

September 2020

## Square Footage:

# What Is the Capacity of NYC Schools When Maintaining Social Distancing Requirements?

## Summary

Reopening the city's public schools in the midst of the Covid-19 pandemic raises a host of questions and concerns. Council Member Mark Treyger, chair of the Education Committee, requested that IBO look into some of these issues. One fundamental problem that IBO examined is the physical capacity of schools to accommodate students and teachers while meeting social distancing guidelines.

Last month, the city's Department of Education released three different scheduling models for traditional public schools that would allow schools to operate with either two or three cohorts of students. Depending on the model, students would receive either five or six days of in-person instruction over either two or three weeks, with remote learning for the balance. Schools could choose the scheduling model they want to use, while parents could opt in and out of sending their children for in-school instruction.

At this point, there remains considerable uncertainty regarding how many parents at a particular school will opt for in-school instruction. Instead, IBO estimated the maximum capacity of the city's traditional public school buildings based on the assumption that each school's entire enrollment seeks in-person instruction while maintaining social distancing. Among our findings:

- Over 70 percent of schools could accommodate their full enrollment under the alternative scheduling models while just using their regular classrooms.
- If schools used their labs and other specialty rooms as regular classrooms, over 90 percent of schools could accommodate all their students using one of the scheduling models.
- When auditoriums, gyms, cafeterias and similar spaces are included for potential classroom use, roughly 12 percent of schools could accommodate their full enrollment on a daily basis, although using these nontraditional spaces for general instruction use may be challenging.
- A regular classroom could accommodate 8 students on average while an average specialty classroom could accommodate 10 students.

IBO used the annual school space survey submitted by principals in school year 2018-2019 to develop these estimates. The surveys do not reflect changes since then or potential impediments to using space for classrooms, such as the adequacy of ventilation and schools' ability to staff classrooms with teachers—both essential considerations for the duration of the pandemic. Accordingly, these findings should be viewed as rough estimates of potential capacity across the system.



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## School Capacity During the Covid-19 Pandemic

In August, New York City's Department of Education (DOE) released [its school reopening plan](#) that was submitted to the New York State Department of Education to offer in-person and/or remote instruction at traditional public schools. Schools are to choose among three proposed "hybrid" models or schedules that would limit students' in-school time to five or six days over two- or three-week periods. In each model a school's schedule would be built around having either two cohorts of students or three, meaning that either one-half or one-third of the school's enrollment would get in-person instruction on a given day, with the other half or two-thirds receiving remote instruction outside of school. Schools that propose an alternate model may submit plans that must be approved by the DOE. The models proposed for traditional public schools were:

1. Two in-person cohorts with two days in a school each week and alternating Mondays so students receive five days of in-person instruction over two weeks.
2. Three in-person cohorts with one to three days in a school each week resulting in five days of in-person instruction every three weeks. This model is the only three-cohort model recommended for elementary schools.
3. Three in-person cohorts with two days of in-person instruction during a six-day rotation. This model is only available to middle and high schools.

The instruction model adopted by a school will directly affect cleaning, staffing, and transportation costs. Parents initially had to decide whether their children were going to opt out of in-person instruction by Friday, August 7th. The number of children that decide to opt into in-person instruction will influence the type of model a school will choose to use. In the city's reopening plan, initial survey results indicated that 26 percent of families will be opting out of in-person instruction. Families can opt into in-person instruction during specific windows with at least two weeks' notice, and additional families can opt out at any time, which suggests that the amount of space needed to accommodate all those seeking in-person instruction will fluctuate, leading to considerable uncertainty.

