

## ASSUMPTIONS \& METHODOLOGIES

## ASSUMPTIONS

The following assumptions were used as the basis for analysis in this study. These assumptions were derived through information provided by the District and through meetings and dialogue with principals and the Working Group.

- Class Size Guidelines
- Kindergarten through $3^{\text {rd }}$ Grade $=18$ to 22 Students
- $4^{\text {th }}$ and $5^{\text {th }}$ Grade $=20$ to 24 Students
- $6^{\text {th }}-8^{\text {th }}-$ "Reasonable" $=20$ to 24 students for purposes of the study arithmetic
- District's preference is to maintain class sizes within these guidelines.
- Repurposing of Space
- In the elementary schools, calculations assume spaces currently dedicated to specials like Art, Music, STEAM, Technology, and World Languages would remain or return to those dedicated functions. The sizing of new elementary school projects would assume enough general classroom spaces across the district to allow those specials to have dedicated space. Master plan calculations, however, assume that specials that haven't had dedicated space historically would still not have dedicated space in the future.
- Spaces currently dedicated to Special Education functions may not be considered as targets to be repurposed into general classrooms. Calculations will assume appropriate and dedicated space for special education spaces in each elementary school across the district.
- Master Plan Level Programming
- Programming for this study was based largely on general classroom counts at the elementary grades, overall teaching station counts at the middle grades, and capacity analyses. Individual space summaries were not prepared for each school in every master plan scenario. However, theoretical space summaries were prepared for potential projects resulting from the exploration of new grade configurations. For example, the Design Team relied on MSBA space summary templates to determine the approximate size of a project that would house grades $6^{\text {th }}-8^{\text {th }}$ in a single facility.
- Redistricting
- The study did not explore alterations to the existing elementary school catchment area boundaries. However, the study took a wholistic view of the elementary schools to see if redistricting "around the edges" could be a strategy to alleviate perceived and/or emerging overcrowding in specific areas of town.
- Utilization Rates at the Middle Grades
- Daily school schedules for middle school grades are often more complex than at elementary schools. They are often based on whether or not instructional spaces are "owned" by teachers, on the middle school model of being "onteam" versus "off-team", and based on offering the widest range of specials and electives possible. This often results in inefficient utilization of space.
- Observed utilization rates for the High Rock School differ from those at Pollard Middle School.
- Calculations to determine capacity and to size potential projects assume utilization rates of either 67\% (Current Pollard Utilization Rate), 71\% (Current High Rock Utilization Rate), 75\% (Rate based on students occupying instructional spaces 6 of 8 periods per day, or $85 \%$ (Rate based on MSBA guidelines).
- Enrollment Forecasts
- McKibben Demographic Research, LLC prepared three enrollment forecast scenarios: Low, Best, and High.
- Dore + Whitter analyzed all three scenarios to determine space needs but relied mostly on the Best scenario when preparing master plan scenarios.


## METHODOLOGIES

In order to understand the capacity of each facility and the impact of the enrollment forecast on space, Dore + Whittier performed several calculations. With many of these calculations, the objective was to establish the boundary conditions so that the District could understand how changing one or more independent variable impacted the dependent variable. Dore + Whittier's methodology for performing those calculations is detailed below.

## Elementary Building Capacity

Number of Existing Grade Level Classrooms X Minimum Allowable Class Size for Each Grade Level

4 Kindergarten x 18
$+41^{\text {st }}$ Grade x 18
$+42^{\text {nd }}$ Grade $x 18$
$+43^{\text {rd }}$ Grade $x 18$
$+44^{\text {th }}$ Grade $\times 20$
$+45^{\text {th }}$ Grade $\times 20$
448 Student Capacity

4 Kindergarten x 22
$+41^{\text {st }}$ Grade x 22
$+42^{\text {nd }}$ Grade $\times 22$
$+43^{\text {rd }}$ Grade x 22
$+44^{\text {th }}$ Grade $\times 24$
$+45^{\text {th }}$ Grade $\times 24$
544 Student Capacity

