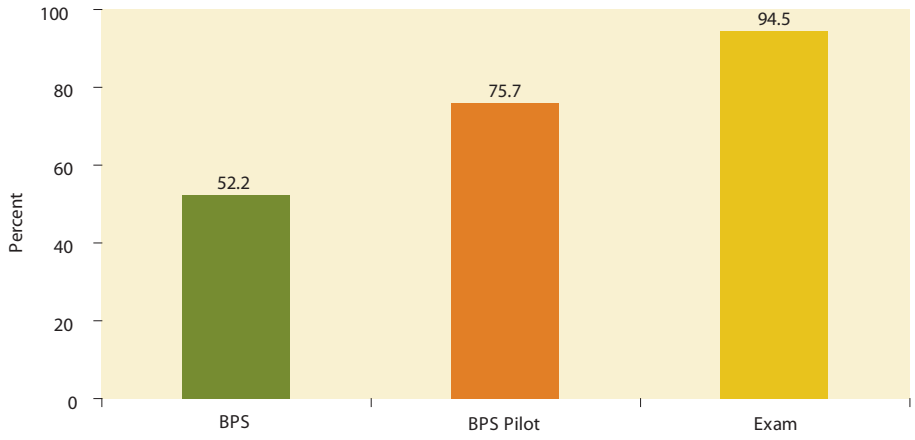
	Grade 8 in 2002 to grade 10 in 2004	Grade 8 in 2003 to grade 10 in 2005
BPS	28.8	27.6
BPS Pilot	36.4	28.0

Because data for only two cohorts were available, it is not possible to understand whether or not the difference in changes in pass rates is trend or anomaly.

Four-Year Cohort Graduation Rates, Class of 2006

Data used to calculate a four-year cohort graduation rate for the freshman class that started in September 2002 was downloaded from the Massachusetts Department of Education (DOE).[10] A simple four-year cohort graduation rate was computed by school type. Students in BPS high schools had a four-year graduation rate of 52.2% in 2006, compared to 75.7% in Pilot high schools.[11]

Figure 8: Four-Year Cohort Graduation Rates by School Type (in percent)



The student performance indicators examined in this section show consistently strong academic outcomes in the Pilot high schools in comparison to the BPS high schools. On almost every indicator for each cohort, Pilot students outperform BPS students, with small to medium effect sizes. While there are several data points that require further research, the overall picture of Pilot high school performance is that students in these schools progress on time and meet standards at a higher rate than students in BPS high schools.

[10] Data can be found at http://profiles.doe.mass.edu/gradrates.aspx.

[11] The data exclude schools dedicated to students with special needs and schools dedicated to over-age students in second-chance programs (who are not meant to take four years to graduate).

Summary of How Are Boston Pilot High School Students Faring?

Taken together, the student engagement and performance findings show that Pilot high school students are outperforming the district average on a range of indicators of behavior and academics. These findings are consistent with previous studies of Pilot high school student engagement and performance (CCE, 2001a; CCE, 2004a; Tung, Ouimette, and Rugen, 2006).

II. Whom Do Pilot High Schools Serve?

Pilot high schools are representative of BPS by race, income status, and mainstream special education status; they are underrepresented for students with moderate to severe special needs and students with limited English proficiency. Pilot high schools serve significant proportions of students with the risk factor of MCAS scores of warning in grade 8. However, they serve a smaller proportion of students with risk factors than do BPS high schools.

The Pilot high school student population can be compared to BPS in several ways:

1) By demographic subgroup, to determine representativeness compared with BPS;

2) By subgroups that predict future academic achievement, such as those that have "risk" characteristics (Barrington and Hendricks, 1989);

3) By factors that are difficult to measure, like motivation and social capital, or by data that are difficult to obtain, like family education level (Zimmer and Buddin, 2005).

Using the data currently available, this report examines the student population of Pilot high schools for items 1 and 2 in the list above. Studying the factors in item 3 would require data that are currently not systematically collected. Following this analysis of whom Pilot high schools serve, the outcomes of these subgroups will be examined.

Pilot High Schools Are Largely Representative of BPS Enrollment, with a Few Exceptions

By the measures of race and eligibility for free/reduced-price lunch, Pilot high school students have mirrored the district for all four years studied. In regard to mainstream special education, Pilot high school students in this subgroup have steadily increased in proportion, from 7.9% in 2002 to 9.7% in 2005, and are nearing the BPS average (10.5%).

Two factors that increase a student's risk of dropping out of high school are: being an English language learner (as opposed to being a native English speaker); and having moderate to severe special needs that require substantially separate placement (Crawford, 2004; Echevarria and Graves, 2003; Genesse et al., 2005; Wagner et al., 1992). For both of these demographic subgroups, Pilot high schools serve a smaller proportion of students than BPS. While the BPS proportion of students with substantially separate special needs has hovered around 9–10%, Pilot high school proportions have risen from 0.2% to 4.3% in the four years of the study. This increase reflects a district initiative, supported by the Pilot high schools, to increase the proportion of students with moderate to severe special needs to be representative of the district demographics.

Limited English Proficient (LEP) designation indicates that a student is not able to perform ordinary coursework in English.[12] In both BPS and Pilot high schools, the

proportion of students who are designated as LEP has dropped in the four years of the study, likely due to state policy changes that abolished bilingual education in 2003, affecting the education of English language learners.[13] BPS proportions dropped from 31% to 16%, while Pilot proportions dropped from 5% to 3.2%. The potential impact of Pilot high schools enrolling smaller proportions of students in substantially separate special education and of students with limited English proficiency is addressed in section IV of this study.

The table below shows, by school type, the proportion of each demographic subgroup detailed above for the most recent year of data available, school year 2004–05.

Table 5: Demographic Subgroup Representation by School Type for 2004–05 (in percent)

	BPS	BPS Pilot	Exam
Race/Ethnicity			
American Indian	0.3	0.5	0.4
Asian/Pacific Islander	5.1	7.3	26.1
Black	51.2	57.4	25.3
Latino	33.7	23.2	10.2
White	9.7	11.6	38.1
Economic Status			
Eligible for free/reduced-price lunch	69.8	68.4	43.0
Special Education Status			
Mainstream special education	10.5	9.7	0.8
Substantially separate special education	9.9	4.3	NA
English Proficiency			
Not able to perform ordinary coursework in English (LEP)	16.3	3.2	NA

One difference between BPS and Pilot high school enrollment is the proportion of first-time ninth graders who were not eighth graders in BPS schools the year before. Pilot high schools consistently enroll a greater proportion of non-BPS eighth graders in the ninth grade.

Table 6: Proportion of First-Time Ninth Graders Who Were Not BPS Students in Eighth Grade by School Type (in percent)

	2003	2004	2005
BPS	18.4	16.2	15.9
BPS Pilot	29.7	25.3	25

[12] Massachusetts Department of Education designates students both with LEP and with ELL program status. Definitions can be found at: http://www.doe.mass.edu/infoservices/data/sims/DataHandbook.pdf.

[13] Referendum Question 2 passed in November 2002. This act abolished transitional bilingual education (TBE) as the primary program available in Massachusetts for children requiring language support. The act mandated that instruction be conducted primarily in English through Sheltered English Immersion (SEI) programs starting in the fall of 2003.

Pilot High Schools Serve Students with Risk Factors at Lower Levels than BPS

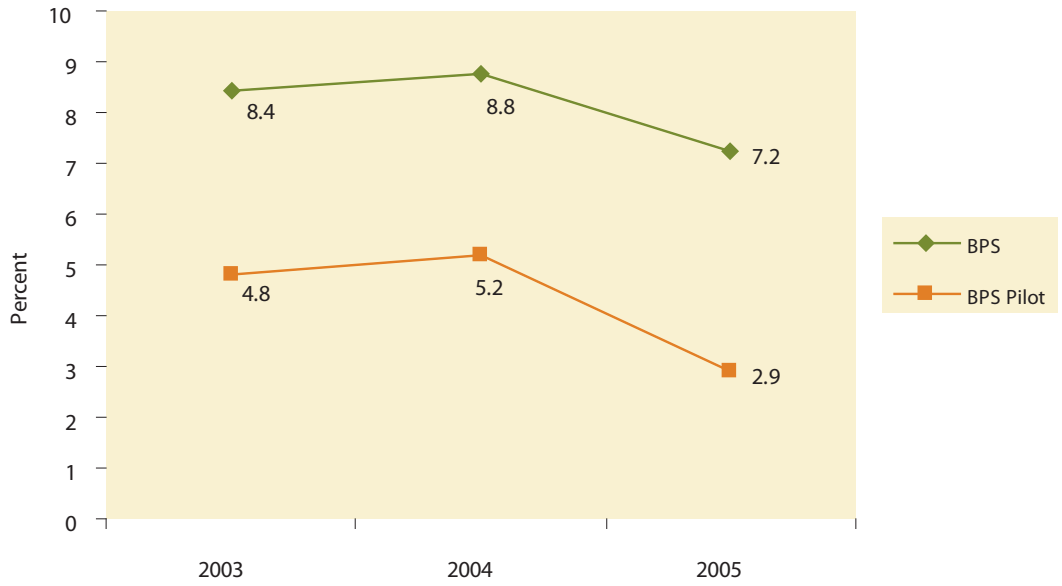
Specific characteristics that are predictive of high school academic performance include the following commonly studied risk factors:

- Low eighth-grade attendance rates
- Warning on the grade 8 math MCAS
- Over-age first-time ninth grader

Students in these three categories are typically less engaged in school, are not progressing on time, and are at higher risk for academic failure and dropping out of high school (Balfanz and Byrnes, 2006; Neild and Balfanz, 2006a; Neild and Balfanz, 2006b).