Given this uncertainty, IBO has developed models to estimate the maximum capacity of the DOE system if each school's entire enrollment sought in-person instruction while maintaining social distancing requirements. As it is unclear which schools will opt to use outdoor space for classroom instruction after the Mayor's recent announcement, IBO's analysis does not include outdoor

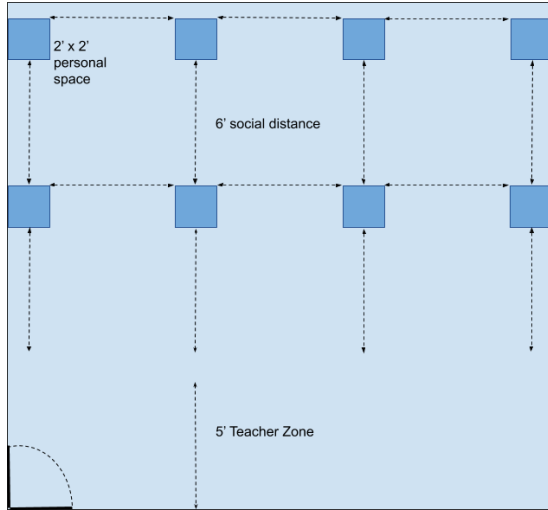
space. Thus, the estimates presented here are an extreme case, but they can provide a baseline for considering the Department of Education's building capacity under these extraordinary circumstances.

The most recent data released by the DOE indicate that about 37 percent of students have opted for remote only instruction, making it unlikely that any one school would have to find space for 100 percent of its student population. Council Member Mark Treyger, chair of the Council's Committee on Education, asked IBO to examine several questions about school reopening. One area IBO examined is capacity in the city's school buildings to accommodate students and teachers while meeting social distancing guidelines.

Using data from school year 2018-2019 on the use of every room in every school, IBO assessed the capacity of three main types of rooms in schools (regular classrooms, specialty instruction rooms, and public assembly rooms) and determined how many students can be accommodated in each room while maintaining social distancing. Based on each school's capacity and enrollment from 2018-2019, we calculated what share of a school's student population could be accommodated on a given day. We sequentially added each room type and at each stage, grouped schools into those that would need to operate with one, two, three, or more than three cohorts in order to offer in-person instruction to every student. We first looked at all 1,539 traditional public schools, and then divided the schools into three categories: district pre-kindergarten centers and early education schools, elementary schools, and middle and high schools.

IBO found that over 71 percent of schools can accommodate their full enrollment using two- or three-cohort models while relying entirely on their regular classrooms. When specialty instruction classrooms are added, over 90 percent of schools can handle all of their students using either a two- or three-cohort model. Repurposing these spaces as regular classrooms doubles the number of schools that could operate with two cohorts. Public assembly spaces could potentially help schools accommodate more students, reducing the amount of cohorts a school would need. However, school staff would need to determine how to run classes in these spaces safely. If public assembly spaces were indeed converted to classroom space, all but 26 schools could accommodate their full enrollment with three or fewer cohorts. When incorporating all three types of spaces, roughly 12 percent of schools could potentially accommodate their full student body (one cohort for five-day per week in-person instruction).

**Following Social Distancing Guidelines and Allowing Space for Teachers and Classroom Furniture, the Most Common Rooms—Regular Classrooms—Can Accommodate Eight Students on Average**



Classroom Type	Median Number of Students	Average Number of Students	Total Number Of Rooms
Regular Classroom	8	8.3	41,382
Specialty Classroom	9	10.2	9,445
Public Assembly	32	29	4,051

SOURCE: IBO analysis of 2018-2019 Department of Education Principal Annual Space Survey

New York City Independent Budget Office

**Methodology**

To determine how many cohorts a school would need if all of its students opted for in-person instruction, IBO used the 2018-2019 Principal Annual Space Survey (PASS) and school enrollment data to calculate the space available for students given the following layout and space considerations:

- Each student has two feet by two feet of personal space.
- Six feet of social distance separates each student’s personal space.
- At the front of each room, we allowed a five-foot deep teacher zone, spanning the full width of the classroom to give teachers space to move around and to accommodate any classroom materials and furniture (such as books and bookshelves).<sup>1</sup>

We found that after taking social distancing guidelines into account, and taking the maximum number of students that could safely fit after reviewing configurations of classrooms both lengthwise and widthwise, the average regular classroom can accommodate 8 students and the average specialty instruction classroom can accommodate 10 students; not surprisingly, many more students can be accommodated in public assembly rooms.

