

Capacity Counts

Demonstrating the Need for
Adequate, Transparent Data

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Report prepared by:
The Campaign for Fiscal Equity, Inc.
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The Campaign for Fiscal Equity, Inc. (CFE) is a leading non-profit organization working to protect and promote the constitutional right to a sound basic education - defined as a meaningful high school education - for every public school child in the State of New York. CFE was founded in 1993 by a coalition of concerned parents and education advocates who filed the landmark case *CFE v. State of New York*, which established this right. To make this right a reality, CFE works to ensure that the neediest students in low performing schools make academic progress, graduate high school and become active civic participants who can compete in the global economy. CFE works to educate and engage the public and policy makers to ensure that the historic school budget increases, accountability reform and meaningful public participation that resulted from the landmark CFE court decision and law reform are fully implemented.

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Executive Summary

WHY SPACE MATTERS: CAPACITY AND BUILDING USE AFFECT NEW YORK CITY'S SCHOOLS AND PROGRAMS

How school buildings are used is a constant concern of educators, parents and advocates, because the condition, design and utilization of school buildings affect educational opportunity, student outcomes, and the health of the students and adults who share school buildings.¹ Studies of other large urban districts show that teachers are far more likely to leave a school and teaching altogether when their facility is in poor condition.²

The importance of facilities in education adequacy and equity has meant that they have been a key component of the school finance challenges in 26 states – including *CFE v. The State of New York*, where the Court was particularly concerned about the shortage of classroom space causing many schools to convert libraries, laboratories, auditoriums and the like into use as classrooms.

“Overcrowding is even worse than indicated above because the ECU [Enrollment Capacity Utilization] formulas actually overstate schools’ capacity,” Judge Leland DeGrasse of the trial level court declared in his 2001 decision. “This inflation occurs because the formulas adjust for overcrowding by adding to school’s capacity non-classroom space if such space is in fact used for classrooms.”³ The Court of Appeals upheld this finding and stated: “One symptom of an overcrowded school system is the encroachment of ordinary classroom activities into what would otherwise be specialized space: libraries, laboratories, auditoriums and the like. There was considerable evidence of a shortage of such spaces.”⁴ Capacity affects equity because access to teachers, programs and services are in part driven by access to space.

The ECU Reports are crucial to school planning, including co-locations and new construction. Additionally, they inform significant funding allocations by elected officials and government entities. Yet deep flaws in the ECU Reports’ accuracy, completeness and consistency of reporting undermine their integrity and compromise their essential transparency, creating a pressing need for careful scrutiny and thorough review of the ECU Reports in order to provide broader access to educational opportunity and increased equity in the city’s schools.

1 Schneider, M. *Do School Facilities Affect Academic Outcomes?*, *National Clearinghouse for Educational Facilities*, November 2002;

Research on the Impact of School Facilities on Students and Teachers, 21st Century School Fund, Washington, DC, September 2009

2 Buckley, J., Schneider, M., & Shang, Y. (2005). *Fix it & they might stay: School facility quality and teacher retention in Washington, D.C.* *Teachers College Press*, 107, 1107–1123.

3 *CFE et al v. The State of New York*, 187 Misc. 2d 1,50 (S. Ct., N.Y. Co.2001).

4 *CFE et al v. The State of New York*, 100 N.Y. 2d 893, 911, n.4 (2003).

This study examines 12 years of ECU Reports with regard to building capacity and utilization, which can be thought of as the ‘real estate’ factor in facility quality: What space is available, where, and for whom?

DEFINING ‘CAPACITY’

To define capacity, the New York City Department of Education compares buildings’ “maximum physical capacity ... to actual enrollments, which together allow for a standard framework with which to assess ... utilization.”⁵

Capacity formulas differ at each school level, from primary to high school. (See “How the City Defines Capacity,” p. 6.) Capacity calculations are based on information provided by principals in the Annual Facilities Survey, conducted by the Department of Education (DOE) and the School Construction Authority (SCA). (See “How Rooms Count in Each Formula, p. 7.)

THE CASE FOR TRANSPARENCY

Every decision about school building use is mediated through the ECU Reports produced by the DOE and the SCA. Known colloquially as The Blue Book, the ECU Report is the crucial document that informs DOE decisions on school management and space planning. Inaccuracies, inconsistencies, and a lack of transparency have wide and durable repercussions.

The study analyzed 12 years of ECU Reports and documented a high level of instability in public school capacity assessments. But the ECU Report itself does not provide sufficient information to discern or address the reasons for capacity change – or to predict the effects of capacity change at the school, district and citywide levels.

Extensive analysis of the 12 years of ECU Report data reviewed in this study shows wild fluctuations in school capacity, which do not appear to accurately represent the changes that have occurred in actual school buildings. For example, ECU Reports for School Years (SY) 1997–98 through 2008–09 document that school capacity grew by 130,339 seats, while enrollment dropped by 80,264 students. Approximately 80,000 new seats came on line through new schools and additions, but ECU Reports do not disclose how the other 50,000 seats originated. Nor is it possible to address the wide fluctuations from year to year in district and individual building capacity with the data provided in the ECU Reports. Thus, the key tool used by policymakers and legislators to make informed decisions is seriously flawed and not transparent.

⁵ New York City Department of Education and School Construction Authority, **Enrollment-Capacity-Utilization Report 2008–2009 School Year**, September, 2009.

MEASURING CAPACITY

CFE employed the following measures of change to examine how capacity changed in school buildings from year to year:

Net Change: Actual increase or decrease of seats in a school building.

Aggregate Change: The total change in number of seats in a school building, regardless of whether the capacity increased or decreased.

The study found that aggregate change often substantially outstripped net change in New York City's school buildings: the actual (net) change in building capacity, **75,132** seats citywide, was dwarfed by aggregate capacity shifts of **510,051** seats citywide – the sum of each year's changes over time. (See chart for IS 14, p.10.)

MAJOR FINDINGS

An enormous number of changes – many greater than 100 seats – have occurred in most city school buildings. The major finding of this report is that ***most of the 1,455 New York City public school buildings in this study experienced significant variations in capacity*** over the 12-year study period, with greater gains than losses: more than half of the city's schools grew, a third diminished, and 45 experienced no change.

We found the ***high levels of instability*** a cause for concern, if the changes reported in the ECU have been realized. If the schools are actually more stable than reported and the capacity shifts overstated, that overstatement challenges the accuracy of the data in the ECU Reports.

Over 12 years, ***aggregate change was 6.8 times greater than net change***. Not surprisingly, capacity change was not evenly distributed over time or across the city's five boroughs. In some instances, significant capacity cuts in a single year were immediately followed by significant capacity gains. We also found:

- ***Change is sweeping and dramatic:*** A third of all city schools gained or lost at least 100 seats (4 classrooms). Thirty-four school buildings had increases of greater than 500 students (equivalent to 25 classrooms), while one experienced a comparably large decrease.
- ***Change is inconsistent over time:*** The capacity of 1,006 elementary school buildings in the study grew dramatically. Over half of the grade-school gains during the 12-year study period were made in 1999 and 2003, adding 15,652 additional seats.
- ***Change is variable:*** In 2001, 961 new middle-school seats were added. In 2002, 496 were lost. In 2006, 4,883 seats were added, and the next year, 3,900 were lost.

- **Location matters:** Surges in 2003 and 2004–2006 added nearly 28,500 high school seats. Yet trends are not consistent across boroughs, with thousands more seats added in the Bronx and Manhattan than in Queens, Brooklyn, and Staten Island.
- **Special-education schools are most vulnerable:** District 75 schools, which serve the city’s neediest students, had the highest rates of capacity change citywide; one in eight District 75 elementary school building seats was in flux, on average, across the study period.
- **Building-sharing and co-locations proliferated during the study period.** The number of separate organizations in individual school buildings has risen dramatically since 1997: 20% of all city high school buildings currently shelter four or more organizations; 65% house more than one. (In 1997, high school buildings housed, on average, fewer than two.) In the middle schools, the number of buildings with four or more organizations doubled since 1997. By 2008–09, 27% of middle school buildings contained four or more organizations.

(See p. 18 for the complete report Findings, with expanded explanations.)

RECOMMENDATIONS

The annual Enrollment Capacity Utilization Report must be overhauled to:

- Ensure that the data is accurate;
- Provide an enhanced and more expanded narrative;
- Include more comprehensive data; and
- Explain changes or exceptions to standards.

(See p. 110 for CFE’s full recommendations.)

Additionally,

- 1. The State Comptroller and/or City Comptroller should audit the ECU Report,** to assure accuracy and confidence in the reported data.
- 2. The Annual School Facilities/Turn-Around Document, the School Organization Chart, and the Official Class Information List (RACL Report) should be made publicly available.** These documents underpin the data of the ECU report and are necessary to determine a comprehensive review of a school’s utilization.
- 3. DOE should produce a checklist for every school, comparing each school’s entitlement according to the ECU formula with what the school actually has.** This checklist should be shared with each school community and a process should be established to convene stakeholders in sharing this document. DOE should then establish a process and a method for prioritizing how they will address these programmatic needs in the next 5 year capital plan.

- 4. The ECU Report should be reformed to make it an accurate, transparent and usable document. There should be a means of enforcing that reform. New York City and State policymakers should work with the DOE to achieve this reform, including enacting legislation, if necessary.**
- 5. DOE must additionally revamp and expand the ECU Report to provide greater detail and a transparent accounting of how school buildings are used.**

This expansion should include more complete data on each building, new reporting mechanisms, a temporary- and specialty-space database (including science labs and studios for music, dance, and art), and detailed guidelines for principals on how to complete the annual survey. Additionally, DOE/SCA should have a quality assurance mechanism to verify the accuracy of the information provided in the annual facilities survey documents.

CONCLUSION

The ECU Report is a critical document used for school space planning, co-locations, capital planning, and re-zoning decisions, as well as to establish cause for new school construction. Elected officials and governmental entities allocate substantial funding based in part on the information in this Report, underscoring its vital role.

Despite its crucial role in school decision-making and resource allocation, the ECU Report is deeply flawed and data-deficient. Correct information on how a building is being used should be complete, accurate, and available and presented so users have the ability to interpret it factually. The ECU Report has been repeatedly criticized for its inaccuracies, difficulty of use and incompleteness, as the current study documents. A thorough and objective overhaul of the ECU Report is needed now, in order to provide greater equity and access to educational opportunity by all of New York City's schoolchildren and their families.

Understanding the Context for Change

WHY THIS STUDY MATTERS

The importance of facilities in education adequacy and equity cannot be overstated. Schools that are overcrowded cannot function as successfully as schools that have adequate space for instruction and programs. As Judge Leland DeGrasse noted in his 2001 decision in *CFE v. NYC*, overcrowding formulas “actually overstate schools’ capacity ... because the formulas adjust for overcrowding by adding to school’s capacity non-classroom space if such space is in fact used for classrooms.”⁶ This means a library can be split into classrooms and counted as instructional space; a full-size room can be divided into two and counted as two special-education rooms, which require smaller spaces to serve fewer students; public space like cafeterias and auditoriums can be ‘repurposed’ as instructional space, and can count as viable teaching and learning areas in capacity assessments. Capacity and utilization are education quality and equity issues because access to education – to teachers, programs, classes, and services — are in large part, driven by access to space.

This study examines one aspect of facility quality—that of building capacity. Capacity and use are affected by building condition and design, but constitute different elements of facility quality. It is the facility quality factor that is determined by what space is available, where and for whom.

HOW THE CITY DEFINES CAPACITY

The Department of Education (DOE) defines school capacity and utilization as “the maximum physical capacity of all Department of Education buildings to serve students, compared to actual enrollments, which together allow for a standard framework with which to assess the utilization of our buildings.”⁷ The Department’s standardized means of assessing the use of school buildings is determined by a series of separate formulas for Primary School, Middle School, Primary/Middle School, Middle/High School, High School and Special Education programs. The formulas are then compared with actual enrollments to determine the rate of utilization.

The capacity calculation is based on information provided by principals in the Annual Facilities Survey, which is conducted by DOE and the School Construction Authority (SCA). The survey verifies the usage and size of every room used for instruction within each building. Once all the surveys are completed and the function of every room has been determined, the DOE calculates a school’s capacity, which is the total number of students the building should accommodate.

⁶ *CFE et al v. The State of New York*, 187 Misc. 2d 1,50 (S. Ct., N.Y. Co.2001).

⁷ New York City Department of Education & School Construction Authority, “Enrollment-Capacity-Utilization Report 2008–2009 School Year,” September, 2009.

HOW ROOMS COUNT IN EACH FORMULA

Capacity formulae differ for each school level, with smaller children thought to require greater amounts of physical space, for example, than high-school students. As an example, we will consider the Primary School formula, which mandates that a classroom is at least 500 square feet in area. For each grade-school class model, a maximum number of students or range of students is specified by the formulae, as shown below. (Specialty Instruction Spaces include labs, art studios and music rooms.)

Grade School Rooms Counted towards Capacity:	No. of Students
Pre-Kindergarten (Full Day)	18
Pre-Kindergarten (Half Day)	18
Kindergarten	20–25
Grades 1, 2, 3	20–25
Other Grades (Title I Schools)	28–29
Other Grades (Non-Title I Schools)	28–31
Special Education MIS 1-8 in CSDs	12
Specialty Instructional Spaces (Title I Schools)	28–29
Specialty Instructional Spaces (Non-Title I Schools)	28–31

Rooms Not Counted towards Capacity:

Libraries

Offices

Lunchrooms

Auditoriums

Gymnasiums

Rooms of less than 240 square feet

Cluster Rooms (can include Specialty Rooms like Art and Science), determined by size of school and Title I status ranging from 0-5.

Additionally, schools may use some rooms that do not count toward a school building's instructional capacity for administrative purposes, even if those spaces exceed 500 square feet. For example, space is allotted for:

General office/school reception

Guidance counseling

Medical or nurse's office

Supply storage

Audiovisual storage

Duplicating rooms

The Principal's office, and

Family Rooms (for prekindergarten families).

Space may also be used for funded support services for remediation and for Parents' and Teachers' Rooms, equal to the capacity of a full-size classroom.

THE EFFECTS OF OVERCROWDING ON CAPACITY AND UTILIZATION

Each school's need for space and usage patterns change when enrollment rises or declines, and when programs, services and approaches to local school administration change. School districts follow a classic set of actions in response to both increasing and decreasing enrollment pressures, articulated below.

In response to higher enrollments, the typical first action is to increase class size to a maximum. The second response is generally to convert various "non-capacity" spaces, such as art rooms or libraries at the elementary level into grade level classrooms. The different capacity formula used for high schools means that all instructional spaces carry capacity, so increased enrollment could result in the conversion of administrative, student support areas and other non-instructional space to instructional spaces. A third type of response to crowding is to reduce the room sizes or subdivide spaces, for example, reducing the size of a special education class from a full sized classrooms into a half sized classroom. (Another response is a staggered or split schedule, most often used in high schools, where students start and end school at different times of the day.)

When a school still cannot meet the level of demand for enrollment, the district may respond by increasing the school's capacity, by adding temporary classroom units (trailers), mini-schools, annexes, or permanent additions. Another district-level response would be re-zoning the boundaries of schools, in order to reallocate students to nearby school buildings that are less crowded. Finally, when demand cannot be met by these other measures, a new school is built and new zoning is done – setting capacity for the new school and re-zoning (re-distributing students) at surrounding schools.

THE OTHER SIDE OF THE COIN: UNDER-UTILIZED BUILDINGS

When school enrollments decline, districts can return to schools some of the space that might have been lost during periods of high enrollments. Schools subject to less enrollment pressure would theoretically be able to reduce class size and reclaim instructional support spaces (at the elementary level) and non-instructional spaces (at the secondary level). Schools experiencing reduced enrollment would be able to provide more space for special-education instruction and services and for administrative, staff and student and family support functions in the school building.

When enrollment declines are extreme, then the district is faced with the high cost of maintaining, cleaning, operating and repairing under-utilized buildings. A classic response to under-utilization is to open up school spaces to district-level administrative users, but also to non-district organizational entities. The district can place district level offices, charter schools, or other entities into an under-utilized school building through a co-location agreement. Finally, if the demand for a particular school is so low and other local schools can meet the existing enrollment demand, the district can opt to close a public school program and facility and dispose of it through a lease or sale.

TRANSPARENCY IS VITAL

All of the decisions about which actions are appropriate—whether to increase class size, build new space or make space available for co-location, for examples—are mediated through the Enrollment – Capacity – Utilization (ECU) reports produced by the DOE and the SCA. These reports function as a kind of Bible for school-level changes; no decisions about school buildings are made without consulting ECU Reports and related data.

Despite the extraordinary weight placed on the ECU Reports, the current study documented a high level of instability in public school capacity assessments. A close analysis of 12 years of ECU Reports (covering SY 1997–98 through SY 2008–09) shows that the ECU Reports do not provide sufficient information to discern or address the reasons for capacity change, or to predict the effects of capacity change at the school, district and citywide levels.

Building capacity has educational quality, equity, facility, budget and policy issues hidden in its formulation. Although the DOE tracks capacity and utilization measures by school, it provides little insight into how space use in our schools connects to instruction, programs and services to students. CFE's extensive analysis shows that the current reporting system documents wild fluctuations in school capacity, which do not appear to accurately represent the changes that have occurred in actual school buildings. Explanations for changes in capacity are not explicit in the ECU Report or related materials, giving rise to questions and speculation. This crucial tool used by school district leaders, legislators and policymakers to inform decisions is seriously flawed and additionally marred by a lack of transparency that subverts discovery and clear communication.

HOW CFE MEASURED CHANGES IN CAPACITY

CFE analyzed building capacity changes in the 1,455 school buildings included in this study. Buildings included main school buildings and the temporary structures (transportable, mini-schools, and annexes) associated with them.

The following Measures of Change were developed to perform this analysis:

Net Change — Year to year increase or decrease: The difference in the number of seats in a school building.

Aggregate Change — The total change in number of seats in a school building, regardless of whether the capacity increases or decreases.

The chart below illustrates how net and aggregate change capture different elements of reported change over time using a single school as an example:

**NET AND AGGREGATE CAPACITY CHANGES FROM SY 1997–98 THROUGH SY 1999–00
IS 14 DISTRICT 22, BROOKLYN**

YEAR	CAPACITY (SEATS)	NET CAPACITY CHANGE	AGGREGATE CAPACITY CHANGE
SY 1997–98	1451	-118	118
SY 1998–99	1333	105	105
SY 1999–00	1438		
TOTAL		-13	223

Between SY 1997–98 and 1999–00, IS 14 had a net loss of 13 seats – but 223 seats actually shifted in the school’s capacity over this time, when the changes for each 2-year period are added together.

Aggregate change captures *all* reported changes to capacity, regardless of whether they are increases or decreases. While net capacity reflects the total gain or loss, aggregate capacity incorporates the internal fluctuations that can be masked when increases and decreases are totaled. So in this case, IS 14 lost a total of 13 seats in 3 years’ time, but underwent changes that were nearly 20 times greater than the net change, with 223 seats in play over the same interval.

LEGITIMATE REASONS FOR CAPACITY CHANGES

Over the 12 years reviewed for this study, more than half of the city’s schools increased their capacity. Because the ECU does not document *why* these changes occurred, we can only speculate as to why some schools grew. Many schools may have had their capacity increase as non-capacity spaces were utilized for classrooms. But changes in capacity can reflect the repurposing of a building or the bringing back on line of former unusable space. Two examples are the following:

- Beacon High School, located in CSD 3 in Manhattan, is a very popular school whose utilization rate has ranged from 119% to 166%. From SY 1997–98 to SY 2002–03, the school’s capacity ranged from 524 to 560 students – reflecting an addition of one classroom. One could postulate that a non-capacity space for programmatic support was repurposed as classroom space. But in SY 2003–04, Beacon’s capacity jumps to 849. It then hovers between 824 and 874 over the next five years. What changed? A Committee on Special Education (CSE) occupied space in the basement was moved to another administrative site. Beacon was then able to repurpose the basement space for classroom use, increasing its capacity.
- PS 40 is an elementary school located in CSD 2 in Manhattan. From SY 1997–98 to SY 2002–03, capacity at the school ranged from 798 to 959. But in SY 2003–04, capacity rose to 1,074. It ranged from 1,006 in SY 2005–06 to 1,037 in SY 2006–07. PS 40 – a victim of the lean capital times following the deep school cuts of the 1970’s — had previously had the entire fifth floor of the building declared unusable because of roof damage and the need to repair the parapet and re-point the building. When the 5th floor was finally restored for classroom use, the school’s capacity increased.

So surely, among the more than half of the schools that realized significant jumps in their capacities, there are legitimate changes like Beacon High School and PS 40. But there are also the schools where growing enrollment drives the repurposing of programmatic support spaces. Yet the ECU Report does not permit a reader to distinguish any of the reasons for the sizable increases – nor for the decreases that other schools have experienced during the study interval. Understanding *why* changes are made is at least as important as understanding *what* changes are made, yet the ECU does not provide sufficient information to discern cause for school-use changes, limiting the document’s usefulness to non-DOE users who wish to comprehend school changes.

QUESTIONS IN ONE SCHOOL PERTAIN TO ALL SCHOOLS

In early April 2010, CFE was contacted by the PS 15 parent community in Brooklyn's District 15 to develop an independent analysis of the utilization of the PS 15 school building. The Department of Education estimated that the school building, which is shared by PS 15 and the PAVE charter school, had sufficient space for increasing the PAVE charter school organization by six additional full classrooms, three 'cluster' rooms (for specialized instruction like science, music, or art), and two half-size rooms (for support services or for smaller special-education classes). PS 15 parents in the community sought an objective assessment to compare with the DOE's projections.

CFE asked Mary Filardo, Executive Director of the 21st Century School Fund, to provide an independent analysis. Ms. Filardo is a national expert on school facilities and has participated in school planning as it related to co-location of schools in Washington, DC and other urban centers.

After reviewing PS 15's Annual School Facilities/Turn-Around Document, School Organization Charts, Official Class Information Lists and a Floor Plan for the building, CFE and Ms. Filardo performed a walkthrough of the entire building. Ms. Filardo also recruited and secured help from a project management firm in the DC area.

Ms. Filardo's extensive analysis concluded: "My overall impression is that even following the most optimal collaborative planning process and support from DOE, that it will not be possible for PS 15 to support the continued expansion of PAVE [, a co-located charter school in the PS 15 building,] per the DOE proposal. I think it may be possible to free up space equivalent to 1 [full] classroom and one half-classroom without having a negative effect on PS 15." Filardo documented much less available space than the DOE estimate suggested. CFE supported the findings of this analysis.

The practical evaluation of school building utilization is part of CFE's ongoing work. Irregularities and open questions regarding the ECU Report for PS 15 underscore systemic questions about the effectiveness and integrity of the DOE's critical school-use reporting tool, prompting the wider scrutiny of the current study.

Methodology

OVERVIEW

This report examines 12 years of building-specific capacity data in the New York City Department of Education/School Construction Authority's Enrollment Capacity Utilization (ECU) Reports for the school years 1997–98 through 2008–09. DOE/SCA recently released the ECU Report for the 2009–10 school year; this report was in final draft when the new ECU Report was issued. This report does not incorporate data from this new report. All of the data used in this report are publicly available. CFE has not independently verified any of the data.

The report:

- Investigates how capacity has changed in school buildings over a 12-year period;
- Analyzes capacity changes City-wide, borough-wide, and on a district level for elementary and middle schools, and City-wide and borough-wide for the high schools;
- Identifies all schools with new additions;
- Identifies temporary structures as a subset;
- Analyzes schools with large capacity changes (at least 100 seats in any two-year period), and schools with capacity changes of 25 seats or greater in a two-year period;
- Investigates potential reasons for capacity changes.

CFE DATABASE

The analysis in this report relies upon a database that CFE has created for every public school building utilizing the 12 years of data contained in the ECU Reports, and includes information on 1,455 instructional buildings – main school buildings and the temporary structures associated with them. This number includes all educational buildings that were in existence and appear in an ECU Report for at least one year. Not included in this analysis are buildings that are no longer being used for educational purposes, buildings that house special programs outside of the five boroughs and buildings that house a specialized space only that is used by a school organization housed in a separate building. Some schools are no longer in use that existed in previous years and other schools were created within the study's 12-year time span; data are analyzed for the years the schools have been in existence. However, there are a number of schools that are primarily temporary structures that were in use for only a few years, generally, in the

early years of the ECU Reports available to CFE. These school buildings are not included in the database.

For all school buildings the database includes: identifying data (Building ID, borough, district, grade level, school name), the number of educational organizations and non-classroom organizations in the building, and enrollment and historical capacity for each of the 12 study years. For the purposes of this study, organizations are entities that occupy school buildings – they can be educational organizations (e.g., schools) or non-educational, like DOE satellite offices, community-based organizations, and a school’s sponsors or partnering organizations, which have no formal capacity or enrollment. All school buildings contain at least one classroom organization; many contain more.

The following information was developed for this report and is now part of the core database. It includes four measures of the difference in capacity for each two-year period:

- **Net Change In Capacity:** The increase or decrease for each two year period;
- **Aggregate Change in Capacity:** The absolute value, or magnitude, of the capacity change over time of all seat fluctuations;
- **Net increases/decreases larger than 25 seats;** and
- **Aggregate change in 25-seat increments.**

In addition, we also identified the following variables:

- A variable for whether the building had one school organization or several and, if there were multiple organizations, whether these organizations changed over the 12 year period;
- A variable for the number of years the building was overcrowded;
- A variable to indicate whether new seats were added and the number of new seats added; and
- A variable to indicate whether a building is a temporary structure or a main school building.

MEASURES OF CHANGE ANALYZED

Net change over 12 years: This is the most straightforward way of approaching capacity change. The increase or decrease in seats in a school over the 12-year period is calculated showing the difference in capacity between the 1997–98 and 2008–09 school years.

Aggregate change over 12 years: Aggregate change is the sum of the magnitude of all the capacity changes over a 12-year period whether the change is positive or negative. This measure captures the levels of internal fluctuation within a school's 12-year history which may be significant and are often masked if only net capacity were measured.

Year to year net increase or decrease: This measure provides the data on a school building's capacity increases or decreases between two school years. It tracks the changes – both large and small – in a building's capacity. This measure can also be tested for correlation with changes in enrollment or utilization rate. This measure is key to the analysis undertaken in this report.

Year to year aggregate change: Similarly, this measure identifies the overall change in a given year. This measure is important for isolating which years had major fluctuations. This measure is key to the analysis undertaken in this report.

Percentage of Aggregate Change Attributable to Net Change: This measure distinguishes between schools that show high levels of net capacity change due to growth or decline from schools that have high levels of capacity fluctuation, i.e., aggregate change. Since one of the stated purposes of this report is to advocate for more transparency in the City's capacity data, locating places in the school system where large fluctuations occur with limited net results is a critical part of this analysis.

UNIT OF ANALYSIS FOR MEASURING CHANGE

Two basic units are used to measure capacity change in this report. The first, Seats, refers to the actual number of seats by which a school's capacity increases or decreases. The second, Classroom, represents a unit of 25 seats – the relative capacity of a single classroom — to allow assessment of how many hypothetical classrooms were added or removed in a given period. An important focus of the analysis was to identify schools that had large changes in capacity (100 seats or more).

TARGETED VS. HISTORICAL CAPACITY

The ECU Report provides both historical and target capacity. Historical capacity, which has been consistent over the 12-year study period, is calculated according to standard class sizes published in the ECU Report. Targeted capacity, which projects class sizes lower than historical class counts, integrates class size modifications that have changed over time.

This report utilizes historical capacity data, because it is the only consistent approach to calculating capacity and utilization for the entire 12-year period. Although targeted capacity reflects current DOE room and school standards as they have evolved over the last six years, only historical capacity provides an accurate picture of capacity shifts over the 12 years.

RESEARCH QUESTIONS

Some of the major questions that this report sought to answer include the following:

- How do variations in net and aggregate change at the district level affect capacity?
- Are schools in a certain borough/district disproportionately represented?
- Are there differences among the various school levels?
- Are there peak years of change?
- Over a 12-year period, is there correlation between schools that have high levels of net change and may also have high levels of aggregate change? Are there other correlations between net and aggregate change?
- How does an addition to an existing building affect capacity?
- Are schools that change organizations or have multiple organizations disproportionately represented?
- What is the pattern of change in temporary structures?

POTENTIAL CAUSES FOR CAPACITY CHANGES

CFE examined several conditions to understand potential causes for the capacity changes:

- The impact of new additions to existing school buildings. The report identified when new additions were built and the resulting change in capacity.
- The number and capacity of temporary structures changes over time and the potential relationship to the capacity of all buildings is examined.
- Repurposing or restructuring a building to create a campus for multiple schools. Many buildings have been carved into schools that house multiple organizations. This report looks at how a building reorganization affects net and aggregate capacity changes.
- Single organization schools are buildings that have housed a single educational organization for the entire 12 year period. The analysis looked at whether these buildings have more stable capacity.

The ECU Report has been criticized for over-stating a school's capacity. In addition to the issue of potential overstatement, the ECU also reports significant amounts of unaccounted capacity change. At present it is difficult to understand how much capacity growth is tied to the addition of new seats or the conversion of non-classroom uses to

classroom use solely from the ECU. Even efforts to pair DOE/SCA's capital reports with the ECU data are imprecise at best. Additionally, it is unclear how substantial fluctuations in reported capacity at the borough, district, and school level actually relate to the utilization and conditions of schools buildings. This information is essential to a wide array of stakeholders including administrators, parents, and teachers, as decisions about school and building programming are enacted.

Appendix A offers detailed information on data sources, this report's approach to analysis, and measures of change to provide a comprehensive understanding of the methodology used in this report.

Findings

The annual Enrollment-Capacity-Utilization (ECU) Reports are critical in documenting where the 1.1 million students enrolled in the New York City public school system attend school. These reports identify all of the school buildings and other spaces that the country's largest school system uses for educational purposes. With multiple year reports it is possible to see how enrollment and capacity shifts over time. CFE has the ECU Reports for 12 years from SY 1997–98 to SY 2008–09 and the following section examines the data in these Reports in detail over this time frame.

This report analyzes enrollment, capacity and utilization data for 1,455 school buildings – 1,006 elementary buildings, 211 middle school and 238 high school buildings - with its primary focus on the capacity changes in these school buildings over time.⁸ The 1,455 school buildings include main school buildings and the temporary structures associated with them. With 12 years of ECU Reports available, it is possible to analyze how the school buildings expand and contract over time and then to broaden this analysis to district, borough and Citywide bases for each school level.

The findings that follow demonstrate the complexity of New York City's school system and raise serious questions about the quality and transparency of the data in the ECU Reports. CFE focuses on the capacity shifts in this report and developed two key measurements for this analysis:

- **net change**, the difference in the number of seats in a school building in a two year period; and
- **aggregate change**, the total change in the number of seats in a school building in a two-year period, regardless of whether the capacity increased or decreased in any year.

The use of the capacity calculation on a school, district and borough levels is a crucial element in many of the most important decisions the school system makes on its space use and needs – the amount of space needed to house a school or to expand a school in any given year, where to build new schools and increasingly this information has become crucial in decisions on co-location of schools in buildings identified as under-utilized in the ECU Reports. And for parents the availability and accuracy of this data assist in their decisions in choosing schools.

Understanding what stories this data tells and the conclusions that can be drawn are crucial for all space planning issues that the Department of Education makes as well as providing information to parents, educators,

⁸ See *Methodology* for further details about the 1,455 school buildings examined in this report.

elected officials and the public. Illuminating the changes in the capacity data in the ECU Reports is CFE's focus in this report.

NET CAPACITY CHANGE

One of the primary measurements CFE developed for looking at capacity shifts, **net change**, is the difference in the number of seats in a building over any two-year span. Accordingly, this section examines both positive and negative net change at the school building level, to identify gains and losses at each of the 1,455 buildings analyzed in this report. The number 1,455 represents the total number of educational buildings containing capacity spaces that are listed for at least one year in the ECU Report during the 12 years analyzed. Because of the addition of new school buildings during this period and the removal of other structures, the total number of school buildings varies annually.

Within 12 years of reports, there are 11 two-year periods, describing changes over two consecutive school years that are examined. This report analyzes the net change at the building level; for buildings housing multiple schools, the pattern of net change for each school organization in a shared building or campus may not follow the same pattern as experienced at the overall school building. Net change does not include seats gained through the addition of new school buildings accept if their capacity changes over time or lost through the removal of a building from the system.

Over the 12 year period net capacity change increased by 75,132 seats in the 1,455 school buildings, leased spaces and temporary structures examined in this report. But actual capacity growth was not universal. More than half — 846 of the 1,455 buildings — increased their net capacity change, while 564 experienced decreases. Forty-five school (45) buildings did not experience any net capacity change. For school buildings that experienced a decrease in the number of seats, the average size of this loss was 65 seats, though losses ranged from a single seat to a 792-seat loss. School buildings that experienced net capacity gains had an average increase of 132 seats. As with school buildings that experienced a decrease in the number of seats, the size of the changes varied greatly. The smallest gain was a single seat and the largest was a gain of 1,089 seats.

The following example of the changes in a Brooklyn middle school, IS 14, illustrates how net capacity change – the change recorded over two school years – was calculated to track fluctuations in a school's capacity over a given period of time. IS 14 is a single organization building; there are no other schools occupying this building during the 12 years examined.

	CAPACITY AS REPORTED 97-98 ECU REPORT	CAPACITY AS REPORTED 98-99 ECU REPORT	CAPACITY AS REPORTED 99-00 ECU REPORT	NET CAPACITY CHANGE CALCULATED BTW 97-98 AND 98-99	NET CAPACITY CHANGE CALCULATED BTW 98-99 AND 99-00	TOTAL NEW CAPACITY CHANGE CALCULATED BTW 97-98 AND 99-00
I.S. 14	1451	1333	1438	-118	105	-13

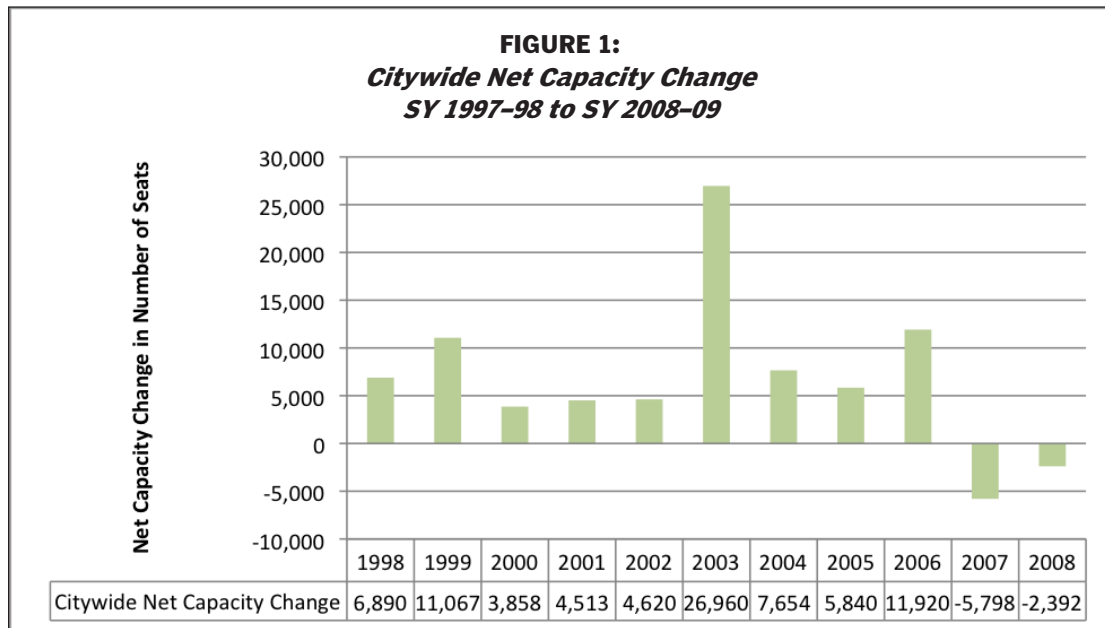
The net capacity change for 1998 represents the difference in seats between SY 1997–98 and SY 1998–99. Between the beginning of SY 1997–98 and SY 1998–99, the capacity of I.S. 14 had decreased by 118 seats. But by the next year (SY 1999–2000), the capacity of the school increased by 105 seats. These two sizeable, opposed capacity changes effectively blunted IS 14’s total capacity change, for a decrease of 13 seats between SY 1997–98 and SY 1999–2000.