Figure 9 shows that the proportion of Pilot school ninth graders with low attendance (less than 80% attendance) in the eighth grade is lower than that of BPS ninth graders in all three years.[14]

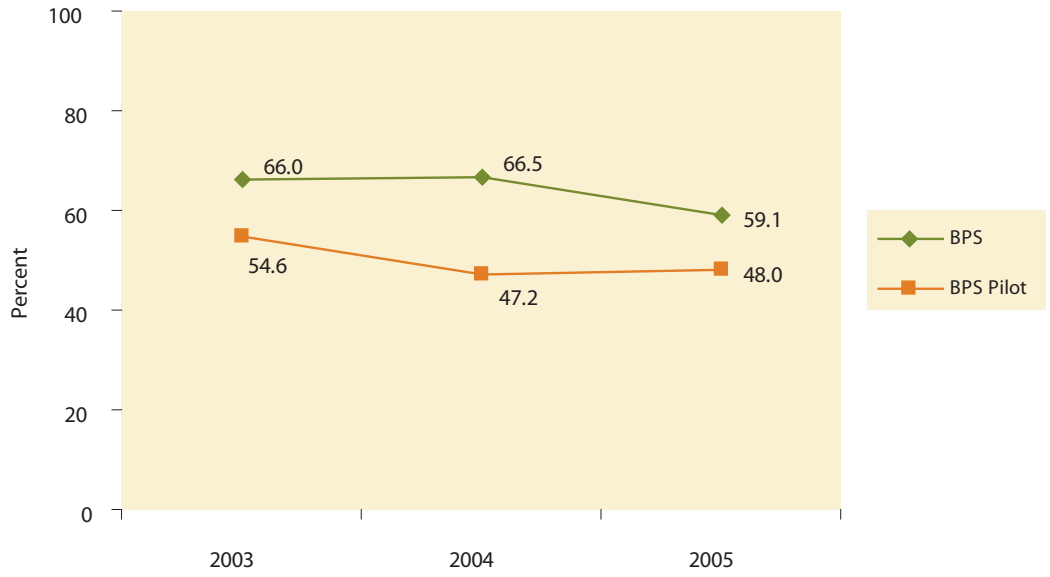
Figure 9: Proportion of First-Time Ninth Graders with Low Eighth-Grade Attendance Rates by School Type (in percent)



Grade 8 math MCAS exam warning rates of ninth graders were examined by school type. BPS students had higher eighth-grade warning rates than Pilot high school students in each cohort studied. Forty-eight percent of Pilot ninth graders received warning on the grade 8 math MCAS exam, as compared with 58.5% of BPS ninth graders in 2005. Cramer's *V*, which indicates the magnitude of the difference between BPS and Pilot, showed effect sizes from 0.09 to 0.15 for the three cohorts (Cohen, 1988).

[14] The analyses in this section exclude schools that do not use grade-level designations (BDEA and Egleston) and those that span middle and high school (exam schools and Josiah Quincy Upper School), since their ninth graders are in the same school as grade 8.

Figure 10: Proportion of First-Time Ninth Graders Who Scored Warning on Grade 8 Math MCAS Exam by School Type (in percent)



Third, the proportion of first-time ninth graders who were over-age each year was examined. Although the sample sizes are small for this indicator, BPS high schools had more than three times the Pilot proportion of over-age ninth graders—students who were at least two years over age as of the start of the school year.[15]

Table 7: Proportion of Over-age First-Time Ninth Graders by School Type (in percent)

	2003	2004	2005
BPS	9.1	8.0	6.9
BPS Pilot	2.7	2.6	1.6

These findings show that for the three high-risk indicators examined, Pilot high schools serve a significant proportion of students with the eighth-grade risk factor of warning on the math MCAS. Almost half of Pilot ninth graders scored warning on the grade 8 math MCAS, which is lower than the BPS rate. For the risk indicators of low eighth-grade attendance and being an over-age first-time ninth grader, Pilot high schools enrolled lower proportions than BPS high schools.

[15] The analysis excludes schools that serve exclusively over-age students: Boston Adult Technical Academy (BPS), Boston Day and Evening Academy (Pilot), and Greater Egleston Community High School (Pilot).

Summary of Whom Do Pilot High Schools Serve?

In summary, to answer the question of whom Pilot high schools serve, demographic subgroups and risk factor subgroups were examined by school type. Data on demographic subgroups indicate that Pilot students reflect BPS students by measures of race, eligibility for free/reduced price lunch, and mainstream special education status. Pilot high schools are intentionally increasing the proportion of students with moderate to severe special needs that they serve, with the goal of being representative of the district. Pilot high schools serve a smaller proportion of students who are English language learners.

In regard to risk factors for students entering high school, Pilot high schools serve a lower proportion of students who attended less than 80% of eighth grade and of students who are over age. They serve a somewhat smaller proportion of students who scored warning on their grade 8 MCAS exams. Pilot high schools serve a significant proportion of students with risk factors, but a lower proportion than the BPS average.

Section I shows that Pilot high schools are serving students well by a range of engagement and performance indicators, and that these students are outperforming their BPS counterparts on all indicators examined. Section II shows that by race, income, and mainstream special education status, Pilot high schools serve a largely representative population of students. However, they differ from BPS high schools in the proportions of students designated as LEP and with moderate to severe special needs, as well as in the proportions of students with the three risk factors studied. A question emerges from these two sections of analysis: *How much of the difference in engagement and performance outcomes is due to "Pilot-ness" and how much is due to differences in population?* While we are limited in our ability to explore the impact of differing percentages of subgroups on the relative outcomes of school types, the remaining research questions ask how subgroups perform in each school type:

III. How are students with risk factors performing in Pilot high schools?

IV. How are students in different demographic subgroups performing in Pilot high schools?

V. How does lottery assignment or application for admission affect Pilot high school enrollment?

III. How Are Students with Risk Factors Performing in Pilot High Schools?

While Pilot high schools serve a lower percentage of students with risk factors than do BPS high schools, Pilot students with risk factors fare better in high school than their BPS counterparts.

The prior analysis shows that Pilot high schools have a significant proportion of students with risk factors, although this is lower than the BPS average. Almost half of Pilot ninth graders score warning on the grade 8 math MCAS exam. Examining gains over time of comparable groups of students in BPS and Pilot high schools is one way to understand differences in outcomes. How do students with the risk factor of warning on grade 8 MCAS do in Pilot high schools, as compared to BPS high schools?[16] Four indicators of progress in high school, a subset of the indicators examined for the full school type aggregate analysis, were examined for students with this risk factor:

- Attendance in ninth grade
- On-time promotion from grade 9 to grade 10
- Passing grade 10 ELA MCAS exam
- Passing grade 10 math MCAS exam

First, these students' ninth-grade mean attendance rates were calculated by school type. Pilot ninth graders who had scored warning on the grade 8 math MCAS exam consistently had higher mean attendance rates than BPS ninth graders who had scored warning on the grade 8 math MCAS exam, with a difference of 7–10 percentage points. If a school year is 180 days, one percentage point is 1.8 days of school; the difference translates to 13–18 days of school.

Table 8: Ninth-Grade Mean Attendance Rates of Students Who Scored Warning on Grade 8 Math MCAS Exam by School Type (in percent)

	2003	2004	2005
BPS	83.7	83.5	82.1
BPS Pilot	93.4	91.0	88.8

Second, ninth graders who had scored warning on the grade 8 math MCAS exam were examined for on-time promotion to the tenth grade. Previously, it was shown that Pilot high schools had higher ninth-grade promotion rates overall. With this subgroup of ninth graders with the risk factor, Pilot high schools promoted students at a higher rate for the two cohorts shown. Phi was used as a measure of effect size in this analysis and was 0.12 for ninth graders in 2003 and 0.07 for ninth graders in 2004.

[16] The research questions in sections III–V focus on BPS and Pilot high schools; exam schools are excluded from these analyses.

Table 9: Grade 9 Promotion Rates to Grade 10 of Students Who Scored Warning on Grade 8 Math MCAS Exam by School Type (in percent)

	2003	2004
BPS	71.1	76.0
BPS Pilot	88.5	86.0

Two cohorts of high school students who had earned warning on the grade 8 math MCAS exam and took the grade 10 ELA and math MCAS exams two years later were studied. These cohorts include only the students who were promoted on time. For these two cohorts of eighth graders, the proportion who passed the grade 10 MCAS exams two years later was calculated by school type. On average, Pilot high schools produced higher pass rates for students with this risk factor than BPS high schools, from 16 to 24 percentage points higher. Cramer's *V* was used to compare pass rates in the two school types. Effect sizes ranged from 0.14 to 0.19 for the ELA exam and from 0.13 to 0.14 for the math exam.

Table 10: Grade 10 ELA MCAS Exam Pass Rates of Students Who Scored Warning on Grade 8 Math MCAS Exam by School Type (in percent)

	2004	2005
BPS	60.6	62.8
BPS Pilot	84.5	79.5

Table 11: Grade 10 Math MCAS Exam Pass Rates of Students Who Scored Warning on Grade 8 Math MCAS Exam by School Type (in percent)

	2004	2005
BPS	52.8	50.7
BPS Pilot	72.9	70.4

Summary of How Are Students with Risk Factors Performing in Pilot High Schools?