Elementary School Theoretical Classroom Count Need
Total Forecasted Enrollment by Grade $\div$ Minimum Allowable Class Size for Each Grade Level

100 Kindergartners $\div 18$ Students per Classroom $=5.55$ Sections $=6$ Sections Needed
100 Kindergartners $\div 22$ Students per Classroom $=4.55$ Sections $=5$ Sections Needed

Elementary School Theoretical Classroom Size
Total Forecasted Enrollment by Grade $\div$ Bounding Number of Sections per Grade

90 Kindergartners $\div 4$ Sections $=22.50$ Students per Section $=22$ in 2 sections, 23 in 2 sections
90 Kindergartners $\div 5$ Sections $=18.00$ Students per Section

Total District-wide Elementary School Classroom Need
Sum of the Enrollment Forecast for Kindergarten through $3^{\text {rd }}$ Grade $\div 20$ Students per Classroom + Sum of the Enrollment Forecast for $4^{\text {th }}$ and $5^{\text {th }}$ Grade $\div 22$ Students per Classroom

Perform this calculation for each year of the enrollment forecast and identify the minimum and maximum classroom count needs.

Middle Grades Building Capacity<br>Number of Existing Teaching Stations X Midpoint of Allowable Class Size (22) x Current Utilization Rate (71\%)<br>Number of Existing Teaching Stations X Midpoint of Allowable Class Size (22) x Proposed Utilization Rate (75\%)

## ENROLLMENT PROJECTIONS AND ANALYSIS

## MCKIBBEN ASSOCIATES: DISTRICT-WIDE POPULATION AND ENROLLMENT FORECASTS, DECEMBER 2019

In the summer of 2019, Needham Public Schools hired McKibben Demographic Research, LLC to prepare a population and enrollment forecast for the district. The study documents the demographic characteristics of the Town of Needham and presents three enrollment forecast scenarios based on different predictions for changes to the median age of the population and the expected impact of both housing stock turnover and development of new rental units in town. A copy of the complete report is provided in the appendices. In the executive summary, McKibben writes:

1. The resident total fertility rate for Needham Public Schools over the 15-year life of the forecasts is below replacement level. (1.82vs. The theoretical replacement level of 2.1).
2. Most in-migration to the district continues to occur in the 0-to-9 and 30-to-44 year old age groups.
3. The local 18-to-24 year old population continues to leave the district, going to college or moving to other urbanized areas. This population group accounts for the largest segment of the district's out migration flow. The second largest out flow is the 70+ age group, which are downsizing their homes and leaving the district
4. The primary factors causing the district's enrollment to rise and then stabilize over the next 15 years is the number of empty nest households (home owners age 70+) "turning over" compared to the number of homes (homeowners age 50-59) that become empty nest each year.
5. Changes in year-to-year enrollment over the next five years will primarily be due to the size of the grade cohorts entering and moving through the school system in conjunction with the size of the cohorts leaving the system.
6. The elementary enrollment will begin a slight decline after the 2025-26 school year in all three scenarios. This will be due primarily to the fact that the rising $5^{\text {th }}$ grade cohorts will be greater the 440 in size while the incoming grade cohorts will decline slightly.
7. In the Low scenario, the median age of the population will increase from 42.9 in 2010 to 43.4in 2035. In the Best scenario, the median age of the population will increase from 42.9 in 2010
to 43.5in 2035. In the High scenario, the median age of the population will decrease from 42.0 in 2010 to 42.8 in 2035.
8. Even if the district continues to have some of annual new home construction (particularly if that construction is rental units), the rate, magnitude and price of existing home sales will become the increasingly dominant factor affecting the amount of population and enrollment change.
9. In the Low scenario, total district enrollment is forecasted to increase by 178 students, or 3.1\%, between 2019-20 and 202425. Total enrollment is forecasted to decrease by 124 students, or-2.1\%, from 2024-25 to 2029-30.The total enrollment is forecasted to decline by 66 students, or-1.1\%, from 2029-30 to 2034-35.
10. In the Best scenario, total district enrollment is forecasted to increase by 182students, or 3.2\%, between 2019-20 and 202425. Total enrollment is forecasted to decrease by 116 students, or2.0\%, from 2024-25 to 2029-30.The total enrollment is forecasted to decline by 77 students, or-1.3\%, from 2029-30 to 2034-35.
11. In the High scenario, total district enrollment is forecasted to increase by 182 students, or 3.2\%, between 2019-20 and 202425. Total enrollment is forecasted to decrease by 59students, or-1.0\%, from 2024-25 to 2029-30.The total enrollment is forecasted to decline by 57students, or-1.0\%, from 2029-30 to 2034-35.