CITYWIDE NET CAPACITY CHANGE

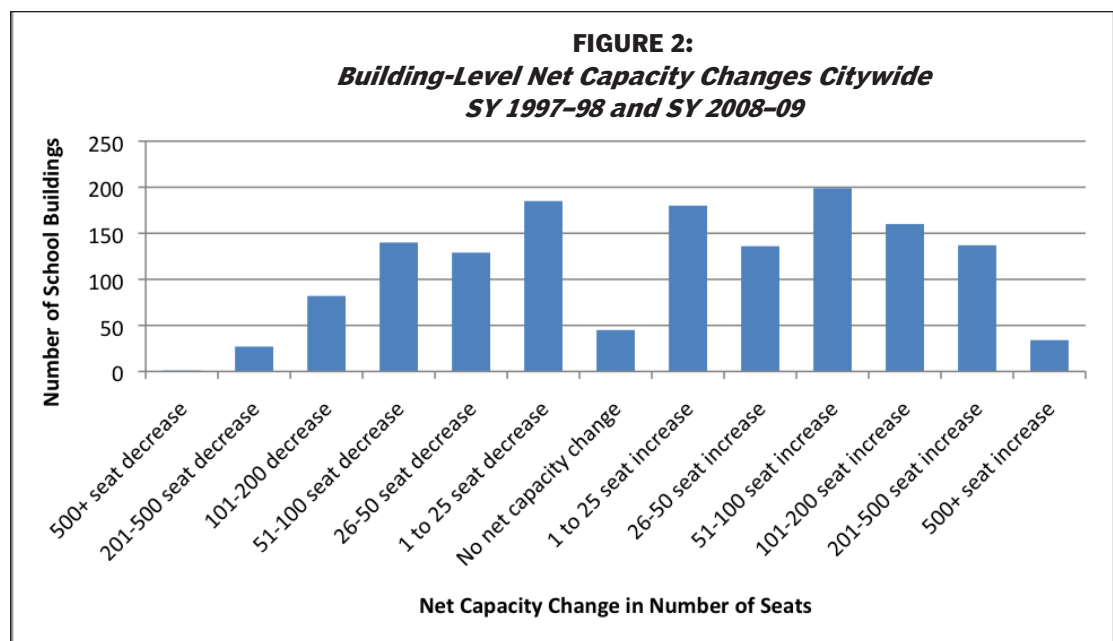
Citywide net capacity change includes all buildings and temporary spaces at the 3 school levels—elementary, middle and high schools—listed in the ECU Reports during this 12-year period. The Citywide analysis provides a framework for the detailed discussions of net capacity change that follow on the school level and borough and district levels.

The Citywide analysis examines the net capacity change for each year. This section also provides the magnitude of the change on a building level – how the 1,455 buildings experience change over this time frame.

Converting the net counts into 25-seat (one class) increments, the following chart illustrates the number of school buildings expressed as ranges from no change to a net capacity change over 500 during the 12-year study period: There are eleven two year intervals in the 12 year period. In the following chart and in subsequent charts and graphs throughout the report, each year listed is the 2nd year of the interval and the net capacity change is the change between the two years. For example, the citywide net capacity change below the year 1998 is the change in the capacity figures for the 1997–98 and the 1998–99 school years.



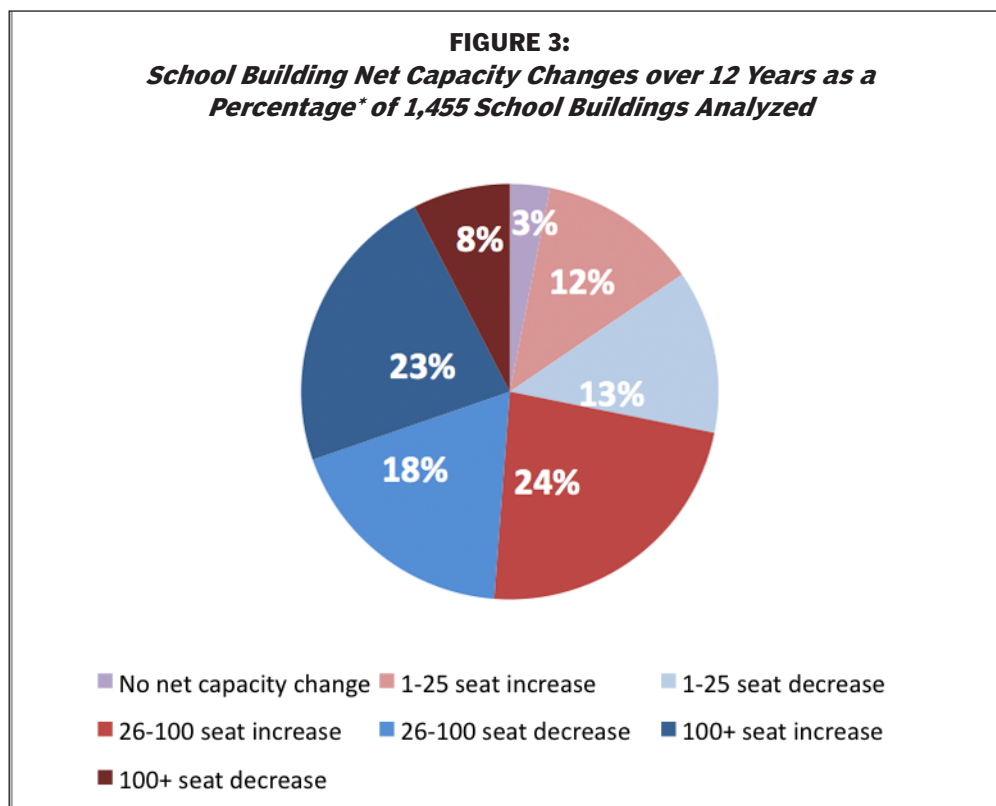
- Total net capacity change citywide was 75,132 seats
- Peak year for net capacity change was 2003 with capacity growth of 26,960 seats. The average annual change in net capacity for the entire period was 6,830 seats.
- Net capacity increased for nine consecutive two-year intervals from 1998–99 through 2006–07 followed by two years of decreases in 2007–08 and 2008–09.
- Between SY 2005–06 and 2006–07 the city gained 11,920 seats. The next year it lost 5,798 seats, 49% of its prior year gain. Including the loss of capacity the following year, the city lost 69% of the capacity it gained in the 2006–07 school year by the end of the 2008–09 school year.



- More schools had increases than decreases over the 12 years: 846 schools with increases and 564 with decreases.
- 339 schools had changes of 51–100 seats, the category with the greatest number of schools; 199 with increases and 140 with decreases.
- The number of schools that had a 1-25 seat increase is 180 schools and 185 schools with a 1-25 seat decrease are the next two highest categories. The capacity changes in these two categories almost cancel each other out.
- There are 265 schools that had increases between 26 and 50 seats; 136 of these schools had increases and 129 had decreases.

- The next highest category with the most schools are those with an increase of 101–200 seats; 242 schools are in this category that include 160 schools with increases and 82 with decreases.
- There are 171 schools with increases above 200 seats.
- 28 schools with decreases above 200 seats.
- 45 schools had no change in capacity.

The following chart expresses these categories of net capacity change as percentages of the total pool of schools examined.



*Due to rounding, the percentages above add up to more than 100%.

Examining the net capacity changes for the eleven two year periods, between SY 1997–98 and SY 2008–09 school years finds:

- Nearly one third (30%) of all school buildings - 441 buildings - experienced a net increase or decrease of over 100 seats (four classrooms) during at least one year of the 12-year period analyzed.
- 42% of school buildings – 604 buildings - had changes (increases or decreases) of 26 to 100 seats (two to four classrooms).

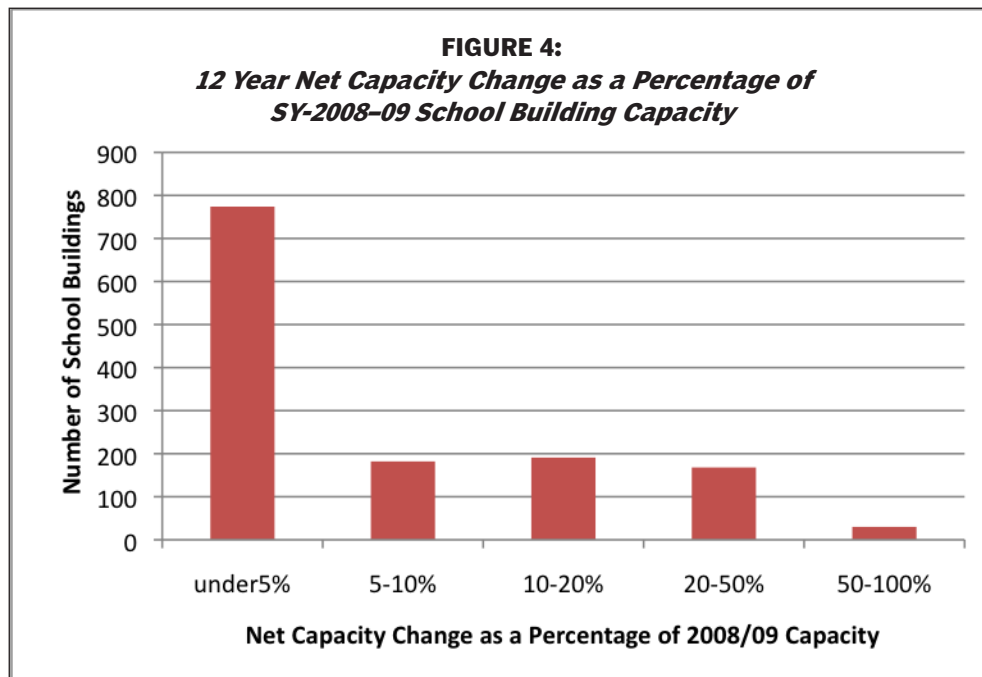
- 25% of school buildings – 356 buildings - had changes of 25 or fewer seats, roughly the equivalent of one classroom.
- 3% of school buildings – 45 buildings – experienced no change.

When considering capacity changes in individual schools, it's important to understand that the gain or loss of classroom space is more or less significant, given the size of the individual school. While changes may appear modest or extreme, understanding the impact of capacity changes as they relate to individual schools requires an appreciation of the school's size, and the understanding that changes of similar magnitude affect different-sized schools in different ways. Four classrooms of change in a large school of 3,000, while substantial, have far less impact than it might in a small elementary school of 300 students. At a new secondary school (spanning grades 6 – 12), gaining five classrooms is the equivalent of adding an extra grade, because young schools 'grow up the grades' as students earn promotion.

Though this report uses "classroom" as a unit of measure, it should be noted that a unit of 25 seats does not always translate into an actual classroom. For example, a 25-seat increase could be distributed across several different classes or grades. In a building that formerly housed a K-5 organization but is now structured as a K-8 school, there may be fewer sections of grades K-3 and instead more classrooms with grades 4-8 which have larger class sizes than K-3. As a result, the capacity of the school would increase and be spread over a number of classrooms. In such a case, the number of physical classrooms remains the same, despite a rise in how students are counted. In the current analysis, classroom or "classroom equivalent" is another way to understand the scale of change.

To better understand the impact of capacity change on an individual school, the following frequency chart presents 12-year net capacity change as a percentage of a school building's SY 2008–09 capacity.⁹

⁹ The database of 1,455 consists of all buildings and temporary structures in use at any point during the 12 year period but in SY 2008–09 only 1,344 buildings and temporary structures had capacity. Of the 99 buildings that had no SY 2008–09 capacity, 39 had net decreases, 31 had no net change, and 29 had net capacity increases over the entire period that these buildings were listed in the ECU Reports.



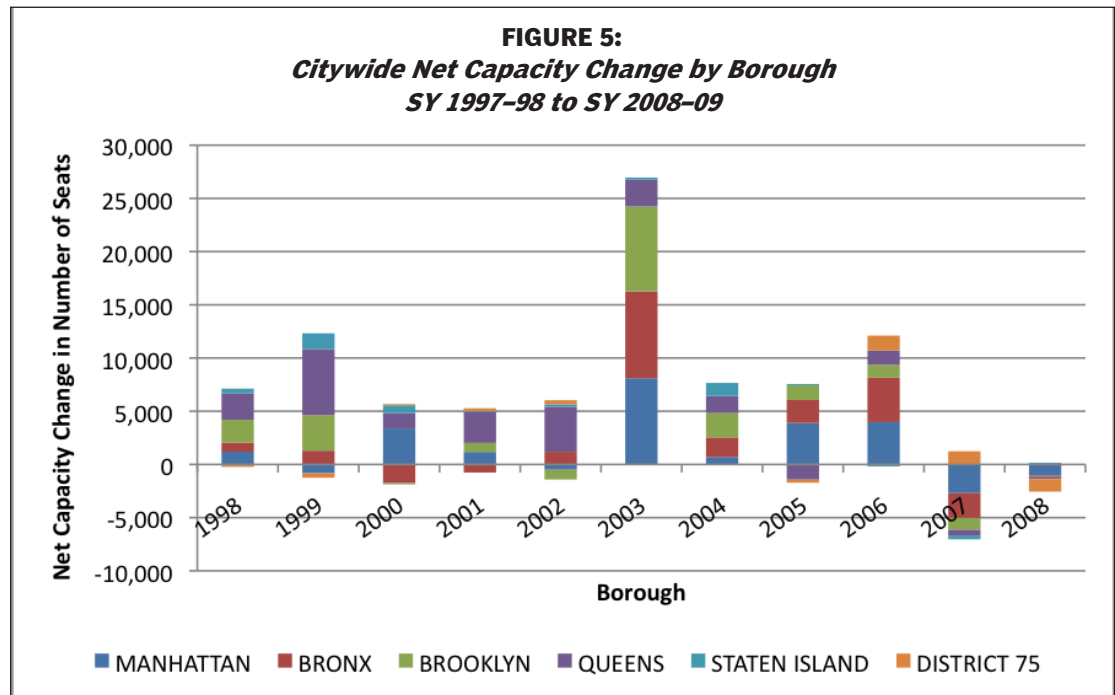
While most schools did experience small amounts of capacity change relative to their size, 15% of the schools - 189 schools - experienced a capacity shift – either an increase or decrease - equivalent to 20% of their size or greater in the 12-year period analyzed. Fourteen percent of school buildings (14%) - 191 - experienced net change equivalent to 10–20% of their SY 2008–09 capacities. Seventy-one (71%) of the school buildings - 956 – had a net capacity change of 10% or less over the 12 years using the 2008–09 building capacity as the base.

CITYWIDE NET CAPACITY CHANGES BY SCHOOL LEVEL AND BOROUGH

Analyzing the capacity changes by borough and by school level provides a more detailed examination of how and when capacity changes occurred. By understanding where and when these shifts occurred, it is possible to consider some of the factors that drive or influence major changes in capacity. For this section of the analysis, buildings are presented by school level.

CITYWIDE NET CAPACITY CHANGE BY BOROUGH

The following section discusses how capacity changes over time in the boroughs. With a school system spread out over 5 boroughs, the shifts in capacity vary geographically. Change on a borough level can also have dramatic changes from year to year. In 2004 Queens had a significant capacity increase followed by an almost equal decrease the following year. District 75 is included in the borough analysis; many of its programs are borough-wide.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	1,197	-824	3,384	1,173	-504	8,099	698	3,899	3,978	-2,697	-1,053	17,350
BRONX	861	1,292	-1,762	-761	1,188	8,169	1,846	2,152	4,181	-2,331	-157	14,678
BROOKLYN	2,138	3,334	-53	847	-912	7,972	2,279	1,381	1,203	-1,112	-36	17,041
QUEENS	2,476	6,204	1,435	2,939	4,237	2,512	1,605	-1,431	1,344	-531	-131	20,659
STATEN ISLAND	451	1,490	745	56	230	208	1,226	125	-188	-366	162	4,139
DISTRICT 75	-233	-429	109	259	381	0	0	-286	1,402	1,239	-1,177	1,265
TOTAL	6,890	11,067	3,858	4,513	4,620	26,960	7,654	5,840	11,920	-5,798	-2,392	75,132

- Queens had the greatest net capacity change of 20,659 seats, 27% of the total City-wide net capacity change of 75,132 seats.
- Manhattan had the second highest net capacity change with a total of 17,350 seats followed by Brooklyn with 17,041 seats, the borough with the greatest number of school buildings of any of the boroughs.
- The Bronx had the second smallest growth of the 5 boroughs with a net capacity increase of 14,678 seats.
- Staten Island had the smallest increase of the 5 boroughs with an increase of 4,139 seats.

- District 75, a City-wide program, experienced the smallest increase over the twelve years of 1,265 seats.
- In two of the 11 two year periods – 2003 and 2004, every borough gained capacity; District 75 had no change in capacity in these two intervals.
 - The number of seats gained in 2003 was three and a half times the number of seats gained in 2004.
- ◊ In 2007 there was a Citywide decrease in net capacity of 5,798 seats. In this year every borough lost capacity, there was an increase in District 75 only in this year, the second largest annual increase in District 75 in the 12-year period.
- ◊ In 3 of the 11 2-year periods – 1998, 2001 and 2006, only a single borough experienced a decrease annually:
 - District 75 experienced a decrease of 233 seats in 1998.
 - The Bronx had a decrease of 761 seats in 2001.
 - Staten Island was the only borough to decrease its capacity by 188 seats in 2006.
- ◊ Out of the 12 years examined, no borough lost capacity over fewer than two or more than four 2-year periods:
 - Manhattan, the Bronx, Brooklyn and District 75 each had 4 years of net capacity decreases.
 - Manhattan, Bronx and Brooklyn lost capacity in both 2007 and 2008.
 - Manhattan lost capacity in 1999, 2002, 2007 and 2008 with losses of 824, 504, 2,697 and 1,053, respectively, for a total decrease of 5,078 seats.
 - The Bronx's capacity decreased in 2000, 2001, 2007 and 2008. The pattern in the Bronx has two 2-year periods of decreases. The decreases were 1,762, 761, 2,331 and 157, respectively for a total reduction of 4,975 seats.
 - Brooklyn's capacity decreased 53 seats in 2000, 912 in 2002, 1,112 in 2007 and 36 in 2008 for a total decrease of 2,113.
 - District 75 experienced capacity decreases in 1998, 1999, 2005 and 2008 with a total decrease of 2,180 seats of net capacity. District 75 had a modest increase in net capacity of only 1,265 seats for the 12 years. There is no capacity change shown for 2003

and 2004 because there is no data for District 75 buildings in the 2003–04 ECU Report.

- Queens had 3 years of net capacity decreases.
 - In spite of having the highest net gain of any borough for the first five two-year periods examined, Queens experienced capacity decreases in 2005, 2007 and 2008 of 1,431, 531 and 131 seats, respectively, for a total loss of 2,093 seats. District 75 was the only other jurisdiction to lose capacity in 2005.
- Staten Island is the only borough to have lost capacity in only two years.
 - This borough lost capacity in 2005 and 2008 for a total decrease of 1,463 seats. Staten Island’s increase in capacity for the twelve years was 4,139 seats.

NET CAPACITY CHANGE BY SCHOOL LEVEL

The 1,455 school buildings examined break down by school level as follows:

- 1,006 buildings are elementary schools;
- 211 buildings are middle schools; and
- 238 buildings are high schools.

While this set of buildings examined encompasses all buildings and temporary structures at all levels and jurisdictions, including District 75 – Citywide Special Ed over the 12-year study period, not all of these buildings existed for the entire 12 years. This report identifies the school level as it is designated in the ECU Reports. However, school buildings designed to serve primarily one education level – for example, elementary school buildings – may share their premises with schools of other levels, as when a middle school is placed in an elementary school, or when a new high school is incubated (or permanently placed) in a middle school building. In addition, some buildings that are included among the elementary schools are K-8 buildings, and thus also enroll middle school students.

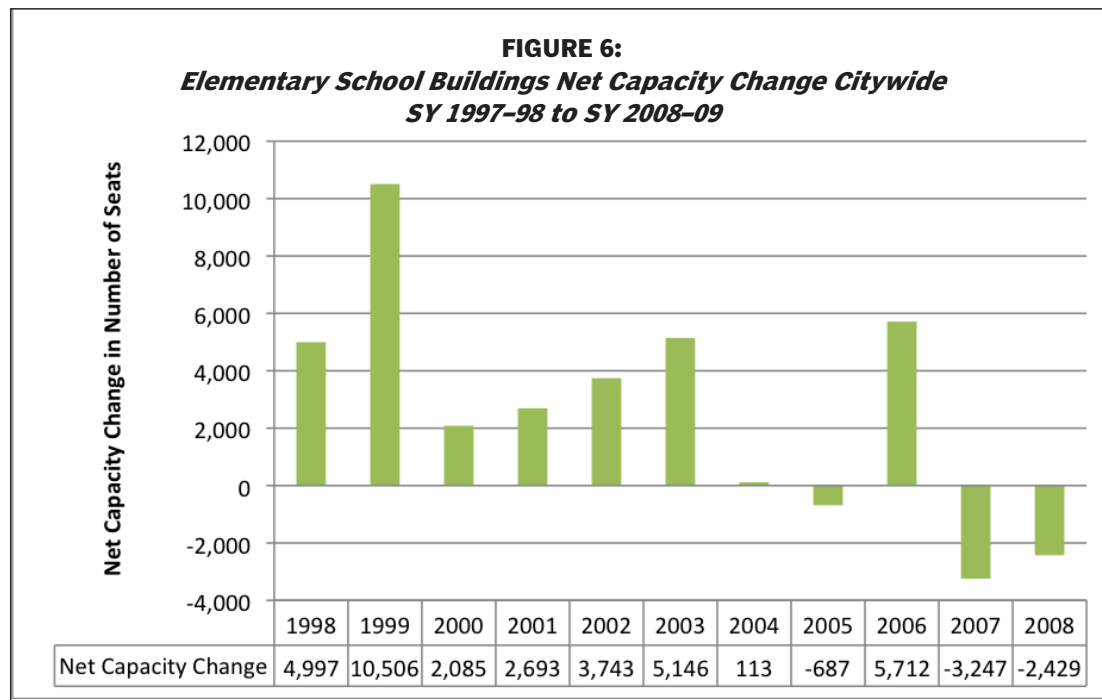
Elementary Schools

Elementary school buildings comprised 69% of the 1,455 school buildings examined in this report. In SY 1997–98, the ECU Report listed 870 main elementary school buildings and the temporary structures associated with them. Enrollment for that year was greater than the building capacity. Their capacity was listed as 552,872 seats, with a total enrollment of 556,469 students. By the end of the survey period, the balance had shifted. Total capacity in 950 buildings in 2008–09 was 618,732 seats, an increase of 11% or 65,860 seats, but enrollment had fallen to 505,026, a decrease of 51,443 students or 9.2%.

An estimated 37,228 seats were added by new buildings or acquiring new spaces. The other 28,632 seats were added to existing buildings via additions, reprogramming, space reconfigurations or other internal changes in building usage. The ECU Reports do not provide any clarification for capacity data as it changes over time. This second category of change - the 28,632 in net capacity change at the elementary level - is the focus of the following capacity change analysis.

Net Capacity Change Citywide

The following chart shows the rate and direction of capacity change of 28,632 seats in elementary school buildings between the 1997–98 and 2008–09 school years.



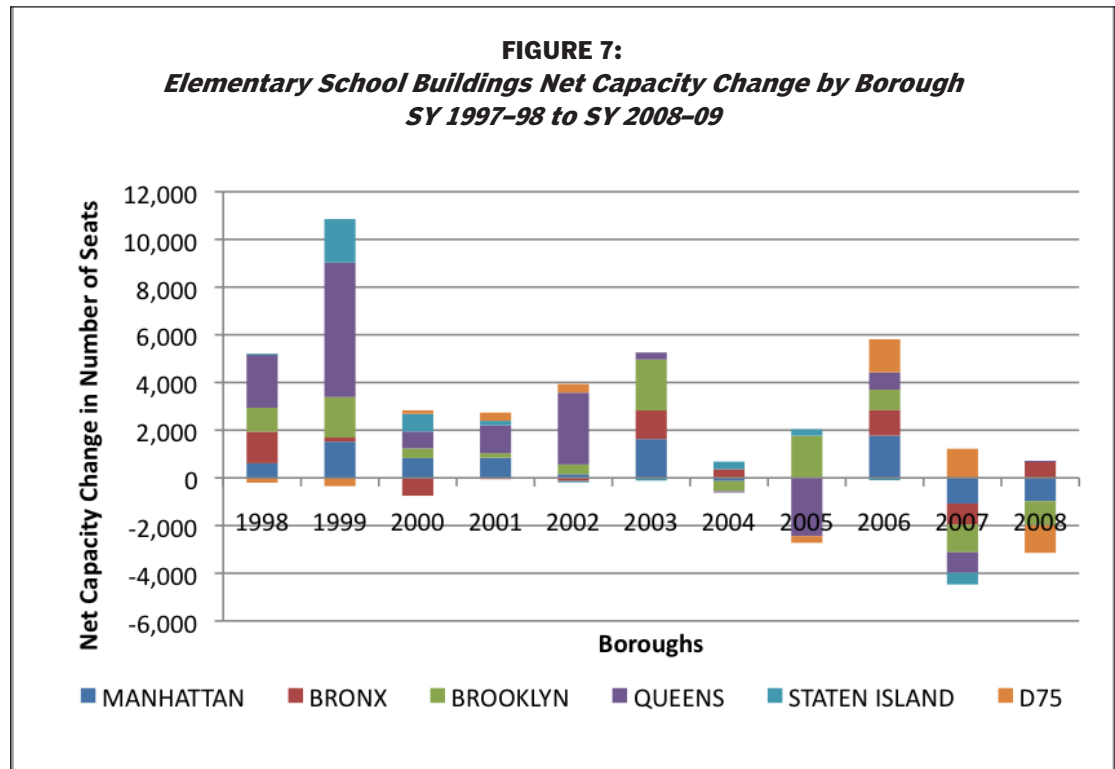
- Capacity at the elementary level grew Citywide in all school years except for 2005, 2007 and 2008.
- 1999 had the greatest increase in net capacity change of 10,506 seats. The smallest increase was in 2004 with a gain of 113 seats.
- Increases were posted every school year from 1998 through 2004 and in 2006 with a total net increase in building capacity of 34,995 seats during these years.
- The annual patterns of change in the elementary school buildings vary greatly over the 12 years. The decline in elementary school capacity was modest in 2005 with a loss of only 687 seats city-wide followed by a significant increase in 2006 of 5,712 seats, the year with the second highest growth. In just two years – 2007

and 2008, 5,676 seats were lost, almost the same amount that had been gained in 2006–07.

- A year of significant growth – 5,146 seats in 2003 – was followed by one year of very small growth – 113 seats in 2004.

Net Capacity Change by Borough

Examining elementary school net capacity change at the borough level reveals that capacity change was not consistent amongst the boroughs, nor did it uniformly increase or decrease over the same time periods in the different boroughs. District 75’s elementary buildings are analyzed as part of the borough discussion as many of District 75’s programs are organized on a borough-wide basis. The following graph and chart show elementary school buildings net capacity change at the borough level:



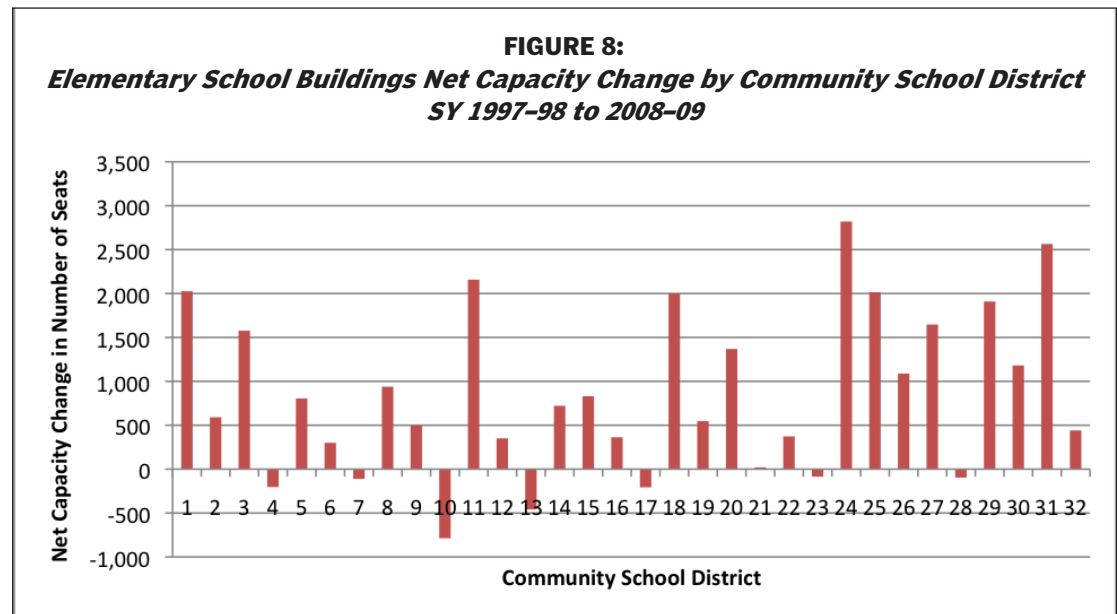
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	615	1,519	831	845	158	1,628	-134	-32	1,774	-1,074	-976	5,154
BRONX	1,325	173	-749	-44	-134	1,202	364	23	1,066	-883	704	3,047
BROOKLYN	1,002	1,697	409	190	405	2,132	-424	1,747	858	-1,160	-966	5,890
QUEENS	2,243	5,639	706	1,168	3,013	296	-11	-2,405	728	-859	11	10,529
STATEN ISLAND	15	1,825	738	191	-57	-112	318	266	-100	-494	-26	2,564
D75	-203	-347	150	343	358	0	0	-286	1,386	1,223	-1,176	1,448
TOTAL	4,997	10,506	2,085	2,693	3,743	5,146	113	-687	5,712	-3,247	-2,429	28,632

- During the 12 years analyzed, Queens had the greatest net increase in elementary school level seats - 10,529 seats - and also had the greatest single-year increase in 1999 of 5,639 seats. Despite a significant overall 12-year increase, Queens lost seats in 3 years with a loss of 2,405 seats in 2005.
- Brooklyn had a capacity increase of 5,890 seats, the second greatest increase of any borough. The greatest single year of elementary school capacity growth in this borough was 2003 with an increase of 2,132 seats – 36% of the total over the 12 years. In 2005, Brooklyn added 1,747 seats, the second-highest increase in the borough. These two years represented 66% of this borough’s 12-year net capacity increase.
- Manhattan had the third highest increase in capacity – 5,154 seats - at the elementary level. Manhattan experienced its greatest increase in capacity in 2006 with 1,774 seats.
- The Bronx had the second smallest overall net increase of the boroughs with a total of 3,047 seats of net capacity change over 12 years. The Bronx had significant capacity increases totaling 4,857 seats but decreases in 4 years totaling 1,810 seats.
- Staten Island had an overall increase of 2,564 seats, the smallest increase of the 5 boroughs. Staten Island lost capacity in 5 of the eleven 2-year intervals and had the smallest increase in a single year of any of the boroughs with a 15 seat increase in 1998.
- District 75 experienced a total increase of 1,448 seats over the 12 years. District 75 had its two years of greatest increases in 2006 and 2007 with 1,386 and 1,223 seats, respectively, followed by its greatest decrease of 1,176 seats in 2008. There is no capacity change shown for 2003 and 2004; that is the result of the lack of any data for District 75 buildings in the 2003–04 ECU Report.
- There was no one year in which all boroughs and District 75 gained capacity. In six of the eleven 2-year periods, only one borough or District 75 lost capacity – 1998, 1999, 2000, 2001, 2003 and 2006. 1999 was the year of the greatest increase in net capacity at the elementary level city-wide.

- In 2007 all 5 boroughs lost capacity. District 75 had a significant increase in net capacity in this year with an increase of 1,223 seats.

Net Capacity Change by Community School District

Examining net capacity change at the district level provides a better understanding of capacity changes geographically. On a local level net capacity change shifts dramatically across the boroughs; there is no set pattern even when using overcrowding as one measure. District 1 is not overcrowded but has experienced a large change in net capacity almost as much as District 11 which has had overcrowding during the 12 years. Total net capacity change at the district level is 27,184 seats; this number does not include the 1,448 seats in net capacity change that District 75 experienced. District 75 is the Citywide Special Ed jurisdiction that is not included in the district analysis because its programs are not district-based. The following graph and chart shows elementary school building net capacity change at the district level:



- Six districts had net capacity gains of over 2,000 seats over the 12 years. The greatest net capacity increases at the elementary level occurred in the following districts:
 - ◊ District 24 in Queens with 2,820 seats
 - ◊ District 31 in Staten Island with 2,564 seats
 - ◊ District 11 in the Bronx with 2,158 seats
 - ◊ District 1 in Manhattan with 2,026 seats

- ◊ District 25 in Queens with 2,015 seats
- ◊ District 18 in Brooklyn with 2,002 seats.
- Seven districts had net capacity losses – Districts 4, 7, 10, 13, 17, 23 and 28. The greatest net capacity decreases at the elementary level occurred in the following five districts:
 - ◊ District 10 in the Bronx with a loss of 787 seats
 - ◊ District 13 in Brooklyn with a loss of 458 seats
 - ◊ District 17 in Brooklyn with a loss of 207 seats
 - ◊ District 4 in Manhattan with a loss of 204 seats
 - ◊ District 7 in the Bronx with a loss of 111 seats.
- The remaining 19 districts all had increases in capacity over the period of less than 2,000 seats. The smallest increase was in District 21 in Brooklyn with 21 seats and the greatest increase in this category was in District 29 in Queens with 1,909 seats.

The following table shows year-by-year total net changes in elementary school building capacity by school district. Note that in some districts, gains and losses nearly balance out. While only seven districts lost capacity over the 12-year period, the majority gained seats, consistent with the overall growth in elementary school seats observed. (Every district lost seats on average 4.65 years with the range from 3 to 7 years.)

**ELEMENTARY SCHOOL NET CAPACITY CHANGE BY COMMUNITY SCHOOL DISTRICT,
SY 1997-98 TO SY 2008-09**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
1	98	-262	394	640	-273	736	63	-48	1,002	-334	10	2,026
2	158	113	93	162	0	121	-185	338	65	-206	-68	591
3	92	924	150	-10	306	124	-125	441	-27	-9	-289	1,577
4	-336	198	48	2	69	436	88	-323	254	-9	-631	-204
5	452	-29	152	57	141	224	299	-552	93	-306	274	805
6	153	570	-55	-6	-85	-13	-274	112	387	-210	-279	300
7	178	-446	-113	222	45	131	201	104	17	-225	-225	-111
8	223	16	-447	-264	-148	454	222	382	485	-120	136	939
9	199	197	-478	106	-18	18	38	526	-204	-195	308	497
10	395	-28	-156	-8	-419	310	-363	-479	109	-419	271	-787
11	38	343	408	-25	146	294	260	-29	289	275	159	2,158
12	292	91	37	-75	260	-5	6	-481	370	-199	55	351
13	-253	169	-29	-110	-266	306	-181	188	-252	114	-144	-458
14	-2	337	-131	-256	238	125	279	1,051	-580	-87	-253	721
15	259	182	30	-166	-46	76	50	172	169	104	1	831
16	-37	-59	-139	382	-149	515	-43	375	189	-487	-184	363
17	161	29	-37	-106	360	-160	-216	-420	195	0	-13	-207
18	8	1,140	295	44	-180	621	-13	399	-164	-146	-2	2,002
19	23	-110	-350	283	50	461	-195	-52	456	10	-28	548
20	320	-16	383	-9	614	-214	-25	129	196	-31	22	1,369
21	342	-28	85	-149	50	-18	-149	-5	326	-225	-208	21
22	-177	205	179	-82	-408	67	-215	69	571	54	110	373
23	199	-127	-131	352	178	69	376	-338	57	-474	-247	-86
24	308	2,164	-30	389	1,210	-461	-506	-219	-107	-164	236	2,820
25	-125	1,021	571	345	518	-99	409	-712	117	109	-139	2,015
26	65	109	194	-96	-143	205	80	517	-20	122	55	1,088
27	171	379	208	-27	974	385	209	-830	321	-190	47	1,647
28	352	561	-111	33	-49	203	-255	-1,018	406	-288	70	-96
29	584	1,056	-22	159	395	168	161	-272	238	-265	-293	1,909
30	876	365	-116	377	104	-105	-74	129	-227	-183	35	1,181
31	15	1,825	738	191	-57	-112	318	266	-100	-494	-26	2,564
32	157	-36	303	23	-32	284	-127	179	-305	8	-13	441
TOTAL	5,188	10,853	1,923	2,378	3,385	5,146	113	-401	4,326	-4,470	-1,253	27,188

- Net capacity increases were the greatest in 1999 with a total increase of 10,853 seats. In 1999 5 districts – Districts 18, 24, 25, 29 and 31 - had increases greater than 1,000.
- The preceding two-year period between 97-98 and 98-99 had the second highest increase in net capacity of 5,188 seats. In 1998, no districts had increases greater than 1,000 seats and 7 districts experienced decreases.