In short, almost half of Pilot School ninth graders and more than half of the BPS ninth graders scored warning on the grade 8 math MCAS exam. An analysis of students with this risk factor shows that these students make greater progress in Pilot high schools than in BPS high schools on all four of the engagement and performance indicators studied.

IV. How Are Students in Different Demographic Subgroups Performing in Pilot High Schools?

Overall, within each race and income subgroup, Pilot students outperform BPS students. For the differences that do exist between subgroups (such as White/Black and White/Latino), Pilot high school differences in racial subgroups have reduced over time, and by the end of the four-year period are smaller than BPS high school differences. Pilot high school differences in income- level subgroups have fluctuated over time. Differences in BPS and Pilot high school MCAS pass rates could not be accounted for by greater proportions of English language learners and students with moderate to severe special needs enrolled in BPS high schools.

Pilot high schools are diverse, each school serving different proportions of the demographic subgroups listed in Table 5 (see Appendix 5 for individual school proportions). However, as a Network, they serve the race and income demographic subgroups in similar proportions to BPS. Subgroup performance in Pilot high schools as compared to BPS high schools and differences in subgroup performance in each school type were analyzed.

Prior research has concluded that historically underserved groups fare more poorly than White students and those ineligible for free/reduced-price lunch in engagement and performance (Coleman et al., 1966; Lee, 2002). We examine three pairings in all school types: White/Black, White/Latino, ineligible/eligible for free or reduced-price lunch (Snipes, 2007). American Indians are underrepresented in some school types and therefore not included in the analysis; Asians in BPS consistently outperform the other racial subgroups on MCAS exams and therefore are also excluded.

Differences in MCAS Pass Rates by Racial Subgroup Have Narrowed over Time

The four-year tables presented below show that all racial subgroups in Pilot high schools do better than their BPS counterparts for pass rates in 22 of the 24 data points over this period.

Differences were computed between Whites and Blacks/Latinos for both ELA and math MCAS exam pass rates. Differences exist between subgroups in both school types. The data for these four years show that White/Black and White/Latino differences in pass rates have narrowed in Pilot high schools, while almost all of those in BPS have stayed the same or increased. In the first year of analysis, Pilot high school differences in pass rates between subgroups were greater than BPS high school differences. By the final year of data available, the differences between subgroups in Pilot high schools are all smaller than the differences in BPS schools.

Table 12: White/Black Comparison in Grade 10 ELA MCAS Exam Pass Rates over Four Years (in percent)

Year	BPS Black	BPS Pilot Black	BPS White	BPS Pilot White	BPS Difference (White – Black)	BPS Pilot Difference (White – Black)
2002	49.7	78.7	64.8	97.9	15.1	19.2
2003	66.6	68.5	72.2	85.8	5.6	17.3
2004	56.6	77.5	71.7	88.4	15.1	10.9
2005	57.6	79.6	75.8	93	18.2	13.4

Table 13: White/Latino Comparison in Grade 10 ELA MCAS Exam Pass Rates over Four Years (in percent)

Year	BPS Latino	BPS Pilot Latino	BPS White	BPS Pilot White	BPS Difference (White – Latino)	BPS Pilot Difference (White – Latino)
2002	50.2	74.4	64.8	97.9	14.6	23.5
2003	65.9	73.5	72.2	85.8	6.3	12.3
2004	55.2	80	71.7	88.4	16.5	8.4
2005	56.5	81.9	75.8	93	19.3	11.1

Table 14: White/Black Comparison in Grade 10 Math MCAS Exam Pass Rates over Four Years (in percent)

Year	BPS Black	BPS Pilot Black	BPS White	BPS Pilot White	BPS Difference (White – Black)	BPS Pilot Difference (White – Black)
2002	34.2	52	46.4	90	12.2	38
2003	58.4	53.4	64.5	72.8	6.1	19.4
2004	59	68.5	67.5	91	8.5	22.5
2005	46.7	67.1	61	75.5	14.3	8.4

Table 15: White/Latino Comparison in Grade 10 Math MCAS Exam Pass Rates over Four Years (in percent)

Year	BPS Latino	BPS Pilot Latino	BPS White	BPS Pilot White	BPS Difference (White – Latino)	BPS Pilot Difference (White – Latino)
2002	35.2	55.6	46.4	90	11.2	34.4
2003	59.2	57.1	64.5	72.8	5.3	15.7
2004	59.6	69.2	67.5	91	7.9	21.8
2005	54.8	70.2	61	75.5	6.2	5.3

Differences in MCAS Pass Rates by Income-Level Subgroup Fluctuate over Time

Eligibility for free/reduced-price lunch is used as an indicator of household income level, even though this indicator does not take into account several important variables: the effect of concentrated poverty; the fact that some eligible families do not apply; and the wide range of family income among those eligible under federal guidelines (Kurki, Boyle, and Aladjem, 2005). Because other measures of socioeconomic status, such as neighborhood poverty level or level of concentrated poverty, are unavailable, eligibility for free/reduced-price lunch is used as a proxy. Among Pilot high school students, 68.4% are eligible for free/reduced-price lunch, compared with 69.8% of BPS high school students. Pilot high school students eligible for free/reduced-price lunch outperform those in BPS every year in both MCAS exams, except for 2003 math. Pilot students not eligible for free/reduced-price lunch outperform their counterparts in BPS every year on both MCAS exams.

Pilot students not eligible for free/reduced-price lunch outperform those who are eligible in both tests for all four years. There persists a gap in both ELA and math that does not exist in BPS schools. Interestingly, BPS students who are eligible for free/reduced-price lunch almost always do better than those who are ineligible. This finding stands in contrast to many research studies that link poverty to poorer student achievement (Adams, 1994; Grinion, 1999) and should be further investigated.

Table 16: Ineligible/Eligible for Free/Reduced-Price Lunch Comparison in Grade 10 ELA MCAS Exam Pass Rates over Four Years (in percent)

ELA	BPS Eligible	BPS Pilot Eligible	BPS Ineligible	BPS Pilot Ineligible	BPS Difference (Ineligible – Eligible	BPS Pilot Difference (Ineligible – Eligible
2002	51.7	77	52.3	86.3	0.6	9.3
2003	68.9	70.4	64.9	76	-4.0	5.6
2004	57.9	79.5	57.1	79.9	-0.8	0.4
2005	60	80.3	58.4	87.8	-1.6	7.5

Table 17: Ineligible/Eligible for Free/Reduced-Price Lunch Comparison in Grade 10 Math MCAS Exam Pass Rates over Four Years (in percent)

Math	BPS Eligible	BPS Pilot Eligible	BPS Ineligible	BPS Pilot Ineligible	BPS Difference (Ineligible – Eligible	BPS Pilot Difference (Ineligible – Eligible
2002	39.2	55.3	34	63.2	-5.2	7.9
2003	61.5	56.7	57.1	59.8	-4.4	3.1
2004	62.2	70.7	58.2	75.9	-4.0	5.2
2005	53.6	69	48	74.1	-5.6	5.1

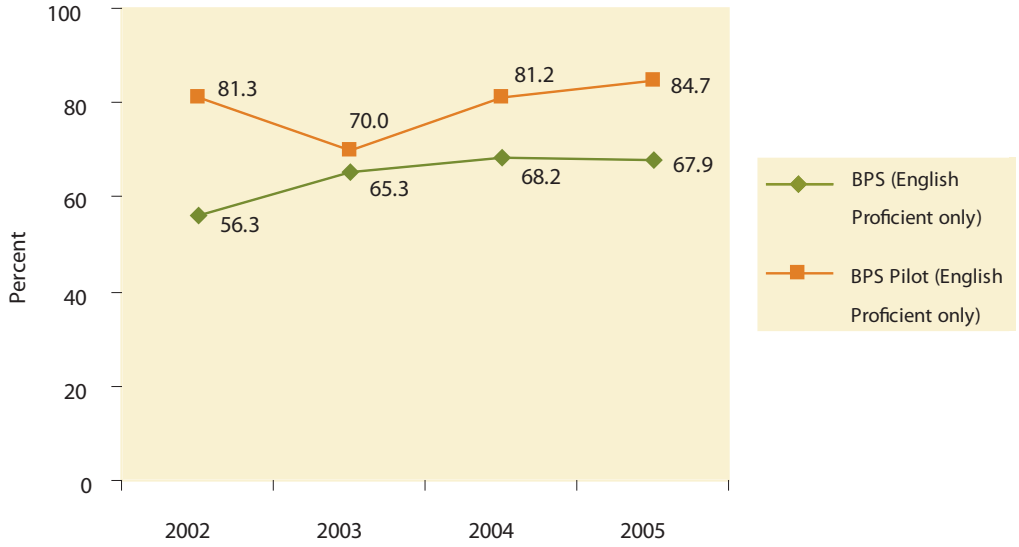
MCAS Pass Rates for Other Demographic Subgroups

The following section addresses two subgroups for which Pilot high schools serve smaller proportions than BPS high schools: Limited English Proficient (LEP) students and students with moderate to severe special needs. Students in these two subgroups typically have below average academic performance because they face learning challenges that other students do not (Crawford, 2004; Echevarria and Graves, 2003; Genesse et al., 2005; Wagner et al., 1992). It was important to determine whether Pilot high schools have higher MCAS pass rates (Figures 6 and 7) because they serve smaller proportions of these students. However, the numbers of LEP students and students with substantially separate special needs in Pilot high schools were too low to conduct a proper analysis analogous to the previous two sections on the MCAS pass rates based on race and socioeconomic levels. Given this limitation, to test the hypothesis that MCAS pass rates were affected by disproportionate representation of these students in the two school types, comparisons were made of MCAS pass rates excluding these students. The prediction was that excluding these students would cause BPS pass rates to increase more than Pilot pass rates.