FORECASTS AND ANALYSIS FOR GRADES K-5 ${ }^{\text {TH }}$


The following table summarizes the projected classroom need for grades $\mathrm{K}-5^{\text {th }}$ over the course of the 'best' scenario enrollment forecast. There are currently four modular classroom spaces at Mitchell that are excluded in the existing classroom count and three classroom spaces, (one at Eliot, one at Broadmeadow, and one at Newman) that have been repurposed into classrooms from other functions that are also excluded from the existing classroom count.

## District-Wide Classroom Need - 'Best' Enrollment Forecast Scenario

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| Total Classroom <br> Need @ Minimum Students/ Classroom | 139 | 141 | 141 | 140 | 140 | 139 | 138 | 137 | 135 | 134 | 133 | 133 | 132 | 132 | 130 | 130 |
| Total Classroom <br> Need @ Midpoint Students/ Classroom | 125 | 127 | 127 | 127 | 126 | 125 | 124 | 124 | 122 | 121 | 121 | 120 | 119 | 119 | 117 | 117 |
| Total Classroom Need @ Maximum Students/ Classroom | 114 | 116 | 115 | 115 | 115 | 115 | 114 | 112 | 111 | 111 | 109 | 109 | 108 | 108 | 107 | 107 |
| Total Available Classrooms* | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 |
| Surplus Classrooms <br> @ Maximum <br> Students/ Classroom | 2 | 0 | 1 | 1 | 1 | 1 | 2 | 4 | 5 | 5 | 7 | 7 | 8 | 8 | 9 | 9 |

* Does not include four modular classrooms at Mitchell or three classrooms that have been repurposed into general classrooms (one at Broadmeadow, one at Eliot, and one at Newman).

This high level analysis suggests that even if the three spaces that have been repurposed into classrooms were converted back to their specialized function, the District could accommodate the entirety of the K$5^{\text {th }}$ 'best' scenario enrollment forecast within the existing classrooms AND stay within the district's class size guidelines by redistricting around the edges.

## District-Wide Classroom Need - 'High' Enrollment Forecast Scenario

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| Total Classroom Need @ Minimum Students/ Classroom | 139 | 141 | 141 | 140 | 140 | 139 | 138 | 138 | 137 | 137 | 135 | 136 | 135 | 133 | 132 | 132 |
| Total Classroom Need @ Midpoint Students/ Classroom | 125 | 127 | 127 | 127 | 126 | 125 | 125 | 124 | 124 | 123 | 122 | 123 | 122 | 120 | 119 | 119 |
| Total Classroom Need @ Maximum Students/ Classroom | 114 | 116 | 115 | 115 | 115 | 115 | 114 | 113 | 113 | 112 | 112 | 111 | 111 | 110 | 109 | 108 |
| Total Available Classrooms* | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 | 116 |
| Surplus Classrooms <br> @ Maximum <br> Students/ Classroom | 2 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 7 | 8 |

* Does not include four modular classrooms at Mitchell or three classrooms that have been repurposed into general classrooms (one at Broadmeadow, one at Eliot, and one at Newman).

This high level analysis suggests that even in the 'high' enrollment forecast scenario, the District would only need to continue the current repurposing of three spaces into classrooms to accommodate the enrollment forecast to stay within the District's class size guidelines.