Three districts had total net capacity that changed the least for the entire period. The gains and losses over the 12 years nearly balanced out.

- ◊ District 21 in Brooklyn with an increase of 21 seats;
 - ◊ District 23 in Brooklyn with a loss of 86 seats; and
 - ◊ District 28 in Queens with a decrease of 96 seats.
- Two districts each had one year of no change in net capacity: District 2 in 2002 and District 17 in 2007.
 - Seven districts had annual net changes greater than 1,000 seats – District 1 in Manhattan, Districts 14 and 18 in Brooklyn, Districts 24, 25 and 29 in Queens and District 31 in Staten Island.
 - District 28 is the only district that had a decrease greater than 1,000 in a single year with a loss of 1,018 seats in 2005.
 - District 24 had the greatest increase overall of 2,820 seats. This district is the only district with an increase greater than 2,000 in a single year in 1999. District 24 had increases in only 5 of the 11 2-year intervals. Most of this district's increases occurred in only two years—1999 and 2002—with a total of 3,374 seats.
 - District 31 had the second greatest increase in net capacity with 2,564 seats. This district's greatest increase was in 1999 with 1,825 seats. District 31 lost capacity in 5 years and most of its increase occurred in 1999 and 2000.
 - Between 2006–07 and 2007–08, the greatest loss in net capacity occurred with a loss of 4,470 seats. Twenty-three districts experienced decreases in this year. Manhattan and Staten Island overall lost capacity. But gains were posted in:
 - ◊ District 11 in the Bronx with an increase of 275 seats even though the capacity in the borough overall fell by 1,158 seats.
 - ◊ Districts 13, 15, 19, 22, and 32 in Brooklyn all had increases for a total capacity increase of 282 seats but the borough's overall capacity fell by 1,614 seats.
 - ◊ Districts 25 and 26 in Queens had a combined increase of 231 seats while the borough's capacity overall fell by 1,090 seats in this year.
 - Between 2007–08 and 2008–09, net capacity in elementary school buildings decreased by 1,253 seats. In that year 17 districts lost net capacity. Manhattan, Brooklyn and Staten Island overall lost capacity.
 - ◊ Districts 1 and 5 in Manhattan had an increase in capacity of 284 seats while the borough overall lost 1,267 seats.

- ◊ In the Bronx only District 7 lost net capacity in this year with a decrease of 225 seats.
- ◊ Districts 15, 20 and 22 in Brooklyn gained a total of 133 seats while the borough lost 1,079 seats.

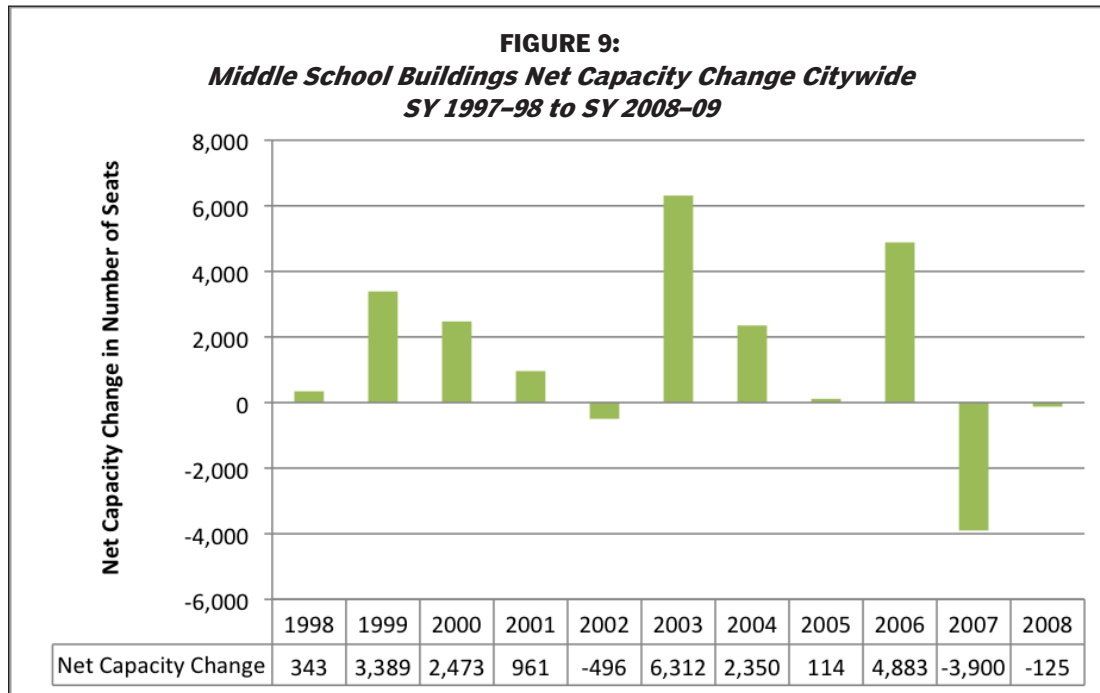
Middle Schools

At the beginning of the analysis period in 1997–98, New York City middle school buildings had a capacity of 232,812 and an enrollment of 199,850; in 1997–98 there were 198 middle school main buildings and the temporary structures associated with them listed in the ECU Report. Twelve years later, in 2008–09, 204 middle school buildings had a total capacity of 258,072 seats and an enrollment of 193,202 students. This represents an 11% increase – 25,260 seats - in total capacity and less than 4% decrease – 6,648 seats - in enrollment. The middle school buildings analyzed – a total of 211 buildings - experienced a net capacity change over this period of 25,260. An estimated 8,956 seats were added by new buildings or acquiring new spaces. The other 16,304 seats were added to existing buildings via additions, reprogramming, space reconfigurations or other internal changes in building usage. The ECU Reports do not provide any clarification for capacity data as it changes over time. This second category of change - the 16,304 in net capacity change at the middle school level - is the focus of the following capacity change analysis.

This analysis looks only at changes in capacity numbers to existing buildings in each two year period. Schools that may close or consolidate are not counted as net capacity additions, just as new buildings do not count as net capacity additions. In other words, a building must be in existence for two years before its net capacity change can be calculated.

Net Capacity Change Citywide

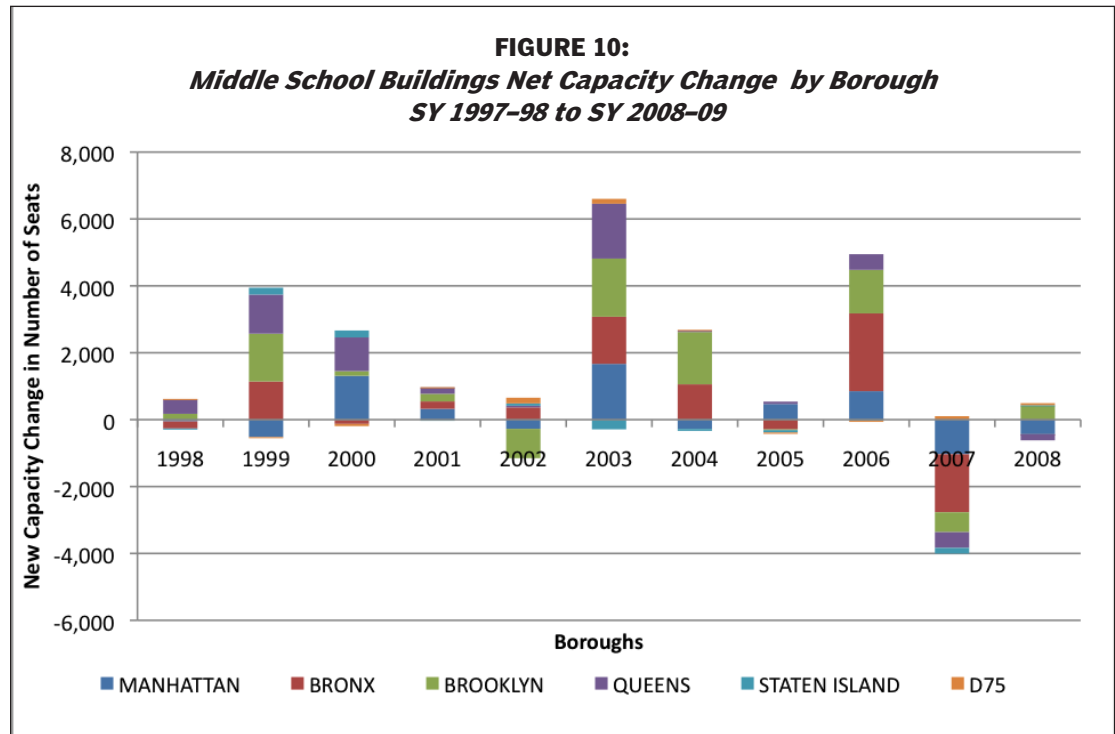
The following chart shows the rate and direction of net capacity change in middle school buildings between the 1997–98 and 2008–09 school years.



- Middle school buildings increased in capacity for 8 of the 11 two year periods. The three years with decreased capacity were 2002, 2007 and 2008. Elementary schools increased in capacity in 8 two-year periods also; elementary schools also decreased their net capacity in 2007 and 2008.
- As with elementary school buildings, the greatest single year of capacity growth for middle school buildings was 2003, when net capacity increased by 6,312.
- Like elementary school buildings, middle school buildings experienced net capacity decreases of 3,900 and 125, respectively, in 2007 and 2008. The decrease of 3,900 seats was the single greatest loss in net capacity in one year.
- Middle school buildings had their smallest increase of 114 seats in 2005. In this same year elementary buildings lost 687 seats.
- Middle school buildings also saw sizeable increases in capacity in 1999 and 2006 of 3,389 and 4,883 seats, respectively. These two increases represent the second- and third-highest years of capacity increases for middle schools during the 12 years.

Net Capacity Change by Borough

At the borough level, middle school capacity change varied widely over the 12 years. This borough analysis includes data for District 75 middle school buildings. Net capacity change at the borough level is much smaller than at the elementary level. The following graph and chart shows middle school buildings net capacity change at the borough level.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	-52	-521	1,311	324	-274	1,668	-276	469	852	-1,034	-437	2,030
BRONX	-212	1,142	-128	221	367	1,410	1,057	-292	2,325	-1,735	-1	4,154
BROOKLYN	175	1,429	141	228	-878	1,738	1,565	-23	1,302	-594	419	5,502
QUEENS	434	1,169	1,007	192	49	1,640	40	70	469	-471	-180	4,419
STATEN ISLAND	-14	204	207	-9	69	-290	-60	-69	-33	-171	14	-152
D75	12	-34	-65	5	171	146	24	-41	-32	105	60	351
TOTAL	343	3,389	2,473	961	-496	6,312	2,350	114	4,883	-3,900	-125	16,304

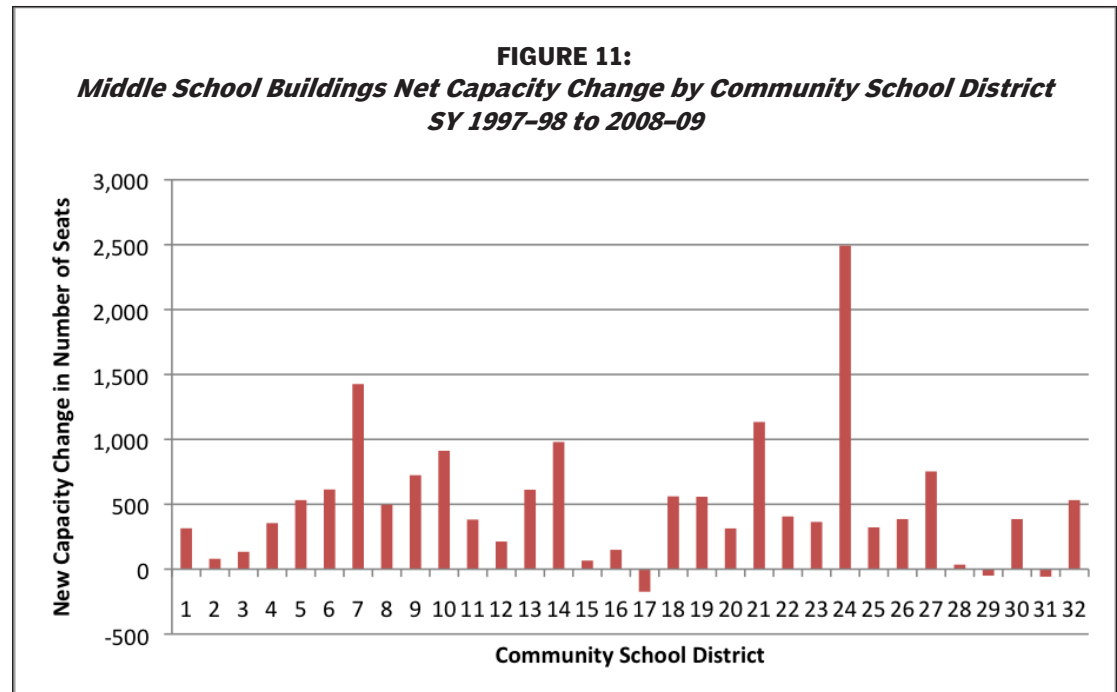
- Brooklyn’s middle school buildings had the greatest net capacity increase of any borough, with 5,502 seats added. Queens followed with an increase of 4,419 seats and the Bronx added 4,154 seats over the 12-year study period. Manhattan’s net capacity increased by 2,030 seats. District 75’s middle schools experienced an increase of 351 seats.¹⁰

¹⁰ Previously it was noted that there is no data for District 75 schools in the 2003-04 ECU Report. At the middle school level there is data for District 75 in this year as the middle school building – M047 – was listed in District 2. Other years it is listed in District 75. For consistency it has been analyzed as a District 75 building.

- Staten Island is the only borough with a decrease over the 12 years of 152 seats.
- The Bronx had increases greater than 1,000 seats in 4 years – 1999, 2003, 2004 and 2006 with an increase in excess of 2,000 seats in 2006. There was no other borough with an increase of this magnitude in a single year. The Bronx also had the single greatest annual decrease of any of the boroughs in 2007 with a decrease of 1,735 seats.
- Brooklyn had 4 years in which it experienced annual net capacity growth greater than 1,000. Brooklyn had the second single greatest annual increase of any of the boroughs in 2003 with an increase of 1,738 seats.
- Manhattan had the third highest annual net capacity increase of 1,668 seats in 2003. Manhattan had decreases in 6 of the eleven 2-year periods. Most of its capacity was gained in 2 years – 2000 and 2003.
- Queens lost net capacity in its middle schools in only two years – 2007 and 2008. All other boroughs experienced at least 3 years of decreases
- Staten Island’s middle school building capacity had very limited capacity change – a total net decrease of 152 seats – over the 12-year period. It also had decreases in 6 of the 2-year periods.
- District 75 had its largest increase in net capacity in 2002 with 172 seats.
- In 2003, the year with the overall largest increase Citywide, all of the boroughs except Staten Island and District 75 had increases in net capacity greater than 1,000 seats. Staten Island lost 290 seats in capacity in this year. At the elementary level, all boroughs except Staten Island also increased capacity.
- All of the boroughs except for District 75 lost capacity in 2007; the elementary buildings had the same pattern in this year.

Net Capacity Change by Community School District

Middle school buildings had a total net capacity change of 15,953 seats in 210¹¹ buildings. The following analysis shows that almost 16% of this net capacity change occurred in one district – District 24 in Queens. District 75 is not included in the district analysis as many of its programs are borough-wide. The following graph and chart show middle school building net change at the community school district level:



- Three school districts had net capacity increases in their middle schools of more than 1,000 over the 12 year period:
 - ◊ District 24 in Queens had the greatest increase in middle school seats with a total additional capacity of 2,493 seats.
 - ◊ District 7 in the Bronx had an increase of 1,426 seats.
 - ◊ District 21 in Brooklyn had an increase of 1,134 seats.
- Three districts had capacity losses. The greatest net capacity decreases at the middle school level occurred in the following 3 districts:
 - ◊ District 17 in Brooklyn lost 174 seats.
 - ◊ District 31 in Staten Island had a total decrease in net capacity of 58 seats.
 - ◊ District 29 in Queens lost 50 seats of net capacity during this period.

¹¹ There is one District 75 middle school building.

- The remaining 26 districts all had increases in capacity over the period. Ten of the 26 districts – Districts 5, 6, 9, 10, 13, 14, 18, 19, 27 and 32 – all had increases in net capacity greater than 500 seats but less than 1,000 seats.

The following table shows year-by-year total net changes in middle school building capacity by community school district.

**MIDDLE SCHOOL NET CAPACITY CHANGE BY COMMUNITY SCHOOL DISTRICT,
SY 1997–98 TO SY 2008–09**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
1	-56	-131	44	97	-93	159	-98	295	-163	111	150	315
2	110	162	-249	-29	192	81	29	-162	-63	134	-125	80
3	-162	-389	384	127	-249	439	147	257	-311	-72	-37	134
4	-149	-34	307	-65	212	405	-209	133	88	-188	-145	355
5	39	-333	734	62	-125	180	-159	60	139	-140	75	532
6	166	204	91	132	-211	404	14	-114	1,162	-879	-355	614
7	-8	53	16	-291	143	807	373	30	11	238	54	1,426
8	-104	75	-88	322	359	146	281	-6	432	-688	-232	497
9	10	421	-215	121	-332	196	56	-225	537	-56	211	724
10	39	508	51	-35	-147	387	98	-69	346	-305	39	912
11	108	-3	80	120	202	-126	159	58	468	-658	-26	382
12	-257	88	28	-16	142	0	90	-80	531	-266	-47	213
13	160	137	3	-126	-26	149	128	156	109	-72	-6	612
14	-145	28	-101	-9	-66	456	319	25	46	195	232	980
15	43	12	11	344	-550	277	255	-141	46	-273	42	66
16	-133	6	115	-192	-80	-1	245	-90	-102	-45	426	149
17	-200	75	-158	-78	-227	129	-57	56	481	-170	-25	-174
18	0	-4	20	-83	194	15	-71	172	44	359	-85	561
19	31	290	286	-24	-189	84	62	-163	228	31	-78	558
20	126	-60	136	-103	27	235	23	99	47	-74	-142	314
21	66	299	0	248	119	56	435	88	-40	-76	-61	1,134
22	-46	517	16	67	24	-32	20	-77	123	-67	-139	406
23	50	7	-8	52	-191	402	68	-237	144	-208	285	364
24	384	717	228	145	18	1,371	-6	57	164	-390	-195	2,493
25	5	-44	120	129	-27	136	7	-137	105	-16	44	322
26	-1	76	-5	28	-2	103	132	48	-128	135	0	386
27	-14	332	620	-64	65	-46	-215	123	147	-175	-20	753
28	-71	160	54	18	-74	-10	-64	189	-46	5	-126	35
29	-16	-33	20	68	37	86	2	-260	-12	-81	139	-50
30	53	-39	-30	-132	32	0	184	50	239	51	-22	386
31	80	204	207	-9	69	-290	-60	-69	-33	-171	14	-58
32	223	122	-179	132	87	-32	138	89	176	-194	-30	532
TOTAL	331	3423	2538	956	-667	6166	2326	155	4915	-4005	-185	15,953

- Between school years 2006–07 and 2007–08, the year of the greatest decline in net capacity in the middle school buildings, nine districts experienced middle

school capacity growth while net capacity at the city and borough levels decreased.

- ◊ Districts 1 and 2 in Manhattan gained 111 and 134 seats, respectively. The borough lost 1,034 seats in this year.
- ◊ District 7 in the Bronx gained 238 seats. The borough lost 1,735 seats in 2007.
- ◊ Districts 14, 18 and 19 in Brooklyn gained 195, 359, and 31 seats, respectively. The borough's overall capacity fell by 594 seats in this year.
- ◊ Districts 26, 28, and 30 in Queens gained 135, 5 and 51 seats respectively while the borough's net capacity decreased by 471 seats.
- ◊ District 19 in Brooklyn and District 26 in Queens also experienced net capacity growth at the elementary school building level in 2007.
- Between school years 2007–08 and 2008–09, 7 districts experienced middle school net capacity growth while net change at the city level and their borough level were decreasing in this period. Brooklyn and Staten Island gained capacity in this period.
 - ◊ Districts 1 and 5 in Manhattan gained 150 and 75 seats, respectively.
 - ◊ Districts 7, 9, and 10 in the Bronx gained 54, 211, and 39 seats, respectively.
 - ◊ District 25 and 29 in Queens gained 44 and 139 seats, respectively.
- District 24 had the greatest increase in net capacity growth with 2,493 seats. It also had the single greatest annual increase in 2003 with 1,371 seats. This district lost capacity in only 3 years – 2004, 2007 and 2008. At the elementary level District 24 also had the greatest increase in net capacity of 2,820 seats.
- Only 1 other district had an increase in a single year greater than 1,000 – District 6 in Manhattan in 2006.
- District 31's middle schools lost 58 seats of net capacity over the 12 years. The losses were not significant but they occurred steadily; this district lost capacity in 6 years with the greatest loss of 290 seats in 2003. The district's increases in net capacity were modest; they ranged from 14 seats in 2008 to 207 seats in 2000.
- District 17 experienced the greatest decrease at the middle school level of any district with a loss of 174 seats. The district lost capacity in 7 years but the increases in the other 4 years were modest ranging from 56 to 481.
- Five districts – District 2 in Manhattan with a gain of 80 seats, 15 in Brooklyn with an increase of 66 seats, 28 in Queens with an increase of 35 seats, 29 in

Queens with a decrease of 50 seats and 31 in Staten Island with a loss of 58 seats had gains and losses that nearly balanced out. Net capacity changed the least in these 5 districts for the entire period.

- Five districts – 12, 18, 21, 26 and 30 – each had one year where there was no change in net capacity.
- In 2007, 23 districts lost middle school net capacity, the highest number of districts with decreases in any one-year. This year was the greatest loss of middle school net capacity with a decrease of 4,005 seats. This was also the year of the greatest loss in elementary school capacity with a loss of 3,247 seats.
- In 2003, the year of the greatest gain in net capacity of 6,166 seats, 23 districts had net increases. At the elementary school level, the year of the greatest increase in net capacity was 1999.
- In 2006, the year with the second greatest increase of 4,915 seats, 23 districts had increases in net capacity increases. Elementary school buildings had its second largest increase in net capacity with a total of 5,712 seats in 2006.

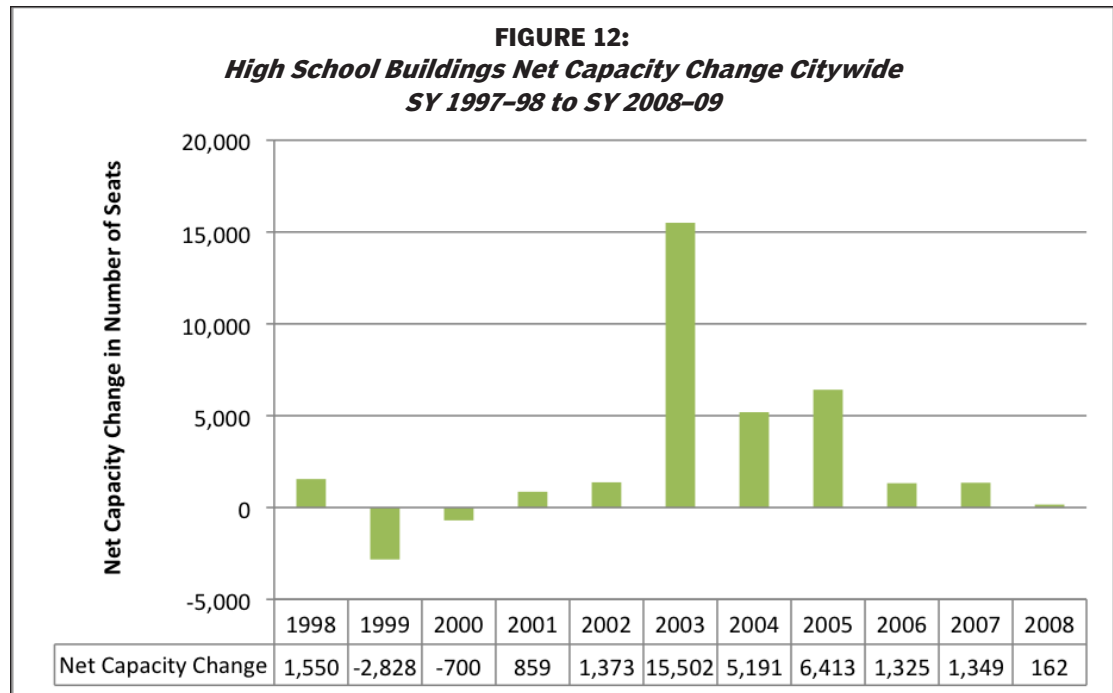
High Schools

Net Capacity Change Citywide

There are 238 high school main buildings and the temporary structures associated with them examined in this study. In SY 1997–98 there was a total capacity of 257,957 seats in 181 high school buildings and a total enrollment of 292,480. In 2008–09 199 high school buildings had a total capacity of 304,738 - an increase of 18% or 46,781 seats. In 2008–09 total enrollment fell to 291,750 which represents a 0.2% decrease or 730 students. Of the increase of 46,781 seats, 16,585 were added through the addition of new buildings, while 30,196 seats were added to existing buildings via additions, temporary spaces, reprogramming, space reconfigurations or other internal changes in building usage. The ECU Reports do not provide any clarification for capacity data as it changes over time. This second category of change - the 30,196 seats in net capacity change at the high school level - is the focus of the following capacity change analysis.

High school buildings have the greatest net capacity change of all 3 school levels with a net capacity change of 30,196 followed by elementary schools with 28,632 in net capacity changed and middle schools with 16,304.

The following chart shows the rate and direction of capacity change in high school buildings between the 1997–98 and 2008–09 school years.



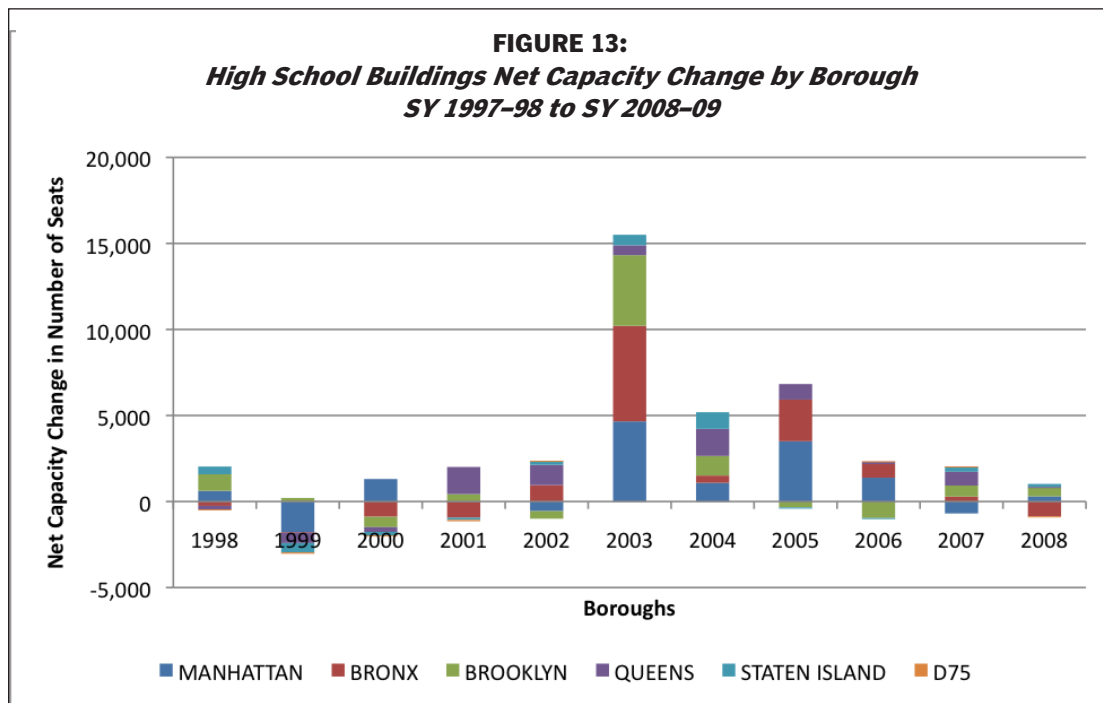
- High school buildings had increases in capacity for every two-year period except for 1999 and 2000 when there was a decrease. Increases were greater than 1,000 seats for 7 of these 10 two-year periods.
- In 2003, high school buildings added 15,502 seats – equivalent to a 5.5% increase over the SY 2002–03 capacity – the largest single-year capacity increase for any year at any school level.
- High schools experienced a significant net decrease of 2,828 seats in only one year – 1999 – followed by a modest decrease in 2000 of 700 seats. The increases of the next two years were only 2,232 seats; this lost capacity was not completely restored until the major increase in 2003.
- High school buildings also had additional substantial capacity increases in 2004 and 2005, with 5,191 and 6,413 seats added, respectively.
- Citywide net capacity increases peaked in 2003, the same year in which high school level capacity increases also topped out. Elementary buildings had their greatest capacity increase in 1999 and middle schools in 2003.

Net Capacity Change by Borough

Examining high school net capacity change at the borough level reveals that capacity change was not consistent amongst the boroughs, nor did it uniformly increase or decrease over the same time periods in the different boroughs. At the borough level,

high school building net capacity change differs from net capacity change at the elementary and middle school levels. There are years in which elementary and middle school capacity will rise in a borough while high school capacity drops and vice versa. The following analysis points out some of these relationships. It is also important to note that high schools are generally not tied to neighborhoods in the way that elementary schools are and to a limited extent middle schools are; student assignments in high schools are made according to a completely different process that is citywide. Because of these fundamental differences there will not always be expected correlations. However, the movement of cohorts of students through the public school system does have links particularly in terms of enrollment projections.

The following graph and chart shows high school net capacity change at the borough level:



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	622	-1,788	1,307	-1	-559	4,657	1,084	3,503	1,384	-694	300	9,815
BRONX	-252	-23	-885	-938	955	5,557	425	2,421	790	287	-860	7,477
BROOKLYN	961	208	-603	429	-439	4,102	1,138	-343	-957	642	511	5,649
QUEENS	-201	-604	-278	1,579	1,175	576	1,576	904	147	799	38	5,711
STATEN ISLAND	450	-539	-200	-126	218	610	968	-72	-55	299	174	1,727
D75	-30	-82	-41	-84	23	0	0	0	16	16	-1	-183
TOTAL	1,550	-2,828	-700	859	1,373	15,502	5,191	6,413	1,325	1,349	162	30,196

- All five boroughs have total net capacity increases over the 11 two year periods analyzed. Only District 75 high schools have a modest decline in net capacity.
- In 2003 and 2004, net capacity increased in each of the 5 boroughs. There was no net capacity change in District 75 high schools in these 2 years; the ECU Report for 2003–04 contains no data on District 75 buildings.
- In 2000 only Manhattan increases high school net capacity.
- In 2007, only Manhattan lost net capacity. Every other borough and District 75 gain high school net capacity.
- High school buildings in Manhattan, Bronx, Queens, Staten Island and District 75 all lost capacity in 1999, despite substantial net capacity increases in elementary and middle school buildings in those boroughs. This is the peak year for increases in the elementary school buildings. Only Brooklyn gained high school seats at the high school level in 1999. The peak year for high school buildings was 2003 with an increase of 15,502 seats; middle school buildings also had their greatest increase in this year with a total of 6,312 seats.
- High school buildings had their smallest increase in 2008. The pattern of change is different in the elementary and middle schools. Elementary schools had their smallest increase in 2004 and they also had decreases in 2005, 2007 and 2008. Middle schools had the smallest increase in 2005 and decreases in 2002, 2007 and 2008.
- Manhattan had the *greatest* high school building capacity increase over the 12-year study period – an increase of 9,815 seats; it had its greatest increase in net capacity in a single year of 4,657 seats in 2003. This increase was the second highest annual increase of any of the boroughs. Manhattan lost capacity in 4 years – a total decrease of 3,042 over the entire period. The borough gained capacity in excess of 1,000 seats in each of 5 years. At the middle school level

Manhattan had the smallest net capacity increase of any borough with 2,030 seats.

- The Bronx had the second-highest level of net capacity increase, adding 7,477 high school seats over the 12-year period with the addition of 5,557 seats in 2003. In 2002 and 2003, the Bronx added over 6,000 seats and then had another large increase in 2005 of 2,421 seats. The Bronx had the fourth largest increase in capacity in the elementary schools with 3,047 seats and the third highest increase in the middle schools with 4,154 seats.
- Queens had the third greatest increase in net capacity with 5,711 seats. The borough lost capacity in 1998, 1999 and 2000 followed by 8 years of increases through the end of the period examined. Queens had the greatest increase in elementary school capacity for the period examined - 10,529 seats in the elementary schools and the second highest increase in the middle schools with 4,419 seats.
- Brooklyn gained a total of 5,649 seats of net capacity; it had the fourth highest gain in net capacity of all the boroughs. In 2003 Brooklyn gained 4,102 seats, the third greatest increase in a single year in all of the boroughs. In this same year Brooklyn also experienced its peak capacity increases in a single year in the elementary schools with 2,132 seats and 1,738 seats in the middle schools. Brooklyn had the greatest increase in net capacity in the middle school buildings and the second greatest increase in the elementary buildings.
- Staten Island had the smallest increase in net capacity of all of the boroughs with 1,727 seats. In 2004 the borough had its greatest increase in capacity of 968 seats in a single year. It lost capacity in 5 years. Staten Island was the only borough to lose capacity at the middle school level and had the smallest increase at the elementary level of all of the boroughs although District 75's increase was smaller.
- District 75 high schools have a small net capacity decrease of 183 seats over the 12 years. These buildings also show no net capacity change for 3 years – 2003, 2004 and 2005; no borough has a similar profile. At the elementary level there is no capacity change for 2003 and 2004. This is due to a lack of data in the 2003–04 ECU Report for District 75 buildings. District 75 elementary and middle school buildings had the smallest increases in net capacity of 1,448 seats and 351 seats, respectively.

AGGREGATE CAPACITY CHANGE

The other primary measurement CFE developed for this analysis is aggregate change. This report examined aggregate capacity change in the 1,455 main school buildings and the temporary structures associated with them. Aggregate change is the measure designed to capture *all* reported changes to capacity, regardless of whether they are increases or decreases. While net capacity reflects the total gain or loss of capacity, aggregate capacity incorporates the internal fluctuations that can be masked when increases and decreases are totaled. Using aggregate capacity is an important measure to consider the full extent of increases and decreases that happen at the various grade levels by borough and community school district. It is important to note again that the ECU Reports only report the capacity figures not the reasons for them.

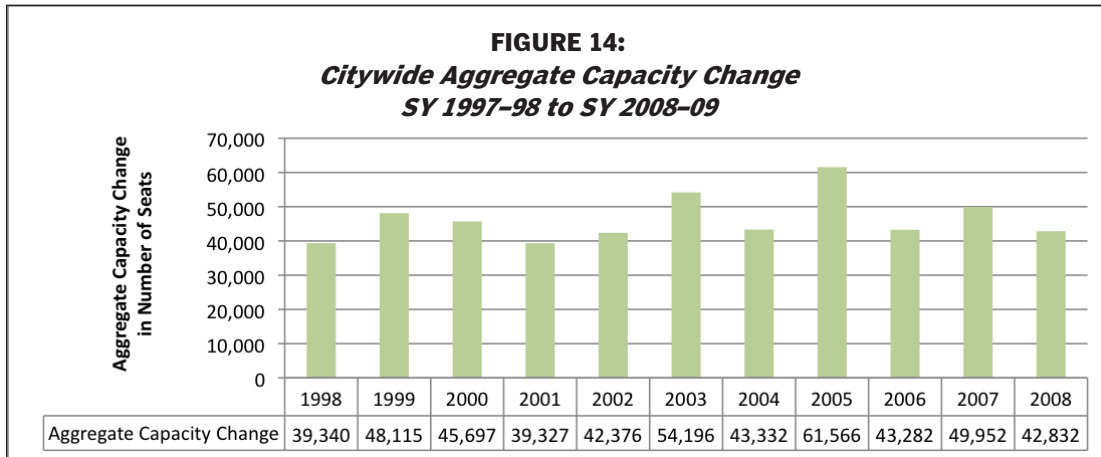
Year-to-year aggregate change measures total change, both increases and decreases, in seats within the same building over a two-school year period. Returning to the example of IS 14 to consider how net and aggregate change capture different elements of reported change over time:

YEAR	CAPACITY	NET CAPACITY CHANGE	AGGREGATE CAPACITY CHANGE
SY 1997-98	1451	-118	118
SY 1998-99	1333		
SY 1999-00	1438	105	105
TOTAL		-13	223

Between school years 1997–98 and 1999–00, IS 14 had a net loss of 13 seats – but 223 seats actually shifted in the school’s capacity over this time frame, when the changes for each two-year period are added together, regardless of whether they reflect increases or decreases.