MCAS Outcomes for English-Proficient Students Only

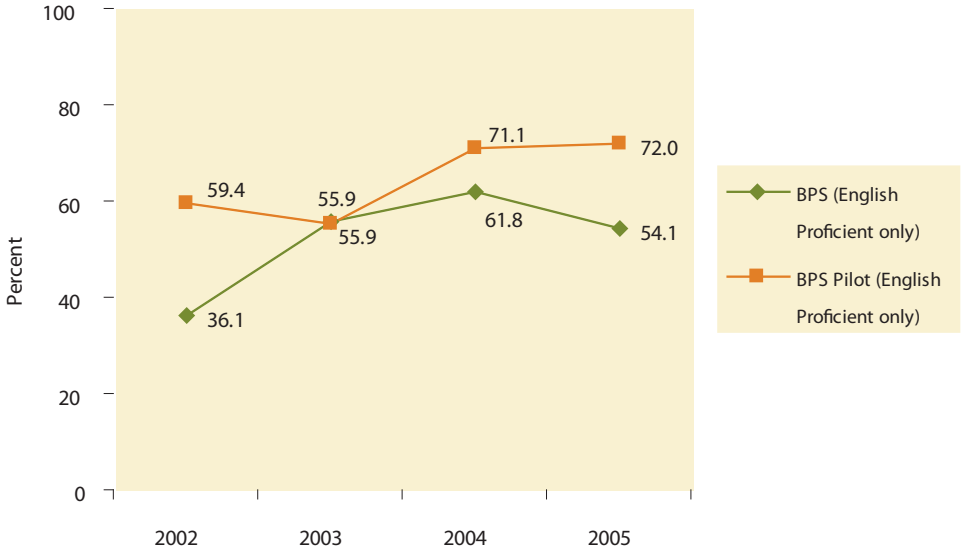
MCAS pass rates were analyzed for the four years with the scores of LEP students excluded (Figures 11 and 12). In grade 10 ELA MCAS exams, Pilot English-proficient students outperformed BPS English-proficient students in all four years. Comparison of Figure 6 with Figure 11 reveals that the relationship between BPS and Pilot outcomes on ELA MCAS exam pass rates did not change with the exclusion of LEP students.

Figure 11: Grade 10 ELA MCAS Exam Pass Rates of English-Proficient Students Only by School Type (in percent)



In grade 10 math MCAS exams, Pilot English-proficient students outperformed BPS English-proficient students in all four years.

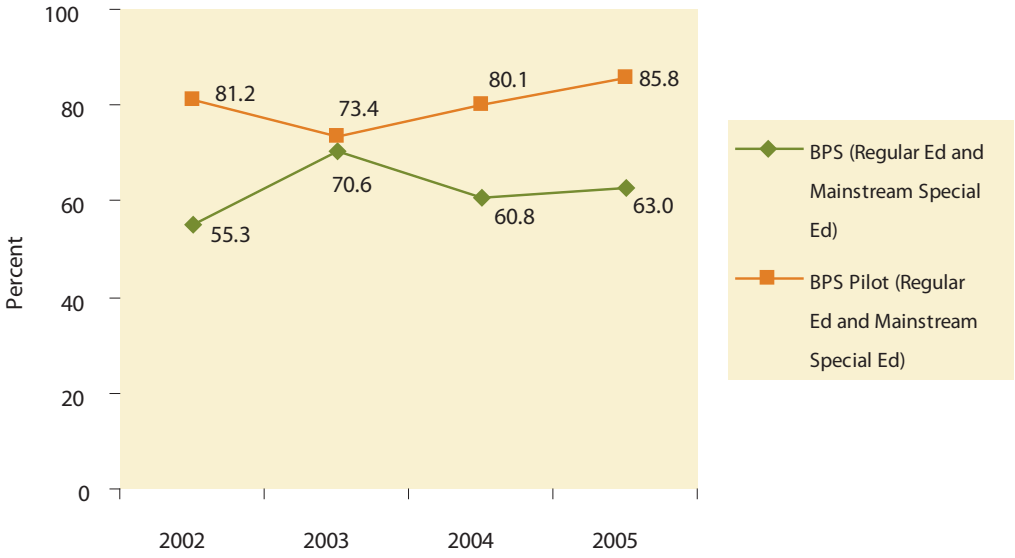
Figure 12: Grade 10 Math MCAS Exam Pass Rates of English-Proficient Students Only by School Type (in percent)



MCAS Outcomes for Students in Regular Education and Mainstream Special Education Only

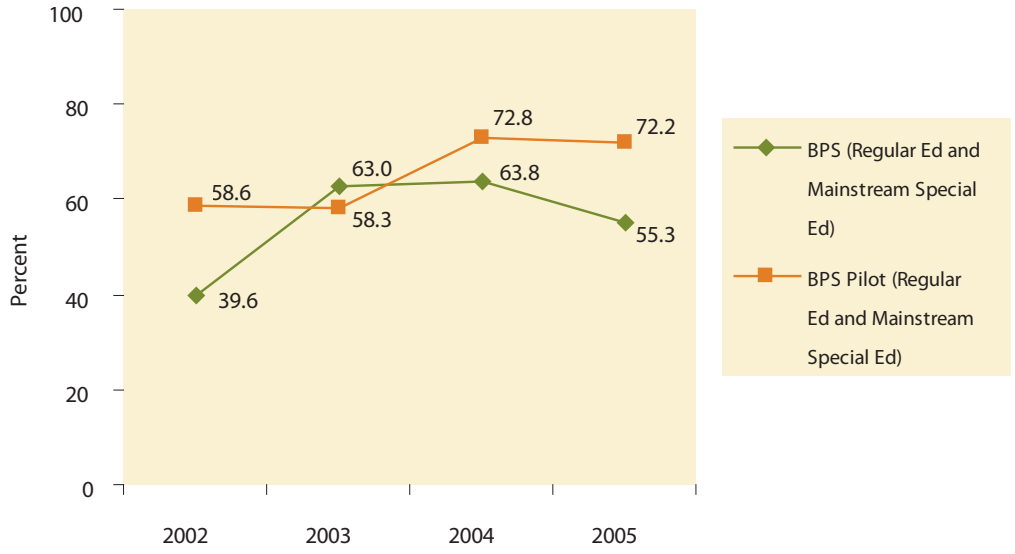
MCAS pass rates were analyzed for the four years excluding the scores of students with substantially separate special needs (Figures 13 and 14). In grade 10 ELA MCAS exams, Pilot regular education and mainstream special education students outperformed BPS regular education and mainstream special education students in all four years. Comparison of Figure 6 with Figure 13 reveals that the relationship between BPS and Pilot outcomes on ELA MCAS exam pass rates did not change with the exclusion of students with moderate to severe special needs.

Figure 13: Grade 10 ELA MCAS Exam Pass Rates of Students in Regular Education and Mainstream Special Education Only by School Type (in percent)



In grade 10 math MCAS exams, Pilot regular education and mainstream special education students outperformed BPS regular education and special education students in three of the four years. In 2003, Pilot students passed at a lower rate than BPS students. Comparison of Figure 7 with Figure 14 reveals that the relationship between BPS and Pilot outcomes on ELA MCAS exam pass rates did not change with the exclusion of students with moderate to severe special needs.

Figure 14: Grade 10 Math MCAS Exam Pass Rates of Students in Regular Education and Mainstream Special Education Only by School Type (in percent)



Summary of How Are Students in Different Demographic Subgroups Performing in Pilot High Schools?

In summary, in 37 of 40 comparisons, each race and income subgroup in Pilot high schools outperformed its BPS counterpart subgroup as measured by MCAS pass rates. The differences that exist between racial subgroups within Pilots have narrowed, so that by 2005, Pilot high school differences are smaller than BPS high school differences. The differences that exist between income subgroups within Pilots have fluctuated; these differences are still larger than in BPS schools. Similar patterns of differences between subgroups over time were found for proficiency rates, the proportion of students scoring in the advanced and proficient levels for MCAS.

The hypothesis that differences in BPS and Pilot high school MCAS pass rates could be accounted for by the different proportions of LEP students and students with moderate to severe special needs in the two school types tested untrue. English-proficient students in Pilot high schools performed better than their BPS counterparts. Students in regular education and mainstream special education classes performed better than their BPS counterparts, except in 2003, when they performed similarly. Similar outcomes for these subgroups over time were observed for proficiency rates. These findings suggest that differences in MCAS performance between the two school types are not explained by their having different proportions of students in these two subgroups.

V. How Does Lottery Assignment or Application for Admission Affect Pilot High School Enrollment?

In comparing the proportions of students with risk factors in Pilot lottery, Pilot application, and BPS high schools, several observations were made. Pilot lottery schools decreased their proportion of students with each risk factor within two years of opening, to lower than the Pilot application school proportion. Pilot application schools enrolled a greater proportion of students with the risk factors than the Pilot lottery schools did in 2004–05. Pilot application and lottery schools serve a lower proportion of students with risk factors than BPS high schools. Contrary to the prediction that admissions processes requiring applications result in enrollment of a lower proportion of students with risk factors, this analysis suggests that neither method of student assignment guarantees a certain student population.