Both the de Blasio Administration and the New York State Education Department recommend that contact between students be limited as much as possible to those within the same classroom. While classes for younger students in pre-K through fifth grade generally already operate in this manner, middle and high school classes usually

require students to move around to different classrooms. Because of these programmatic differences by school level, we looked at all schools citywide as well as by school type: district pre-kindergarten centers and early education schools, elementary schools (including K-5 and K-8), and middle and high schools (including junior high schools, secondary schools, and high schools). We do not report separately on a small number of K-12 schools, though they are included in an “all schools” category, and we exclude citywide special education schools (district 75), charter schools, and pre-K classes at sites run by community-based organizations. In addition, this study does not address social distancing issues that may arise in hallways/entrances and exits or shared bathrooms. Finally, while the city’s reopening plan states that Building Councils and co-located campuses must provide a plan for shared spaces, we attribute all shared classrooms and public assembly rooms to the schools that reported them on the PASS.

Information on classroom space is available for 1,539 traditional public schools in districts 1-32. Classrooms in a school are divided into a variety of different categories for reporting purposes on the PASS. IBO analyzed the space available at each school using their regular classrooms, specialty instruction classrooms (these include art and music rooms, or computer and science labs) and public assembly rooms such as cafeterias, gymnasiums, and auditoriums. IBO first looked only at regular classrooms, then sequentially added specialty instruction classrooms, and finally public assembly rooms to estimate a school’s capacity while maintaining recommended social distancing.

<b>Cohorts and Capacity</b>	
<b>Share of School Enrollment Accommodated at One Time</b>	<b>Number of Cohorts Required</b>
0% - less than 33%	More than 3 cohorts
33% - less than 50%	3 cohorts
50% - less than 100%	2 cohorts
100% or more	1 cohort
SOURCE: IBO analysis of 2018-2019 Department of Education Principal Annual Space Survey <i>New York City Independent Budget Office</i>	

The capacity for all rooms used for instruction were capped by school type based on the United Federation of Teachers' contractual class size limits for those grades (these limits affect less than 1.0 percent of regular and specialty classrooms and 77.1 percent of public assembly rooms).<sup>2</sup>

The share of school enrollment that can be accommodated at one time while maintaining social distancing determines the number of cohorts a school requires. For example, a school that can accommodate at least half—but not all—of its enrollment at one time would require two cohorts. Similarly, a school that can accommodate less than 33 percent of its enrollment would require more than three cohorts.

## Results

Under social distancing guidelines the average number of students that can be accommodated in regular classrooms is eight; specialty instruction classrooms could accommodate an average of 10 students.

While most public assembly spaces can physically accommodate a large number of students actual capacity will likely be limited by safety concerns and the need for additional barriers. The maximum class size for regular classrooms and specialty instruction rooms would be 34, although 99 percent of rooms would have a class size of 16 or fewer for regular classrooms (below the contractual limit for pre-K students) and 32 or fewer for specialty instruction classrooms (at or below the contractual limit for elementary grade students).

If schools used only their regular classrooms for instruction—preserving the specialty rooms and public assembly spaces for their normal use—1,099 schools (71.4 percent of all schools) would be able to operate with two or three cohorts. However, 421 schools (27.4 percent of all schools) would need more than three cohorts to accommodate their full enrollments. On the opposite end of the spectrum, although the DOE has not suggested schools bring back their full populations in a single cohort,

19 schools (1.2 percent) could actually operate with a single cohort while maintaining social distancing; these schools are mostly under-enrolled or newly opened.

Using specialty rooms and labs as regular instruction space shrinks the number of schools that would need more than three cohorts from 421 schools to 92 (6.0 percent of all schools)—a decline of over three-quarters. The number of schools that could operate with two or three cohorts would grow to 1,387 (90.1 percent), with 60 schools (3.9 percent) able to accommodate all of their students as a single cohort for five-day a week, in-person instruction.

Using public assembly spaces in addition to the specialty instruction rooms for instruction could potentially leave only 26 schools (1.7 percent) unable to accommodate their full enrollment in three or fewer cohorts. Meanwhile, 187 schools (12.2 percent) could accommodate all of their students for five-day a week, in-person instruction. However, the use of public assembly spaces could be logistically difficult (for example, coordinating around fixed seating in auditoriums) and provide less space safely than our models allowed for, thus reducing the impact these spaces make on the number of students a school can accommodate.