CITYWIDE AGGREGATE CAPACITY CHANGE

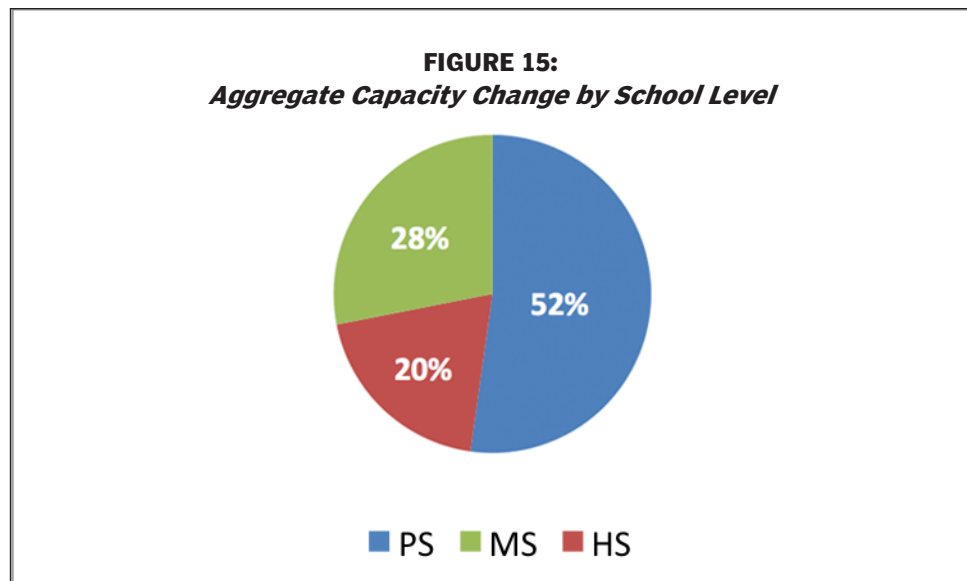
Citywide, the 1,455 buildings analyzed had an aggregate capacity change of 510,051 seats during the course of the 12-year period. This number is 6.8 times greater than the net change of 75,132 seats for the same period because it considers the full volume of increases and decreases. Elementary school buildings with the greatest number of buildings – 1,006 - have the greatest aggregate change of 266,325 seats. There are 211 middle school buildings, which had a total aggregate change of 100,446. High school buildings, which number 238, had total aggregate change of 143,280 seats.



SCHOOL LEVEL	AGGREGATE CHANGE
ELEMENTARY	266,325
MIDDLE SCHOOL	100,446
HIGH SCHOOL	143,280

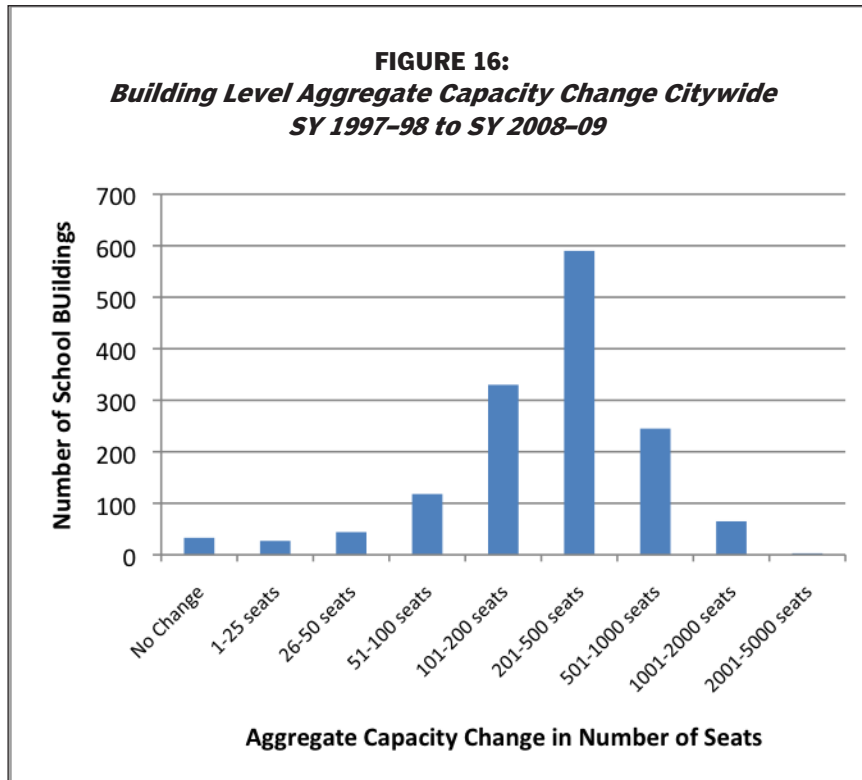
- The total aggregate capacity change that occurred between SY 1997–98 and SY 2008–09 was 510,051 seats
- Citywide aggregate capacity change ranged from a low of 39,340 seats in 1998 to a peak of 61,566 seats in 2005.
- 2005 was the year of the highest level of aggregate change but it was the sixth highest level of net capacity growth of 5,840 seats. Similarly, in 2003 there was the second highest level of aggregate change of 54,196 seats and the highest level of net capacity growth of 26,960 seats.
- Though 2005 had the highest level of aggregate capacity change of any year with an increase of 61,566 seats, on the net capacity side it was an increase of below average size of 5,840 seats. Though its net growth was not as prominent as its aggregate capacity change, 2005 was a year of net increases followed by the second highest year of net increases and then three years of net capacity decreases. Between 2004 and 2005, 33,703 seats were added to school buildings. During the same period, other buildings had capacity decreases, totaling 27,863 seats. The total aggregate change then was 61,566 (the sum of 33,703 and 27,863) . Ninety-two percent of this change – 55,726 seats (27,863 x 2) - that occurred during this period cancelled each other out. The other 8% of the aggregate change was expressed as 5,840 seats worth of citywide net growth.

- The volume of aggregate capacity change in each 2-year period was roughly equivalent to between 2% and 6% of the total number of seats citywide. In other words, between 2 and 6% of the system's total capacity is added, removed, or shifted within buildings. This turnover measure is an indicator of how much the system is in flux. Consider the following example: In 2004, the 1,455 school buildings in the study had a combined capacity of 1,167,752 seats. Between that school year and the next, school buildings experienced 61,566 seats worth of aggregate change. This change is roughly equivalent to 5.2% of the total number of seats in the city.



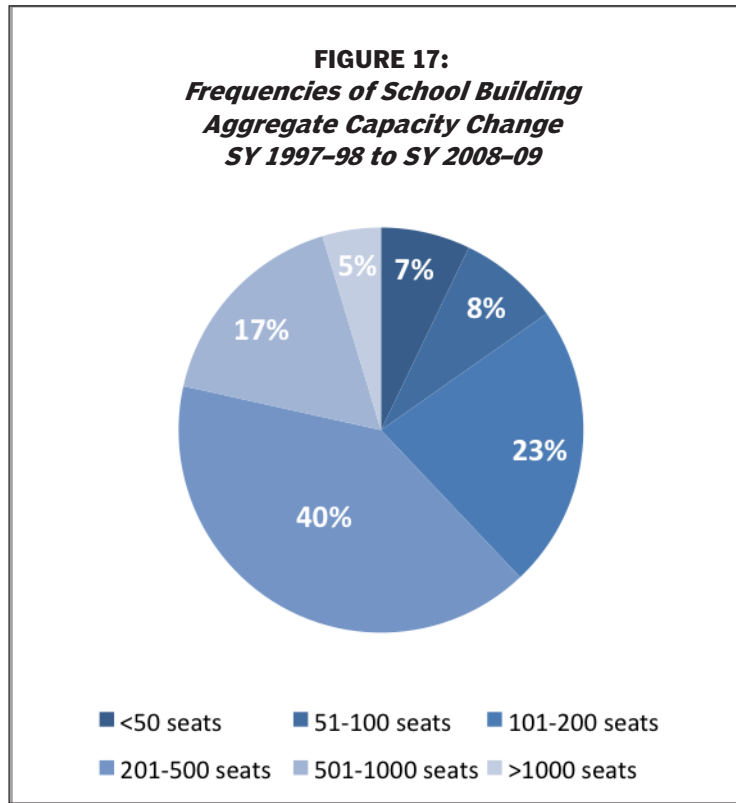
Elementary schools are 69% of the total buildings examined in this report and had 52% of the aggregate change; middle schools represent 15% of the total buildings and had 28% of the aggregate change. High school buildings had 20% of aggregate change and represent 16% of the overall buildings.

Converting the aggregate counts into 25-seat (one class) increments, the following chart illustrates the number of school buildings expressed as ranges from no change to an aggregate capacity change of 2,991 during the 12-year study period:



- 3 school buildings experienced shifts of 2,001–5,000 seats (100–200 classrooms)
- 65 school buildings experienced shifts between 1,001 and 2,000 seats (40–100 classrooms)
- 245 school buildings experienced shifts of 501–1,000 seats (20–40 classrooms)
- 590 school buildings experienced shifts of 201–500 seats (8 – 20 classrooms)
- 330 school buildings experienced shifts of 101–200 seats (4-8 classrooms)
- 118 school buildings experienced shifts of 51–100 seats (2-4 classrooms)
- 44 school buildings experienced shifts of 26–50 seats (fewer than 2 classrooms)
- 27 school buildings experienced shifts of 1-25 seats (up to one classroom)
- 33 schools experienced no capacity change.¹²

¹² These 33 school buildings have no aggregate change. They are a sub-set of the 45 schools with no capacity change. The remaining 12 school buildings had the same capacities in 1997–98 and 2008–09 but had some fluctuation in the intervening years.

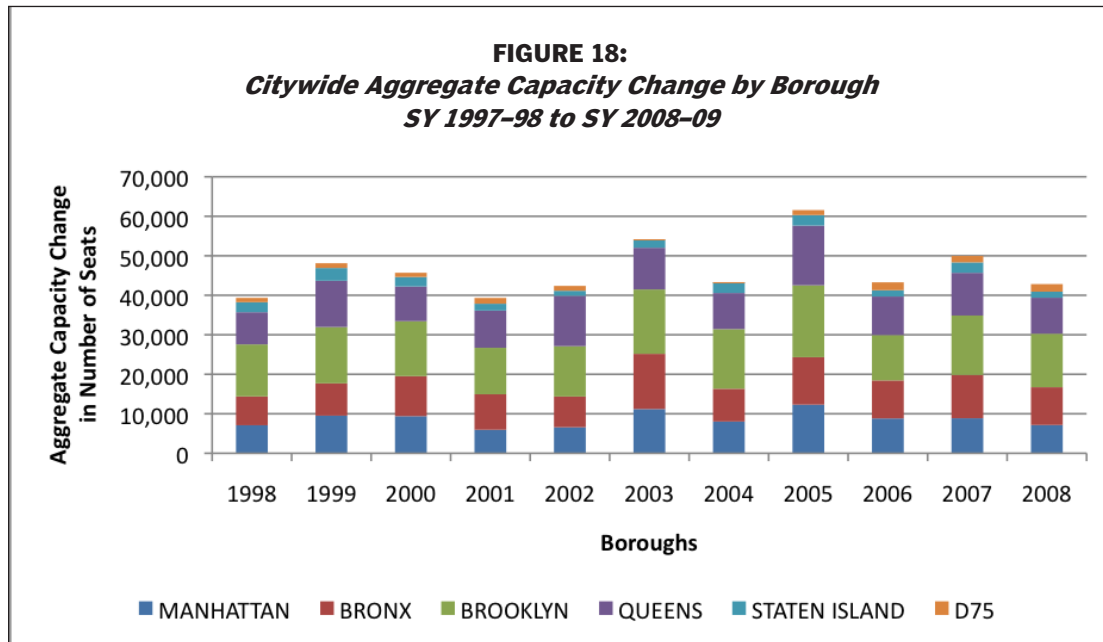


Expressed as percentages of the schools studied citywide, 63% -904 - of the 1,455 school buildings had shifts of greater than 200-seats:

- 40% of schools - 590 buildings - had shifts of 201–500 seats
- 23% - 330 buildings - had shifts of 101–200 seats
- 17% - 245 buildings - had shifts of 501–1000 seats
- 8% - 118 buildings - had shifts of 51–100 seats
- 5% - 68 buildings - had shifts of at least 1000 seats
- 7% - 104 buildings - had 50 or fewer seats of aggregate change

CITYWIDE AGGREGATE CHANGE BY BOROUGH

Aggregate change is greatest in Brooklyn and Queens due in great part to the size of these boroughs.



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	7,095	9,524	9,395	5,952	6,589	11,197	8,040	12,308	8,818	8,868	7,153	94,939
BRONX	7,299	8,174	10,126	8,989	7,778	13,975	8,298	12,008	9,631	10,961	9,567	106,806
BROOKLYN	13,176	14,264	13,922	11,761	12,750	16,306	15,097	18,211	11,485	15,042	13,554	155,568
QUEENS	8,140	11,714	8,789	9,421	12,753	10,550	9,135	15,119	9,748	10,815	9,105	115,289
STATEN ISLAND	2,533	3,228	2,395	1,738	1,276	2,022	2,738	2,657	1,594	2,640	1,536	24,357
D75	1,097	1,211	1,070	1,466	1,230	146	24	1,263	2,006	1,626	1,917	13,056
TOTAL	39,340	48,115	45,697	39,327	42,376	54,196	43,332	61,566	43,282	49,952	42,832	510,051

- Aggregate capacity change peaked in 2005 with aggregate change of 61,566 seats. This period saw the highest aggregate capacity change for Manhattan, Brooklyn and Queens, the second highest for the Bronx, the third highest for Staten Island and the fifth highest for District 75.
- Over the 12 year period, Brooklyn accounted for the largest amount of aggregate change of 79,911 seats. Though it accounted for the greatest volume of net capacity change, Queens accounted for the second highest level of aggregate change.

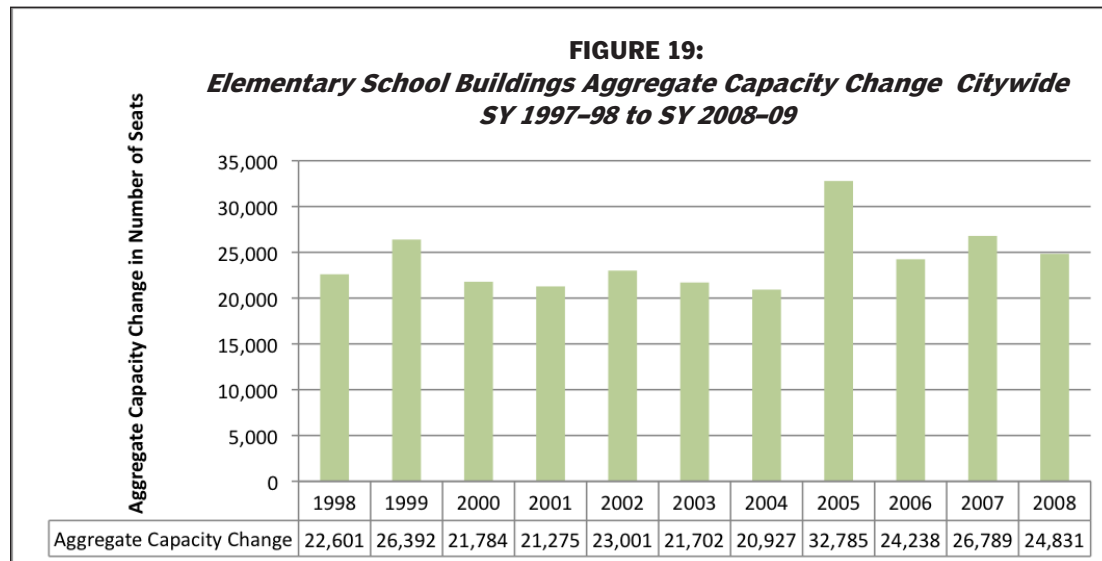
- ◊ Brooklyn accounts for an average of 30.5% of citywide aggregate change or 155,568 seats of aggregate change, with a low of 26% between 2005 and 2006 and a peak of 42.5% between 1998 and 1999. It is notable that Brooklyn's smallest annual aggregate capacity change – 11,485 seats in 2006 is larger than the largest annual share of aggregate capacity in any other borough, except Queens. On average, seats in Brooklyn comprised 33.5% of citywide capacity.
- ◊ Queens accounts for an average of 22.6% of citywide aggregate change or 115,289 seats of aggregate change, with its smallest share of annual aggregate change occurring in 1999 with 17.9% of aggregate change for that year and a peak share of 26.8% in 1998. It's notable that these are consecutive periods. On average, seats in Queens comprised approximately 23.8% of citywide capacity.
- ◊ The Bronx accounts for an average of 20.9% of citywide aggregate change or 106,806 seats of aggregate change, with a low of 14.9% in 1999 and a peak of 20.2% in 2002. On average, seats in the Bronx comprised 20.1% of citywide capacity.
- ◊ Manhattan accounts for an average of 18.6% of citywide aggregate change or 94,939 seats, with a low of 14.9% in 2001 and a peak of 20.2% in 2006. On average, the total number of seats located in Manhattan school buildings comprised 16.3% of the total capacity of school seats in the city.
- ◊ Staten Island accounts for an average of 4.8% of citywide aggregate change or 24,357 seats of aggregate change, with a low of 2.7% in 2002 and a peak of 6.3% in 2004. On average, seats in Staten Island comprised 5.2% of citywide capacity.
- ◊ District 75 accounts for an average of 2.6% of citywide aggregate change, with a low of 1.8% in 1999 and a peak of 4.4% in 2008. On average, seats in District 75 comprised 1.1 % of citywide capacity.
- ◊ Net capacity change peaked in 2003 with 26,960 seats of net capacity while aggregate capacity reached its highest level in 2005 with 61,566 seats of aggregate change. Manhattan, Bronx and Brooklyn had their peak years of net capacity change in 2003. In 2005, the fifth highest year of net capacity change Citywide, Queens experienced its lowest amount of net capacity change with a decrease of 1,431 seats.

AGGREGATE CAPACITY CHANGE BY SCHOOL LEVEL

Elementary Schools

Aggregate Capacity Change Citywide

The following chart shows the volume of aggregate change in 1,006 elementary school buildings between each two-year segment in the 12-year study period. Total aggregate change in the elementary buildings totaled 266,325 seats for the entire period. In every two-year period examined, the aggregate change in the elementary school buildings exceeded 20,000 seats with a maximum aggregate change of 32,785 seats in 2005; the lowest amount of aggregate change was 20,927 seats in 2004. Net capacity change in the elementary school buildings had a much lower range from a low of -3,247 seats in 2007 to a high of 10,506 seats in 1999.



- The greatest volume of aggregate change occurred between SY 2004-05 and SY 2005-06, when elementary school buildings shifted capacity by 32,785 seats.
- In the two prior years between SY 2002-03 and SY 2003-04, the lowest amount of aggregate change occurred, a shift of 20,927 seats.
- From SY 2006-07 and SY 2007-08, net capacity change in elementary buildings was at its lowest, comprising a decrease of 3,247 seats. Aggregate change citywide totalled 49,952 seats for the same 2-year period; 2007 was the third highest year of aggregate change in the elementary school buildings.
- The aggregate change for 4 years from 2005 to 2008 totaled 108,643, 41% of the overall total of aggregate change of 266,325. During this same period elementary

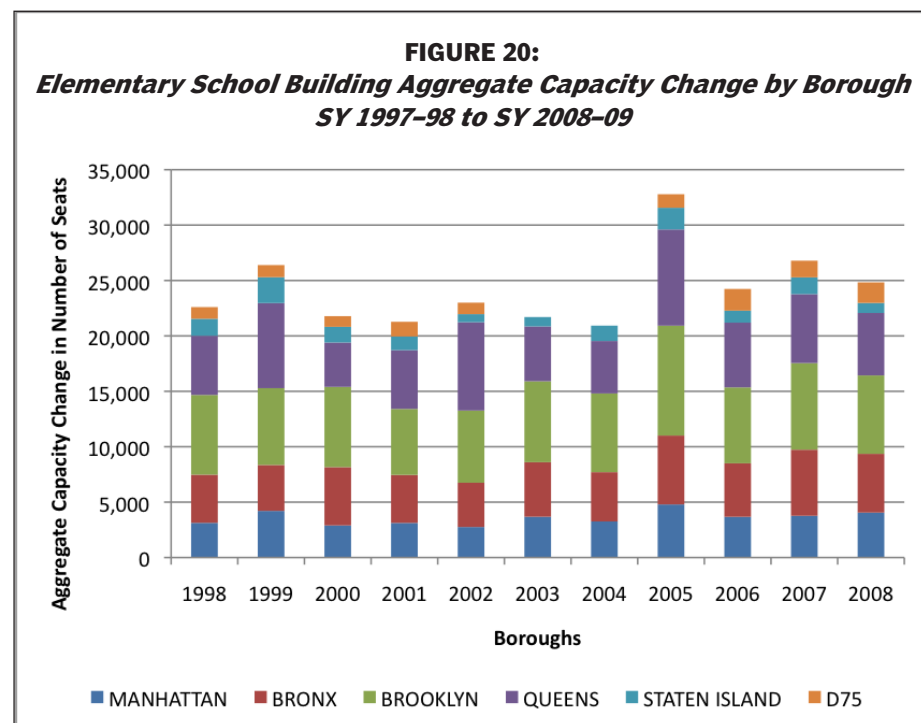
buildings had 3 years of decreases in net capacity totaling 6,363 and one year with an increase of 5,712 in 2006.

- In 2005 the year of the greatest aggregate change of 32,785, net capacity change in the elementary buildings was a decrease of 687 seats.

During the 12 years, elementary school building capacity ranged from 552,872 seats to 618,732 seats. Thus, on average each year, using total aggregate changes in the above chart, elementary school buildings changed their total capacity every year between 4% and 5% through increases or decreases. Using the total capacity in 2008–09 of 618,732, the 24,831 seats of aggregate change represents 4% of the total capacity in the elementary school buildings in that year.

Aggregate Capacity Change by Borough

Examining elementary school aggregate capacity change at the borough level reveals that the relative magnitude of the change is not unexpected given the number and size of the school buildings in each borough. Brooklyn has the largest number of school buildings and the greatest amount of aggregate change followed by Queens. As with the analysis of net capacity change District 75's elementary buildings are analyzed as part of the borough discussion but not in the following section on the districts. District 75 is not organized on a district level and the most relevant look at this jurisdiction's buildings is on a borough-wide basis. The following graph and chart shows elementary main school buildings' and associated temporary structures' aggregate capacity change by borough:



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	3,131	4,211	2,899	3,125	2,756	3,682	3,258	4,792	3,676	3,768	4,058	39,356
BRONX	4,347	4,143	5,261	4,330	3,994	4,920	4,446	6,215	4,826	5,965	5,300	53,747
BROOKLYN	7,194	6,931	7,240	5,956	6,515	7,308	7,104	9,917	6,852	7,816	7,078	79,911
QUEENS	5,341	7,679	4,004	5,306	7,971	4,948	4,731	8,683	5,842	6,223	5,633	66,361
STATEN ISLAND	1,533	2,333	1,416	1,233	729	844	1,388	1,956	1,084	1,512	906	14,934
D75	1,055	1,095	964	1,325	1,036	0	0	1,222	1,958	1,505	1,856	12,016
TOTAL	22,601	26,392	21,784	21,275	23,001	21,702	20,927	32,785	24,238	26,789	24,831	266,325

- Aggregate change varied by the total capacity in each borough. Brooklyn and Queens, which had the largest capacities and enrollments, also had the highest levels of aggregate change, while Staten Island, the smallest borough had the least. District 75 had the lowest aggregate change of 12,016 seats, however, there is no aggregate change for 2003 and 2004 because there is no data in the 2003–04 ECU Report for District 75 buildings.
- Relative to its size, District 75 had the highest rate of aggregate capacity change over the 12-year period. The capacity of District 75 schools in 1997 was 9,778 seats; by 2008 this number had increased to 12,021 seats. District 75's elementary buildings had an aggregate change equal to an average of 12.1% of their elementary school building seats in any given two-year period. At the highest level of change, between 2005 and 2006, 15.4% of District 75 seats were lost or gained in a single two year period; there was an aggregate change of 1,958 seats and a total capacity of 12,357 seats in 2006.
- Brooklyn, with the largest number of total seats gained or lost of any borough – 79,911 seats - also had the highest aggregate change annually of all of the boroughs except for 1999 and 2002 when Queens had a higher aggregate change. The borough had its peak year of aggregate change in 2005 with 9,917 seats, the single largest annual aggregate change of any borough. Brooklyn's seats turned over an average of 3.1% of its capacity through aggregate change, the lowest of any borough. For example, in the 2007–08 school year total capacity in the borough was 210,497; by the next year, 7,078 seats of aggregate change had occurred, representing 3.4% of capacity.
- Queens had the second highest number of seats turned over through aggregate change of any borough in the city with a total of 66,361 seats. It also had the second highest rate of relative turnover: an average of 5.4% of the borough's seats turned over in any two-year period. Examining aggregate change in Queens in its two peak years - in 2002 with 7,971 seats and 8,683 seats in 2005, shifts were equal to 7.1% and 6.5% of the borough's total capacity in those two years – 142,117 and 145,862 seats, respectively.

- Bronx had the third highest aggregate change with a total of 53,747 seats. The annual aggregate change ranged from a low of 3,994 seats in 2002 to a high of 6,215 in 2005. Its rate of relative turnover was an average of 4% in any two-year period. At its peak in 2005 there was aggregate change of 6,215, which represented 4.9% of the borough's total elementary capacity for that year of 126,158 seats.
- Staten Island had 14,934 seats of aggregate change, which represented a range of 729 seats of aggregate change in 2002 to a peak of 2,333 seats in 1999. This borough's rate of relative turnover was an average of 4.3% in any two-year period.

Comparison of Net and Aggregate Change by Borough

Considering both aggregate and net change together yields important insights into how capacity changes in school buildings, and how possible fluctuations in capacity effectively cancel each other out, as when a district, borough or individual school building's losses and gains swing in size and direction from year to year. Just as an iceberg's visible tip signals a greater mass hidden below the water's surface, net change – the tip – often rests on an accumulation of gains and losses that together add up to a 'mountain' of change. If net change and aggregate change are comparable, the flow of capacity is obvious. But if net change and aggregate change differ substantially, the magnitude of capacity change can be effectively submerged by net gains or losses over time.

The following table compares annual net and aggregate changes by borough for elementary schools:

ELEMENTARY SCHOOL BUILDINGS: COMPARISON OF NET CAPACITY AND AGGREGATE CAPACITY CHANGE SY 1997-98 – SY 2008-09

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	NET	615	1,519	831	845	158	1,628	-134	-32	1,774	-1,074	-976	5,154
	AGG	3,131	4,211	2,899	3,125	2,756	3,682	3,258	4,792	3,676	3,768	4,058	39,356
BRONX	NET	1,325	173	-749	-44	-134	1,202	364	23	1,066	-883	704	3,047
	AGG	4,347	4,143	5,261	4,330	3,994	4,920	4,446	6,215	4,826	5,965	5,300	53,747
BROOKLYN	NET	1,002	1,697	409	190	405	2,132	-424	1,747	858	-1,160	-966	5,890
	AGG	7,194	6,931	7,240	5,956	6,515	7,308	7,104	9,917	6,852	7,816	7,078	79,911
QUEENS	NET	2,243	5,639	706	1,168	3,013	296	-11	-2,405	728	-859	11	10,529
	AGG	5,341	7,679	4,004	5,306	7,971	4,948	4,731	8,683	5,842	6,223	5,633	66,361
STATEN ISLAND	NET	15	1,825	738	191	-57	-112	318	266	-100	-494	-26	2,564
	AGG	1,533	2,333	1,416	1,233	729	844	1,388	1,956	1,084	1,512	906	14,934
D75	NET	-203	-347	150	343	358	0	0	-286	1,386	1,223	-1,176	1,448
	AGG	1,055	1,095	964	1,325	1,036	0	0	1,222	1,958	1,505	1,856	12,016

The following table shows what percentage of annual aggregate change is attributable to net change:

NET CHANGE AS A PERCENTAGE OF AGGREGATE CHANGE BY BOROUGH

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	AVERAGE
MANHATTAN	19.6%	36.1%	28.7%	27.0%	5.7%	44.2%	4.1%	0.7%	48.3%	28.5%	24.1%	24.3%
BRONX	30.5%	4.2%	14.2%	1.0%	3.4%	24.4%	8.2%	0.4%	22.1%	14.8%	13.3%	12.4%
BROOKLYN	13.9%	24.5%	5.6%	3.2%	6.2%	29.2%	6.0%	17.6%	12.5%	14.8%	13.6%	13.4%
QUEENS	42.0%	73.4%	17.6%	22.0%	37.8%	6.0%	0.2%	27.7%	12.5%	13.8%	0.2%	23.0%
STATEN ISLAND	1.0%	78.2%	52.1%	15.5%	7.8%	13.3%	22.9%	13.6%	9.2%	32.7%	2.9%	22.7%
D75	19.2%	31.7%	15.6%	25.9%	34.6%	NA	NA	23.4%	70.8%	81.3%	63.4%	40.6%

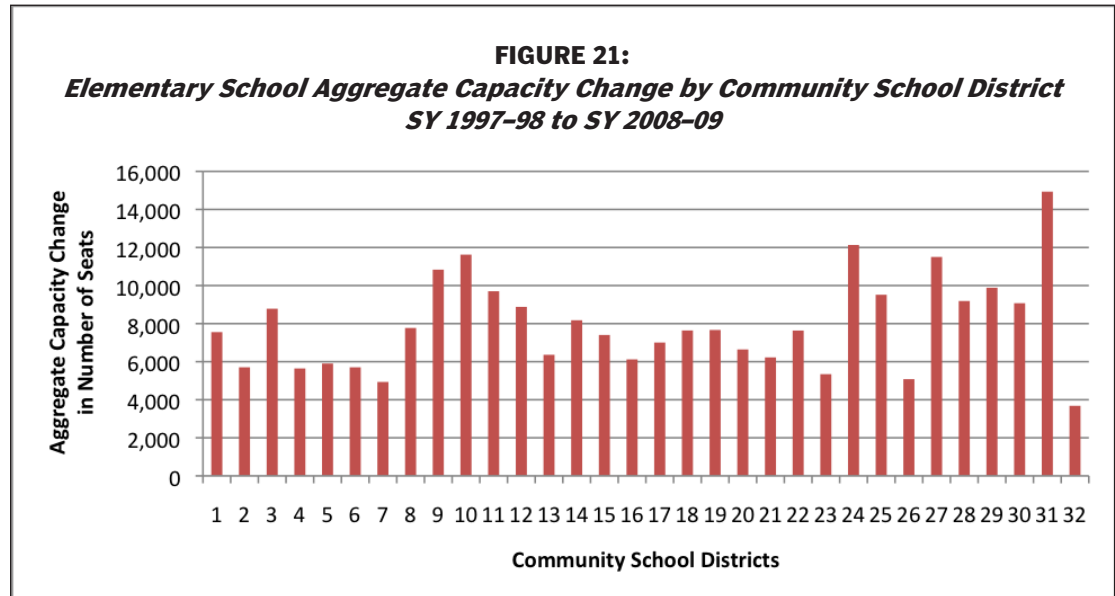
A comparison of aggregate and net capacity, particularly, the percentages of aggregate capacity attributable to net capacity show that there is not a consistent relationship between net and aggregate capacity changes. Consider the Bronx between 1997 and 1999. Between 1997 and 1998 and then 1998 and 1999, the Bronx experienced 4,347 and 4,143 seats worth of aggregate capacity change, respectively. However, in the first two year period, the Bronx's capacity as a whole expanded by 1,325 seats, a large net increase in capacity for the borough. The next two-year period, though, it had a comparable amount of aggregate change but a net increase in capacity of only 173 seats. On average Bronx net capacity represented 12.4% of aggregate change.

This pattern of growth and change is most evident in Queens in the year-to-year comparisons between net and aggregate change. Net capacity change (here, growth) represents 73% of the borough's aggregate change between 1998 and 1999, but only 0.2% between 2007 and 2008. At the beginning of the period net capacity increases were a significant percentage of aggregate change. By the end of the 12 year period, even though Queens had 5,633 seats worth of aggregate change between 2007–08 and 2008–09 the overall net capacity gain was only 11 seats, suggesting that most gains and losses cancelled each other out as capacity within the borough shifted among its school buildings.

Patterns such as these suggest that capacity is shifting at the school level on an as needed basis.

Aggregate Capacity Change by Community School District

The following section examines aggregate change at the district level for elementary schools. Aggregate change captures both capacity growth and total capacity change, i.e., internal fluctuations in capacity. Analyzing aggregate change provides a more transparent view of the capacity changes that many school buildings experience over time. The total aggregate change for the elementary school buildings at the district level is 254,309 seats. This number differs from the 266,325 seats discussed above because District 75, Citywide Special Education, which had 12,016 seats of aggregate change, is not included in the community school district analysis.



In descending order, the districts with the greatest volume of aggregate capacity change in the elementary school buildings over the 12-year period studied were:

- District 31 in Staten Island with 14,934 seats
- District 24 in Queens with 12,132 seats
- District 27 in Queens with 11,503 seats
- District 10 in the Bronx with 11,625 seats
- District 9 in the Bronx with 10,835 seats.

The above five districts all experienced more than 10,000 seats worth of aggregate change each. These 5 elementary school districts account for 24% - 61,029 seats - of the total aggregate change of 254,257 seats at the elementary school level.

In ascending order, the 5 districts with the lowest levels of aggregate change were:

- District 32 in Brooklyn with 3,681 seats
- District 7 in the Bronx with 4,935 seats
- District 26 in Queens with 5,082 seats
- District 23 in Brooklyn with 5,344 seats
- District 4 in Manhattan with 5,644 seats.

The following chart tracks annual volumes of aggregate capacity change in elementary school buildings at the district level:

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
1	590	362	514	812	653	1,126	513	674	1,124	648	538	7,554
2	394	673	393	510	294	601	361	870	459	666	484	5,705
3	598	1,443	814	704	808	408	829	863	539	955	874	8,835
4	608	422	470	460	289	638	456	875	470	247	709	5,644
5	632	499	454	337	337	594	543	722	499	702	584	5,903
6	309	812	243	302	375	315	556	788	585	550	869	5,704
7	380	658	431	366	297	549	383	524	423	375	549	4,935
8	547	518	775	640	390	788	684	896	775	1,128	630	7,771
9	459	643	996	950	946	904	746	1,370	996	1,731	1,094	10,835
10	967	810	1,302	1,096	925	944	935	1,479	1,025	953	1,189	11,625
11	794	871	724	611	678	1,018	1,170	1,153	677	1,033	973	9,702
12	1,200	643	1,033	667	758	717	528	793	930	745	865	8,879
13	517	499	717	426	490	446	873	982	572	388	452	6,362
14	574	651	401	556	564	425	1,129	1,283	690	999	905	8,177
15	1,061	504	713	764	552	634	790	788	405	692	501	7,404
16	391	591	543	528	295	893	605	593	361	629	692	6,121
17	577	397	375	386	964	844	552	1,226	637	590	457	7,005
18	522	1,440	943	484	400	721	477	867	622	530	634	7,640
19	617	608	586	569	488	863	559	1,222	722	710	722	7,666
20	644	404	859	425	830	752	337	479	572	769	572	6,643
21	628	388	449	555	540	490	377	845	558	741	654	6,225
22	805	667	865	450	694	587	541	775	917	736	598	7,635
23	477	443	405	490	446	225	548	492	445	726	647	5,344
24	746	2,394	502	843	1,988	1,109	824	1,523	627	790	786	12,132
25	485	1,143	867	977	834	703	891	1,100	783	1,067	667	9,517
26	393	293	422	404	447	341	406	605	516	738	517	5,082
27	705	897	854	691	2,412	833	833	1,314	1,185	936	843	11,503
28	798	741	515	737	653	879	749	1,514	698	1,060	844	9,188
29	1,190	1,322	434	639	1,055	582	527	1,232	1,240	705	959	9,885
30	1,012	905	398	1,003	586	501	536	1,395	793	927	1,017	9,073
31	1,533	2,333	1,416	1,233	729	844	1,388	1,956	1,084	1,512	906	14,934
32	383	328	433	307	248	428	281	365	351	306	251	3,681
TOTAL	21,536	25,302	20,846	19,922	21,965	21,702	20,927	31,563	22,280	25,284	22,982	254,309

Though elementary schools account for 69% of the buildings in the sample, they only account for 52%– 266,325 seats, including District 75 elementary schools– of the total aggregate change during the 12 years.