The data in this paper have shown that while Pilot high schools serve a smaller proportion of students with risk factors than BPS high schools, these students with risk factors perform better than their counterpart BPS students on a number of indicators. This higher performance cannot be attributed to the smaller proportion of English language learners and students with moderate to severe special needs in the Pilot high schools. The purpose of this section is to understand some of the factors at play in Pilot high school enrollment in Boston, including perceptions of selectivity that result from admissions processes using applications. A common hypothesis is that enrollment of students with risk factors will differ depending on whether a school uses the district lottery process for student assignment or its own separate application process. More explicitly, those with a process involving more steps would be expected to enroll a smaller proportion of students with risk factors than those where a lottery decides placement.

BPS's choice system operates through lottery. Students select their schools and rank them in order of preference. Students are then assigned by a computer, based on seats available in each school. At the elementary and middle school levels, all BPS and Pilot Schools use the district lottery. Boston's three exam schools use entrance exam scores and previous academic performance to admit students at grades 7 and 9.

The ten Pilot high schools have varied admissions processes, many of which differ from BPS high schools and exam schools (Appendix 2). None of the Pilot high schools selects students based on entrance exam or prior academic performance. Two of the Pilot high schools use the district lottery process, two accept only over-age students who have previously been unsuccessful academically and have been referred directly to the schools, one is a pathway school that admits students who have attended its feeder school, and five others have an application process. The ones with an application process include: a Horace Mann Charter School that admits students by application and then lottery per state charter guidelines; a performing arts school that admits students based on an academically blind application and audition; and three that have students complete an application to evaluate the match between student and school.

To elucidate the impact that a school's admission process (whether by district lottery or application) may have on student enrollment, we studied the proportion of students with the three risk factors for the five Pilot high schools with applications in comparison with the two Pilot high schools using the district lottery.

Table 18: Pilot High Schools Studied for the Impact of Admissions Process on Student Enrollment

District Lottery	Another Course to College (ACC) (9th in 2004 and 2005 only)
	TechBoston Academy (TBA)
Application	Boston Arts Academy (BAA)
	Boston Community Leadership Academy (BCLA) (9th in 2004 and 2005 only)
	Fenway High School
	Health Careers Academy (HCA)
	New Mission High School (NMHS)

If the hypothesis were true, that admissions processes at certain Pilot high schools created a selection bias for more academically prepared students, then Pilot high schools using the district lottery would enroll students with risk factors in similar proportion to the BPS average, while Pilot high schools using applications would enroll students with risk factors in lower proportion to the BPS average. The proportion of first-time ninth graders with the three risk factors identified in section II was calculated.

The first indicator was the proportion of first-time ninth graders who had less than 80% attendance in eighth grade. The lottery Pilot high school proportions were similar to the BPS proportions in the first year of TBA. In the next two years, those proportions for TBA and ACC combined decreased to one-third of the BPS proportion. The Pilot application high school proportions were lower than the BPS proportions all three years. The Pilot lottery and Pilot application proportions of first-time ninth graders with low eighth-grade attendance gradually came closer together over the three cohorts, with Pilot application school proportions were higher in 2005 than Pilot lottery school proportions.

Table 19: Proportion of First-Time Ninth Graders with Low Eighth-Grade Attendance Rates by School Type and Admissions Process (in percent)

	2003	2004	2005
BPS	8.4	8.8	7.2
BPS Pilot with lottery	8.9	6.5	2.4
BPS Pilot with application	1.1	3.5	3.1

The second risk factor examined was the proportion of first-time ninth graders who scored at the warning level on the grade 8 math MCAS exam. In comparison to BPS proportions, Pilot high schools with both types of admissions processes (lottery and application) enrolled lower proportions of students with this risk factor. Comparison of Pilot lottery and Pilot application schools' proportions of students with this risk factor

showed the differences to be small. In the second two years of analysis, Pilot application schools served a slightly greater proportion of students scoring warning in grade 8 math MCAS exam than Pilot lottery schools.

Table 20: Proportion of First-Time Ninth Graders Who Scored Warning on Grade 8 Math MCAS Exam by School Type and Admissions Process (in percent)

	2003	2004	2005
BPS	66.0	66.5	59.1
BPS Pilot with lottery	54.5	46.2	42.6
BPS Pilot with application	51.4	47.4	44.2

The third risk factor examined was the proportion of first-time ninth graders who were at least two years over age for their grade level. In comparison to BPS proportions, Pilot high schools with either type of admissions process (lottery or application) enrolled lower proportions of students with this risk factor. Comparison of Pilot lottery and Pilot application schools for proportions of students with this risk factor shows the pattern is similar to that found with the low-eighth-grade-attendance risk factor. Over the three years the proportions of students with this risk factor changed in relationship, with Pilot application school proportions higher in the most recent year of data than Pilot lottery school proportions.

Table 21: Proportion of Over-age First-Time Ninth Graders by School Type and Admissions Process (in percent)

	2003	2004	2005
BPS	9.1	7.9	6.9
BPS Pilot with lottery	4.2	3.0	0
BPS Pilot with application	1.2	2.5	2.2

Interestingly, for all three risk factors, Pilot lottery schools opened with a higher proportion of students with risk factors than the Pilot application schools, as hypothesized, although still lower than the BPS proportion. By the third year, Pilot lottery schools had lower than the Pilot application school proportion of students for all three risk factors. This change in the proportion of students with risk factors in the two Pilot lottery schools, within two and three years of opening, is noteworthy. Contrary to the prediction, it suggests that the district lottery process does not result in similar proportions of students with risk factors to the BPS average, or higher proportions of students with risk factors than the Pilot application average.

Data available on the BPS website show the number of applicants per seat for entering ninth graders in 2006.[17] Another Course to College was the most highly chosen lottery high school in Boston, with 7.3 applicants per seat. TechBoston Academy was the third most highly chosen lottery high school in Boston, with 4.1 applicants per seat. These

[17] Data can be found at http://www.bostonpublicschools.org/register/documents.asp.

data, and the analysis on the change in proportions of students with risk factors in these two schools over their first few years, suggest that good schools may attract certain students and families based on reputation, and therefore these schools are disproportionately listed as first choice by students without risk factors.

Conversely, the hypothesis that admissions processes that include an application create a selection bias for more academically prepared students is neither accepted nor rejected. Compared with BPS, Pilot application schools do serve a lower proportion of students with all three risk factors. However, they serve a higher proportion of students with risk factors than do Pilot lottery schools.

Summary of How Does Lottery Assignment or Application for Admission Affect Pilot High School Enrollment?

In summary, to answer the question of the impact on enrollment of district lottery or application process, enrollment data of students with risk factors was analyzed from seven different Pilot high schools, two using the district lottery and five with their own application processes. The lottery schools did not enroll students with risk factors in proportions similar to the district average. By their second or third year, they enrolled a smaller proportion of students with risk factors than either the district or the Pilot application averages. In 2004–05 the application schools enrolled a greater proportion of ninth graders with the risk factors of low eighth-grade attendance, warning on the grade 8 math MCAS exam, and being over age than the lottery schools did.

From this analysis, the conclusion is that neither method of student assignment guarantees a certain student population. Lottery does not necessarily ensure a more representative risk population. Application does not necessarily ensure a more academically prepared population than district lottery. Rather, in a district in which there are high schools with varying levels of academic outcomes, students and families who are searching for a college preparatory education disproportionately select high-performing high schools.

Discussion of Findings

Boston Public Schools are the first district in the country to create Pilot Schools. While other urban districts (Seattle, Houston, Chicago) have experimented with small, decentralized schools, none of them includes an agreement between the school district and the local teachers union for full autonomy. Until 2006, the Boston Public School district was the only district to use this model. More recently, similar district–teachers union agreements have been developed in Fitchburg and Springfield, Massachusetts, and in Los Angeles, California, with Pilot Schools opening in all three districts.

Pilot Schools were opened in Boston with two goals: to increase the number of viable school choices for Boston school-aged children at a time when charter schools were starting up, and to serve as laboratories of innovation for the district.

The data in this paper demonstrate that Pilot high schools provide good choices for Boston students. Understanding how Pilot high schools operate to meet student needs effectively will enable educators to spread the model of small, autonomous, vision-driven schools, thus serving more children.

Pilot High Schools Are Serving Students Well

While Pilot Schools are diverse in mission, instructional focus, and student composition, as a whole, Pilot high school students perform better than the district average on all indicators of student engagement and performance, including attendance, suspensions, grade-level promotions, four-year graduation rates, and MCAS pass rates.

Pilot high schools serve a significant proportion of students with risk factors, such as warning scores on the grade 8 math MCAS exam, although the Pilot proportion is lower than the BPS proportion. The Pilot high school students with risk factors outperform their BPS counterparts in all outcome measures examined: ninth-grade attendance, ninth-grade promotion, and grade 10 ELA and math MCAS exam pass rates.

All race and income subgroups are performing better than their district counterparts on multiple indicators. In addition, over four years Pilot high schools have reduced the differences in achievement between Whites and Blacks as well as between Whites and Latinos. The differences that do remain are smaller in Pilot high schools than in BPS schools. There persists a difference in achievement between Pilot high school students who are eligible and those who are ineligible for free/reduced-price lunch that is greater than the difference for these subgroups in BPS schools.