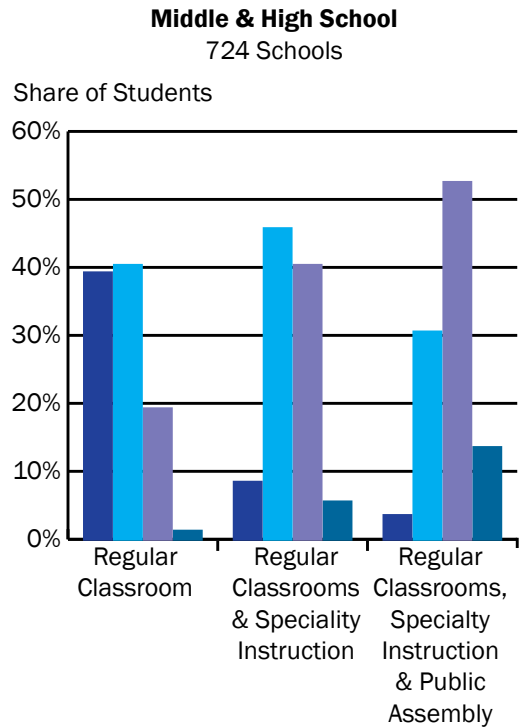
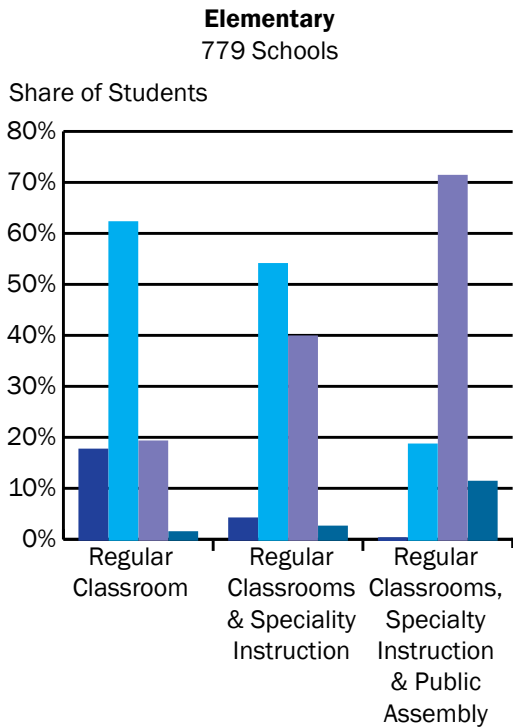
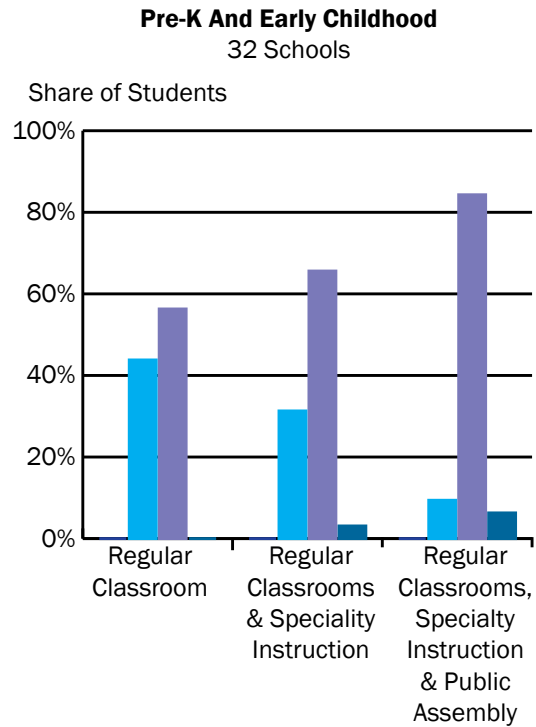
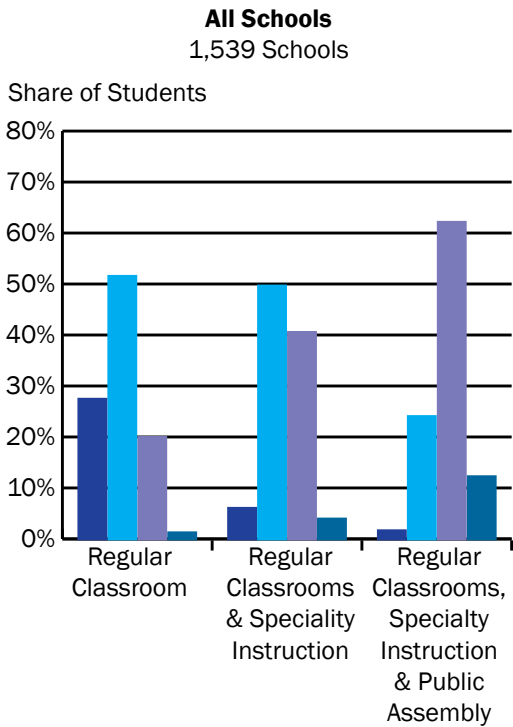
All pre-K and early childhood schools can operate with at most three cohorts using any combination of their instructional and public assembly spaces. When public assembly spaces are used, all but three schools could operate with one or two cohorts.