- In each year there are at least two districts with over 1,000 seats worth of aggregate change. 2005 has the greatest aggregate change with a total of 31,563 seats. Thirteen districts have aggregate changes greater than 1,000 seats in this

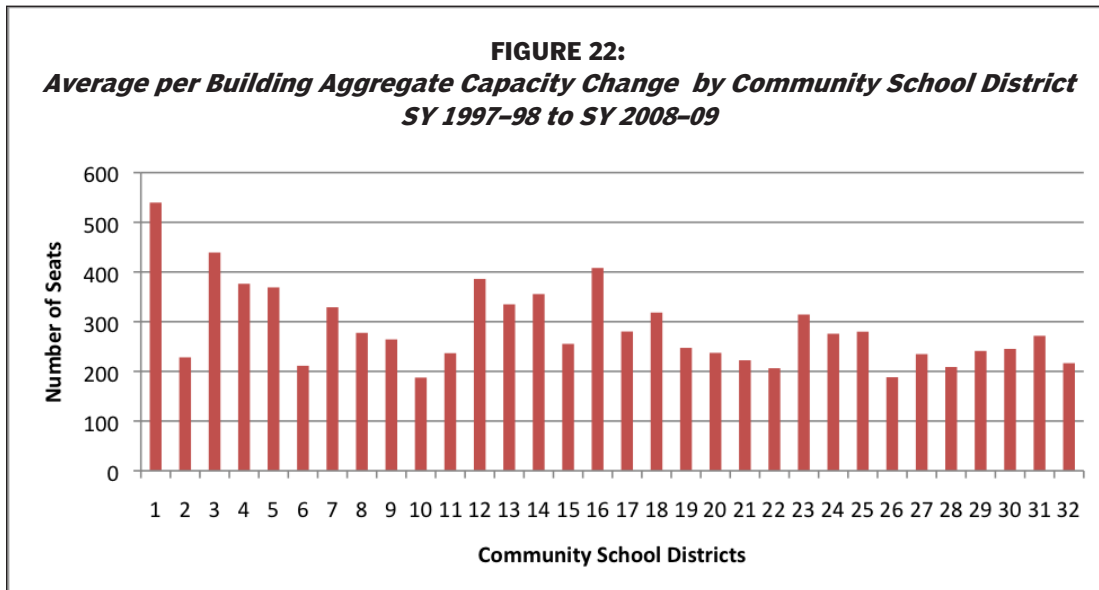
year. Six of the 7 districts in Queens are in this category as are 3 of the 6 districts in the Bronx. Three of the 12 Brooklyn districts and Staten Island also have this level of change. Net capacity change in 2005 was -687 and in this year only two districts— 14 in Brooklyn and 28 in Queens— experienced net change over 1,000 seats. District 14 had an increase over 1,000 and District 28 had a decrease in excess of 1,000.

- 1999 has the third highest year of aggregate change with a total of 25,302 seats. Six districts have aggregate change in excess of 1,000 seats in this year and two districts – 24 and 31 – have change in excess of 2,000 seats, the only two districts with this high a level of aggregate capacity change in a single year.
- In 2001 there are only 3 districts – 10, 30 and 31 - with over 1,000 seats of aggregate change. 2001 has the smallest amount of aggregate change in a single year with 19,922 seats. The 2001 net capacity change in 2001 was the sixth highest with 2,693 seats of net capacity change. This was a year of modest net capacity growth for the districts; 15 districts had decreases in net capacity in this year.
- There are 14 districts that did not experience an aggregate change in excess of 1,000 seats in a single year – Districts 1, 2, 4, 5 and 6 in Manhattan, District 7 in the Bronx, Districts 13, 16, 20, 21, 22, 23 and 32 in Brooklyn and District 26 in Queens.
- District 24 has the second highest aggregate change with 12,132 seats; it had the highest level of net capacity change with 2,820 seats. Its peak year for aggregate change was 1999 with 2,394 seats of aggregate change and its peak year for net capacity change was 1999 with 2,164 seats.
- District 31 had the highest level of aggregate change with 14,934 seats of aggregate change; its peak year of aggregate change was 1999 with 2,333 seats. District 31 had the second highest level of net capacity change with 2,564 seats; its peak year of net capacity change was 1999 with 1,825 seats.
- District 10 had the lowest amount of net capacity change with a decrease over the 12 years of 787 seats. District 10 had high aggregate change with 11,625 seats of aggregate change. This district had 5 years when aggregate change exceeded 1,000 seats.
- District 13 had the second lowest level of net capacity change with a decrease of 458 seats over the 12 years. The district had a moderate amount of aggregate change with a total of 6,362 seats

Elementary School Average per Building Aggregate Capacity Change

Each district has a different number of elementary school buildings, ranging from 14 buildings in District 1 to 62 buildings in District 10. To adjust for this, this analysis

includes an average aggregate change per building calculation to examine better how aggregate change occurs across a district, borough and the City. This number was derived by dividing the total aggregate change measured over 12 years in a district by the number of buildings in that district. In this analysis, those averages are further split into elementary and middle school averages.



Adjusting for the number of buildings in each district, the five districts with the highest average rates per building of aggregate capacity change are distinct from the five districts with the greatest volume of aggregate capacity change.

In descending order, the districts with the highest rate of change per building were:

- ◊ District 1 (Manhattan) with 540 seats
- ◊ District 3 (Manhattan) with 439 seats
- ◊ District 16 (Brooklyn) with 408 seats
- ◊ District 12 (Brooklyn) with 386 seats
- ◊ District 4 (Manhattan) with 376 seats

In ascending order, the elementary school districts with the lowest volume of aggregate change were:

- ◊ District 10 (Bronx) with 188 seats
- ◊ District 22 (Brooklyn) with 206 seats

- ◊ District 28 (Queens) with 209 seats
- ◊ District 6 (Manhattan) with 211 seats
- ◊ District 32 (Brooklyn) with 217 seats
- Only District 10 in the Bronx had an average per building aggregate capacity change of less than 200 seats. District 10 also has the largest number of elementary buildings – 62 - in one district.
- District 1 has 14 buildings – the smallest number in any district – with the second highest average per building aggregate change of 540 seats.
- A closer look at other districts with a large number of buildings – District 24 with 44 and Districts 9 and 11 with 41 each – have 276, 264 and 237 seats on average per building, significantly higher than District 10.
- Examining districts with a small number of buildings – District 4 with 15 buildings and Districts 5 and 14 with 16 each – these districts have average per building net change of 376, 356 and 408 seats, respectively. Again these numbers are significantly lower than District 1's average.

**ELEMENTARY SCHOOL AVERAGE PER BUILDING AGGREGATE CAPACITY CHANGE BY DISTRICT
SY 1997-98 THROUGH SY 2008-09**

DISTRICT	NUMBER OF BUILDINGS	TOTAL AGGREGATE CHANGE	AVERAGE AGGREGATE CHANGE PER BUILDING
1	14	7,554	540
2	25	5,705	228
3	20	8,835	442
4	15	5,644	376
5	16	5,903	369
6	27	5,704	211
7	15	4,935	329
8	28	7,771	278
9	41	10,835	264
10	62	11,625	188
11	41	9,702	237
12	23	8,879	386
13	19	6,362	335
14	23	8,177	356
15	29	7,404	255
16	15	6,121	408
17	25	7,005	280
18	24	7,640	318
19	31	7,666	247
20	28	6,643	237
21	28	6,225	222
22	37	7,635	206
23	17	5,344	314
24	44	12,132	276
25	34	9,517	280
26	27	5,082	188
27	49	11,503	235
28	44	9,188	209
29	41	9,885	241
30	37	9,073	245
31	55	14,934	272
32	17	3,681	217
TOTAL	951	254,309	

*Main elementary school buildings and the temporary structures associated with them.

Comparison of Net and Aggregate Capacities in the Elementary Schools at the Community School District Level

Comparing net and aggregate change revealed that in some years of high aggregate change net change constituted a large part of aggregate change. In other years, where net change constituted a relatively small portion of aggregate change suggesting that,

while growth or decline occurred, increases and decreases cancelled each other out. Examining the relationship between net and aggregate change at the district level provides a further look at this phenomenon.

Consolidating the above data, which is shown in the following table, may provide additional insight into capacity change in the elementary school buildings. The measures in this table, except for Net Change per Building, have been discussed separately above and are defined briefly again so that this table can be easily read in this section:

Summary of Elementary School Capacity Measures

The following indicators have been examined at the district level:

Net change. The overall 12 year capacity increase or decrease in a district that results from the gain or loss of seats in existing buildings.

Aggregate Change. The total number of seats gained or lost in a district over the 12-year period.

Net Change per Building. This indicator scales the total net change relative to the number of buildings, allowing for building level comparisons across districts for the 12-year period.

Aggregate Change per Building. This indicator scales the total aggregate change for the 12 years relative to the number of buildings in a district. Calculating change on a per building basis allows for building level comparisons across districts for the entire period.

Net Change as a Percentage of Aggregate Change. This indicator is calculated by dividing net change by aggregate change. It shows what percentage of the total fluctuation in existing building capacity contributed to the overall growth or decrease of capacity at the district level. This measure is useful for comparing districts to see whether most of their change was in a single direction over the 12 year period or whether they experienced a series of increases and decreases that largely cancelled each other out.

12 Year Capacity Change. This is the difference between the district's capacities in SY 2008–09 versus SY 1997–98.

Rank. For each indicator the district's numerical standing amongst all of the districts is provided. For example, District 1 has 14 buildings. There are 30 districts with a greater number of school buildings.

SUMMARY OF ELEMENTARY SCHOOL CAPACITY MEASURES

DISTRICT	BUILDINGS		NET CHANGE		AGGREGATE CHANGE		NET CHANGE/BUILDING		AGGREGATE CHANGE/BUILDING		NET AS A % OF AGGREGATE		12 YEAR CAPACITY CHANGE	
	NUMBER	RANK	SEATS	RANK	SEATS	RANK	SEATS	RANK	SEATS	RANK	PERCENT	RANK	SEATS	RANK
1	14	32	2026	4	7554	18	145	1	540	1	26.8%	1	2026	14
2	25	19	591	17	5705	26	24	19	228	25	10.4%	17	1083	22
3	20	24	1577	9	8835	12	79	3	442	2	18.0%	9	1681	16
4	15	29	-204	29	5644	28	-14	31	376	5	3.6%	27	-204	29
5	16	28	805	15	5903	25	50	7	369	6	13.6%	12	1018	24
6	27	17	300	24	5704	27	11	23	211	28	5.3%	23	1671	17
7	15	29	-111	28	4935	31	-7	28	329	9	2.2%	29	1731	15
8	28	14	939	13	7771	14	34	13	278	14	12.1%	14	1369	20
9	41	6	497	19	10835	5	12	22	264	17	4.6%	25	3630	6
10	62	1	-787	32	11625	3	-13	30	188	32	6.8%	21	1391	19
11	41	6	2158	3	9702	7	53	6	237	23	22.2%	4	4660	3
12	23	22	351	23	8879	11	15	21	386	4	4.0%	26	2127	13
13	19	25	-458	31	6362	22	-24	32	335	8	7.2%	19	-458	31
14	23	22	721	16	8177	13	31	15	356	7	8.8%	18	487	26
15	29	13	831	14	7404	19	29	16	255	18	11.2%	16	1074	23
16	15	29	363	22	6121	24	24	18	408	3	5.9%	22	363	27
17	25	19	-207	30	7005	20	-8	29	280	12	3.0%	28	-320	30
18	24	21	2002	6	7640	16	83	2	318	10	26.2%	2	3430	7
19	31	12	548	18	7666	15	18	20	247	19	7.1%	20	1582	18
20	28	14	1369	10	6643	21	49	8	237	22	20.6%	7	2240	11
21	28	14	21	25	6225	23	1	25	222	26	0.3%	32	316	28
22	37	9	373	21	7635	17	10	24	206	30	4.9%	24	2142	12
23	17	26	-86	26	5344	29	-5	27	314	11	1.6%	30	1159	21
24	44	4	2820	1	12132	2	64	4	276	15	23.2%	3	6149	1
25	34	11	2015	5	9517	8	59	5	280	13	21.2%	6	2846	10
26	27	17	1088	12	5082	30	40	11	188	31	21.4%	5	3111	9
27	49	3	1647	8	11503	4	34	12	235	24	14.3%	11	3860	5
28	44	4	-96	27	9188	9	-2	26	209	29	1.0%	31	1012	25
29	41	6	1909	7	9885	6	47	10	241	21	19.3%	8	4236	4
30	37	9	1181	11	9073	10	32	14	245	20	13.0%	13	3312	8
31	55	2	2564	2	14934	1	47	9	272	16	17.2%	10	5681	2
32	17	26	441	20	3681	32	26	17	217	27	12.0%	15	-680	32

All of the following 5 districts experienced the highest growth in net capacity; several of these districts do not have correspondingly high aggregate change. All of these districts except for District 1 have had historical overcrowding as well as new school capacity added to the district.

- District 1 in Manhattan was one of the highest-ranking districts in 12-year net change with an increase of 2,026 seats; the district also had high net change per

building, aggregate change per building and net change as a percentage of aggregate change. This district has also had one of the lowest rates of historical overcrowding so capacity change has been within existing buildings not as a result of any additions.

- District 24 in Queens also ranked among the highest in net change with 2,820 seats and a 12 year capacity change of 6,149 seats. It also had high net change per building. District 24 had additional capacity through new additions to existing buildings and new structures because of its very high level of historical overcrowding. This district also has very high aggregate change. New schools and additions were also key to its overall capacity increase of 6,149 seats.
- District 29 in Queens had high levels of net change and net change per building plus a high ranking in net capacity change with an increase of 1,909 seats. This district had significant aggregate change but low aggregate change per building. This district has had a history of overcrowding throughout the 12 years.
- District 18 in Brooklyn had the second highest levels of net change per building and the sixth highest level of net change overall. It ranked in the middle of the districts based on its level of aggregate change. Its net capacity change was 2,002.

The following districts experienced significant increases in net capacity and aggregate capacity; net capacity in both of these districts is a high percentage of aggregate capacity. Because of the high capacity fluctuations seen in high aggregate change, the continual shifts in capacity tend to cancel out the net growth.

- District 11 in the Bronx had a high rate of net change overall, a high rate of net change relative to aggregate change and consistent overcrowding. The district has a relatively high level of aggregate change. District 11 showed 2,158 seats of net change and 9,702 seats worth of aggregate change. Its percentage of aggregate change expressed as net growth was 22.2%, the 4th highest in the city. While this district experienced substantial growth, there were significant shifts in the buildings' capacity over the 12 years.
- Similarly, District 31 experienced 2,564 seats of net growth and 14,934 seats worth of aggregate change. Its percentage of aggregate change expressed as net growth was 17.2%, the 10th highest in the city.

The following district had minimal amount of capacity growth over the 12-year period:

- District 12 in the Bronx experienced low levels of net change relative to aggregate change. It had a moderately high level of aggregate change. District 12 experienced the 7th highest levels of aggregate change per building and among the lowest levels of net change per building; this district had slightly above average levels of aggregate change – 8,879 seats of aggregate change over the 12 years, while only having 351 seats of net change. For every 100 seats worth of

aggregate change in the average elementary school building in District 12, only 4 seats were gained in net capacity.

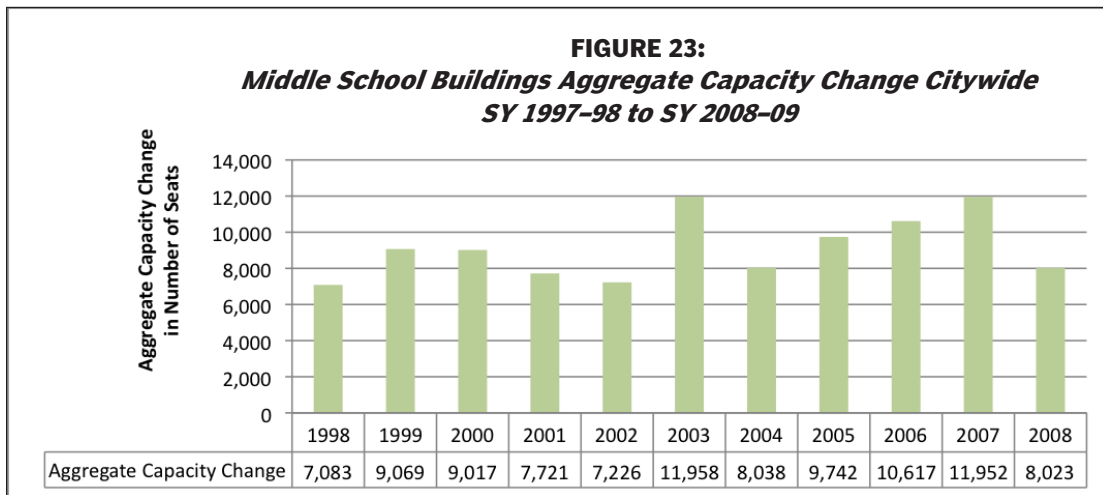
The following districts did not experience much growth nor were there significant fluctuations in overall capacity. The districts described below have also not had a history of overcrowding:

- District 7 in the Bronx had low levels of net change losing 111 seats over the 12 years with a very low aggregate change of 4,935 seats, the second lowest in the City. The district’s net change per building was low although its aggregate change per building was significant at 329 seats.
- District 23 in Brooklyn experienced a 86-seat loss in capacity and it also had one of the lowest levels of aggregate change among elementary school districts – 5,344 seats over 12 years.
- District 32 in Brooklyn had low levels of aggregate change - 3,681 seats, the lowest in the city. District 32 had low levels of aggregate change per building and very few seats added through net change – a total of 441 over the 12 years.

Middle School

Aggregate Capacity Change Citywide

The following section examines aggregate change at the district level for middle schools. Aggregate change captures both net capacity growth and internal fluctuations within the buildings. Middle school buildings and the temporary structures associated with the main buildings had a total aggregate change of 100,446 for the 12 years; net capacity change for the middle school buildings was 16,304 seats for the same period.

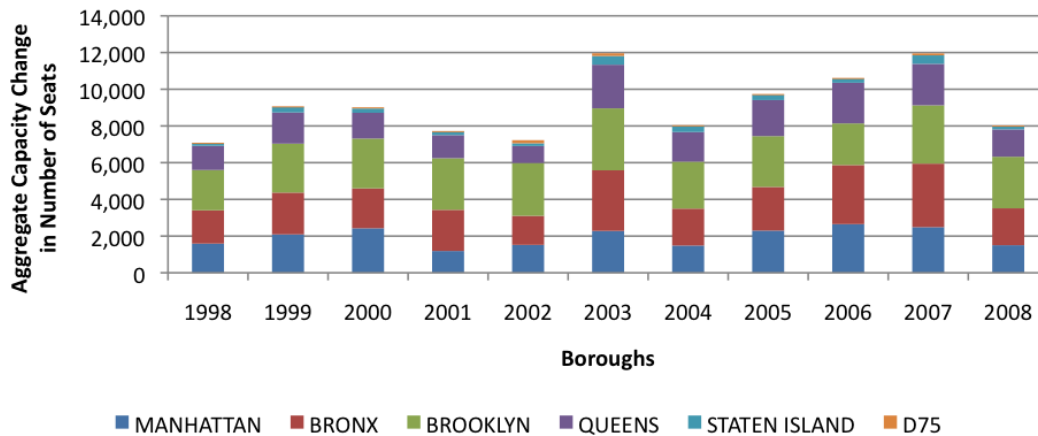


- The peak year of aggregate change for the middle school buildings was 2003 with a total of 11,958 seats of aggregate change. Net capacity increased by 6,312 seats in this year. This was the peak year for net capacity change.
- The smallest total aggregate change of 7,083 occurred in 1998. Net capacity change for this year was an increase of 343 seats, which means that only 4.8% of aggregate change is attributable to net change.
- The period between the 2004–05 and 2005–06, which marked the highest period of aggregate change for elementary school buildings, was the 4th highest period of aggregate change for middle school buildings.
- Both elementary and middle school buildings experienced relatively low levels of aggregate change in 2004. At the elementary level it was the year with the lowest amount of aggregate change – 20,927 seats. At the middle school level it ranked seventh in the annual level of aggregate change with 8,038 seats.
- In 2007 there was a decrease in net change of 3,900 seats, the largest decrease in the middle school buildings, while aggregate change was 11,952 seats, the second highest year of aggregate change.
- The year with the second highest total aggregate change was 2007 with a change of 11,952; it was also a year of significant change in net capacity – a loss of 3900 seats, the largest annual decrease.
- During the 12 year period, middle school building capacity citywide ranged from 232,812 seats to 262,618 seats. Middle school buildings turned over an average of 4.1% of total capacity (range of 3% to 6.2%) for the entire 12 years.

Aggregate Capacity Change by Borough

Aggregate change in the middle school buildings on a borough basis does not follow the same pattern as in the elementary buildings. Brooklyn has the highest level of aggregate change in both the elementary and middle schools; Staten Island and District 75 have the smallest amount of aggregate change in both building levels. The big shift in the level of aggregate change is in Queens middle schools. The following graph and chart shows middle school buildings aggregate capacity change by borough:

FIGURE 24:
Middle School Aggregate Capacity Change by Borough
SY 1997-98 to SY 2008-09



ANNUAL MIDDLE SCHOOL AGGREGATE CAPACITY CHANGE BY BOROUGH

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	1,590	2,091	2,425	1,188	1,520	2,280	1,484	2,299	2,650	2,486	1,503	21,516
BRONX	1,814	2,278	2,176	2,243	1,583	3,302	2,013	2,378	3,219	3,461	2,009	26,476
BROOKLYN	2,195	2,667	2,713	2,812	2,880	3,378	2,557	2,769	2,270	3,178	2,811	30,230
QUEENS	1,316	1,697	1,401	1,258	923	2,378	1,612	1,962	2,213	2,259	1,488	18,507
STATEN ISLAND	156	302	237	215	149	474	348	293	233	463	152	3,022
D75	12	34	65	5	171	146	24	41	32	105	60	695
TOTAL	7,083	9,069	9,017	7,721	7,226	11,958	8,038	9,742	10,617	11,952	8,023	100,446

- Brooklyn had the highest aggregate change of all of the boroughs with 30,230. This borough had the highest change on an annual basis for 9 of the 11 two year periods. In 2003 Brooklyn had its highest aggregate change in a single year with 3,378 seats of aggregate change, the second highest annual aggregate change of all of the boroughs. In 2006 the borough had its lowest level of aggregate change with 2,270 seats. This borough had the highest year of net capacity change with a total of 1,738 seats in 2003, the peak year for net capacity in middle schools. Brooklyn had an average turnover, that is aggregate change as a percentage of capacity, of 3.89%, ranging between 2.7% and 7.6%
- Bronx had the second highest level of aggregate change with a total of 26,476 seats. This borough had the highest level of aggregate change in a single year with an aggregate change of 3,461 in 2007, the highest level of aggregate change of all of the boroughs in that year. 2006 was also the year of the borough's

greatest increase in net capacity in the middle school buildings with an increase of 2,325 seats. Seventy-two percent of aggregate capacity in 2006 was made up of capacity growth. On average, the Bronx turned over 4.3% of its capacity each year, though turnover ranged between 3.4% and 6.1%.

- Manhattan follows with a total aggregate change of 21,516 seats. Similar to the Bronx it had its peak year of aggregate change in 2006 with 2,650 seats. Net change in 2006 – 852 – makes up a relatively small percentage of aggregate change in that year. Manhattan’s peak year of net capacity was 2003 with 1,668 seats of net change; it comprises 73% of aggregate capacity in this year. Manhattan turned over an average of 5.45% of its capacity each year during the 12 year period with a high of 6.7% and a low of 3%.
- Queens had the fourth highest level of aggregate change with a total of 18,507 seats. Its lowest level of aggregate change was in 2002 with 923 seats. Queens had the second greatest net capacity increase of any borough in the middle school buildings and had its peak increase in net capacity in 2003 with 1,640 seats.
- Staten Island has the smallest amount of aggregate change of all the boroughs with only 3,022 seats of total aggregate change. Its annual aggregate change varies from a low of 156 in 2008 to a high of 474 in 2003. This borough’s net capacity change was very small – a decrease of 152 seats, the only borough that lost capacity in the 12 year period. Staten Island also had the lowest rate of turnover, averaging 2% over the 12-year period. Turnover rates ranged from 1% to 3.2% of capacity.
- District 75 had only one middle school building – M047. This school had a total aggregate change of 695 seats; the peak year of aggregate change was 2002 with 171 seats. Net change was 351 seats with the peak change of 146 seats in 2003. In 2003 net change equaled aggregate change. Because only one building is in this data set, the difference between net capacity and aggregate is that aggregate change treats all change as positive whereas net capacity change recognizes both increases and decreases.

Comparison of Net Capacity and Aggregate Change by Borough

Similar to the elementary buildings, a comparison of aggregate and net capacity, particularly, the percentages of aggregate capacity attributable to net capacity, show that there is not a consistent relationship between net and aggregate capacity changes. In 2000, for example, Staten Island’s net capacity represents 87.3%% of aggregate change, the highest of any borough in a single year but this borough’s net change as a percentage of aggregate change dips to a low of 4.2% the next year in 2001.

NET CHANGE AS A PERCENTAGE OF AGGREGATE CHANGE BY BOROUGH

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	NET	-52	-521	1,311	324	-274	1,668	-276	469	852	-1,034	-437	2,030
	AGG	1,590	2,091	2,425	1,188	1,520	2,280	1,484	2,299	2,650	2,486	1,503	21,516
BRONX	NET	-212	1,142	-128	221	367	1,410	1,057	-292	2,325	-1,735	-1	4,154
	AGG	1,814	2,278	2,176	2,243	1,583	3,302	2,013	2,378	3,219	3,461	2,009	26,476
BROOKLYN	NET	175	1,429	141	228	-878	1,738	1,565	-23	1,302	-594	419	5,502
	AGG	2,195	2,667	2,713	2,812	2,880	3,378	2,557	2,769	2,270	3,178	2,811	30,230
QUEENS	NET	434	1,169	1,007	192	49	1,640	40	70	469	-471	-180	4,419
	AGG	1,316	1,697	1,401	1,258	923	2,378	1,612	1,962	2,213	2,259	1,488	18,507
STATEN ISLAND	NET	-14	204	207	-9	69	-290	-60	-69	-33	-171	14	-152
	AGG	156	302	237	215	149	474	348	293	233	463	152	3,022
D75	NET	12	-34	-65	5	171	146	24	-41	-32	105	60	351
	AGG	12	34	65	5	171	146	24	41	32	105	60	695

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	AVERAGE
MANHATTAN	3.3%	24.9%	54.1%	27.3%	18.0%	73.2%	18.6%	20.4%	32.2%	41.6%	29.1%	31.1%
BRONX	11.7%	50.1%	5.9%	9.9%	23.2%	42.7%	52.5%	12.3%	72.2%	50.1%	0.0%	30.1%
BROOKLYN	8.0%	53.6%	5.2%	8.1%	30.5%	51.5%	61.2%	0.8%	57.4%	18.7%	14.9%	28.2%
QUEENS	33.0%	68.9%	71.9%	15.3%	5.3%	69.0%	2.5%	3.6%	21.2%	20.8%	12.1%	29.4%
STATEN ISLAND	9.0%	67.5%	87.3%	4.2%	46.3%	61.2%	17.2%	23.5%	14.2%	36.9%	9.2%	34.2%
D75	100%	100%	100%	100%	100%	NA	NA	100%	100%	100%	100%	100%

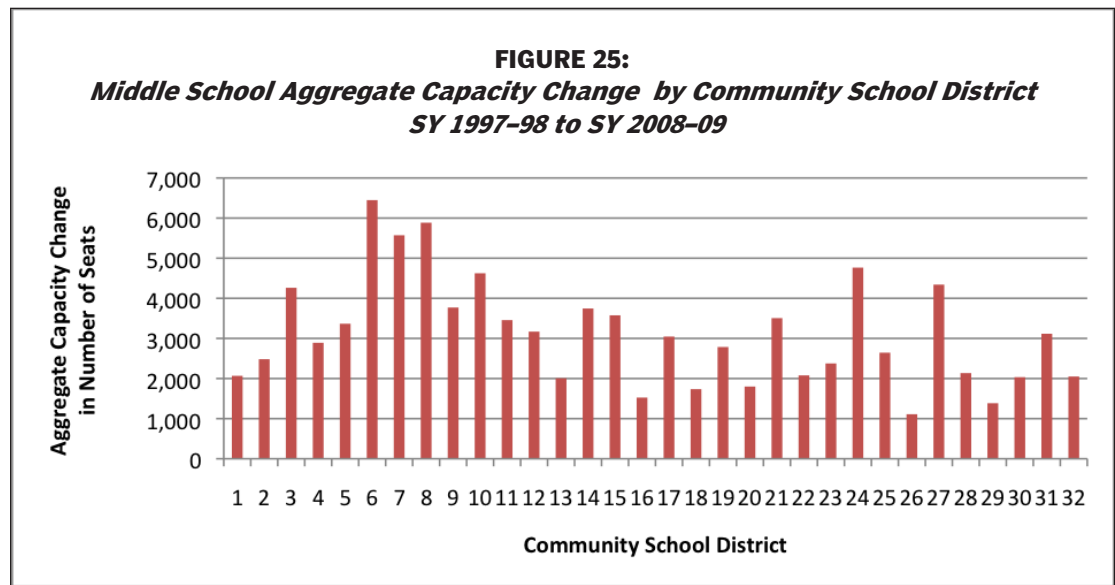
Looking at the shifts from year to year, the movement is often volatile. As with the elementary schools, consider the Bronx between SY 1998–99 and SY 2000–01. Between SY 1998–99 and SY 1999–00 and SY 1999–00 and SY 2000–01, the Bronx experienced 2,278 and 2,176 seats of aggregate capacity change, respectively. However, in the first 2-year period, the Bronx’s capacity as a whole expanded by 1,142 seats, a large net increase in capacity for the borough. The next 2-year period, though, it had a comparable amount of aggregate change but a net decrease in capacity of 128 seats.

Comparing average net capacity to total aggregate capacity for each of the boroughs for the entire period analyzed, the range varies by only 6 percentage points. Staten Island has the highest percentage— 34.2%— of aggregate change attributable to net capacity. The lowest average is in Brooklyn where 28.2% of aggregate change is attributable to net capacity. What these averages mean is that in the middle school buildings a relatively low share of net capacity is associated with the aggregate change even though annual changes are much more volatile. At the elementary school level the comparison of aggregate change attributable to net capacity is lower; the averages for the 12 years range from a low of 12.4% in the Bronx to a high of 24.3% in Manhattan. Net capacity is a smaller component of aggregate change on average in the elementary buildings although annual change by borough is much more volatile as in the middle school buildings.

Patterns such as these seem to suggest that capacity is shifting at the school level on an as needed basis.

Aggregate Capacity Change by Community School District

Aggregate change in the middle school buildings in the community school districts is significant with a total of 99,751 seats of aggregate change. District 75 is not included in the following analysis; its 695 seats of aggregate change have been deducted from the 100,446 seats of aggregate change discussed above. The aggregate change swamps net capacity change of 16,304 seats; there are 6.1 seats of aggregate change for each seat of capacity change. In some districts the correlation is much higher, e.g., in District 3, for each seat of net capacity change there are 31.8 seats of aggregate change. The following graph and chart show middle school buildings aggregate capacity change by Community School District:



**MIDDLE SCHOOL AGGREGATE CAPACITY CHANGE BY
COMMUNITY SCHOOL DISTRICT OVER 12 YEARS**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
1	360	131	44	183	107	229	226	295	181	115	196	2,067
2	204	186	277	181	346	189	125	302	81	268	323	2,482
3	162	609	384	157	277	549	261	601	735	408	119	4,262
4	345	266	395	113	270	405	235	287	104	304	167	2,891
5	267	495	734	276	125	372	289	248	139	182	239	3,366
6	252	404	591	278	395	536	348	566	1,410	1,209	459	6,448
7	464	157	524	697	297	1,543	523	496	227	434	210	5,572
8	440	459	520	580	407	382	443	264	916	944	530	5,885
9	98	463	407	381	332	202	262	453	639	190	343	3,770
10	331	736	363	197	169	555	358	415	410	627	463	4,624
11	130	249	196	200	236	288	229	324	496	978	130	3,456
12	351	214	166	188	142	332	198	426	531	288	333	3,169
13	232	137	93	210	118	149	128	248	127	294	270	2,006
14	179	240	265	189	296	768	569	329	238	321	352	3,746
15	203	392	315	576	568	369	255	195	172	369	162	3,576
16	133	44	115	192	80	45	245	90	102	45	434	1,525
17	348	145	318	382	227	129	159	168	567	416	187	3,046
18	174	80	50	237	194	37	153	232	134	359	85	1,735
19	73	310	604	270	331	84	74	299	230	225	286	2,786
20	192	156	222	157	121	255	47	231	105	172	142	1,800
21	152	337	186	248	587	658	513	250	152	236	187	3,506
22	190	547	270	71	42	230	40	173	123	253	139	2,078
23	96	157	96	90	191	612	128	283	144	294	285	2,376
24	484	717	228	273	276	1,371	86	361	298	442	229	4,765
25	171	136	190	159	199	244	217	275	453	288	312	2,644
26	55	76	35	108	64	123	132	72	212	233	0	1,110
27	216	462	620	306	131	274	389	475	531	523	414	4,341
28	169	164	152	156	116	38	434	213	314	197	182	2,135
29	60	103	96	84	37	144	82	260	88	291	139	1,384
30	67	39	80	172	100	184	272	306	317	285	212	2,034
31	250	302	237	215	149	474	348	293	233	463	152	3,116
32	223	122	179	190	125	42	246	271	176	194	282	2,050
TOTAL	7,071	9,035	8,952	7,716	7,055	11,812	8,014	9,701	10,585	11,847	7,963	99,751

- In descending order, the five districts with the greatest volume of aggregate capacity change over the 12 year period studied were:
 - ◊ District 6 in Manhattan with 6,448 seats of aggregate change.
 - ◊ Districts 8 and 7 in the Bronx with 5,885 and 5,572 seats of aggregate change, respectively.
 - ◊ District 24 in Queens with 4,765 seats of aggregate change.
 - ◊ District 10 in the Bronx with 4,624 seats of aggregate change.

- In ascending order, the five districts with the lowest volume of aggregate change at the middle school level were:
 - ◊ District 26 in Queens with 1,110 seats worth of change.
 - ◊ District 29 in Queens with 1,384 seats worth of change
 - ◊ Districts 16,18 and 20 in Brooklyn with 1,525, 1,735, and 1,800 seats of aggregate change, respectively.
- District 7 in the Bronx had the greatest aggregate change in a single year of any district with 1,543 seats in 2003; it had an increase of 807 seats in net capacity in 2003. This district had the highest aggregate change for the entire period of 6,448 seats; net capacity was 1,426 seats for this district.
- Aggregate change in a single year above 1,000 seats occurred in only 3 districts. In addition to District 7 discussed above, District 6 in Manhattan had aggregate change greater than 1,000 in two years and District 24 in Queens had aggregate change greater than 1,000 in one year.
- District 26 is the only district that had a year with no aggregate change, which occurred in 2008. This district also had the smallest overall aggregate change of 1,110. Its net capacity change was 386.
- District 8 in the Bronx had the second highest aggregate change of 5,885 seats, the net capacity for this district's middle schools was only 497 seats. For every seat of net capacity change there was 11.8 seats of aggregate change.
- District 24 in Queens had the fourth highest aggregate change of 4,765 seats. It also had the highest level of net capacity increases at the middle school level with a net capacity change of 2,493 seats. District 24's year of greatest aggregate change was 2003 with 1,371 seats. In 2003 this district had 1,371 seats of net capacity change so that net capacity equaled aggregate change in this year.