These subgroup engagement and performance findings show that not only are Pilot high school students performing well in the aggregate, but each subgroup by race, income, and risk factors is also performing well in comparison to its BPS counterpart. In the absence of ways to control for nonquantifiable factors (such as motivation or family involvement), this analysis of subgroup outcomes demonstrates that students in Pilot high schools perform better over time on key engagement and performance indicators than students in BPS high schools.

There are potentially two factors that contribute to the aggregate Pilot high school outcomes relative to BPS high school outcomes—"Pilot-ness" and differences in population. While Pilot students with risk factors perform better that their BPS counterparts, such analysis does not address the balance of this subgroup's in the two school types and the impact of that balance on aggregate school performance.

What Makes Pilot Schools Different?

Past studies have investigated "Pilot-ness" and suggest that a unique combination of several key features allows Pilot Schools to serve their students well, including being vision-driven, small, accountable, and having a focus on equity. These four features on their own do not differentiate a Pilot School from a regular BPS school. The key to Pilot School success is having the autonomy to take advantage of these conditions to best serve students and families.

Pilot Schools have autonomy over budget, staff, schedule, curriculum and assessment, and governance. They are able to use their autonomy over these five areas to adopt practices that have been shown to correlate with improved student achievement. Some of the differences that have been documented between Pilot Schools and BPS schools include (CCE, 2001b; Tung, Ouimette, and Rugen, 2006):

- Class sizes are smaller
- Student:teacher ratios are lower
- Students spend more time in school
- Authentic performance assessments are used
- Student support is higher, through structures such as advisories
- Teachers spend more time collaborating and sharing about their practice

Pilot high schools use their flexibility over staffing and scheduling to create lower student:teacher ratios, smaller class sizes, and longer classes, allowing greater personalization in instruction. In addition, almost all Pilot high schools have advisories, time during the school week for teachers and students to reflect on their school work, plan for their future, and share about non-academic aspects of their lives. Thus, a greater proportion of students are known well by at least one adult in the building (CCE, 2001b).

Curriculum and assessment autonomy allows Pilot Schools to offer academically challenging courses and extracurricular activities tailored to their own student populations. Multiple formative and performance assessments in all the high schools help staff more quickly understand where students have strengths and challenges than do standardized tests results alone (CCE, 2004b).

Teachers and other staff have more time during the school day to meet. During their meetings, they are able to share assignments, pose dilemmas, and discuss topics of teaching and learning across subject areas, grade levels, and roles. This focus on adult collaboration and learning results in a more cohesive academic experience for students as they travel from grade to grade in a school.

Table 22: High School Characteristics[18]

	BPS	BPS Pilot
Average grade 9 English class size	28 (all classes)	18
Length of student school day (minutes)	380	392[19]
Minutes per week of professional collaboration time	No minimum	285
Number of full professional development days	3	6

In addition to the features described above, Pilot Schools are further strengthened by participation in a collaborative Network. The Network offers Pilot Schools a forum to reflect and problem-solve with like-minded school leaders and staff. In the spirit of the Network's guiding philosophy of equity and high achievement for all students (Appendix 1), Pilot leaders address new and ongoing issues, for example, the Pilot high school admissions processes and the gaps by race and income seen in Pilot outcomes. In the past, the Pilot Schools/Horace Mann Network has taken collective action to work with the district to enroll more students with substantially separate special needs, negotiate appropriate professional development for staff to teach these students, and seek external funding to support this increased enrollment. Several of the observations made in this report, such as the fluctuation in MCAS exam scores, the increasing grade-level retention rate, and the MCAS pass rate gaps by subgroup in Pilot high schools, are all issues that the Network can address collectively.

To summarize, Pilot Schools are small, autonomous schools with enough flexibility to create conditions which have been documented as beneficial for student performance, such as increased time on instruction, increased time for collaboration, and decreased class sizes and student:teacher loads. These schools are intentional about creating a reflective professional culture in which challenges at the school and the Network levels are identified and addressed. It is not possible to make a causal link between these characteristics of Pilot Schools and having strong student engagement and achievement outcomes. However, on the whole, autonomy over resources allows these schools to create engaging and relevant curriculum and assessment, strong relationships between students and adults, and a collaborative culture among staff—all key elements in effective schools.

Families and Students Seek High-Performing High Schools

Currently, eight of ten Pilot high schools use admissions processes that vary from those of BPS high schools and from each other. Most Boston public high schools, including two Pilot high schools, use the district lottery process. Some have suggested that the Pilot high school admissions processes create barriers for those students most in need of good schools (Sacchetti and Jan, 2007). All of the Pilot high schools share their admissions process rationale with students and families. Their goal is to find a good match between the student's interests and the school's culture, expectations, and offerings, without being academically selective.

[18] This table is reprinted from Tung, Ouimette, and Rugen, 2006.

[19] This calculation excludes one outlier school. Boston Day and Evening Academy students attend school four days a week, for an average of 300 minutes per day, because they are older students who have other responsibilities such as parenting and work.

The Pilot high schools TechBoston Academy and Another Course to College were two of the three most highly chosen high schools in the district lottery. These two lottery high schools had decreasing proportions of ninth graders with risk factors in each successive year after opening. Comparing Pilot lottery high schools and Pilot application schools for their proportion of first-time ninth graders with risk factors reveals that neither lottery nor application guarantees a certain demographic mix of students.

A previous CCE study showed that Pilot students choose Pilot high schools for three main reasons: academic rigor, student support, and school culture (Doyle and Feldman, 2006). With solid educational choices available, students with different interests and educational histories found schools that met their needs. Students interviewed in this study "described schools in which they received a challenging curriculum and preparation for college, that were small and supportive, that had good teachers who paid attention to students' academic and personal needs, and that encouraged positive student relationships." The schools in this study varied in mission and instructional focus, but the themes of academic rigor, student support, and school culture were consistent.

The Boston Public Schools student enrollment has declined roughly 10%, by about 7,000 students since 2000. Approximately 27% of Boston's school-age residents do not attend its public schools,[20] but rather opt to attend private, parochial, charter, and METCO schools.[21] Over the same period, the enrollment in Pilot Schools has grown almost sevenfold as the number of Pilot Schools has expanded.[22]

The contrast between Boston Public Schools enrollment trends and Pilot School enrollment trends suggests that families and students seek and find good schools, regardless of the student assignment process. When schools have a reputation for being academically successful, students and families disproportionately apply for these schools in the lottery as well as through application. Over time, if there are a limited number of available seats in these schools, the demographics of highly chosen schools may change to reflect the students and families who consider those schools good matches. While the student assignment process can be improved, until families and students have enough high-performing high schools from which to choose, there will continue to be differences in the proportions of students with risk factors in these schools as compared with low-performing high schools.

An equity challenge for Boston, as for most urban systems using a managed portfolio approach to high school reform, is to meet the demand for good choices for students and families. The goal is to have a variety of high schools that successfully educate a variety of students. With a greater number of high-performing schools like Pilot high schools from which to choose, more Boston high school students will graduate and experience the long-term benefits of having a high school diploma, such as enrolling in postsecondary education, earning an income sufficient to support a family, and being civically engaged. In turn, the district will stem the trends of declining enrollment and high drop-out rates, and improve its performance overall.

[20] Data can be found at http://www.bostonpublicschools.org/bps/bpsglance.asp.
[21] METCO is a voluntary desegregation program that buses approximately 3000 Boston children to suburban school districts.
[22] Data can be found at http://www.bostonindicators.org/IndicatorsProject/Education/Indicator.aspx?id=3432.

Policy Implications

Create more Pilot Schools. Pilot Schools have had increasing enrollment since their inception 12 years ago. Many are among the most highly chosen of all BPS schools. One-quarter of Pilot high school students entering ninth grade enroll from outside the district, demonstrating the Pilot School ability to attract to BPS families and students who had chosen to enroll elsewhere. Most importantly, the findings in this study confirm that Pilot high school students perform well in comparison to their non-Pilot peers for every engagement and achievement indicator, and across race, income, and risk factors.

The Boston Public Schools and Boston Teachers Union should respond to the demand. By creating more Pilot Schools, the district can improve student performance, retain more of the city's school-age population, and attract back into the district families and students who have chosen to leave. Simultaneously, the Boston Public Schools should take advantage of declining enrollment to identify facilities that can be made available for a new generation of start-up Pilot Schools via a Request for Proposals process.

During the past four years, only one new Pilot School has been established—the Gardner Elementary School, a conversion school. The progress toward increasing Pilot options for students has been slow despite the strong outcomes of Pilot Schools and the existence of Boston Teachers Union contract language enabling at least seven new Pilot Schools to be created from 2006 to 2010 (Boston Teachers Union, 2003). As a partnership, the Boston Public Schools and Boston Teachers Union should work together to create a favorable climate for regular schools to convert to Pilot status.

Simply creating new autonomous schools is not enough. Any new Pilot School Request for Proposals should emphasize the Pilot characteristics that correlate to increased student achievement, such as smaller class sizes and student:teacher loads, increased time for teacher collaboration, improved student support, and authentic assessments. Technical assistance provided to new Pilot Schools should coach school leaders on using their new-found autonomy to implement these effective characteristics. In exchange for autonomy, Pilot Schools must be accountable to students and families. All Pilot Schools must continue to regularly assess their progress through the School Quality Review process in order to have their status as Pilot Schools renewed.