Using specialty classrooms doubles the number of elementary schools that could operate using two cohorts, increasing from 149 to 309 schools. Only 31 schools, or 4.0 percent, of elementary schools would have to operate with more than three cohorts. Using public assembly spaces could reduce the number of schools operating with more than three cohorts even further. Adding public assembly spaces increases the number of elementary schools able to accommodate half or more of their student population, with the share of schools that could operate with two cohorts increasing from 39.7 percent to 70.2 percent. With all these spaces in use, 87 elementary schools would potentially need to operate with more than three cohorts, if all students opt into in-person instruction.

For middle and high schools, inclusion of specialty classrooms also has a large impact on how many schools are able to accommodate half or more of their student population. Using only regular classrooms, 59.5 percent of

**Opening Up Specialty Instruction and Public Assembly Rooms Allows More Than Half of Schools to Hold Two Sessions to Accommodate Their Whole Student Population While Adhering to Social Distancing Guidelines**

More Than Three Cohorts    Three Cohorts    Two Cohorts    One Cohort



SOURCE: IBO analysis of 2018-2019 Department of Education Principal Annual Space Survey

New York City Independent Budget Office

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schools would be able to operate with either two or three cohorts. Adding specialty instruction classrooms increases the share of schools that could operate with two or three cohorts to 86.0 percent. With all these spaces in use, only 26 out of 724 middle or high schools would potentially need to operate with more than three cohorts, even if all students opted for in-person instruction. (See the [appendix](#) for an estimate of capacity by community school district.)

### Conclusion

Although it is unlikely that schools would need to accommodate their entire student body on any given day, a majority of schools could operate under one of the three DOE hybrid models using only regular classrooms. Repurposing spaces traditionally used for other specialized

instruction can help schools maximize the number of students that can receive in-person schooling. Even after schools have reopened, the size and composition of student cohorts are likely to remain in flux as families make new decisions to opt in and out of in-person instruction. Additionally, after calls from elected officials, parents, and union leaders for the city to lease private space and take advantage of outdoor space to minimize health risks from Covid-19, the de Blasio Administration agreed to allow schools to apply to use outdoor space for educational purposes. The more space the education department is able to use for instruction, the fewer cohorts that will be required to operate safely.

*Prepared by Tainá Guarda*

### ENDNOTES

<sup>1</sup>IBO selected a teacher zone of five feet after modeling teacher zones ranging from two to six feet. When decreasing the teacher zone from six to five feet, we found that schools were able to accommodate over 53,000 more students. When decreasing further to five feet or fewer, we found the marginal increase in students that can be accommodated remained relatively constant in the range of 20,000 to just over 26,000 students for each one foot decrease. IBO selected a teacher zone of five feet to allow teachers the most flexibility and because that was the length at which the marginal change plateaued.

<sup>2</sup>The following class size limits were placed on each school type: Pre-K centers, 18 students; elementary schools, early childhood schools, and K-8 schools, 32 students; junior high/intermediate schools and secondary schools, 33 students; and high schools, 34 students.

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