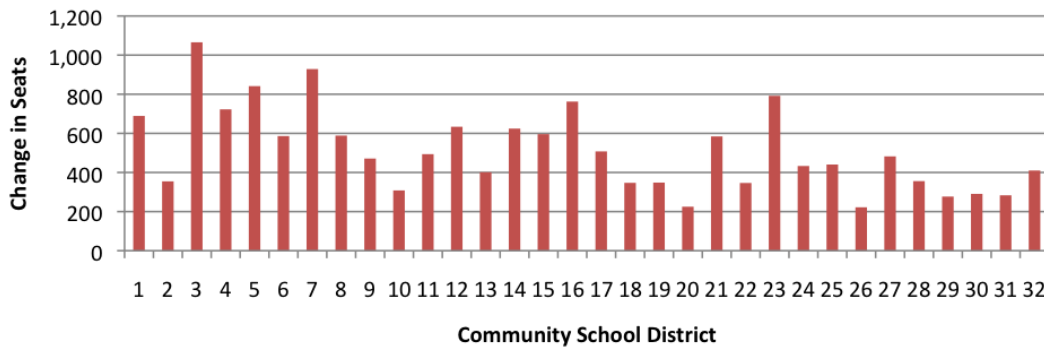
Average per Building Aggregate Capacity Change

Middle school buildings on the community school district level experienced lower overall volumes of aggregate change over the 12-year period compared to elementary buildings but this is attributed in part to the significantly greater number of elementary buildings – 1006 elementary buildings compared to 211 middle school buildings and temporary structures. However, examining the average per building aggregate capacity change, middle school buildings experienced substantially higher levels of average per building aggregate change than elementary buildings.

The range of the average per building aggregate capacity change in an elementary building was between 200 and 540 seats with an average of 300 seats per building. In the chart on the succeeding page, the average per building aggregate capacity change in a

middle school building was between 222 and 1,066 seats with an average of 527 seats per building. Each district has a different number of school buildings, ranging from 2 buildings in District 16 to 15 buildings in District 10. To adjust for this, CFE has also added an average aggregate change per building calculation. This number was derived by dividing the total aggregate change measured over 12 years in a district by the number of buildings in that district. In this analysis, those averages are further split into elementary and middle school averages.

FIGURE 26:
Average per Building Aggregate Capacity Change by Community School District
SY 1997-98 to SY 2008-09



**MIDDLE SCHOOL AVERAGE PER BUILDING AGGREGATE
CAPACITY CHANGE BY COMMUNITY SCHOOL DISTRICT**

DISTRICT	NUMBER OF BUILDINGS	TOTAL AGGREGATE CHANGE	AVERAGE AGGREGATE CHANGE PER BUILDING
1	3	2,067	689
2	7	2,482	355
3	4	4,262	1,066
4	4	2,891	723
5	4	3,366	842
6	11	6,448	586
7	6	5,572	929
8	10	5,885	589
9	8	3,770	471
10	15	4,624	308
11	7	3,456	494
12	5	3,169	634
13	5	2,006	401
14	6	3,746	624
15	6	3,576	596
16	2	1,525	763
17	6	3,046	508
18	5	1,735	347
19	8	2,786	348
20	8	1,800	225
21	6	3,506	584
22	6	2,078	346
23	3	2,376	792
24	11	4,765	433
25	6	2,644	441
26	5	1,110	222
27	9	4,341	482
28	6	2,135	356
29	5	1,384	277
30	7	2,034	291
31	11	3,116	283
32	5	2,050	410
TOTAL	210	99,751	

*Main school buildings and the temporary structures associated with them.

Adjusting for the number of buildings in each district, the five districts with the highest average rates per building of aggregate capacity change are distinct from the five districts with the greatest volume of aggregate capacity change.

-
- In descending order the middle school districts, which experienced the greatest average aggregate change per building were:
 - ◊ District 3 in Manhattan with an average of 1,066 seats of aggregate change per building.
 - ◊ District 7 in the Bronx with an average of 929 seats of aggregate change per building.
 - ◊ District 5 in Manhattan with an average of 842 seats of aggregate change per building.
 - ◊ District 23 in Queens with an average of 792 seats of aggregate change per building.
 - ◊ District 16 in Brooklyn with an average of 763 seats of change per building.
 - In ascending order the middle school districts that experienced the smallest average aggregate change per building were:
 - ◊ District 26 in Queens with an average of 222 seats of change per building.
 - ◊ District 20 in Brooklyn with 225 seats of change per building.
 - ◊ District 29 in Queens with an average of 277 seats of change per building.
 - ◊ District 31 in Staten Island, with an average of 283 seats of change per building.
 - ◊ District 30 in Queens with an average of 291 seats of change per building.
 - District 3 in Manhattan had a high level of aggregate change and the largest average aggregate change per building with 1,066 seats of aggregate change per middle school building. At the elementary school level, District 3 was among the 5 districts with the highest amount of aggregate change on average per building.
 - District 7 in the Bronx had the fourth highest aggregate change overall and a similarly high average aggregate change per building of 929 seats per building.
 - District 23 had a relatively low level of aggregate change of 2,376 seats but a high average aggregate change per building of 792 seats.
 - Both Districts 20 and 26 had low volumes of overall aggregate change and low average per building of aggregate change with 225 and 222 seats, respectively.
 - District 29 had one of the lowest levels of aggregate change and one of the lowest average aggregate change per building.
-

Summary of Middle School Capacity Measures

The following section compares the capacity change profiles of districts along multiple parameters to better illustrate the kind of growth that happened in different parts of the city. The following table provides a number of measures of capacity change for each district. For example, District 6 in upper Manhattan had a low net capacity change but a high aggregate change. The net capacity change as a percent of the aggregate change was low and the net capacity change per building was low. Historically, this district has had significant overcrowding.

The following indicators have been examined at the district level:

Net change. The overall 12 year capacity increase or decrease in a district that results from the gain or loss of seats in existing buildings.

Aggregate Change. The total number of seats gained or lost in a district over the 12-year period.

Net Change per Building. This indicator scales the total net change relative to the number of buildings, allowing for building level comparisons across districts for the 12-year period.

Aggregate Change per Building. This indicator scales the total aggregate change for the 12 years relative to the number of buildings in a district. Calculating change on a per building basis allows for building level comparisons across districts for the entire period.

Net Change as a Percentage of Aggregate Change. This indicator is calculated by dividing net change by aggregate change. It shows what percentage of the total fluctuation in existing building capacity contributed to the overall growth or decrease of capacity at the district level. This measure is useful for comparing districts to see whether most of their change was in a single direction over the 12 year period or whether they experienced a series of increases and decreases that largely cancelled each other out.

12 Year Capacity Change. This is the difference between the district's capacity in SY 2008–09 versus SY 1997–98.

Rank. For each indicator the district's numerical standing amongst all of the districts is provided. For example, District 1 has 14 buildings. There are 30 districts with a greater number of school buildings.

MIDDLE SCHOOL SUMMARY OF CAPACITY MEASURES

DISTRICT	BUILDINGS		NET CHANGE		AGGREGATE CHANGE		NET CHANGE/BUILDING		AGGREGATE CHANGE/BUILDING		NET AS A % OF AGGREGATE		12 YEAR CAPACITY CHANGE	
	NUMBER	RANK	SEATS	RANK	SEATS	RANK	SEATS	RANK	SEATS	RANK	PERCENT	RANK	SEATS	RANK
1	3	30	315	22	2067	24	105	10	689	7	15.2%	18	315	23
2	7	10	80	27	2482	20	11	27	355	23	3.2%	28	358	20
3	4	27	134	26	4262	7	34	26	1066	1	3.1%	29	134	29
4	4	27	355	20	2891	17	89	12	723	6	12.3%	19	355	21
5	4	27	532	12	3366	13	133	5	842	3	15.8%	16	532	15
6	11	2	614	8	6448	1	56	19	586	12	9.5%	23	371	18
7	6	13	1426	2	5572	3	238	1	929	2	25.6%	8	1426	7
8	10	5	497	14	5885	2	50	23	589	11	8.4%	24	1863	5
9	8	7	724	7	3770	8	91	11	471	17	19.2%	12	825	11
10	15	1	912	5	4624	5	61	18	308	27	19.7%	10	3154	1
11	7	10	382	18	3456	12	55	21	494	15	11.1%	21	382	17
12	5	21	213	24	3169	14	43	24	634	8	6.7%	25	213	27
13	5	21	612	9	2006	27	122	6	401	21	30.5%	5	612	12
14	6	13	980	4	3746	9	163	4	624	9	26.2%	6	980	10
15	6	13	66	28	3576	10	11	28	596	10	1.8%	31	268	26
16	2	32	149	25	1525	30	75	15	763	5	9.8%	22	149	28
17	6	13	-174	32	3046	16	-29	32	508	14	5.7%	26	-174	31
18	5	21	561	10	1735	29	112	8	347	25	32.3%	4	561	14
19	8	7	558	11	2786	18	70	16	348	24	20.0%	9	599	13
20	8	7	314	23	1800	28	39	25	225	31	17.4%	14	314	24
21	6	13	1134	3	3506	11	189	3	584	13	32.3%	3	1134	9
22	6	13	406	15	2078	23	68	17	346	26	19.5%	11	313	25
23	3	30	364	19	2376	21	121	7	792	4	15.3%	17	364	19
24	11	2	2493	1	4765	4	227	2	433	19	52.3%	1	2115	3
25	6	13	322	21	2644	19	54	22	441	18	12.2%	20	322	22
26	5	21	386	16	1110	32	77	14	222	32	34.8%	2	386	16
27	9	6	753	6	4341	6	84	13	482	16	17.3%	15	2264	2
28	6	13	35	29	2135	22	6	29	356	22	1.6%	32	1841	6
29	5	21	-50	30	1384	31	-10	31	277	30	3.6%	27	-50	30
30	7	10	386	16	2034	26	55	20	291	28	19.0%	13	1249	8
31	11	2	-58	31	3116	15	-5	30	283	29	1.9%	30	-260	32
32	5	21	532	12	2050	25	106	9	410	20	26.0%	7	1994	4

At the middle school level all five of the districts with the highest levels of net change overall – District 7 in the Bronx, Districts 14 and 21 in Brooklyn and District 24 in Queens - also had among the five highest levels of net change per building.

- The following districts have experienced both large increases in capacity and relatively low amounts of aggregate change. A number of these districts have also experienced overcrowding for at least a part of the 12 years.

- ◊ District 21 in Brooklyn and District 24 in Queens were also in the top five highest ranked districts for the percentage of aggregate capacity expressed as net change.
- ◊ Over 30% of the aggregate change in these districts was expressed as net growth. District 24 had 52% of its aggregate change as net capacity change.
- ◊ District 24 is the only district with major growth at the elementary level to also have significant growth on the middle school level.
- The one district with high net capacity not mentioned above is District 7 in the Bronx. It is an example of a district with capacity growth that occurs alongside fluctuation, resulting in high levels of net change and net change per building as well as high levels of aggregate change and aggregate change per building.
 - ◊ District 7 in the Bronx averaged 929 seats worth of aggregate change in each of its six middle school buildings over the 12-year period. For every four seats worth of aggregate change, a seat of net change was gained. The district had a total of 5,572 seats of aggregate change and 1,426 seats of net change.
- The following districts – District 18 in Brooklyn and District 26 in Queens - also experienced growth but not at as great a level as the above districts. These districts had low levels of internal fluctuation, i.e., aggregate change, but among the highest levels of aggregate change expressed as net change. Most of the change in these districts was expressed as growth, i.e., net capacity increases rather than aggregate change—increases and decreases that cancelled each other out.
 - ◊ District 18 experienced 1,735 seats worth of aggregate change. Thirty-two percent of that was expressed as net change. District 26 experienced 1,110 seats worth of aggregate change, of which 35% was net change.
 - ◊ Net change was 561 seats in District 18 and 386 seats in District 26, not particularly high compared to the citywide average of 453 seats of net growth for middle school districts. However, when examining the level of net capacity relative to aggregate change, these districts' net growth was comparatively high.
 - ◊ District 26 also had the lowest levels of aggregate change and aggregate change per building in the City.
- The following district – District 3 in Manhattan - had among the lowest overall levels of net change and among the highest levels of overall aggregate change. Consequently, this district also had among the lowest levels of aggregate change expressed as net change. The middle school buildings in this district experienced

a series of increases and decreases but their capacity did not change significantly between SY 1997–98 and SY 2008–09.

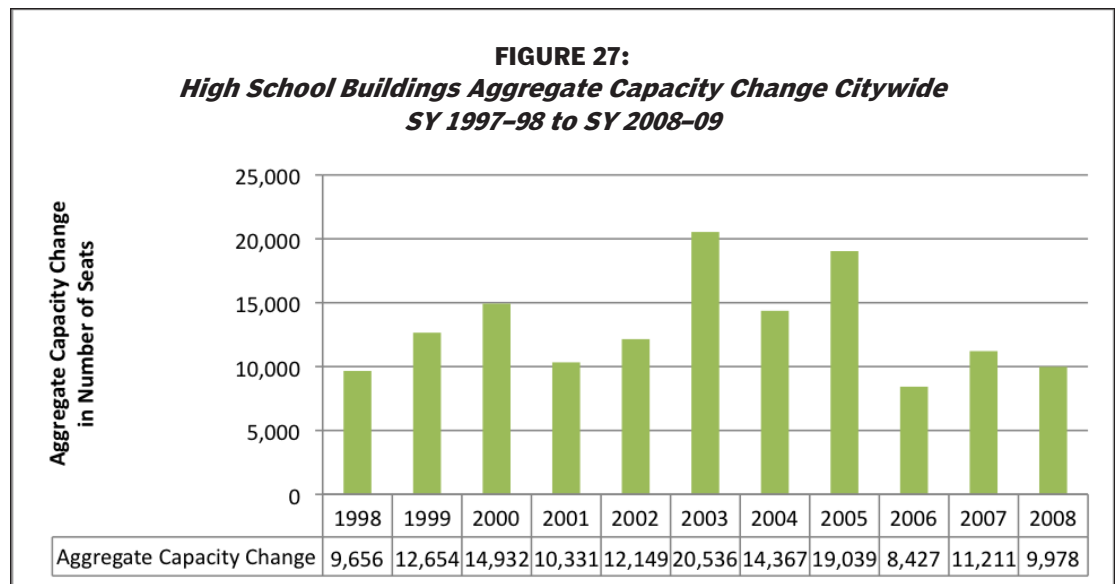
- District 3 had high aggregate change – 4,262 seats of aggregate change and the highest aggregate change per building - 1,066 seats per building. While District 3 had high levels of net change per building at the elementary level, it had the sixth lowest level of net change per building at the middle school level. District 3 also had one of the lowest levels of aggregate change expressed as net change at the middle school level.
- The following districts – District 8 in the Bronx and Districts 15 and 17 in Brooklyn, have high aggregate change per building but low to moderate net change as a percentage of aggregate change or low net change per building. Their growth trajectory over the 12 years was also minimal but marked by heavy fluctuation, however to a lesser extent than other districts noted previously above.
 - ◊ District 17 in Brooklyn has high levels of aggregate change – 3,046 seats - and high levels of aggregate change per building – 508. It also has relative low levels of aggregate change expressed as net change – 4%, the lowest citywide. For every 50 seats worth of aggregate change, District 17 only experienced 3 seats of net growth.
 - ◊ District 8 in the Bronx had moderate levels of aggregate change per building – 589 - but average levels of net change – 497 - and net change relative to aggregate change of 8%.
 - ◊ District 15 of Brooklyn had low levels of net change – 66 seats – and 11 seats of net change per building, and aggregate change expressed as net change was also low at 2%. Since it had roughly average levels of aggregate change of 3,576, this suggests it had internal changes at a higher rate than it grew.
- The following districts – Districts 16 and 20 in Brooklyn and Districts 29 and 30 in Queens - maintained a comparatively stable level of capacity over the 12-year period. Most of these districts had both low levels of aggregate and net change. All of these districts except for District 16 have overcrowding problems.
 - ◊ Two districts – District 16 in Brooklyn and District 29 in Queens had among the city’s lowest levels of aggregate change at the middle school level – 1,525, and 1,384, respectively.
 - ◊ District 20 had both low net and aggregate changes – 314 and 1,800 seats, respectively. Net change per building of 39 seats and aggregate change per building of 25 seats were also both low. This is a very overcrowded district and the data indicates that little change occurred in its middle school buildings.

- ◊ District 29 had one of the lowest levels of aggregate change per building - 227.
- ◊ District 30 in Queens also had low levels of aggregate change per building – 291 - and low levels of aggregate change – 2,034. The net capacity change in this district was average at 386 seats with only 55 seats of net capacity change per building. District 30 also had high levels of historic overcrowding.

High Schools

Aggregate Capacity Change Citywide

The aggregate change in the high school buildings reveals greater system-wide capacity change than the net-change data suggest. Periods with apparently small increases or decreases in net capacity are revealed to be years of large-scale internal fluctuation with large aggregate change. Total aggregate change for the period for the high school buildings totaled 143,280 seats. The following chart shows the volume of aggregate change in 238 high school main buildings and the temporary structures associated with them between each two-year segment in the 12-year study period. The annual aggregate change ranged from a low of 8,427 seats in 2006 to a high of 20,536 seats in 2003. Net capacity change, which totaled 30,196 seats for the entire period, had a much lower range – from a decrease of 2,828 seats to a high of 15,502 seats in 2003.

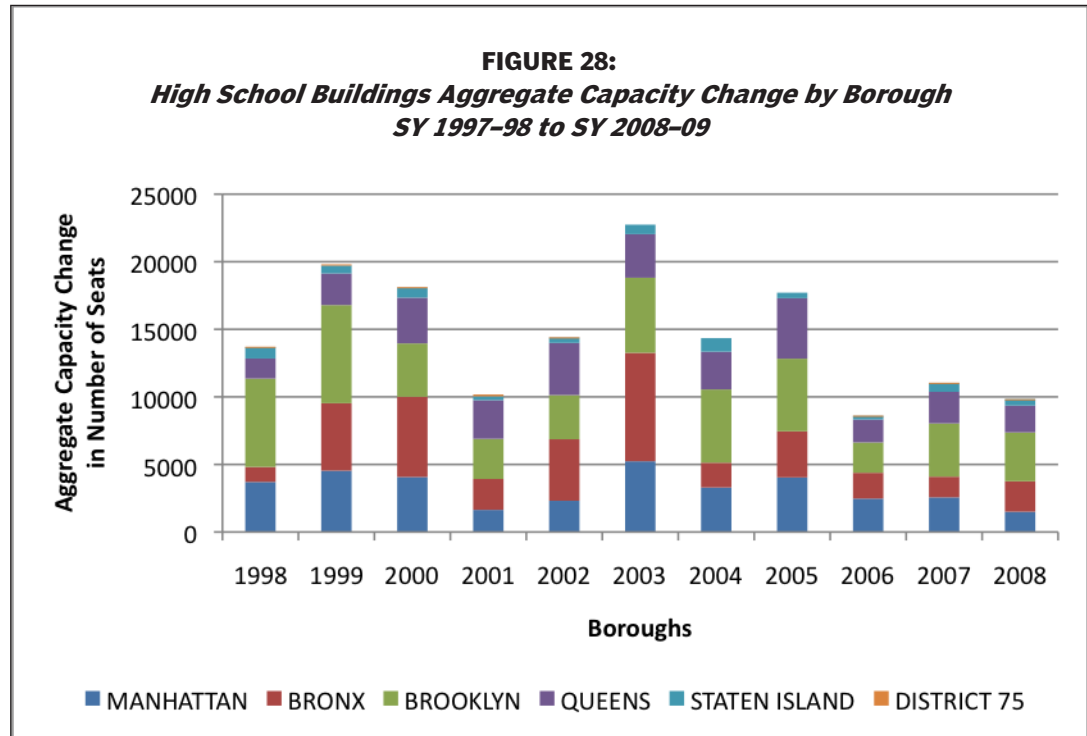


- High school buildings had annual changes in aggregate capacity greater than 10,000 except for three years – 9,656 seats in 1998, 8,427 seats in 2006 and 9,978 seats in 2008.

- The single greatest year of aggregate change was 2003 with 20,536 seats of aggregate change. This was also the year of the greatest increase in net capacity with 15,502 seats.
- The year with the smallest volume of aggregate change was 2006.
- The disparity in figures between net change and aggregate change was most significant in the high school buildings:
 - ◊ In 1998 there were 9,656 seats worth of aggregate change but only a 1,550 seat of net capacity change in that year. Similarly, in 2000 a 700 seat net decrease the following year is actually the product of 14,932 seats of aggregate change.
 - ◊ In 2005, aggregate change increases 32% above the previous year's level of aggregate change while net change for 2005 increases by 23% above the previous year, suggesting that the additional high school aggregate capacity growth reflects increased shuffling of capacity in the buildings. Net capacity continues to trend steadily downwards and aggregate capacity has two of its three smallest changes in 2006 and 2008.
 - ◊ 2008 had a small amount of net change - 162 - relative to the aggregate change of 9,978 seats in the same year.
 - ◊ 2006 had relatively low rates of both net capacity change and aggregate change. Net capacity increased by 1,325 seats and aggregate capacity changed by 8,427 seats, the lowest amount of aggregate change in a single year.
 - ◊ Aggregate change in the elementary and middle school buildings has different patterns of peaks and lows than in the high school buildings. High schools peaked in 2003 and had its lowest level of aggregate change in 2006. Elementary buildings peak in 2005 with the smallest growth in the preceding year – 2004. The middle schools' peak in aggregate change is 2003; 1998 is the year with the lowest volume of aggregate change.

Aggregate Capacity Change by Borough

The distribution of aggregate change across the boroughs is startling. Two boroughs – Manhattan and Brooklyn – have over 50% of the total aggregate change. The following graph and chart show high school buildings aggregate capacity change by borough:



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	2,374	3,222	4,071	1,639	2,313	5,235	3,298	5,217	2,492	2,614	1,592	34,067
BRONX	1,138	1,753	2,689	2,416	2,201	5,753	1,839	3,415	1,586	1,535	2,258	26,583
BROOKLYN	3,787	4,666	4,005	2,993	3,355	5,620	5,436	5,525	2,363	4,048	3,665	45,463
QUEENS	1,483	2,338	3,384	2,857	3,859	3,224	2,792	4,474	1,693	2,333	1,984	30,421
STATEN ISLAND	844	593	742	290	398	704	1,002	408	277	665	478	6,401
D75	30	82	41	136	23	0	0	0	16	16	1	345
TOTAL	9,656	12,654	14,932	10,331	12,149	20,536	14,367	19,039	8,427	11,211	9,978	143,280

- Brooklyn had the greatest aggregate change with 45,463 seats, 32% of the total aggregate change in the high school buildings citywide. Brooklyn had the highest annual aggregate changes in 8 of the 11 2-year periods examined. Brooklyn had the fourth highest level of net capacity change with a total of 5,649 seats. For every seat of net capacity change in the borough there were 8 seats of aggregate change. The peak year of aggregate change in Brooklyn high school buildings was 2003 with 5,620.

- Manhattan had 34,067 seats of total aggregate change, the second highest aggregate change of all of the boroughs. This borough had its single largest annual change in 2003 also with 5,235 seats. The second highest year of annual change for Manhattan was 2000 when the borough had 4,071 seats of aggregate change. Manhattan had the highest net capacity change in its high schools with its peak year in 2003 with 4,657 seats of net capacity change. In 2003 the percentage of aggregate change attributable to net capacity change was 89%.
- Queens had a total aggregate change of 30,421 seats in its high schools, the third highest aggregate change of all the boroughs. Queens had its greatest years of aggregate change in 2005 with 4,474 seats and 3,859 in 2002. Net capacity in this borough in 2005 and 2002 was 904 and 1,175 seats, respectively. The percentage of aggregate change attributable to net capacity change was 20% in 2005 and 30% in 2002.
- The Bronx had the fourth largest aggregate change with 26,583 seats, 19% of the total aggregate change. In 2003 there was total aggregate change of 20,536 seats, the highest aggregate change in any one-year. In that year Bronx had the highest aggregate change— 5,753 seats or 28% of the total for 2003. Net capacity in the Bronx in 2003 was 5,557 seats; 97% of aggregate change in that year was attributable to a net increase in capacity.
- Staten Island had the smallest aggregate change of all of the boroughs with 6,401 seats of aggregate change.
- District 75's 3 high school buildings had the smallest level of aggregate change— 345 seats—for the entire 12 years. There were 3 years with no data for these buildings— 2003 to 2005.
- As with elementary and middle school buildings, Brooklyn high school buildings had the highest level of aggregate change over 12 years of any borough – in sharp contrast to net change in the high school buildings, where Brooklyn ranked fourth, and Manhattan had the largest net increase over the 12-year period.

Comparison of Net Capacity and Aggregate Change by Borough

As noted in the previous discussion, there is significant movement in the high school buildings that is captured in aggregate change but not reflected in net capacity change. The following tables provide a direct comparison of the net and aggregate capacity numbers for each borough and the percentage of aggregate change attributable to net capacity change.

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	TOTAL
MANHATTAN	NET	622	-1,788	1,307	-1	-559	4,657	1,084	3,503	1,384	-694	300	9,815
	AGG	2,374	3,222	4,071	1,639	2,313	5,235	3,298	5,217	2,492	2,614	1,592	34,067
BRONX	NET	-252	-23	-885	-938	955	5,557	425	2,421	790	287	-860	7,477
	AGG	1,138	1,753	2,689	2,416	2,201	5,753	1,839	3,415	1,586	1,535	2,258	26,583
BROOKLYN	NET	961	208	-603	429	-439	4,102	1,138	-343	-957	642	511	5,649
	AGG	3,787	4,666	4,005	2,993	3,355	5,620	5,436	5,525	2,363	4,048	3,665	45,463
QUEENS	NET	-201	-604	-278	1,579	1,175	576	1,576	904	147	799	38	5,711
	AGG	1,483	2,338	3,384	2,857	3,859	3,224	2,792	4,474	1,693	2,333	1,984	30,421
STATEN ISLAND	NET	450	-539	-200	-126	218	610	968	-72	-55	299	174	1,727
	AGG	844	593	742	290	398	704	1,002	408	277	665	478	6,401
D75	NET	-30	-82	-41	-84	23	0	0	0	16	16	-1	-183
	AGG	30	82	41	136	23	0	0	0	16	16	1	345

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	AVER-AGE
MANHATTAN	26.2%	55.5%	32.1%	0.1%	24.2%	89.0%	32.9%	67.1%	55.5%	26.5%	18.8%	38.9%
BRONX	22.1%	1.3%	32.9%	38.8%	43.4%	96.6%	23.1%	70.9%	49.8%	18.7%	38.1%	39.6%
BROOKLYN	25.4%	4.5%	15.1%	14.3%	13.1%	73.0%	20.9%	6.2%	40.5%	15.9%	13.9%	22.1%
QUEENS	13.6%	25.8%	8.2%	55.3%	30.4%	17.9%	56.4%	20.2%	8.7%	34.2%	1.9%	24.8%
STATEN ISLAND	53.3%	90.9%	27.0%	43.4%	54.8%	86.6%	96.6%	17.6%	19.9%	45.0%	36.4%	52.0%
D75	100%	100%	100%	62%	100%	NA	NA	NA	100%	100%	100%	95%

- Manhattan had the greatest amount of net capacity change and the second highest level of aggregate change of all of the boroughs. The relationship between the two shifted significantly throughout the 12 years from a low of 0.1% in 2001 when there was a decrease of 1 seat in the high schools and 1,639 seats of aggregate change to a high of 89% two years later in 2003. In this year net change was 4,657 seats and aggregate change was 5,235.
- Queens had the lowest range of change over the period. The percentage of aggregate change attributable to net capacity ranged from a low of 1.9% to a high of 55.3%. This is a significant range but the other boroughs have wider ranges.
- All of the boroughs except Queens had high levels of net and aggregate change in 2003. For 4 of the 5 boroughs net capacity was a high percentage of aggregate change; the range was 73% to 96.6%.
- In 2000 all of the boroughs except Manhattan experienced decreases in net capacity. The highest percentage of aggregate change attributable to net capacity in this year was 32.9% in the Bronx; all other boroughs had lower percentages although Manhattan's was 32.1%.
- Though 2007 and 2008 were years of relatively small net change for all five boroughs, substantial amounts of aggregate change occurred at the city and borough level, suggesting that seats were shifted to a greater degree than they were being added. For example, Queens had a net change of 38 high schools seats in 2008 and 1,984 seats of aggregate change. As a result, net change as a percentage of aggregate change was relatively low in 2007 and 2008 in the boroughs.

CONTEXT FOR CAPACITY CHANGE: CAPITAL AND PROGRAMMATIC CHANGES

New York City public schools with its 1.1 million students gained or lost thousands of seats annually over the 12-year study period. A total of 75,132 seats were added in net capacity to 1,455 New York City public school buildings at the same time that there was 510,051 seats of aggregate change during the 12 years examined in this report.

The ECU reports *what* happens in the schools – but it does not detail *why* or *how* capacity changes. Specifically, it does not address the causes, extent, or impact of capacity changes as they occur. Significant capacity shifts of this magnitude indicate two likely causes: significant structural and programmatic changes within schools and/or gaps and flaws in the data used for the report. These are serious concerns in a document used to inform major capital decisions.

Several types of capital and programmatic changes may be associated with capacity change. The changes examined in this report include:

- Additions built onto existing school buildings;
- Temporary structures added, often located in a school's open space;
- Programming changes, re-programming of spaces and changes in the number of organizations within a building;
- Single Organization Buildings.

Since the analysis of changes in the number of organizations in a school building were found to correlate with higher than average levels of capacity change, this report also includes an analysis of buildings that contained a single organization over the 12 year period for comparison.

NEW ADDITIONS AND TEMPORARY STRUCTURES

The following section examines the effects that adding an addition or a temporary structure has on an existing school building. Not only does this report consider how these new structures directly affect capacity, but whether buildings that receive additions or temporary structures are, in general, more likely to undergo frequent or large scale capacity changes.

Over the last 12 years, the Department of Education and the School Construction Authority have used additions and temporary structures to add seats to existing school buildings to ameliorate overcrowding. Additions are permanent structures attached to the main school building. It should be noted that the programs contained within an addition could vary from school to school. While they may include additional classrooms, additions may also consist primarily of specialized or common spaces.

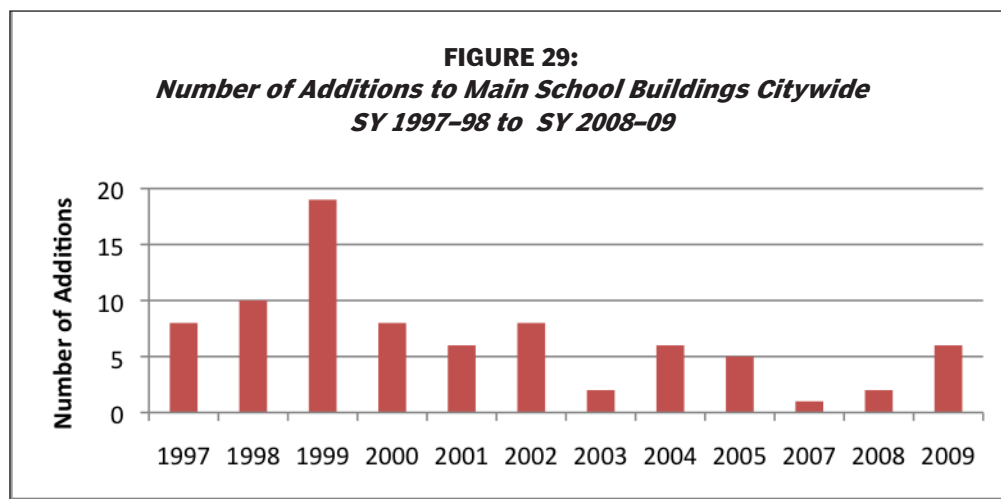
Additions are not separately identified in the ECU Reports. Because they are an integral part of the main building they are attached to, only the main building is listed.

Temporary structures encompass a wide variety of spaces: mini-schools, transportables (two-classroom trailers), temporary classroom buildings and annexes. Temporary structures may be located on- or off-site. All temporary structures have their own Building ID number separate from the main building's Building ID number.

The ECU counts temporary structures in different ways, depending on the school building with which the temporary structures are associated. For elementary and middle school buildings, capacity of temporary structures is counted separately from the main school building and enumerated under the Building ID number assigned to the temporary structure. For high school buildings, temporary-structure capacity is counted in the whole-building capacity count for the main high school building. High school-level temporary structures, like all temporary structures, do have their own Building IDs, but they are listed with no capacity or enrollment, even though students often attend classes in these structures. The reasons for this inconsistency are not provided in the ECU Reports.

The following sections examine capacity changes linked to additions and temporary structures.¹³

Additions and Capacity Change



Eighty-two additions built between 1997 and 2009 have been identified. The distribution of additions over time is displayed in the above chart. Additions were built more frequently in the first half of the 12-year study period than towards the end. The ECU Reports do not provide any information identifying schools with recent additions or why decisions are made to build additions. This report's analysis is limited to an identification of the likely source of some of the net capacity changes identified earlier in the report due to new building additions.

The number of new additions peaked in 1999 with 19, 11 of which were located in Queens, the highest in a single borough in one year; 3 of these new additions were located in Brooklyn. Queens had its largest single year of net growth that year, with an increase in net capacity of 6,204 seats. The total volume of increases in capacity Citywide in 1999 was 11,067 seats. This is the product of 29,591 seats worth of growth and 18,524 seats worth of decrease. Queens' net capacity change in 1999 was 6,204 seats, representing 21% of total growth.

¹³ The list of additions used in this analysis was developed from information in the ECU reports, press releases and other capital documents. CFE has accounted for additions to 82 schools buildings since the 1997-98 school year. Most of these schools do not have data on the exact number of seats added, so estimates have been constructed by attributing major increases occurring in the same year as the additions were built.

**NUMBER OF ADDITIONS TO MAIN SCHOOL BUILDINGS BY BOROUGH
SY 1997-98 TO SY 2008-09**

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2007	2008	2009	TOTAL
MANHATTAN			1					1					2
BRONX		1	2			1				1		1	6
BROOKLYN	3	3	3	4		1		1	1		2	2	20
QUEENS	4	6	11	4	4	6	2		4			3	44
STATEN ISLAND	1		2	1	2			4					10
TOTAL	8	10	19	9	6	8	2	6	5	1	2	6	82

Citywide Manhattan had the fewest number of additions – only two. Queens had the most, with 44. District 24 in Queens had the greatest number of additions among the city’s schools; its 16 additions represent 24% of all the additions noted during this period and 43% of all the additions in Queens. The districts with the second and third highest number of additions are also in Queens - District 27 with 8 additions and Districts 29 and 30 each with 6.

In 2003–04, the ECU began listing new seats including additions scheduled to come online the following fall. The ECU Report lists additions by school name and the expected number of new seats. Prior to 2003, DOE and SCA did not publish new capacity projects in the ECU Reports. In order to calculate how much of the net increase in capacity was due to additions, this report attributed all capacity added in a two-year period (the year an addition came online as well as the following year) to the new addition. Based on an analysis of a sample of schools that have received additions, this provides a reasonable estimate of seats added through additions.¹⁴ Over a 12-year period, the 82 additions CFE accounted for created approximately 19,731 seats. The average number of seats added through an addition was 240.

Profile of Q600: High School Building with Addition

Queens Vocational High School – Q600 – is one of many overcrowded Queens high schools but one of the few to receive a new addition. Although most overcrowded Queens high schools did not receive additions, additions were built more frequently in Queens at all levels than in any other borough. The new addition at Queens Vocational High School opened in 2005. Although there were several major shifts in capacity for this building over the 12-year period examined, only one change can be ascribed to the addition, a 464-seat increase, noted in 2005–06.

Between 1997–98 and 2008–09 this building had a net capacity increase of 414 seats — but the total growth in this building far exceeds this number. In contrast to significant capacity

¹⁴ CFE tested its two-year seat calculation method on the small subset of schools that had information about how many seats were added through additions. This method tended to slightly overestimate the number of seats added but was more accurate than considering only a single year. Consistent overestimation means that CFE has likely ascribed a larger pool of added capacity to additions than was actually added.

shifts, enrollment for this school has been fairly stable over the 12 years; there was an increase in enrollment of only 78 students between 1997–98 and 2008–09.

In 1997–98 the building's capacity was 825 seats with an enrollment of 1140; in 1998–99 the ECU reports that the capacity was reduced to 576, with an enrollment of 1152. This represented a decrease of 249 seats in capacity although the enrollment did not change significantly. The result of simultaneous capacity decreases and enrollment increases is that the building becomes more overcrowded.