Revisit the Boston Public Schools student assignment process to encourage informed choices of high schools by all students. Students need information about the schools they are choosing, so they can make informed, intentional choices. More informed students would lead to increased positive matches between students and schools. A likely outcome would be increased engagement and performance across the district's high schools.

Enroll representative proportions of students who are designated as Limited English Proficient and those who have moderate to severe special needs in Pilot Schools. A goal of the Pilot Network is to serve a student population representative of the district. These two groups, both of which are at higher risk of poor academic achievement and dropping out, are underrepresented in Pilot Schools. Pilot Schools

are already on track to increase their proportion of students with moderate to severe special needs through collaboration with the district. Pilot Schools should work with the district to set a similar plan for increasing their enrollment of English language learners. Concomitant with increasing enrollment of these students should come increased professional development resources for the transition period.

Develop mechanisms to share the lessons of Pilot Schools. Since this and other studies demonstrate that Pilot high schools are consistently effective schools on a range of outcomes over time, including outcomes for students with risk factors and for race and income-level subgroups, Boston Public Schools should use the Pilot Schools for their original purpose, to serve as laboratories of innovation. Through research, programming, and professional development, the district should disseminate the lessons of Pilot Schools.

Ensure that Commonwealth Pilot Schools are documented and studied. A recent statewide policy initiative modifies and expands the Pilot model for implementation in chronically underperforming schools in urban districts. The first district school to convert to Pilot status, Boston Community Leadership Academy, has strong early outcomes (Tung and Ouimette, 2007). This new initiative, to provide underperforming schools with autonomy in exchange for accountability, is promising. The Massachusetts Department of Education should closely track the progress of these schools to assess the promise of the Pilot model as a school turnaround strategy.

Conduct further research on Boston's portfolio of choices in order to understand the impact of the choice policy on the district schools and students. Some research questions include:

- What are the outcomes in the other choices offered Boston high school students, including small schools, charter schools, and small learning communities in large, comprehensive high schools?
- How have enrollment patterns for school-age Boston residents changed over time with the advent of school choices, for example by school type or by race?
- What needs are Pilot Schools meeting that result in students and families choosing Pilot Schools at high rates?
- What teaching and learning approaches do Pilot Schools implement in order to achieve the engagement and performance outcomes reported?
- How do students who apply to but are not chosen to attend a Pilot School fare in comparison to Pilot School students?
- Does the Boston Public Schools choice policy lead to the improvement of district schools and in what ways (Goldhaber, 1999)?
- Does the Boston Public Schools choice policy have equity consequences, such as imbalances by race or class (Goldhaber, 1999)?

As public district schools that were created to serve as laboratories of innovation, Pilot high schools are in high demand and have strong results. They are achieving the goals of equity and high achievement within the public school district. The experiment in innovation that the Boston Public Schools and the Boston Teachers Union created 12

years ago has demonstrated results which suggest that the Boston Public School system need look no further than its own Pilot high schools for examples of high performing high schools. Families across race, income, and students with risk factors seek high performing schools. The logic presented in the creation of Boston's Pilot Schools in 1995 still holds. Demand for quality high schools exceeds supply; the challenge of the district and teachers union is to respond by working together to create more quality school choices for families.

Appendix 1: Pilot Schools/Horace Mann Network Vision, Mission, and Principles and Practices

Vision Statement

The Pilot Schools/Horace Mann Network envisions education as a way to achieve a more just, democratic, and equitable society. Pilot Schools engage their students in rigorous and meaningful learning experiences. We aim to prepare students to become thoughtful and reflective individuals who construct and apply knowledge. The Network believes that a primary purpose of education is to empower all students to succeed in higher education and to contribute to their communities.

Mission Statement

The Pilot Schools/Horace Mann Network engages in:

- Leadership development for governing boards, directors, staff, students, and families, with a focus on creating democratic and shared decision-making governance models;
- Shared accountability to assist schools in assessing their progress and in developing models of authentic assessment for both students and staff;
- Advocacy that includes work with the district and public to ensure support and resources for Pilot Schools;
- Community organizing to broaden the constituency of the Pilot Schools and strengthen our collective voice and support.

Principles and Practices

Unifying Vision and Mission: Each school has a unifying vision and/or mission that is reflected in all school practices and structures, including curriculum, policies, schedule, professional development, and family engagement.

Equity: Patterns of achievement across race/ethnicity, gender, language, disabilities, and socioeconomic status are examined in order to allow schools to become inclusive communities and identify practices that provide all students opportunities to reach high levels of achievement.

Curriculum, Instruction, and Assessment:

- High expectations are explicit for every member of the school community.
- Student learning is purposeful. Teachers empower students to be responsible for their learning, thereby increasing student engagement.
- Instruction is differentiated. Students employ creative problem solving and active use of knowledge.
- A rigorous core academic curriculum is provided to all students.

- Assessment occurs in multiple ways, including exhibitions and portfolios, in addition to standardized tests. Students are expected to demonstrate their knowledge and understanding of key competencies and their relevance to the world.

A Commitment to Small Size: Optimal school size is no more than 450 students. Small schools enable teachers and students to build strong relationships and a safe environment.

Professional Collaborative Culture: Teachers share their practice and work in teams in order to build and sustain a professional collaborative culture. Schools place an emphasis on shared decision making and shared responsibility for student achievement.

Leadership: The people closest to the students make school and policy decisions, including teachers, administrators, support staff, families, community partners, and students themselves. Governing boards have increased decision-making power over the school's mission, budget approval, principal selection and evaluation, and policies.

Family and Community Engagement: Relationships are focused on respect, trust, and collaboration. Families are encouraged to participate as partners in each school. Schools form partnerships with community organizations in order to expand learning opportunities and support services for students and their families.

Appendix 2: Pilot High School Information

School Name	Year Became Pilot	Admissions Process
Another Course to College	2002	District lottery
Boston Arts Academy	1996	Application, includes audition
Boston Community Leadership Academy	2002	Application
Boston Day and Evening Academy (Horace Mann Charter)	2003	Referral
Fenway High School	2002	Application
Greater Egleston Community High School	1995	Referral
Heath Careers Academy (Horace Mann Charter)	1998	Charter school lottery
Josiah Quincy Upper School	1995	Must attend feeder school
New Mission High School	1995	Application
Tech Boston Academy	1999	District lottery

Appendix 3: Group Sizes for Analyses

The following tables show the numbers of students included in each analysis by school type.

Group Sizes for Figures 1–4: Attendance, Suspension, Transfer, and Drop-Out Rates by School Type

	2002	2003	2004	2005
BPS	14,792	13,803	13,986	13,766
BPS Pilot	1374	2125	2302	2695
Exam	3551	3594	3608	3575

Group Sizes for Table 2: In-District Transfer Rates by School Type

	2002–03	2003–04	2004–05
BPS	12,337	12,747	12,519
BPS Pilot	1788	2015	2192
Exam	3669	3684	3644

Group Sizes for Figure 5: Grade-Level Retention Rates by School Type

	2001–02	2002–03	2003–04
BPS	10,590	10,142	10,490
BPS Pilot	922	1564	1781
Exam	2774	2776	2768

Group Sizes for Table 3: Grade 9 Promotion Rates by School Type

	2001–02	2002–03	2003–04
BPS	4186	3805	3905
BPS Pilot	265	509	530
Exam	1051	996	964

Group Sizes for Figure 6: Grade 10 ELA MCAS Exam Pass Rates by School Type

	2002	2003	2004	2005
BPS	4009	5339	4271	4506
BPS Pilot	332	812	695	678
Exam	876	938	913	885

Group Sizes for Figure 7: Grade 10 Math MCAS Exam Pass Rates by School Type

	2002	2003	2004	2005
BPS	4339	5336	4413	4406
BPS Pilot	364	811	831	747
Exam	866	938	914	889

Group Sizes for Table 4: Changes in Math MCAS Exam Pass Rates from Grade 8 to Grade 10 by School Type

	8th in 2001–02 to 10th in 2003–04	8th in 2002–03 to 10th in 2003–04
BPS	1555	1811
BPS Pilot	269	282

Group Sizes for Figure 8: Four-Year Cohort Graduation Rates by School Type

	Class of 2006
BPS	3066
BPS Pilot	519
Exam	834

Group Sizes for Table 5: Demographic Subgroup Representation by School Type for 2004–05

	2004–05
BPS	13,766
BPS Pilot	2695
Exam	3575

Group Sizes for Table 6: Proportion of First-Time Ninth Graders Who Were Not BPS Students in Eighth Grade by School Type

	2003	2004	2005
BPS	3391	3550	3322
BPS Pilot	441	459	547

Group Sizes for Figure 9: Proportion of First-Time Ninth Graders with Low Eighth-Grade Attendance Rates by School Type

	2003	2004	2005
BPS	2790	2990	2805
BPS Pilot	313	347	414

Group Sizes for Figure 10: Proportion of First-Time Ninth Graders Who Scored Warning on Grade 8 Math MCAS Exam by School Type

	2003	2004	2005
BPS	2464	2794	2636
BPS Pilot	306	326	465

Group Sizes for Table 7: Proportion of Over-age First-Time Ninth Graders by School Type

	2003	2004	2005
BPS	3391	3550	3322
BPS Pilot	494	503	602

Group Sizes for Table 8: Ninth-Grade Mean Attendance Rates of Students Who Scored Warning on Grade 8 Math MCAS Exam by School Type