While these analyses suggest it is possible to accommodate the entirety of the enrollment projection within the existing classroom count and remain within the District's class size guidelines, this analysis also suggests that doing so will require all classrooms across the District to be at the maximum end of the class size guidelines leaving little to no room for flexibility to accommodate deviations in the enrollment forecast. It may be in the District's best interest to plan for a total of 126 general classrooms across the District to allow all classes to be at the approximate mid-point of the class size guideline to provide this level of flexibility.

## FORECASTS AND ANALYSIS FOR GRADES $6^{\text {TH }}-8^{\text {TH }}$

McKibben projected $6^{\text {th }}$ grade independent of grades $7^{\text {th }}$ and $8^{\text {th }}$ based on the current grade configuration. However, since some of the master plan scenarios explore the possibility of grades $6^{\text {th }}, 7^{\text {th }}$, and $8^{\text {th }}$ in a single facility, Dore + Whittier has also combined those forecasts into one grade grouping.


The following table summarizes the projected classroom need for grade $6^{\text {th }}$ over the course of the 'best' scenario enrollment forecast assuming the existing utilization rate of $71 \%$ (spaces occupied by students 5 of 7 periods per day).
$\mathbf{6}^{\text {th }}$ Grade Teaching Station Need (71\% Utilization) 'Best' Enrollment Forecast Scenario

|  | $\begin{aligned} & \text { 이 } \\ & \text { N } \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \text { N } \\ & \text { Ǹ } \\ & \text { N } \end{aligned}$ | $\begin{aligned} & N \\ & N \\ & \underset{N}{N} \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \text { m } \\ & \text { N } \\ & \text { N } \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \underset{\sim}{N} \\ & \underset{N}{N} \\ & \underset{\sim}{n} \end{aligned}$ | $\begin{aligned} & \text { n } \\ & \text { N } \\ & \underset{\sim}{N} \\ & \text { N} \end{aligned}$ | $\begin{aligned} & \stackrel{\circ}{N} \\ & \text { Ǹ } \\ & \text { N } \end{aligned}$ | $\begin{aligned} & N \\ & N \\ & \dot{N} \\ & \text { N } \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \infty \\ & N \\ & N \\ & N \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \text { N } \\ & \underset{\sim}{\infty} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \text { O} \\ & \text { Nे } \\ & \text { N} \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \dot{m} \\ & \dot{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & N \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & M \\ & M \\ & \underset{N}{N} \\ & \underset{\sim}{n} \end{aligned}$ | 2033-34 | $\begin{aligned} & n \\ & \underset{\sim}{\sim} \\ & \underset{\sim}{N} \end{aligned}$ |
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| Total Teaching Stations Needed @ 20 Students / Classrooms \& 71\% Utilization | 35 | 30 | 34 | 32 | 33 | 34 | 33 | 33 | 33 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| Total Teaching Stations Needed @ 22 Students / Classrooms \& 71\% utilization | 32 | 28 | 31 | 29 | 30 | 31 | 30 | 30 | 30 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| Total Teaching Stations Needed @ 24 Students / Classrooms \& 71\% utilization | 29 | 25 | 28 | 27 | 28 | 28 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| Total Available Teaching Stations | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| Surplus Teaching Stations @ 22 Students/ Classroom | -7 | -3 | -6 | -4 | -5 | -6 | -5 | -5 | -5 | -4 | -4 | -4 | -4 | -4 | -4 | -4 |

This high level analysis suggests that as many as six more teaching stations are required to accommodate the enrollment forecast. Additional spaces for dedicated special education classrooms or specialty spaces to serve more elective programs may also be needed over and above these teaching station needs.