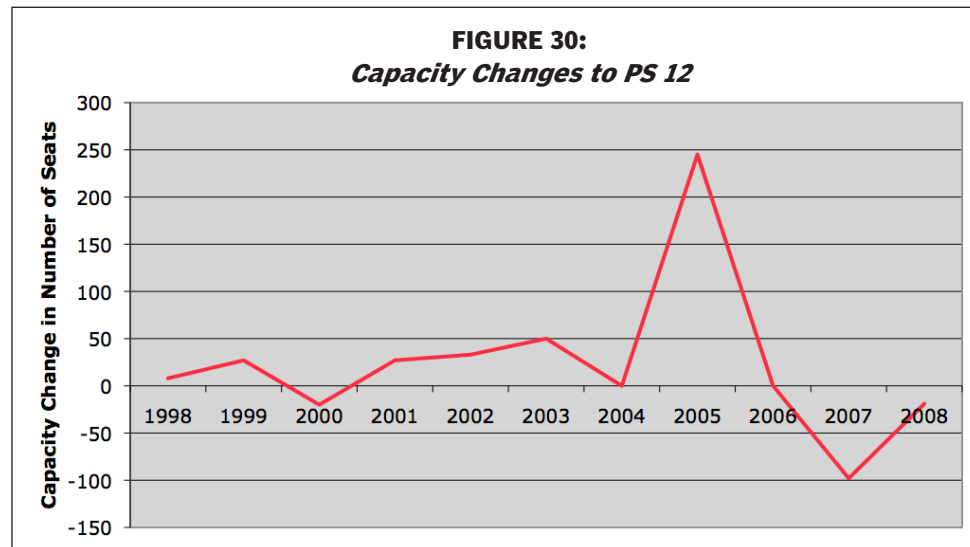
The following year -1999–2000 - capacity increased to 787 seats, a 211-seat rise. Capacity fell by 104 seats between 2001–02 and 2002–03 to 659, with enrollment now at 1,204, yielding a utilization rate of 183%. In 2003–04 capacity rose by 69 seats to 728, and the ECU report lists both a United Federation of Teachers use and a Central Board program for the first time in the building. These organizations remained in place through the 2007–08 school year.

The ECU Report for 2004–05 listed a construction project - a lease/addition - scheduled to open in September 2005, with a total of 643 seats. The 2005–06 ECU Report showed an increase in capacity for Queens Vocational HS of 464 seats for a total capacity of 1,183; there is no annex or temporary structure listed for this school. After the addition opened, the school's enrollment was 1,210 so the building remained overcrowded with the new addition. By 2008–09, capacity increased to 1,239 and the UFT and Central Board Programs were no longer listed for this building.

This report found that schools with additions averaged significantly larger increases in numbers of seats than the general pool of schools. The average sized increase for all schools was 52 seats. For schools with additions, the average net increase over 12 years was 260 seats. School buildings with additions increased their capacity except for six buildings that had an addition but decreased their capacity over the 12 years.

Additions tended to be associated with at least one major single-year capacity increase in a given school building. Typically this increase was over 100 seats. However, even though additions were associated with large increases, additions comprised less than 10% of the major increases. The analysis identified 655 changes of over 100 seats in its analysis of the 12 years of ECU data, yet only 58 of these were connected to additions. Because the analysis showed that some of the additional capacity of the 82 schools was added in more than one year, 24 of the additions are not included in the major changes above 100 seats. In addition to the one major capacity increase (corresponding with the addition) most schools that received additions also had a series of minor increases or decreases. The following chart shows the changing capacity of PS 12 in District 24, which exemplifies this pattern.

PS 12 has relatively small capacity fluctuations until 2004–05 when its addition opens. In that school year 245 seats are added. Capacity remains stable for two years and then it begins to decrease in 2007 and by 2008 the school has lost 116 seats. At the end of the 12 year period, capacity is only 253 seats greater than it was before the addition was built.



A subset of schools that received additions did not display the expected pattern of change. Fifty of the 82 schools with additions had more than one substantial capacity change. Forty-three percent of the time the additional change was an increase. Fifty-six percent of the time it was a decrease. Thirty one percent of schools experienced more than one major shift, and 13% of schools experienced a large increase and a large decrease as well as the expected uptick in capacity from the addition. In most but not all cases the decrease occurred after the growth from the addition.

Though additions comprise a significant and understandable part of capacity change, schools with additions experienced 20,257 seats worth of net change¹⁵ in the 12-year period; this represents 4% of the total aggregate change Citywide. Even with the additional increases and decreases, the presence of additions did have a significant impact on net change. Schools with additions averaged roughly twice the average net increase of schools in the general pool.

However, even though capacity change due to additions did have a significant impact, additions were a relatively small contributor to overall capacity fluctuation as represented by 12 year aggregate capacity change. Part of this is attributable to the fact that only 82 out of 1,455 school buildings examined had additions. In spite of this, they account for a surprisingly small part of the total volume of aggregate capacity change documented in this study. In order to account for the fact that schools with additions had increases and decreases not attributable to additions, CFE measured the capacity directly attributable to additions against aggregate change. The 19,731 seats added through additions are significant and represents 26% of the 75,132 seats of total net capacity growth that were added in the 12-years; the 19,731 seats also represents 3.9% of total aggregate change of 510,051.

¹⁵ Total net change for schools with additions is the combination of the approximately 19,731 seats added through additions, as well as other unrelated capacity increases and decreases that happened in the 82 school buildings that received additions.

Temporary Structures and Capacity Change

Profile of Q483: High School Building with a Temporary Structure

Francis Lewis HS – Q430 – experienced an increase in its capacity of 601 seats over the 12 year period studied.

In 1997–98 the school's capacity was 2,066; in 2008–09 capacity had risen to 2,667, a 29% increase. During the 12 years there were capacity increases in 7 of the 11 two-year periods. This building has been seriously overcrowded for the entire 12 years. There are two school organizations in the building, Francis Lewis HS – Q43 – and a very small special education organization – Q811. Francis Lewis is an extremely popular school in eastern Queens.

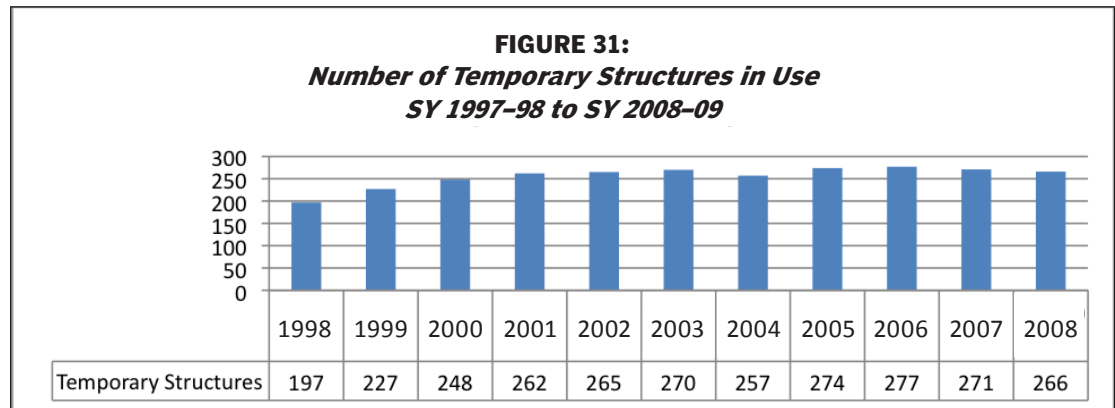
A transportable—2-classroom trailers—was installed on different occasions at this site. According to the Building Condition Surveys conducted by DOE, three units were added in SY 1997–98 and another in 2004. Installation of transportables would account for some capacity increases although it is not possible to determine if all of the capacity increases are due to the trailers, because the enrollment for the main building – Q430 – includes the enrollment for all temporary structures, including trailers supporting this building. The transportables have one building ID – Q966 –which exists in all 12 of the ECU Reports; there is no enrollment or capacity associated with this building ID in the ECU Reports which is typical of all high school temporary structures.

Enrollment at Francis Lewis steadily increased from 1997–98 through 2004–05; it peaked at 4,509 students in 2006–07 and decreased slightly to 4,453 in 2008–09. In these 2 years capacity was 2,638 and 2,667, respectively. Capacity steadily increased over the study period, except for 4 years. The largest capacity increase occurred in 2001–02, with an increase of 226 seats, which does not correspond with the addition of the trailers. The school's capacity peaked at 2,679 seats in 2005–06, an increase in capacity of 108 seats over the 2004–05 capacity; this is likely due to the addition of the temporary structures. In 2005–06 enrollment was 4,244. In spite of these capacity increases, Francis Lewis remains persistently overcrowded. In 2008–09, capacity was 2,667 with a 167% utilization.

In addition to the increase of 226 seats in 2001–02, there were 3 years when capacity increased by at least 100 seats in each of these years: 1999–00, 2004–05 and 2005–06. If one of the transportables was installed in 2004, its presence explains the capacity increase in either 2004–05 or 2005–06, but not both years.

Over the 12-year study period, the ECU Reports list 292 temporary structures; these temporary structures include mini-schools, transportables, temporary classroom buildings and annexes. Eighty of the temporary structures contained multiple school organizations although some of these contained single organizations at one time. Not all temporary structures were in use over the entire 12-year period. In 1997–98 there were 197 temporary structures and 262 in 2008–09.

The following chart shows the number of temporary structures in use during each of the 12 years examined. The number of temporary structures has been counted using the Building ID numbers in the ECU Reports; there may actually be more physical structures. For example, the ECU Report does not specify the quantity of transportables assigned to a school building. If more than one transportable was installed at one time at a school, it is reported as one Building ID number.

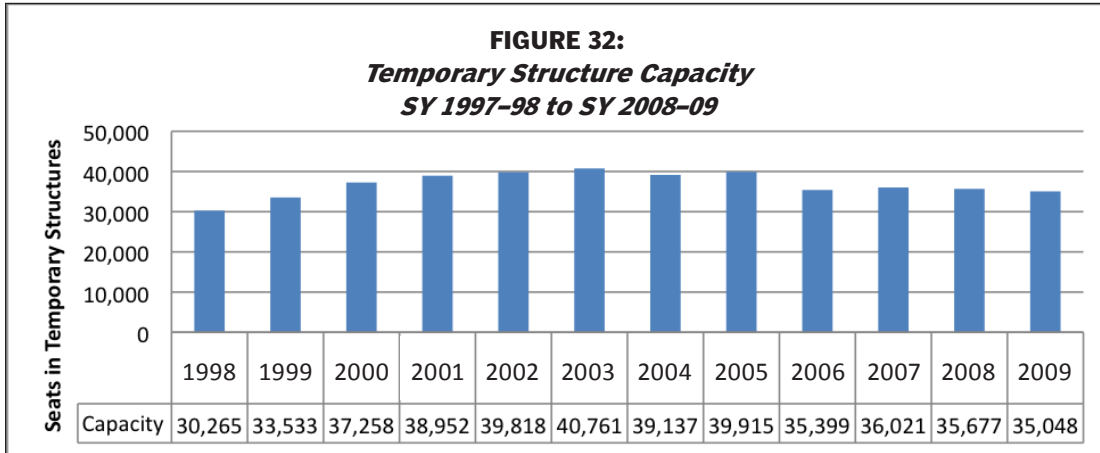


Temporary structures are not uniformly distributed throughout the city, as illustrated below.

NUMBER OF TEMPORARY STRUCTURES BY BOROUGH, 2008-09	
MANHATTAN	14
BRONX	75
BROOKLYN	57
QUEENS	86
STATEN ISLAND	13
D75	17
TOTAL	262

As with additions, Queens was the borough with the greatest number of temporary structures - 86. At the district level, District 10 in the Bronx had the most temporary structures - 23, followed by District 75 with 17 structures, and District 11 in the Bronx, and Districts 24 and 28 in Queens with 16 structures each.

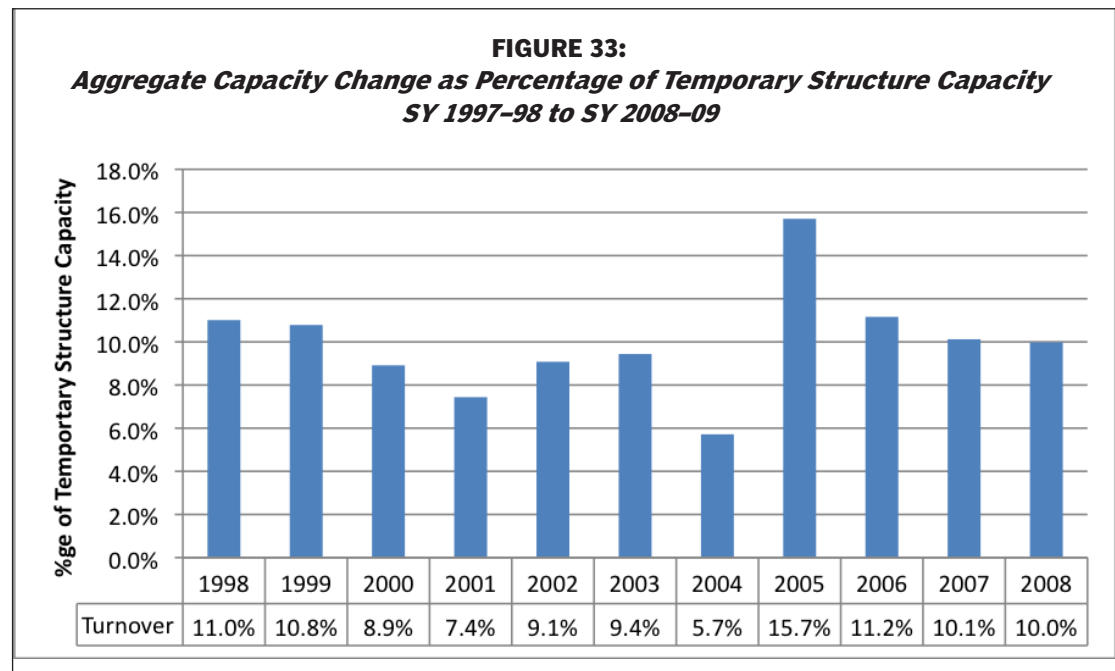
The following chart shows the capacity of temporary structures over the 12-year period examined.



The above graph shows total capacity listed in the ECU Reports annually for temporary structures. The capacity shifts can be attributed in part to the changing number of temporary structures but it also reflects the shift in capacity in the existing temporary structures. For example, there are 43 temporary structures with major capacity shifts, i.e., greater than 100 seats. Of these 43 structures, 38 housed multiple organizations. This suggests that there may be a relationship between multiple school organizations in a building and capacity shifts, at least in the case of temporary structures.

In the first five years of the study period – the years SY 1997-98 through SY 2002-03, there is a steady increase in total capacity in temporary structures, consistent with the increase in the number of temporary structures by 2002-03. In SY 1997-98 there were 197 temporary structures - 169 associated with elementary schools, 15 with middle schools and 13 with high school buildings - with a total capacity of 30,265 seats. By 2002-03 this number had grown to 270 structures with 40,761 seats: 234 associated with elementary schools, 20 with middle schools and 16 with high school buildings.

Capacity in temporary structures began a steady decrease between SY 2004–05, when temporary structure capacity was 39,915 seats, and SY 2008–09, when it had dipped to 35,048. This 12% decrease is consistent with decreasing capacities in buildings citywide, particularly in the elementary and middle school buildings which experience decreases beginning in 2006–07. Though changes in net capacity has a consistent pattern with a gradual rise to a peak in SY 2002–03 followed by a slight decline and then uptick, and finally a steady decrease from 2006 on, temporary structures experience a great deal of aggregate change relative to their overall capacity.



AGGREGATE CAPACITY CHANGE IN TEMPORARY STRUCTURES

1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
3,332	3,616	3,321	2,897	3,615	3,847	2,237	6,269	3,951	3,646	3,559

By dividing aggregate capacity change by total temporary structure capacity, it is possible to see what percentage of the seats in temporary structures turn over annually. For comparison, the full sample of buildings have an average turnover between 3% and 5%, that is year to year aggregate change as a percentage of total capacity. For the temporary structures the volume of aggregate capacity change exceeds 10% of total temporary structure capacity in six of the 11 two year periods. In 2005, temporary structures turned over 15.7% of their capacity.

CHANGING PROGRAMS, REPROGRAMMING SPACE

Throughout the last decade the conversion of buildings and reprogramming of entire buildings or portions of buildings have accelerated. Most of this activity has been to support the creation of small schools, particularly at the middle and high school levels, although there has also been substantial change in the elementary buildings. This activity has affected school capacity. Most public school buildings were designed to house a single school. Changing programs and reprogramming space, particularly to support multiple organizations, often requires reconfiguration of some spaces to provide each school with its own classrooms and support spaces. The following analysis explores the impact that changes such as these have had on capacity.

CFE does not believe that the reorganization of schools is a positive or a negative trend, but does urge the Department of Education to be aware of the capacity changes that accompany these reorganizations, especially in districts with high levels of overcrowding and other issues directly related to school capacity.

Profile of X415: A School Building Converted to a Campus

Christopher Columbus HS in the Bronx – X415 - is a building that housed a single organization, the Christopher Columbus High School in SY 1997–98 but has since been converted into a campus containing multiple school organizations. In 2008–09 this building was home to 6 organizations.

All of the organizations listed in this building during the 12 years analyzed were school organizations, giving rise to the question of how 6 individual organizations, each with its own administrative and support requirements, fit into a building that used to house one organization – and that has an increased capacity of approximately 34% by the end of the 12 years.

The original educational organization – Christopher Columbus HS – X415 (org. ID) remains in the building although it has become a smaller school; this was one of the 19 schools proposed for closure by DOE in November 2009 this past year. In 2001–02 this school had an enrollment of 3,267; starting in 2004–05 enrollment began to decline significantly. In 2008–09, the total enrollment for the smaller Christopher Columbus school organization was 1,452 with a capacity of 1,345. The Columbus Education Complex had a 2008–09 enrollment of 3,307 with a building capacity of only 3,219. Columbus High School remained the largest school in the building; the other five schools had enrollments and capacities between 385 and 524. There was also one small special education organization.

This building is particularly interesting because the enrollment between 1997–98 and 2008–09 remained relatively unchanged: 3,357 and 3,307, respectively, but the capacity increased by 808 seats, from 2,411 in 1997–98 to 3,219 in 2008–09. The Columbus building was overcrowded for the entire 12 years analyzed: its peak utilization was 165.6% in 2003–04 and its lowest utilization during this period was 102.2% in 2007–08. Notably, when capacity increases at a faster rate than enrollment, the building's utilization rate, the standard measure of crowding, will decrease.

Multiple Organization Buildings

Over the 12-year period analyzed, there has been both an increase in the number of school buildings with multiple-organizations and the average number of organizations within these multiple-organization buildings. A restructuring that involves a change in the number or type of organizations housed within a single school building requires the reallocation of classroom and administrative space; the results of these restructurings are strongly associated with large capacity shifts. Of the 1,455 buildings in the study, 957 contained more than one organization at some point in the 12-year period studied; 99 of these were temporary structures. Four hundred ninety-eight (498) buildings - 34% of the total study - contained only one organization at a time during the 12 year period. Of these 498 buildings, 193 were temporary structures. Multiple organization buildings were more common at the middle and high school level than at the elementary school level, with 86% of middle schools and 82% of high schools containing more than one organization, compared to 58% of elementary schools.

Buildings that shift the number of resident organizations experience an average capacity shift that is 63% higher than buildings that do not. Buildings, which housed more than one organization at a time for the entire 12-year period, averaged a net gain of 66 seats over the 12 year period, while buildings which housed just a single organization had an average increase of 24 seats. Multiple organization buildings also had a greater rate of aggregate change over the 12 year period, averaging 436 seats worth of aggregate change as opposed to single organization buildings, which averaged 186 seats worth of aggregate change.

One recent trend in restructurings has been the transformation of large, single school organization buildings into campuses that house multiple small schools. Since 2003, the Department of Education has closed 91 schools, including dozens of large high schools judged to be failing, and has opened new, small high schools within the old buildings, often renamed “educational campuses.” The small schools that now fill the large-school buildings characteristically enroll many fewer students although this is not always the result. The case study of Christopher Columbus HS shows a similar level of enrollment both before and after the conversion.

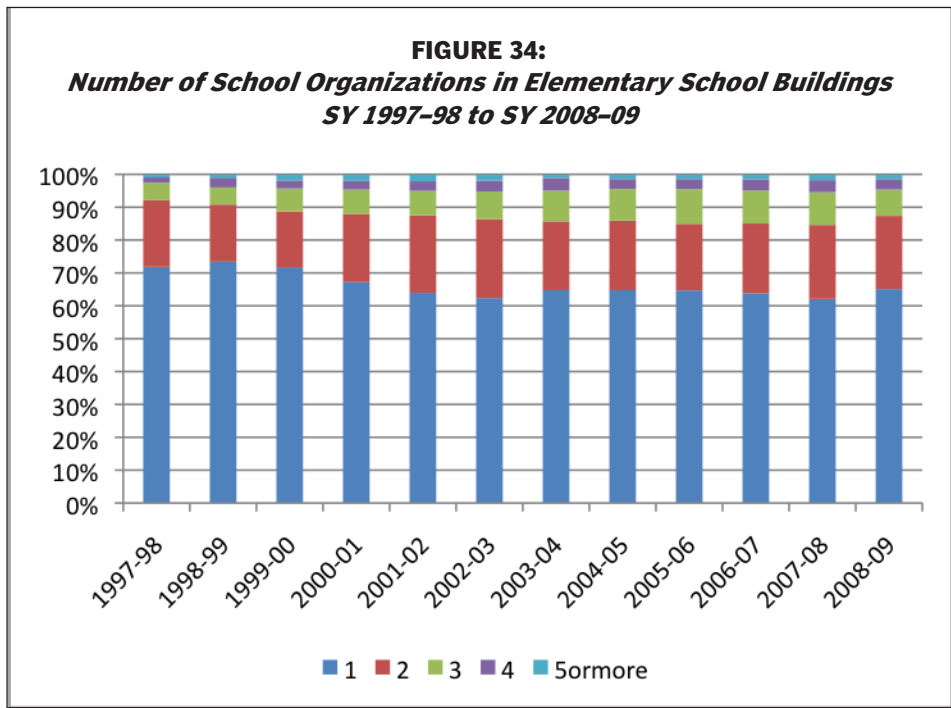
Multiple organizations within school buildings have been increasing at all school levels, either via co-location – the siting of two or more schools in a shared building – or the closure and restructuring of large schools into multiple, smaller schools. In 1997, elementary school main buildings contained an average of 1.4 organizations; by 2008, 1.5 organizations shared elementary school buildings, on average. Middle schools buildings contained an average of 2 organizations in 1997; by 2008 they averaged 2.6 organizations. High school buildings, which contained an average of 1.25 organizations in 1997, averaged 2.7 organizations in 2008.

Buildings that contain multiple organizations may contain multiple schools or a mix of school and non- school uses (i.e., DOE administrative offices, community-based organizations, etc.). In addition, buildings originally intended for a specific grade level

– an elementary school, a high school – may now host school organizations at *different* levels, for example, when a middle school shares a high school building with a high school. Elementary buildings have also been used to house middle schools and high schools.

The following section looks at the prevalence of building reorganizations at different grade levels and how these reorganizations relate to capacity changes.

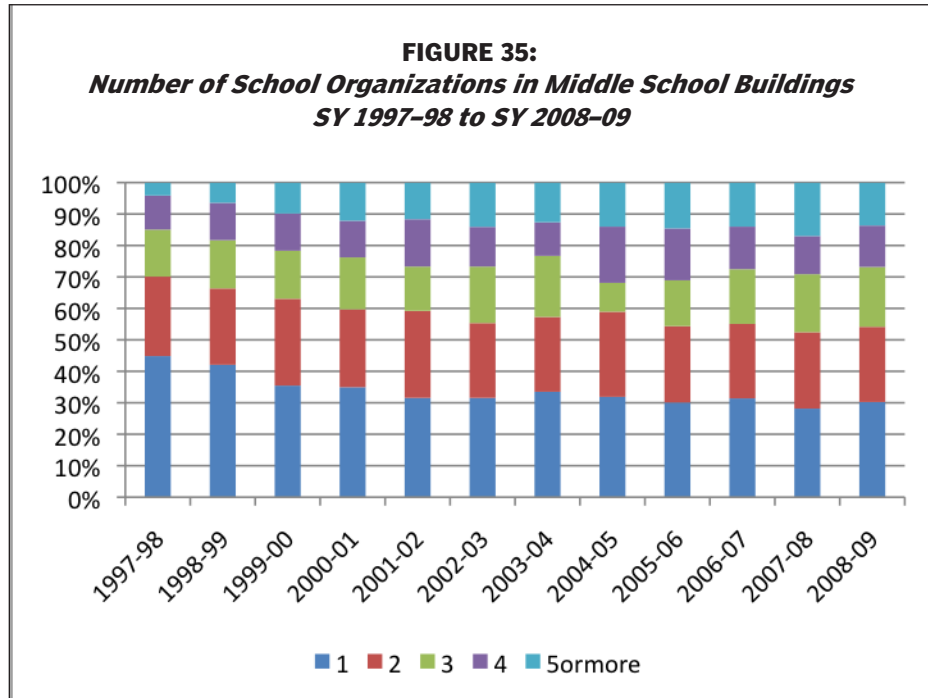
Elementary Buildings with Multiple Organizations



Over the 12 years analyzed, 31% of the elementary school main buildings studied shifted from single-organization to multiple-organization buildings. In 1997-98 621 of a total of 864 elementary school buildings - 72% of the total - contained a single organization. By 2008-09, only 426 of those buildings – 42% - still contained just one organization and 65% of all elementary school buildings contained just one organization. Not only were there fewer single organization buildings but also multi-organization buildings contained an increasingly greater number of organizations. Between 1997-98 and 2008-09, the number of elementary school main buildings with greater than five organizations nearly doubled from 8 buildings to 14. The percentage of two organization buildings increased by 23% and three organization buildings increased by 70%.

Similar links between organization number and capacity change exist at the middle- and high school levels, where the trend towards creating multiple-organization buildings is even more pronounced.

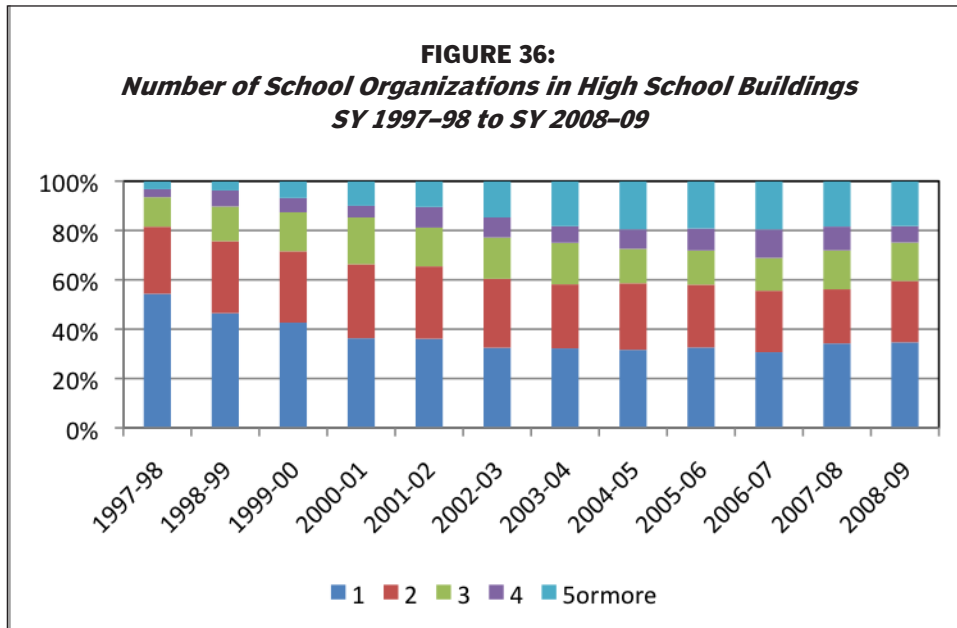
Middle School Buildings with Multiple Organizations



Over the 12 years analyzed, 66% of middle school main buildings that were single-organization buildings shifted to multiple-organization buildings during the 12 years analyzed.

In 1997-98 87 of a total of 194 middle school buildings - 45% of the total - contained a single organization. By 2008-09, single school organization buildings decreased by 29% to 62, and the number of organizations in multi-organization buildings increased correspondingly. During the 12 year period the percentage of middle school buildings with greater than four organizations increased by 47%. Of the 205 middle school buildings in 2008-09, 27% contained 4 or more organizations.

High School Buildings with Multiple Organizations



Over the 12 years analyzed, the equivalent of 50% of the high school main buildings that were initially single organization buildings shifted to multiple organization buildings . In 1997-98 100 of a total of 184 high school buildings - 54% of the total - contained a single organization. By 2008-09, only 43% of those buildings, 43 out of the original 100 single organization high school buildings, remained single-organization structures.

During the 12-year period the percentage of high school buildings with greater than five organizations increased by a multiple of 5.5 from 3.3% in 1997-98 to 18% in 2008-09.

Multiple Organization Changes and Capacity

Increasing the number of organizations in a building tends to be strongly associated with a change in building capacity, both in terms of aggregate and net capacity change. The most likely explanation for this is that increasing the number of school organizations requires each organization in the building which may be phasing in or phasing out grades to modify classrooms and other rooms to meet the educational and administrative needs of multiple organizations. These modifications often result in significant shifts – both increases and decreases - in capacity. These shifts may continue for several years.

Both elementary and middle school buildings experienced a decrease in capacity between SY 2006-07 and SY 2007-08, the same year that they experienced large increases in the number of school organizations within a single school building. Unlike

elementary and middle schools the increase in multiple organizations in the high schools resulted in high school buildings adding 1,349 seats of net capacity in 2007.

Single-Organization Buildings

To further consider the links between programmatic change and capacity change, this report also examined capacity change in single-organization buildings which experienced less capacity change during the 12-year study period than multi-organization buildings or buildings that were reorganized.

Profile of X340 – A Single Organization Building

Newly opened in 1999–00, X340, known as PS340, has housed a single organization since its opening, with no other educational or non-educational uses listed for the building. Although it is located in District 10, a perennially overcrowded district, this building's capacity has steadily decreased, from 705 in 1999–00, to 520 in 2008–09 for a decrease of 185 seats, or a 26% reduction in the capacity of the building.

The largest decrease occurred in the school's second year, when enrollment fell by 94 seats. Capacity rose in 2002–03 to 645 seats (from 609 in 2001–02), but has decreased every year since then. This building's peak enrollment was 602 in 2001–02 and its lowest enrollment was 481 in 1999–00, the year the building opened. In 2008–09, the enrollment had fallen to 499, the second lowest enrollment for this building.

In 1999–00 the utilization for this building was 68% compared with 108% for District 10 elementary school buildings and 104% for all buildings in the district. In 2008–09, X340 had a utilization rate of 96%, while elementary buildings in this district had an overall utilization of 95% and all buildings in the district were at 92%. While overall building capacity has increased in this district from a capacity of 39,830 in 1999–00, when X340 opened, to 41,947 in 2008–09, an increase of 5.3%, capacity at the elementary level has decreased from 30,333 in 1999–00 to 29,718 by 2008–09, a decrease of 2%. The 26% decreased capacity at PS 340 proportionally exceeds the district-wide decrease in elementary school seats.

A total of 498 main school buildings contained just one organization throughout the entire 12- year period. Overall, these single organization buildings experienced 12,053 seats of net change and 92,789 seats worth of aggregate change. Though single organization buildings accounted for 34% of the buildings in the study, they only accounted for 18% of aggregate change. Single organization buildings experienced less net capacity change than multi-organization buildings, averaging gains of 24 and 66 seats per building, respectively. Single organization buildings experienced, on average, 250 fewer seats of aggregate capacity change than buildings with multiple or changing organizations. The average multiple organization building experienced 436 seats worth of aggregate change during the 12 year period while the average single organization building experienced 186 seats worth of aggregate change, suggesting that internal restructurings and capacity change are linked.

However, even single organization buildings experienced a substantial amount of fluctuation not expressed as net gain or loss. Net change accounted for only 13% of aggregate change in single organization buildings suggesting that fluctuations unrelated to capital or programmatic change are widespread and that high levels of unexplained capacity change persist in the ECU.

The following chart shows the number of single and multiple organization buildings identified in the ECU report for the 2008–09 school year:

2008–09 SINGLE & MULTIPLE ORGANIZATION SUMMARY BY SCHOOL LEVEL

	PS	MS	HS	TOTAL
MULTIPLE ORGANIZATIONS	580	182	195	957
SINGLE ORGANIZATION	426	29	43	498
TOTAL	1006	211	238	1455
PERCENTAGE SINGLE ORGANIZATION IN SY08-09	42.3%	13.7%	18.1%	34.2%

In 1997–98, there were 808 single organization buildings. Of these, 498 remained single organization buildings throughout the 12 years. Brooklyn had the largest decrease in single organization buildings, with 89 fewer single-organization buildings in 2008–09 than in 1997–98. This comprised 38% of its single organization buildings in SY 1997–98. The group of schools with the greatest percentage decrease in single-organization buildings was Manhattan schools, which converted 52% of its single organization buildings to multiple organization buildings during the 12 year period. District 75 had a 37% decrease in the number of single-organization buildings from 1997–98. This is of particular interest since the vast majority of organizations moving into D75 buildings were not D75 organizations. The Bronx had the second greatest proportional decrease, with 75 single-organization buildings converting to multi-organization buildings over the 12-year period, a 40% decrease.

SINGLE ORGANIZATION BUILDINGS, BY BOROUGH

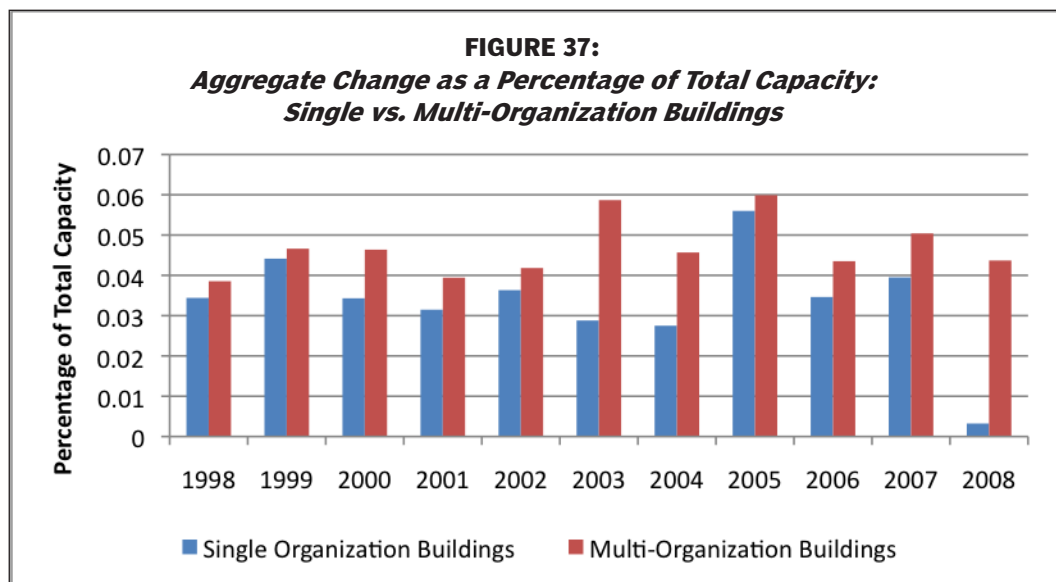
	1997-98	2008-09	% CHANGE
MANHATTAN	77	37	52%
BRONX	183	108	41%
BROOKLYN	236	147	38%
QUEENS	229	156	36%
STATEN ISLAND	51	30	41%
DISTRICT 75	32	20	38%

Capacity Change in Single Organization Buildings

Over the 12-year period analyzed, the 498 single-organization buildings had 92,789 seats of aggregate change, comprising 18% of the total aggregate change in the system citywide, even though they comprise 34% of the buildings examined. This suggests that as a group, single-organization buildings experienced less fluctuation.

Single-organization buildings had a 12,053 net increase in seats over the 12 years, compared to 63,079 seats capacity change in multiple organization school buildings Citywide.¹⁶ Though single organizations were 34% of the system in 2008-09, they only contributed to 18% of the change. Even though it is relatively small, this increase is striking, since this additional capacity was added to school buildings that programmatically had not changed and which resided in the same physical space year after year.