	2003	2004	2005
BPS	1701	1952	1634
BPS Pilot	169	167	237

Group Sizes for Table 9: Ninth-Grade Promotion Rates to Grade 10 of Students Who Scored Warning on Grade 8 Math MCAS Exam by School Type

	2003	2004
BPS	1475	1672
BPS Pilot	157	150

Group Sizes for Table 10: Grade 10 ELA MCAS Exam Pass Rates of Students Who Scored Warning on Grade 8 Math MCAS Exam by School Type

	2004	2005
BPS	935	1129
BPS Pilot	136	122

Group Sizes for Table 11: Grade 10 Math MCAS Exam Pass Rates of Students Who Scored Warning on Grade 8 Math MCAS Exam by School Type

	2004	2005
BPS	946	1131
BPS Pilot	137	122

Group Sizes for Tables 12 and 13: Race Comparison in Grade 10 ELA MCAS Exam Pass Rates over Four Years

ELA	BPS Black	BPS Pilot Black	BPS White	BPS Pilot White	BPS Latino	BPS Pilot Latino
2002	2284	201	370	47	1118	70
2003	3054	493	445	92	1581	189
2004	2287	406	361	94	1390	140
2005	2430	382	348	86	1502	143

Group Sizes for Tables 14 and 15: Race Comparison in Grade 10 Math MCAS Exam Pass Rates over Four Years

Math	BPS Black	BPS Pilot Black	BPS White	BPS Pilot White	BPS Latino	BPS Pilot Latino
2002	2453	229	381	50	1289	72
2003	3052	492	444	92	1581	189
2004	2453	502	384	100	1378	175
2005	2412	440	367	86	1437	158

Group Sizes for Table 16: Ineligible/Eligible for Free/Reduced-Price Lunch Comparison in Grade 10 ELA MCAS Exam Pass Rates over Four Years

Math	BPS Eligible	BPS Pilot Eligible	BPS Ineligible	BPS Pilot Ineligible
2002	2506	200	1503	132
2003	3695	546	1644	266
2004	2979	456	1292	239
2005	3271	678	1235	229

Group Sizes for Table 17: Ineligible/Eligible for Free/Reduced-Price Lunch Comparison in Grade 10 Math MCAS Exam Pass Rates over Four Years

Math	BPS Eligible	BPS Pilot Eligible	BPS Ineligible	BPS Pilot Ineligible
2002	2703	217	1636	147
2003	3694	545	1642	266
2004	2989	553	1424	278
2005	3156	489	1250	258

Group Sizes for Figure 11: Grade 10 ELA MCAS Exam Pass Rates of English-Proficient Students Only by School Type

	2002	2003	2004	2005
BPS	2950	3289	3065	3366
BPS Pilot	316	686	617	634

Group Sizes for Figure 12: Grade 10 Math MCAS Exam Pass Rates of English-Proficient Students Only by School Type

	2002	2003	2004	2005
BPS	3201	3286	3443	3612
BPS Pilot	352	685	755	717

Group Sizes for Figure 13: Grade 10 ELA MCAS Exam Pass Rates of Students in Regular Education and Mainstream Special Education Only by School Type

	2002	2003	2004	2005
BPS	3728	4935	3860	3999
BPS Pilot	330	786	679	643

Group Sizes for Figure 14: Grade 10 Math MCAS Exam Pass Rates of Students in Regular Education and Mainstream Special Education Only by School Type

	2002	2003	2004	2005
BPS	4050	4933	3997	3904
BPS Pilot	362	785	815	712

Group Sizes for Table 19: Proportion of First-Time Ninth Graders with Low Eighth-Grade Attendance Rates by School Type and Admissions Process

	2003	2004	2005
BPS	2790	2990	2805
BPS Pilot with lottery	56	123	125
BPS Pilot with application	188	229	290

Group Sizes for Table 20: Proportion of First-Time Ninth Graders Who Scored Warning on Grade 8 Math MCAS Exam by School Type and Admissions Process

	2003	2004	2005
BPS	2464	2794	2636
BPS Pilot with lottery	55	117	122
BPS Pilot with application	181	215	276

Group Sizes for Table 21: Proportion of Over-age First-Time Ninth Graders by School Type and Admissions Process

	2003	2004	2005
BPS	3391	3550	3322
BPS Pilot with lottery	71	135	143
BPS Pilot with application	258	324	404

Appendix 4: Detailed Methods and Limitations

Indicator	Definition
Attendance rate	Median percentage of days that students in each school type attended school in a given year.
Out-of-school suspensions	The proportion of students in each school type who were suspended from school at least once in each school year.
Out-of-district transfers	The proportion of students who transferred out of the district in a given school year. This includes students who transferred to any school outside of the Boston Public Schools as well as students who dropped out of school.
In-district transfers	The proportion of students who transferred out of a school of a given school type and into another school within Boston Public Schools. Students were considered as transferring if they were not in a natural transition grade and changed schools from the end of June in one school year to the end of June the next year. Students in the "natural transition" grades of grade 5 and grade 8 were considered as transferring if they changed schools between October and June of a given school year. Students new to the district and students who were involuntarily shifted into new schools due to school closures were also considered as transferring if they changed schools from October to June.
Grade-level retention	The proportion of students in a given school year who were not promoted to the next grade. Students attending Greater Egleston Community High School, Boston Day and Evening Academy, and Boston Adult Academy were excluded from this analysis because these schools serve over-age students and do not have traditional grade levels.
Grade 9 promotion rates	The proportion of students who were promoted out of grade 9 in a given school year. Students attending Greater Egleston Community High School, Boston Day and Evening Academy, and Boston Adult Academy were excluded from this analysis because these schools serve over-age students and do not have traditional grade levels.
MCAS English Language Arts pass rate	The sum of the proportions of students scoring in the advanced, proficient, and needs improvement performance categories on the Grade 10 English Language Arts MCAS exam in a given year.
MCAS Mathematics pass rate	The sum of the proportions of students scoring in the advanced, proficient, and needs improvement performance categories on the Grade 10 Mathematics MCAS exam in a given year.

Indicator	Definition
Change in MCAS mathematics pass rates	The change in the proportion of students who passed the MCAS mathematics exams from grade 8 to grade 10. Grade 8 pass rates were analyzed for students who, two years later, were in each high school type. Then grade 10 pass rates were calculated for the same students. The change in pass rate was calculated by subtracting the percentage of students who passed the grade 8 test from the percentage of students who passed the grade 10 test. One limitation of this analysis is that it includes only students who were in a Boston Public School for both grades 8 and 10. Students who attended any school outside of the district were not included in this analysis because scores for those students were not available to CCE researchers. Josiah Quincy Upper School (JQUS) and exam schools were excluded because their students do not change schools between grades 8 and 10.
Four-year cohort graduation rates	The ratio of students who graduated in 2006 to students who entered ninth grade in 2002. Students attending Greater Egleston Community High School, Boston Day and Evening Academy, and Boston Adult Academy were excluded from this analysis because these schools serve over-age students and do not have traditional grade levels.
8th-grade low attendance of 9th graders	The proportion of first-time 9th graders who attended 8th grade the year before less than 80% of the time. JQUS and exam schools were excluded because their students do not change schools between grades 8 and 9.
8th-grade warning rates of 9th graders by school type	The proportion of first-time 9th graders who earned warning on the grade 8 math MCAS exam the year before. JQUS and exam schools were excluded because their students do not change schools between grades 8 and 9.
Over-age 9th graders	The proportion of 9th graders who were at least two years over age as of the start of the school year and were in 8th grade the year before.For example, students who were 16 as of August 31, 2001, would be considered over age for 9th grade in 2001–02.

Limitations of the Study

Several factors limited the scope of this study. Efforts are underway to address each limitation for future studies.

- There is no data available to address the question of possible selection bias for particular school types by family involvement, motivation, and other nonquantifiable factors. Therefore, these unobserved differences cannot be controlled for.
- In addition to the three studied here, Boston and Massachusetts high school reform efforts include other school types: small free-standing schools; small schools in education complexes; small learning communities in large, comprehensive high schools; and charter schools. As data for these school types accumulate and are made available, a more comprehensive study may be done.
- For Pilot high schools, group sizes are too small to report outcomes for some subgroups, such as limited-English-proficient and students with moderate to severe special needs.
- With only four years of data, it is difficult to ascertain trends, especially when analyzing cohort data longitudinally for gains.

Appendix 5: 2004–05 Subgroup Demographics by Pilot High School (in percent)

School Name	American Indian	Asian / Pacific Islander	Black	Latino	White	Eligible for Free/Reduced-Price Lunch
Another Course to College	0.8	10.1	47.2	16.9	25.0	49.6
Boston Arts Academy	0.5	2.7	50.5	25.4	20.9	56.2
Boston Community Leadership Academy	0.2	3.2	61.1	23.8	11.8	66.1
Boston Day and Evening Academy	0	5.6	65.6	24.5	4.3	99.2
Greater Egleston Community High School	1.0	1.0	75.0	23.1	0	54.8
Fenway High School	0.7	2.5	52.0	27.3	17.5	60.7
Health Careers Academy	1.4	5.3	71.8	16.7	4.8	83.3
New Mission High School	0.8	2.9	64.8	27.9	3.7	62.7
Josiah Quincy Upper School	0	61.2	30.2	6.5	2.2	75.5
TechBoston Academy	0.4	5.9	53.8	28.4	11.4	65.7
Average	**0.5**	**7.3**	**57.4**	**23.2**	**11.6**	**68.4**

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