Total 7th-8th Grade Forecast, Best


The following table summarizes the projected teaching station need for grades $7^{\text {th }}-8^{\text {th }}$ over the course of the 'best' scenario enrollment forecast assuming the existing $67 \%$ utilization rate (spaces occupied by students 4 of 6 periods per day). The total existing teaching station count does not include the 10 modular classrooms present.

| $7^{\text {th }}-8^{\text {th }}$ Grade Teaching Station Need (67\% Utilization) <br> 'Best' Enrollment Forecast Scenario |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{gathered} \text { Ǹ } \\ \text { Ǹ } \end{gathered}$ | $\begin{aligned} & \text { N } \\ & \text { Nิ } \\ & \text { ヘ̈ } \end{aligned}$ | $\begin{gathered} \underset{\sim}{N} \\ \underset{\sim}{\sim} \end{gathered}$ | $\begin{gathered} \underset{\sim}{\sim} \\ \underset{\sim}{\sim} \end{gathered}$ | $\begin{aligned} & \underset{N}{N} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{gathered} \sim \\ \underset{\sim}{N} \\ \text { N } \end{gathered}$ | $\begin{gathered} \text { No } \\ \text { Ni } \end{gathered}$ | $\begin{aligned} & \text { N } \\ & \text { ஸ. } \\ & \text { Ni } \end{aligned}$ | $\begin{gathered} \text { N } \\ \text { Nָ } \\ \text { Nิ } \end{gathered}$ | $\begin{aligned} & \underset{\sim}{\infty} \\ & \stackrel{\sim}{\sim} \end{aligned}$ | $\begin{gathered} \text { N్రి } \\ \text { Ni } \end{gathered}$ | $\begin{aligned} & \bar{m} \\ & \stackrel{\sim}{\sim} \\ & \stackrel{\sim}{1} \end{aligned}$ | $\begin{gathered} \underset{N}{\stackrel{N}{\tilde{N}}} \\ \underset{\sim}{2} \end{gathered}$ | $\begin{gathered} \underset{\sim}{N} \\ \underset{\sim}{N} \end{gathered}$ | $\begin{aligned} & \underset{\sim}{N} \\ & \underset{\sim N}{N} \end{aligned}$ | ٓ |
| Total Teaching Stations Needed @ 20 Students / Classrooms \& 67\% Utilization | 67 | 72 | 70 | 68 | 70 | 69 | 70 | 70 | 69 | 69 | 69 | 68 | 68 | 69 | 69 | 68 |
| Total Teaching Stations Needed @ 22 Students / Classrooms \& $67 \%$ utilization | 61 | 65 | 63 | 62 | 63 | 63 | 64 | 63 | 63 | 63 | 62 | 62 | 62 | 62 | 62 | 62 |
| Total Teaching Stations Needed @ 24 Students / Classrooms \& $67 \%$ utilization | 56 | 60 | 58 | 57 | 58 | 58 | 59 | 58 | 58 | 58 | 57 | 57 | 57 | 57 | 57 | 57 |
| Total Available Teaching Stations | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 |
| Surplus Teaching Stations @ 22 Students/ Classroom | 0 | -4 | -2 | -1 | -2 | -2 | -3 | -2 | -2 | -2 | -1 | -1 | -1 | -1 | -1 | -1 |

This high level analysis suggests that as many as four additional teaching stations are needed to serve the enrollment forecast. Or stated slightly differently, four of the ten modular classrooms would need to be replaced to serve the enrollment forecast using the existing daily schedule.

While a $67 \%$ utilization rate for middle school facilities is not uncommon, it falls well short of the MSBA guidelines of $85 \%$ utilization. The table below summarizes the projected teaching station need for grades $7^{\text {th }}-8^{\text {th }}$ over the course of the 'best' scenario enrollment forecast assuming the same $71 \%$ utilization rate as the High Rock School. The total teaching station count excludes the 10 modular classrooms present.

