Nashoba Regional High School Space Needs Task Force

Final Report

March 15, 2016

Introduction

The Nashoba Regional High School Space Needs Task Force evaluated the adequacy of the space for the curriculum and the population that the space supports. This final report presents the space shortages and classroom shortcomings of the high school and how they affect student performance. This report does not recommend remedies for these problems, as the Task Force has neither the expertise nor the budget to determine the best solution(s).

An most important conclusion from our study is that, overall as an existing building, Nashoba Regional High School (NRHS) is a safe building to use for the purpose of education. The well-being of students, teachers, parents, and the general public is a primary concern.

The existing Nashoba Regional High School was opened in 1961, with an academic wing built in 1970 that added a gymnasium and library. In 2002 the building underwent a renovation. Some instructional space was lost during the renovation. Other smaller projects related to classroom reconfigurations and alterations have occurred since 2002.

The ***Executive Summary*** provides an overview of the space issues at Nashoba Regional High School. The ***Detailed Exposition of NRHS Space Needs*** provides full explanations of all the conditions presented in the Executive Summary. **Appendix A** contains the same information as the main body of the report, except that it is sorted by level of criticalness. **Appendix B** contains more detailed information about NRHS Classroom Utilization and Class Sizes. **Appendix C** is a statement about desired classes and curriculum and how current space allocations inhibit development of this curriculum.

Members of the NRHS Space Needs Task Force

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Executive Summary

The NRHS Space Needs Task Force initially met in December 2013. At our monthly meetings, we toured the high school several times, met with NRHS teachers and administrators, NRSD administrators, and others from the community. We have studied the usage of space at the high school, both in the past and at present, and concluded that physical modifications to the high school building are needed to keep it a safe place that offers the best educational opportunities for our children.

Overcrowding *(see Section 1 for details)*
The main issue at the high school is that there are too many students for the number of classrooms available. Although the end of "school choice" will alleviate this problem to some degree, population growth in our towns is expected to restore the student population to current levels and then exceed it.

There is an *immediate* need for nine (9) new general-purpose classrooms and one (1) additional science laboratory for the present student population and current scope of the core course offerings. (The "temporary" classrooms, installed for the 2015-2016 school year, are calculated as part of the current classrooms.)

At the recommendation of the Task Force, the NRSD School Committee contracted with an outside vendor to prepare a ten-year enrollment forecast for NRHS and the elementary schools in Lancaster, Bolton, and Stow. Delivery of this forecast is expected in late April, 2016.

Science Laboratories *(see Section 2 for details)*
The newest science laboratories were designed and built to accommodate a curriculum in place more than forty-five years ago with the older science laboratories being 55 years old. They cannot accommodate the desired current curriculum or a desired future curriculum because their small size and fixed interior layout prohibit the use of modern methods and materials. This issue is completely unrelated to overcrowding.

Current Curriculum *(see Section 3 for details)*
With respect to student performance, the second biggest issue (overcrowding being the first) is the lack of sufficient specialized spaces or classrooms for use in science, technology, arts, journalism or wellness (physical education) courses. This limits the development of course offerings. Curriculum development is necessary to prepare students for the currently competitive job markets or competitive college admissions.

Student Support *(see Section 4 for details)*
Students (and parents) often need additional resources not found in classrooms to succeed in high school. The Guidance Department and Academic Support Center are limited by size to the number of students that can simultaneously use them. Privacy in these areas is important but difficult to

achieve because of physical limitations. Other areas of student support are in makeshift offices that lack privacy.

Wellness (Physical Education/Athletics) *(see Section 5 for details)*
Some wellness classes are conducted in the hallways and auditorium because the upper and lower gyms cannot accommodate the number of classes. The weight-training area is in a too-small cage on the wooden floor of the gym. The trainer conducts physical-therapy sessions in the hallway because the training room is too small. Air for the ventilation of the boys and girls locker rooms does not come from outside, it comes from the interior of the upper gym: the result is constantly high humidity in these locker rooms.

Administration *(see Section 6 for details)*
The largest conference room in the high school seats ten people. This room is often not available when being used for Student Support activities, including make-up tests, and Special Education Team meetings. Both Guidance and Administration need private spaces to talk with parents, allow college interviews, discuss grades, discuss conduct or other private matters. It is difficult to discretely have a conversation with students, parents or visitors anywhere in the building.