The following graph compares annual capacity shift in single-organization buildings with the entire pool of school buildings. It uses aggregate change as a percentage of total capacity as a proxy for capacity volatility.



¹⁶ Total net capacity change for the 12 years was 75,132 seats.

Capacity in single-organization buildings remained far more stable than capacity in the full pool of buildings, especially toward the beginning of the 12-year period. Not only were single-organization buildings less likely to experience sudden changes, but these changes also tended to affect a smaller percentage of schools and, by extension, students. Even so, single-organization buildings still demonstrated substantial fluctuations. In 2006, changes in single-organization buildings begin to closely parallel changes to the entire system. This suggests that while the changes to the number of organizations in a building do play a role in capacity change, there may be other factors.

Conclusion

CFE's analysis reveals that a substantial and mostly unexplained amount of capacity change occurs each year in New York City's school buildings. This change occurs in significant quantities at every grade level and in every borough and district in the City, although the rate, pace and intensity of change is not evenly distributed citywide. Additionally, schools experience both increases and decreases, sometimes large increases and decreases, in consecutive years, generating a volume of total change well in excess of the net increase over time.

While CFE was also able to link some of the capacity change to capital program additions, the impact of policy decisions such as re-programming, closing schools and creating educational campuses being made by the City's Department of Education can only be suggested. The precise effect that various programmatic changes have on capacity is a matter for future investigation but it is clear that these changes are significant and play a major role in how space, a valuable educational resource, is allocated.

The most surprising part of this analysis is the magnitude of aggregate change and how it swamps net capacity change – 510,051 and 75,132 seats, respectively. The level of aggregate change suggests either a careless management of collecting and interpreting the data or a high level of turmoil in many school buildings with regular and significant capacity shifts that are cancelling each other out over time. What the totals of net and aggregate change do show is that for every seat of capacity increase in existing school buildings there are approximately 6.8 seats of aggregate change.

This analysis is not suggesting that net capacity change is good change and aggregate change is bad. With the information provided in the ECU Reports it is possible only to report on the quantity and type of changes. It is important to remember that net capacity change happens in existing buildings in a school's existing classrooms, specialized and common spaces and administrative and support spaces; the exception is a capacity change to reflect a physical addition to an existing school building or a temporary structure added to a high school building.

In other words, a capacity increase or decrease could be the result of assigning a classroom to a grade with a different class size or it could be changing the use of a room, for example, a specialized room, such as an art room, or a support space into general ed classrooms. If this were to happen, the capacity will increase with the change in use of these 2 spaces. The ECU Report will only report the capacity number for that year and the number of cluster rooms in use. With 2 years of data it would be possible to determine that there is one less cluster room in use but not that the support space is no longer available for students and staff.

But capacity increases such as these may be important to schools that suffer from chronic overcrowding. The analysis, though, shows an uneven picture of increases and decreases in net capacity. Decreases to capacity also raise questions. Elementary school buildings in District 24 in Queens, one of the most overcrowded districts in the City for the entire 12-years, lost net capacity in 6 of the 11 two year periods even though District 24 had the greatest increase in capacity of any district for the entire period. Similarly, District 20 in Brooklyn, also one of the most overcrowded districts, lost capacity in 6 of the 11 two-year intervals also. District 10 in the Bronx, previously very overcrowded, lost capacity in 7 years and District 30 in Queens lost capacity in 5 years.

In 2007 the middle school buildings experienced losses with a decrease of 3,900 seats, many significant that affected 23 districts, including the most overcrowded districts in the City. At the high school level there has been overcrowding in all of the boroughs with the worst conditions in Queens and the Bronx; each borough had years with capacity losses. In 1999 and 2000 high school buildings citywide lost seats.

Aggregate change is the biggest secret of the ECU Reports. It can only be seen over multiple intervals but it can reflect potentially profound changes in a school building. In some years net change is a high percentage of aggregate change but in many buildings aggregate change is the result of capacity movement back and forth within a building that does not reflect a capacity increase. How this affects a standard program of spaces to support the educational program of a building is unknown.

The analysis showed that aggregate change is linked to organizational changes. During the 12-year period the percentage of middle school and high school buildings with greater than five organizations increased significantly. There was also significant change at the elementary school level from single organization buildings to multi-organization buildings. District 75, which serves many of the City's neediest students, consistently experiences disproportionately high rates of change.

The analysis of the data showed that single organization buildings had on average 24 seats of net change and 186 seats of aggregate change versus 66 seats of net change and 436 seats of aggregate change for a multiple organization building. It is not clear what this level of capacity swings means for any school. Understanding this data raises questions on the ability of New York City's public school buildings to provide the appropriate educational spaces for all students.

Recommendations

The analysis undertaken in this report has identified the enormous number of changes – many of them significant changes of greater than 100 seats – that have occurred in any two-year period within this report’s 12-year timeframe, in far too many school buildings.

The following recommendations are proposed to address two overarching concerns raised by the findings. First, the high level of instability in programs and utilization as a result of these large capacity shifts is a cause for concern if the changes reported are borne out. Second, if the schools are actually *more* stable than reported and the capacity shifts are overstated, than it calls into question the accuracy of the data in the ECU Reports. Because the ECU Report is used to inform critical DOE decisions on school management and portfolio planning, inaccuracies and inconsistencies in the Blue Book have wide and durable repercussions.

The annual ECU Report must be overhauled to:

- Ensure that the data is accurate;
- Provide an enhanced and more expanded narrative;
- Include more comprehensive data; and
- Explain changes or exceptions to standards.

The ECU Report is a critical document used for school space planning, including school buildings used for co-locations for multiple organizations, capital planning, and re-zoning decisions. This is one of the key documents that makes the case that a new school building is required. Elected officials and governmental entities allocate funding for new schools based in part on the information in this Report. Because of its vital role in how school buildings are used, correct information on how a building is being used requires the ability of the user to interpret it factually. The Report has been continually criticized for its inaccuracies, difficulty in using and its incompleteness. A thorough and objective analysis of the Report is needed now.

CFE has structured its recommendations to develop an improved ECU Report that presents both the capacity data and the context for this number. CFE recommends that incorporating the magnitude of capacity change and information about the usage and conversion of educational spaces into the ECU Report will enhance the value and accessibility of the Report. And the information contained in the ECU Report should also be made available in the form of a searchable database that will allow access to and understanding of capacity change over time.

Specifically, CFE recommends the following:

- 1. The State Comptroller and/or City Comptroller should audit the ECU Report.**
An audit of the ECU Report is the first step in providing an improved and accurate document that is transparent and contains data that merits its users' confidence. The State Comptroller and the City Comptroller are the appropriate entities to conduct this audit. Both officials have the capacity to conduct a thorough examination of the accuracy of the data, including assessments of how data is presented and the procedures for collecting and analyzing the data. CFE recommends an audit occur every three years.
- 2. The Annual School Facilities/Turn-Around Document, the School Organization Chart, and the Official Class Information List (RACL Report) should be made publicly available.** These documents underpin the data of the ECU report and are necessary to determine a comprehensive review of a school's utilization.
- 3. DOE should produce a first-ever checklist for every school showing what a school is entitled to according to the ECU formula with a comparison of what the school actually has.** This checklist should be shared with each school community and a process should be established to convene stakeholders in sharing this document. DOE should then document system wide what is missing and establish a process and propose a method for prioritizing how they will address these programmatic needs in the next 5 year capital plan.
- 4. The ECU Report should be reformed to make it an accurate, transparent and usable document. There should be a means of enforcing that reform. New York City and State policymakers should work with the DOE through whatever means is most effective to achieve this reform including legislation, if necessary.**

This report's Findings make a strong case to revamp the ECU Report; the analysis shows that there are significant changes in capacity over the years, the reasons for which cannot be determined from the ECU Report or other DOE documents. CFE's analysis has shown there is a continuum of capacity impact over the years. Because the ECU Report is used as a stand-alone annual document, awareness of this continuum is lacking in its data.

There needs to be greater detail and transparency in the data in the ECU Report so that this information can be understood more completely, and to ensure accuracy. This information is used to develop policies on how available space in school buildings is used and to justify the need for additional school space.

Confidence in the data and transparency are essential to supporting these policies.

We recommend that reforms be put in place at DOE to address the data and transparency concerns raised in this report and that provide for appropriate levels of accountability.

There are four key areas that the reform should address:

- ◊ Providing more comprehensive data on a building;
- ◊ Identifying significant changes in a building, such as capacity shifts and organizational changes;
- ◊ Developing a compulsory procedure that DOE and SCA must follow to ensure the accuracy of the data. This information should be linked to previous years' reports so that parents, policymakers and the public have a more complete picture of how school buildings are used;
- ◊ Requiring the ECU Report to be issued for each school year by April 1 of the year for which the data is being reported; and

5. DOE must revamp and expand the ECU Report to provide greater detail and a transparent accounting of how a school building is being used. It should include the following:

- a. *The ECU Report must provide more complete data on a building.* There is no objective way of using the data in the ECU Report to answer basic building-use questions, including:
 - ◊ How many educational spaces are in a building;
 - ◊ Identifying all non-school organizations and what spaces they are using;
 - ◊ The presence or absence of appropriate and functioning specialized spaces;
 - ◊ Access to common spaces such as an auditorium, gymnasium and library and whether these and other necessary support spaces are sufficient for the educational program(s) in the building.

A sufficiency standard on the required educational and support spaces that a school needs for the number of students it is enrolling and the program that it is providing must be developed. This standard would delineate the type and size of rooms that a school must have. The ECU Report should affirm that a school meets the sufficiency standard.

Exceptions to this standard should be listed.

The standard programs of requirements that DOE uses to plan a new school is an important resource for developing this standard. CFE believes the sufficiency standard should be used as the guideline for assessing whether a school's facilities are suitable for its estimated capacity, and whether its current capacity is achieved at the expense of important educational resources.

Using the current standard as a baseline, the ECU Report must note the exceptions to the standard, e.g., classrooms with no windows, inappropriate spaces converted into classrooms, buildings that lack specialized common spaces such as cafeterias, libraries, gymnasias, auditoriums, and science labs. This will allow stakeholders to gauge how schools with the same stated capacity are providing different resources for their students.

- b. *The ECU Report should identify and explain where there have been significant changes in capacity and utilization from previous years.* CFE believes the ECU should report on any significant change to capacity. For this purpose, CFE is defining significant change as the addition or removal of any educational space.

Such additions or removal may be linked to changes such as:

- New addition;
- Repurposing or restructuring a building to create a campus to house multiple schools;
- Moving non-school organizations in or out of a building;
- Adding a temporary structure where the enrollment is included in the enrollment of the main building;
- Room conversions;
- Programming needs; or
- Other issues.

Because it is not practical to provide extensive data from previous years, the report should provide electronic linkages on the DOE/SCA website to a library of past ECU Reports.

- c. *DOE/SCA must expand the ECU's narrative components to provide a better description of what information is in the ECU Report, why specific changes were made and provide a guide on how to evaluate the data and the importance of this information.*

The ECU Report should provide more complete explanations on how to interpret the utilization data. For example, at 50% utilization, only 50% of the seats available in the school are being occupied – but does that mean that one-half of the classrooms are vacant? At the other end of the spectrum, numerous buildings post utilization rates above 150%. Does this mean that each classroom has on average 50% more students in it than the DOE’s own capacity standards direct – or does the school have an extended-day, double sessions, or another strategy to address overcrowding? The current ECU format does not provide sufficient information to answer these basic questions.

The ECU Report describes the standards and formulae for each school level but it is silent on how to evaluate the data. In improving and expanding the narrative on the standards and formulae, the data will become more transparent. DOE/SCA should provide linkages to other information that may assist in understanding the data in the ECU Report, such as school information, class size reports, enrollment projections, among others. This is an opportunity to tie together other valuable reports that DOE issues.

- d. *The ECU Report should identify the type and amount of space(s) being used for non-school organizations in the building, and, if the organizations are occupying educational spaces, such as classrooms, the amount of instructional capacity that would otherwise be available should be quantified.* This information will be extremely valuable for planning purposes and in understanding how a building’s spaces are used by the organizations that share it. If a school is growing or implementing class-size reduction, having information on what spaces the non-educational organization is occupying will enable all interested parties, not just DOE’s planners, to develop an optimal educational facilities plan for the school or schools that share a school building.
- e. *The ECU Report must refer to a database that catalogues temporary spaces currently in educational use. This database must be developed and maintained by DOE/SCA.* This database should identify specialty spaces, such as art rooms, common spaces, such as libraries, and administrative and support spaces, now being used for general education and document the impact of these uses on instructional capacity. This expands the standards recommended in item 5d above.

The ECU Report should be clear on what spaces each school currently has and what the school should have. Again, the sufficiency standard must be an integral part of an overhauled ECU Report. Developing the database will facilitate the restoration of overcrowded buildings to full functionality as space becomes available. That said it is important that a

building's capacity not be adjusted permanently upwards because of the conversion of specialized, common or support spaces that are necessary for the basic educational program.

- f. *To foster greater transparency, the ECU Report should identify the main buildings that have temporary spaces: transportables, mini-schools, temporary classroom buildings and annexes.* The ECU Report organizes all structures by building ID numbers without communicating particulars on specific temporary spaces. Cross-referencing between the main building and temporary structures will provide a more complete and necessary profile of the school building. For the high schools, the ECU Report should provide the capacity and enrollment data for the temporary spaces, data that are now rolled into the information for the main building.

There are also temporary spaces that are no longer associated with the main buildings that they were intended to support. Some of these temporary spaces are now occupied by schools that have no space in permanent buildings or leases; these must be identified so that the priority of moving the 'orphan' schools to permanent space as quickly as possible is publicly understood.

- g. *The ECU Report should identify any new building or space that is being reported on in the ECU for the first time. The Report should also identify any new additions to existing buildings.*
- h. *The ECU Report should clearly state the space standards by which buildings should be safely occupied.* Department of Building (DOB) standards are listed in addition to class size standards and it is presumed that capacity for individual classrooms are adjusted to DOB requirements. Buildings that have spaces that do not meet basic space or any other health or safety standards should be identified.
- i. *DOE/SCA must provide detailed guidelines to principals on how to fill out the annual survey document and explain the importance of the ECU Report to them.* As schools move and principals change, this guidance needs to be an ongoing program. DOE/SCA must require the principal(s) of a school to certify the information submitted. The previous year's survey should be provided to the principals when they receive the new survey document as a reference point. Each principal should be given a copy of the ECU Report and shown how to interpret the data. Many principals of schools, particularly those in campus settings, in temporary locations or phasing in of grades, face challenging space issues. The most important report on space should be an essential resource for all principals; the ECU Report certainly is not that now.

- j. *DOE/SCA should have a quality assurance plan to check on the quality of the information provided in the annual survey documents.* There must be confidence in the ECU Report – confidence that does not now exist. This report identifies serious questions on the data, as it shifts over the years in inexplicable ways. A quality assurance plan in combination with a program of ongoing training and guidance to the school-based personnel involved in supplying the underlying information will provide the needed assurances.

This report has identified a number of essential improvements that are needed in the ECU Report. All of the recommendations are a direct result of the analysis in the Findings, which identifies concretely the problems in the current configuration of the ECU Report. The audits that this report recommends are likely to generate other issues and concerns that should be addressed. New York City and State policymakers should make its own inquiry into the shortcomings and deficiencies of the ECU Report; and it is hoped that this report will provide insight to the legislature as it investigates the issues that have been raised.

This report was undertaken to answer long-standing questions on the quality and accuracy of the ECU Report. Because of the many years of disquietude on the data, these reforms should be implemented and be reflected in the next ECU report. Ensuring adequate space and appropriate facilities in schools to all students is as important as the quality of the education received in the public schools.

Appendix A

The following is a detailed explanation of the data sources and methods used to prepare this report, including a description of this report's approach to data analysis, measures of change, and reasons that capacity changes might occur in the City's schools.

DATA SOURCES

School capacity and utilization data are contained in the New York City Department of Education/New York City School Construction Authority *Enrollment – Capacity – Utilization Reports (ECU Reports)*. These reports provide data for each school year and are published annually.

The ECU Reports provides enrollment, capacity and utilization data for each school building by location - borough and district, and by school level – elementary, middle school and high school buildings.

School System Space Inventory

Information on the school system's space inventory is published in the ECU Reports. For the analyses in this report, CFE utilized twelve years of reports starting with school year 1997–98 and ending with school year 2008–09¹⁷.

¹⁷ New York City Board of Education, Division of School Facilities, "Capacity-Enrollment-Utilization 1997–1998", June 1998.

New York City Board of Education, Division of School Facilities, "Capacity-Enrollment-Utilization 1998–1999", May 1999.

New York City Board of Education, Division of School Facilities, "Capacity-Enrollment-Utilization 1999–2000", September 2000.

CFE only has excel spread sheets of the 2000–2001 Utilization Report; no title page exists.

New York City Board of Education, Division of School Facilities, "Enrollment-Capacity-Utilization Report 2001–2002", June 2003.

New York City Department of Education & School Construction Authority, "Enrollment-Capacity-Utilization Report 2002–2003 School Year," September 2003.

New York City Department of Education & School Construction Authority, "Enrollment-Capacity-Utilization Report 2003–2004 School Year," September 2004

New York City Department of Education & School Construction Authority, "Enrollment-Capacity-Utilization Report 2004–2005 School Year," December 2005.

New York City Department of Education & School Construction Authority, "Enrollment-Capacity-Utilization Report 2005–2006 School Year," November 2006

New York City Department of Education & School Construction Authority, "Enrollment-Capacity-Utilization Report 2006–2007 School Year," November, 2007.

New York City Department of Education & School Construction Authority, "Enrollment-Capacity-Utilization Report 2007–2008 School Year," November, 2008.

New York City Department of Education & School Construction Authority, "Enrollment-Capacity-Utilization Report 2008–2009 School Year," September, 2009.

The annual ECU Report provides the following information for each school building and each school organization within a school building¹⁸: enrollment, capacity, the number of seats over or under the maximum capacity and the utilization rate. For elementary schools, the report contains information on cluster (specialized) rooms and pre-kindergarten capacity.

The core unit of the public school system is the DOE school building. However, in a system as vast and as complex as New York City's, schools also occupy leased spaces, generally, privately owned spaces that DOE leases or licenses for a set period of time. Because of overcrowding over the years, there are mini-schools, temporary classroom buildings and transportables or trailers, generally located in schoolyards. There are also annexes to schools, which can be located in another school's building, a lease or mini-school or other temporary space. Each of these has a separate Building ID and is listed separately in the ECU Report along with information on the school organizations occupying the space.

Many school buildings now house multiple school organizations; the ECU Report provides information for the entire building and then breaks it down for individual school organizations within the school building. Enrollment, capacity – both historical and targeted - as well as a utilization rate is provided for each school organization within a building.

For school organizations within a district, the ECU Report summarizes this data for elementary and middle school organizations, and also includes data for any Citywide special education (District 75) or high schools that may be occupying space in the elementary or middle school buildings. The ECU Report also provides borough-wide summaries at the high school level. The summary includes information on all spaces occupied by any different school levels in the high school buildings and the overall capacity of all educational spaces.

BASIC DATA SETS OF THE ECU

Enrollment data: The official audited register which is the register as of October 31.

Capacity: Capacity is the number of seats available in a school building.

Utilization: The relationship between enrollment and capacity expressed as percentage. If the percentage is greater than 100%, the building is overcrowded; if it is lower than 100%, there is capacity availability in the school.

Capacity is calculated annually; it is based on data provided by the principals of each school in an annual survey document and system-wide room standards. In the annual survey the school reports on what each room is used for. The results of the annual

¹⁸ Some school buildings house multiple schools; the Enrollment-Capacity-Utilization Report provides information for the entire building and then breaks it down for individual school organizations within the school building.

survey document are then applied to the DOE room and class size standards to develop a capacity for the building for the school year.

The ECU Report provides an explanation on how capacity is calculated for each school level. The classroom standards that determine capacity are based on the size of the room, the use of the room and what grade level is occupying the room. A building capacity is calculated based on the number of instructional rooms times the capacity assigned to each of these rooms; this results in the unadjusted capacity. Adjustments vary based on the school level; some of these adjustments are outlined below.

An instructional room must be at least 240 SF. In calculating capacity for a room it must also meet minimum square footage requirements per student: 35 SF/student at the pre-kindergarten and kindergarten levels and 20SF/student for all other grades. For example, if a classroom is 500 SF and it is being used for a high school class, the capacity of the classroom is 25 even though the standard class size for high school is 30. That is because the room is not large enough to house more than 25 students allowing each student 20 SF. The standard targeted class size for grades 1 through 3 is 20; a classroom of 500 SF for these grades is sufficient for 20 students as the minimum square footage of 20 SF/student has been met.

Depending on the school level there are a number of spaces that automatically do not have capacity assigned to them. For example, at the elementary level, libraries, offices, lunchrooms, auditoriums, gymnasiums and rooms smaller than 240 SF do not have any capacity assigned to them. These exclusions change at different school levels. For example, at the middle school and high school levels, a gymnasium does have capacity assigned to it.

Cluster or specialized rooms are treated separately at the elementary school level. The capacity of a number of cluster rooms based on the overall enrollment of the school is subtracted from the unadjusted capacity to arrive at the final adjusted capacity for the school.

The middle and high schools have a different adjustment. Because these students change classrooms for most periods, programming these rooms cannot always be 100% efficient, i.e., every instructional room is not used 100% of the time for every period of the school day. For example, under the historical method, middle and high schools are assumed to operate at 81% and 85% efficiency on average, respectively. Under the targeted method non-dedicated middle and high school classrooms are assumed to be programmed 87.5% of the day and dedicated classrooms 67.5%. Total capacity for the instructional spaces are adjusted based on these percentages.

DOE/SCA applies the formulae contained in the ECU Reports to the information provided by each school annually on each room in the school. The survey document that each school must fill out contains a list of all of the rooms in the building and the principal provides information on what each room is currently being used for.

Utilization Rate: This is a comparison of the enrollment to the capacity for each school building and each school organization within a building. If there are more students enrolled than the current capacity, the utilization rate will be above 100%. If fewer students are enrolled than the listed capacity, the utilization rate will be below 100%.

The ECU Report provides a district-wide utilization summary for all spaces used for educational purposes in the district as well as separate summaries of enrollment, capacity and utilization for the elementary level buildings district-wide and middle school buildings district-wide. The ECU Report also identifies non-educational uses that may be located in a building but there is no capacity associated with these uses nor does the ECU Report identify what spaces the non-educational organizations occupy. As a result, any change in non-educational uses will likely have an impact on capacity. The ECU Report also provides a summary of the high school buildings on a borough basis.

HISTORICAL AND TARGETED CAPACITIES

The ECU Report provides both historical and target capacities. Historical capacity is calculated according to standard class sizes that are published in the ECU Report; historical capacity has been consistent for the 12 year period studied in the report. Target capacity calculates capacity based on class sizes and other modifications to the methodology that have changed over time. Targeted capacity appeared initially in the 2003–04 ECU Report and only affected elementary school capacity. Over the last 5 years there have been additional changes and there is now a targeted capacity for all school levels. Historical and target capacities are calculated as follows:

Elementary grades: pre-K through 5.

- *Historical Capacity.* Class sizes are pre-K: 18, K-3: 25, 4-5: 29 or 31, depending on Title 1 status. Adjustments to capacity are made for cluster rooms¹⁹, funded support rooms and a parents' and teachers' room.
- *Target Capacity.* Class sizes are reduced for grades K-3: 20 and 4-5: 28. There are increased adjustments to capacity for cluster rooms. Targeted capacity is a lower number than historical because there are fewer students per classroom in all grades except pre-kindergarten than in the historical capacity calculation.

Middle school grades 6-8.

- *Historical Capacity.* Class sizes are 28 or 30, depending on Title 1 status. Adjustments to capacity are made for parents' and teachers' rooms. There is an overall programming efficiency of 81% for all middle school classrooms.
- *Target Capacity.* Class size for all middle school grades is 28; there is no distinction made because of Title I status. Regular classrooms can be programmed for use 7 out of 8 periods a day or 87.5% of the time. Specialty rooms are programmed for use 5 periods a day or 67.5% of the time. Targeted

¹⁹ The number of cluster rooms is dependent on the school's enrollment.

capacity at the middle school level is not always a lower number than historical capacity because of the change in programming efficiencies.

High school grades 9-12.

- *Historical Capacity.* Regular instructional and specialty spaces have a capacity of 34; shops have a capacity of 25 and there is capacity of 34 assigned to a science demo room but no capacity to a science lab. All classrooms are programmed 85% of the time.

Target Capacity. Regular instructional rooms have a capacity of 30, including science labs, and shops have a capacity of 25. Regular instructional rooms are now programmed 87.5% of the time and specialty rooms are programmed 67.5% of the time. Targeted capacity generally results in a higher capacity number than historical capacity.

USE OF HISTORICAL CAPACITY

This report utilizes the data in ECU Reports for 12 years dating back to the 1997–98 school year. The capacity used for the analysis in this report is the historical capacity as defined above. Historical capacity was used because it is the only consistent approach to calculating capacity and utilization for the entire 12-year period. Targeted capacity reflects current DOE room and school standards but the standards for targeted capacity have evolved over the last six years. As a result, it is only possible to provide an accurate picture of capacity shifts over the 12 years using the historical capacity.

CFE DATABASE

The data in the ECU Reports has been used to create a database for all school buildings for the 12-year period from the school year 1997–98 through the 2008–09 school year. This data forms the cornerstone of the database; however, the final database goes beyond the information supplied in the ECU Reports. Additional data used in the analysis in this report is developed using the ECU database as outlined below. Information on new seats was also incorporated into the database

The **Database** contains information on 1,455 structures. Only instructional buildings – main school buildings and the temporary structures associated with them — are included in the database. All structures are identified by school level: elementary, middle or high school. There are a number of buildings in the ECU Reports identified as OT or other. There are a small number of these building so we did not identify or classify them separately but we did include the students enrolled in the appropriate school level. For example, a number of the structures listed as OT are alternative high schools; these buildings are now included in the high school database.

For all school buildings the database includes the following core information that was derived from the 12 years of ECU Reports:

- Identifying data - Building ID, borough, district, grade level, school name – for each school building;
- The number of organizations in the building;
- The number of non-classroom organizations in the building; and
- Enrollment and historical capacity for each of the 12 years.

The following information was developed for this report and is now part of the core database:

- The difference in capacity for each two year period is shown in four ways:
 - ◊ Increase/decrease (i.e. second year capacity – first year capacity);
 - ◊ Aggregate change (i.e. the absolute value, or magnitude, of the capacity change) regardless of whether the change is an increase or decrease in the number of seats;
 - ◊ Net increases/decreases larger than 25 seats; and
 - ◊ Aggregate change in 25-seat increments.
- Net change - the increase or decrease in the number of seats - between 1997–98 enrollment and 2008–09 enrollment;
- Aggregate change between 1997–98 capacity and 2008–09 capacity;
- A variable for whether the building had one school organization or several and, if there were multiple organizations, whether these organizations changed over the 12 year period;
- A variable for the number of years the building was overcrowded;
- A variable to indicate whether new seats were added and the number of new seats added; and
- A variable to indicate whether a building is a temporary structure or a main school building.

New seats added to a school are identified; these are generally permanent additions but it also includes new temporary structures. CFE has a list of new additions which it used in this analysis. Beginning with the 2004–05 school year the ECU Reports contain the school opening lists. The DOE Five Year Capital Plan is another valuable resource for new school information.

At the high school level the enrollment of the transportables (2 classroom trailers) and annexes are included in the enrollment of the main building; because of this, analysis is only done on the main building. At the elementary and middle school levels, temporary structures, such as transportables, are listed separately and their enrollment is not included in the enrollment of the main building. Analysis of the temporary structures is highlighted to examine the relationship of the capacity changes in both the main building and any temporary structures associated with it.

MEASURES OF CHANGE ANALYZED

Net change over 12 years: This is the most straightforward way of approaching capacity change. The increase or decrease in seats in a school over the 12-year period is calculated showing the difference in capacity between the 1997–98 and 2008–09 school years. Although it is important for understanding global change, this number masks some of the internal fluctuations, which may be significant, that occurred over the 12-year period.

Aggregate change over 12 years: Aggregate change is the sum of the magnitude of all the capacity changes over a 12-year period whether the change is positive or negative. This measure captures the levels of internal fluctuation within a school's 12-year history.

Year to year net increase or decrease: This measure provides the data on a school building's capacity increases or decreases between two school years. It tracks the years that had large patterns of increases and decreases. Additionally, this measure can also be tested for correlation with changes in enrollment or utilization rate.

Year to year aggregate change: Similarly, this measure identifies the overall change in a given year. This measure is useful for isolating which years had major fluctuations.

Percentage of Aggregate Change Attributable to Net Change: This measure distinguishes between schools that show high levels of net capacity change due to growth or decline from schools that have high aggregate levels of capacity fluctuation. Locating school buildings where large fluctuations occur with limited net results is a critical part of this analysis.

UNIT OF ANALYSIS FOR MEASURING CHANGE

Seats: The actual number of seats by which a school's capacity increases or decreases.

Class: A unit of 25 seats, approximately the size of a classroom. This unit will allow for analysis that examines how many hypothetical classrooms were added or removed from a school in a given period of change.

APPROACH TO ANALYSIS

The database was analyzed using the measures as defined previously to determine the net and aggregate changes in the number of seats Citywide, on a Borough basis and district-wide analysis for elementary and middle school capacity over the 12-year period. Citywide and borough analyses of high school capacity changes are also provided. Information is provided both graphically and in tables.

An important focus of the analysis was to identify schools that had large changes in capacity over any two year period. This report identified a change of 100 seats or more as a large change that needed a closer examination. Additionally, the report looked at schools that shifted by more than 25 seats in a year to better understand both large scale capacity change and capacity change at the district level. Schools identified as having a significant amount of capacity change were the basis of the following investigations into unexplained capacity change:

- Are schools in a certain borough/district disproportionately represented?
- Are there differences among the various school levels?
- Are there peak years of change?
- Are schools that change organizations or have multiple organizations disproportionately represented?
- What is the pattern of change in temporary structures? Does it follow the main building it is associated with?
- Over a 12-year period how many schools that have high levels of net change also have high levels of aggregate change?
- Over a 12-year period how many schools that have high levels of aggregate change also have high levels of net change?

Appendix B

The following contains additional information about buildings with large net change and no recorded net change.

BUILDINGS WITH LARGE INCREASES

34 buildings increased their capacity by more than 500 seats during the 12 year study period.²⁰

BLDG ID	BUILDING NAME	DISTRICT/ BOROUGH	LEVEL	12 YEAR NET CHANGE
M064	P.S. 64 (OLD 71)	1	PS	640
M113	P.S. 241	3	PS	516
X102	P.S. 102	12	PS	587
K026	P.S. 26	16	PS	680
K242	P.S. 235 ANNEX	18	PS	758
Q153	P.S. 153	24	PS	740
Q721	P.S. 16 (OLD Q721 SPED)	24	PS	1089
R880	P.S. 80 (PETR COMPL-BLDG B)	31	PS	510
X101	I.S. 101	8	MS	852
K303	I.S. 303	21	MS	659
K055	I.S. 55	23	MS	527
K175	TEACHERS PREP HS(OL REDIRECTION)	BK	HS	594
K465	ERASMUS HALL CAMPUS	BK	HS	678
K480	BUSHWICK HS	BK	HS	771
X039	NEW SCH FOR ARTS AND SCIENCE	BX	HS	536
X405	HERBERT H. LEHMAN HS	BX	HS	784
X415	CHRISTOPHER COLUMBUS HS	BX	HS	808
X430	WALTON HS	BX	HS	799
M081	MID-MANHATTAN ADULT TRAINING CENTER	MN	HS	510
M470	LOUIS D. BRANDEIS HS	MN	HS	548
M480	JULIA RICHMAN ED. COMPLEX	MN	HS	921
M490	MARTIN LUTHER KING, JR. HS	MN	HS	669
M535	PARK WEST HS (ECF)	MN	HS	896
M645	OLD MANHATTAN VOC/TECH HS	MN	HS	559
M646	SCL COOP TECH ED	MN	HS	604
M812	HS FOR MATH, SCI & ENGINEERING	MN	HS	501
Q405	BAYSIDE HS	QN	HS	614
Q410	BEACH CHANNEL HS	QN	HS	648
Q425	JOHN BOWNE HS	QN	HS	807
Q430	FRANCIS LEWIS HS	QN	HS	601
Q475	RICHMOND HILL HS	QN	HS	571
Q480	JOHN ADAMS HS	QN	HS	623
Q735	QUEENS HIGH SCHOOL COMPLEX	QN	HS	1005
R445	PORT RICHMOND HS	QN	HS	761

²⁰ Highlighted buildings received an addition during the 12 year study period.

BUILDINGS WITH LARGE DECREASES

Only one school had a decrease of greater than 500 seats.

BLDG ID	BUILDING NAME	DISTRICT/ BOROUGH	LEVEL	12 YEAR NET CHANGE
Q520	MIDDLE COLL HS(BLDG-L@LAGUARDIA)	QN	HS	-792

BUILDINGS WITH NO NET CAPACITY CHANGE

45 School Buildings experienced no net capacity change over the 12 year period. Of these 45 buildings, 12 had changes in capacity that happened during the 12 year period that eventually cancelled each other out. These buildings had the same starting and ending capacities but in intervening years had more or fewer seats of capacity.

BLDG ID	BUILDING NAME	DISTRICT	LEVEL
X015	P.S. 15	10	PS
X935	P.S. 105 TEMP. C.R. BLDG.	11	PS
X942	P.S. 16 TRANSPORTABLE2	11	PS
K059	P.S. 59	14	PS
K886	P.S. 108 ANNEX	19	PS
Q029	P.S. 29	25	PS
Q968	P.S. 163 TRANSPORTABLE	25	PS
K963	P.S. 188 TRANSPORTABLE	26	PS
Q003	OLD PS 3	28	PS
Q963	P.S. 48 TRANSPORTABLE	28	PS
K376	P.S. 376A	32	PS
M528	I.S. 528	6	MS

The remaining 33 buildings had no net or aggregate change, either because they were buildings that the ECU does not list with capacity or because they did not appear in the database in two consecutive years.

BLDG ID	BUILDING NAME	DISTRICT/ BOR- OUGH	LEVEL
M843	P.S. 234 ANNEX	2	PS
X880	P.S. 69 ANNEX BRONX	8	PS
X361	ECC 361 BRONX	10	PS
Q260	P.S. 307	24	PS
Q262	P.S. 262	27	PS
27	P.S. 106 TRANSPORTABLE	27	PS
Q768	P.S. 78 ANNEX UEENS	30	PS
R829	ARTHUR D. PHILLIPS SCHOOL	31	PS
R887	P.S. 80 ANX (PETR COMPLBLDG E)	31	PS
R819	P.S. 37 TRANSPORTABLE	75	PS
X814	I.S. 269 BRONX	12	MS
K880	MIDDLE COLLEGE HS BROOKLYN	BK	HS
K934	FORT HAMILTON HS MODULAR UNIT	BK	HS
K947	EAST NY FAMILY ACADEMY TRANS	BK	HS
K977	TELECOM. ARTS & TECH. HS TRANS	BK	HS
X920	SOUTH BRONX HS TRANSPORTABLE	BX	HS
X922	ADLAI E. STEVENSON HS TRANS	BX	HS
X960	J.F. KENNEDY HS TRANSPORTABLE	BX	HS
X961	MORRIS HS TRANSPORTABLE	BX	HS
X962	JANE ADDAMS HS TRANSPORTABLE	BX	HS
X968	LEADERSHIP INSTITUTE BRONX	BX	HS
Q726	JOHN ADAMS HS TRANSPORTABLE	QN	HS
Q739	YOUNG W.LEADERSHIP SCL. ASTORIA	QN	HS
Q761	BAYSIDE HS TRANSPORTABLE	QN	HS
Q781	JOHN ADAMS HS ANNEX QUEENS	QN	HS
Q943	B. N. CARDOZO HS TRANSPORTABLE	QN	HS
Q944	RICHMOND HILL HS TRANSPORTABLE	QN	HS
Q949	WILLIAM BRYANT HS TRANSPORTABLE	QN	HS
Q951	JOHN BOWNE HS TRANSPORTABLE	QN	HS
Q966	FRANCIS LEWIS HS TRANSPORTABLE	QN	HS
R814	CURTIS HS TRANSPORTABLE	SI	HS
K656	BKLYN HS OF THE ARTS ANX (S J HL)	BK	HS
Q744	ELMHURST EDUCATIONAL CAMPUS	QN	HS

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