| $7^{\text {th }}-8^{\text {th }}$ Grade Teaching Station Need (71\% Utilization) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 'Best' Enrollment Forecast Scenario |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\begin{aligned} & \text { 이 } \\ & \text { N} \\ & \stackrel{\rightharpoonup}{i} \end{aligned}$ | $\begin{aligned} & \underset{N}{N} \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & N \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \text { n } \\ & \underset{N}{\prime} \\ & \underset{N}{N} \\ & \underset{N}{n} \end{aligned}$ | $\begin{aligned} & \underset{\sim}{n} \\ & N \\ & N \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \text { N } \\ & \text { N } \\ & \text { N } \\ & \text { N } \end{aligned}$ | $\begin{aligned} & 6 \\ & \text { N } \\ & \text { N } \\ & \text { N } \\ & \text { N } \end{aligned}$ | $$ | $\begin{aligned} & \infty \\ & \underset{N}{N} \\ & \underset{N}{N} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \text { N} \\ & \underset{\sim}{1} \\ & \sim \\ & \sim \end{aligned}$ | $\begin{aligned} & \text { 이 } \\ & \text { Nे } \\ & \text { Nे } \end{aligned}$ | $\begin{aligned} & \underset{m}{n} \\ & \underset{N}{N} \\ & \underset{N}{n} \end{aligned}$ | $\begin{aligned} & N \\ & \underset{\sim}{m} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \text { M } \\ & \text { N } \\ & \underset{N}{N} \\ & \sim \end{aligned}$ | $\begin{aligned} & \underset{\sim}{2} \\ & \tilde{m} \\ & \text { Nे } \end{aligned}$ |  |
| Total Teaching Stations Needed @ 20 Students/ Classrooms \& 71\% Utilization | 63 | 67 | 65 | 64 | 66 | 65 | 66 | 66 | 65 | 65 | 65 | 64 | 64 | 64 | 65 | 64 |
| Total Teaching Stations Needed @ 22 Students / Classrooms \& 71\% utilization | 57 | 61 | 59 | 58 | 60 | 59 | 60 | 60 | 59 | 59 | 59 | 58 | 58 | 59 | 59 | 58 |
| Total Teaching Stations Needed @ 24 Students / Classrooms \& 71\% utilization | 52 | 56 | 54 | 53 | 55 | 54 | 55 | 55 | 54 | 54 | 54 | 53 | 53 | 54 | 54 | 54 |
| Total Available Teaching Stations | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 |
| Surplus Teaching Stations @ 22 Students/ Classroom | 4 | 0 | 2 | 3 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 |

This high level analysis suggests that altering the daily schedule to be more efficient with space (71\% utilization, rather than the existing $67 \%$ utilization) would allow the district to accommodate the enrollment forecast in the existing teaching stations without the need for the modular classrooms and still have as many as three additional teaching stations to function as the school desired.

Total 6th-8th Grade Forecast


The following table below summarizes the projected teaching station need for grades $6^{\text {th }}-8^{\text {th }}$ over the course of the 'best' scenario enrollment forecast assuming the same 71\% utilization rate as the High Rock School. The total teaching station count excludes the 10 modular classrooms present.

| $6^{\text {th }}-8^{\text {th }}$ Grade Teaching Station Need (71\% Utilization) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 'Best' Enrollment Forecast Scenario |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | $\begin{aligned} & \text { N } \\ & \text { N } \\ & \text { Ni } \end{aligned}$ | $\begin{aligned} & \stackrel{\rightharpoonup}{N} \\ & \underset{N}{\prime} \\ & \text { N} \\ & \text { N } \end{aligned}$ | $\begin{aligned} & N \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \mathbf{N} \\ & \underset{N}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & \underset{\sim}{N} \\ & \underset{N}{N} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \stackrel{i}{n} \\ & \underset{\sim}{1} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \circ \\ & \underset{N}{\prime} \\ & \stackrel{1}{N} \\ & \underset{N}{N} \end{aligned}$ | $\begin{aligned} & N \\ & \underset{N}{\prime} \\ & \underset{N}{N} \\ & \underset{N}{n} \end{aligned}$ | 8て-LZOZ | $\begin{aligned} & \text { N} \\ & \underset{\sim}{\prime} \\ & \underset{N}{N} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \text { O} \\ & \text { ò } \\ & \text { Ǹ } \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \bar{m} \\ & \text { Ò } \\ & \text { Ǹ } \\ & \text { N } \end{aligned}$ | $\begin{aligned} & \underset{N}{N} \\ & \stackrel{1}{\mathbf{M}} \\ & \underset{N}{2} \end{aligned}$ | $\begin{aligned} & \text { M } \\ & \underset{N}{N} \\ & \underset{\sim}{N} \end{aligned}$ | $\begin{aligned} & \underset{\sim}{2} \\ & \text { Mे } \\ & \text { Nे } \end{aligned}$ | $n$ $m$ $\sim$ $\sim$ 0 $N$ |
| Total Teaching Stations Needed @ 20 Students / Classrooms \& 71\% Utilization | 98 | 98 | 99 | 96 | 99 | 99 | 99 | 98 | 98 | 97 | 97 | 96 | 96 | 96 | 97 | 96 |
| Total Teaching Stations Needed @ 22 Students / Classrooms \& 71\% utilization | 89 | 89 | 90 | 87 | 90 | 90 | 90 | 90 | 89 | 88 | 88 | 87 | 87 | 88 | 88 | 87 |
| Total Teaching Stations Needed @ 24 Students / Classrooms \& 71\% utilization | 82 | 81 | 82 | 80 | 82 | 82 | 82 | 82 | 81 | 81 | 81 | 80 | 80 | 80 | 80 | 80 |
| Total Available Teaching Stations | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 |
| Surplus Teaching Stations @ 22 Students/ Classroom | -28 | -28 | -29 | -26 | -29 | -29 | -29 | -29 | -28 | -27 | -27 | -26 | -26 | -27 | -27 | -26 |

This high level analysis suggests that as many as 29 teaching stations must be added to the Pollard facility to accommodate the enrollment forecast assuming the High Rock utilization rate of $71 \%$.

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## CAPACITY \& NEEDS ANALYSIS

## OVERVIEW

Building Capacities for elementary schools are based on the assumptions and methodologies identified below:

> Minimum Capacity $=$
> Number of general classrooms (grades $\left.K-3^{\text {rd }}\right) \times 18$ students per classrooms
> + number of general classrooms $\left(\right.$ grades $\left.4^{\text {th }} \& 5^{\text {th }}\right) \times 20$
> Maximum Capacity $=$
> Number of general classrooms (grades $\left.K-3^{\text {rd }}\right) \times 22$ students per classroom
> + number of general classrooms $\left(\right.$ grades $\left.4^{\text {th }} \& 5^{\text {th }}\right) \times 24$

This technique generates a range for each school's capacity based on the boundaries of the District's current class size policies.

Building Capacities for middle schools are based on the assumptions and methodologies identified below:

Minimum Capacity =<br>Number of total teaching stations x 20 students per teaching station X 71\% utilization rate<br>Maximum Capacity =<br>Number of total teaching stations x 24 students per teaching station $X 71 \%$ utilization rate

This technique generates a range for each school's capacity based on the boundaries of the District's current class size policies.

## ELEMENTARY SCHOOL BUILDING CAPACITIES

The following table communicates the calculated capacities for each elementary school and compares them to the individual school forecast from the McKibben demographic study.

|  | Capacity |  |  |
| :--- | :---: | :---: | :---: | Need

* Does not include modular classrooms for Kindergarten. Including those modular classrooms would increase capacity to 448 to 544.

This high level capacity analysis suggests that the maximum capacity of the existing buildings (without the modular classroom facilities at Mitchell Elementary School) is nearly identical to the maximum enrollment forecast for grades K-5 ${ }^{\text {th }}$. This suggests that the District can accommodate the entire enrollment forecast within the existing classrooms and remain within its class size policy by redistricting students around the edges of existing catchment area boundaries. While accommodating the entire enrollment forecast within the existing number of classrooms appears possible, this analysis suggests that all classrooms would be at the maximum of the District's class size guidelines, leaving little room for deviations from the enrollment forecast without either increasing class sizes or repurposing specialized spaces into general classrooms. It may be in the District's best interest to pursue master plan scenarios that increase the total number of general classrooms to create this flexibility.

The following table compares the existing classroom counts to proposed classroom counts to demonstrate the impact on class sizes across the district.

## Current

|  | General Classrooms | General Classrooms |
| :---: | :---: | :---: |
| Broadmeadow | 24 | 24 |
| Eliot | 18 | 18 |
| Mitchell | 20 | 30* |
| Newman | 30 | 30 |
| Williams | $24$ | $\left.\begin{array}{c} 24 \\ 126 \end{array}\right)$ |

At the peak $\mathrm{K}-5^{\text {th }}$ enrollment of 2,634 students, the average class size across the District would be just under 23 students per classroom assuming the existing classroom count. In master plan scenarios where a potential Mitchell project assumed five sections per grade level (a total of 126 general classrooms), the average class size across the District drops to just under 21 student per classroom. Based on this analysis, it may be in the best interest of the District to pursue master plan scenarios that target 126 general classrooms across the elementary schools.

## MIDDLE SCHOOL BUILDING CAPACITIES

The table below communicates the calculated capacities for Pollard Middle School and the High Rock school and compares them to the individual school forecast from the McKibben demographic study. Capacity calculations are based on the midpoint of the District's class size guidelines (20-24) and the capacity range is based on two utilization models ( $71 \%$ and $75 \%$ ).


* Does not include modular classrooms. Including those modular classrooms would increase capacity to 1,109 to 1,172 .

The analysis suggests there is an overcrowding challenge at High Rock currently, that will lessen over time but remain a challenge. While not appearing in this simple capacity analysis, High Rock has other spatial deficiencies including the following:

- Limited space for special education and academic support services
- A significantly undersized cafeteria
- A significantly undersized gymnasium
- Limited middle school size labs
- Limited space to offer elective specials

This analysis also suggests that the current daily schedule (under utilization) has led to an overcrowding condition when only considering the existing permanent construction. If the modular classrooms are included in the calculation, there are approximately the right number of teaching stations for the current utilization rate. It appears that if the school were to entertain a slightly more efficient use of space, the
existing building (without) the modular classrooms would be sufficient to accommodate the entirety of the enrollment forecast.

While not appearing in this simple capacity analysis, it is important to note that the existing science labs are well below MSBA guidelines in both their size and their features. Any future project should address these deficiencies in addition to the capacity challenges.

Finally, this analysis suggests that the District would need to increase the capacity of the building by approximately 400 students to accommodate the enrollment forecast for grades $6^{\text {th }}, 7^{\text {th }}$, and $8^{\text {th }}$.

The following table compares the existing teaching stations to a proposed number in three scenarios: an intervention at High Rock to just serve $6^{\text {th }}$ grade, an intervention at Pollard to just serve grades $7^{\text {th }}-8^{\text {th }}$, and an intervention at Pollard to serve grades $6^{\text {th }} 8^{\text {th }}$. The total proposed number of teaching stations is based on the enrollment forecast and assumes 22 students per teaching station and $71 \%$ utilization.

|  | Current | Proposed |
| :---: | :---: | :---: |
| High Rock (6monn) | $\begin{gathered} \text { Teaching Stations } \\ 25 \end{gathered}$ | Teaching Stations 34 |
| Pollard* ${ }^{(m)}$ | 61 | 67 |
| Pollard* ${ }^{\left(6^{n}-8^{\text {a }}\right.}$ | 61 | 101 |

* Does not include modular classrooms.

The 34 teaching stations at High Rock include 4 spaces to serve special education. The 67 teaching stations to serve only grade $7^{\text {th }}-8^{\text {th }}$ at Pollard Middle School contains a few more classrooms than the strict calculation would suggest to give the school the flexibility to either maintain their current utilization rate or support a slightly lower average class size (approximately 20 students per teaching station). In the scenario that explores all three grades at the Pollard site, the proposed number of teaching stations is a few more that are indicated by the strict calculation for reasons similar to those just mentioned for the other two scenarios. If $6^{\text {th }}$ grade relocates to Pollard, its special education space needs will come with it. Having a few additional teaching stations allows the District the flexibility to continue its current utilization or lower the average class size.