Mechanical Systems *(see Section 7 for details)*
Throughout the school there are areas not sufficiently heated in the winter or adequately ventilated in the summer. This is not true of the school as a whole, but there are pockets of these problems in different areas of the building. These do not cause health problems, but are distracting, and far from the optimum class environment for learning, such as when a teacher sends students to get their coats so that class may continue.

In December, 2015, the Task Force voted to recommend to the NRSD School Committee that it authorize the Superintendent to submit a Statement of Interest to the Massachusetts School Building Authority for remediation of conditions at the high school.

For more detail on any area of this Executive Summary, see the matching section in the **Detailed Exposition of NRHS Space Needs**, below

Detailed Exposition of NRHS Space Needs

After creating a long list of NRHS space needs, the Task Force needed to sort them by degree of importance. Some space needs are important for health or accreditation reasons, some space issues have little effect on students and administrators, and many space issues fall between the two extremes. The Task Force created five categories of space needs that encompass the full range of space needs and the degree to which they need to be addressed.

The categories are:

- **Critical** - Areas affecting health, safety, legal, or accreditation
- **Important** - Areas where benefits to most students are large and easy to understand
- **Recommended** - Areas where benefits are not spread across all students
- **Desirable** - Should be addressed but are not directly affecting student performance
- **Defer** - Should be addressed if the successor group to this Task Force can do so economically

Following the sequence established in the Executive Summary, this section provides detailed explanations of the space shortages and classroom shortcomings of Nashoba Regional High School and how they affect student performance.

The main body of the report is organized by building area. Appendix A contains the identical information from the main body of the report, reorganized and sorted based on the five (5) categories (Critical, Important, Recommended, Desirable, and Defer), rather than area of the building.

Section 1 – Overcrowding (CRITICAL)

- NRHS student population is 110% of classroom capacity. There is a shortage of available classrooms affecting about 100 students each period **(CRITICAL)**
- Loss of Building Capacity
  The classroom utilization percentage recommended by the Massachusetts School Building Authority is 85%. NRHS classroom utilization rate is 93% of available classrooms. This does not include the 100 students without a classroom each period. (See Appendix B for more detail about classroom utilization.) After the renovation of NRHS in 2002, the school was believed to be large enough to accommodate a student population of 1250. Despite having a population of only 1087 in the 2014-2015 school year, the school is seriously overcrowded with about one hundred (100) students using the auditorium hallway as their study hall due to lack of classrooms. The Media Center is used for students without homeroom classrooms when a "Homeroom" is required.

  This overcrowding is due to the removal of six general purpose classrooms (accommodating a total of 120 -150 students) for specialized uses.

- Effects of Current Overcrowding Upon Students

- Approximately one hundred students each period are scheduled for Study Halls in the auditorium hallway: a large space with lighting suitable for a hallway but not designed for prolonged and intensive study. Most of these students transition to the Media Center, causing overcrowding in the Media Center. Teachers use the Media Center as a formal classroom and students use it as a study hall. Other students that remain in the auditorium hallway use portable tables. Cooperative work between students and solitary study are difficult in the auditorium hallway.

- There are at least ten (10) teachers who do not have dedicated rooms and must travel to different rooms with a cart containing all of their teaching materials. The effect of this is to reduce the actual "face time" spent teaching each day. If a traveling teacher requires two extra minutes at the beginning of each class to distribute material and two minutes at the end of each class to collect the material, there is a loss of "face time" of four minutes per class. A class period is 46 minutes, so this loss of "face time" is equivalent of missing one class every twelve (12) days of the school year. Also, this adversely affects opportunities for students to interact with their teacher before or after class

- Science Lab Demand Exceeds Availability: Four-credit science courses meet every school day. Five-credit science courses meet every day and have a second period (the Lab period) every fourth day. Six-credit courses meet every day and have a second period (the Lab period) every other day. Four-credit science courses do laboratory work in class; but the hands-on laboratory work is more extensive in the five-credit and six-credit courses.
    - In the 2014-2015 school year:
        - Twenty-two (22) students were denied the opportunity to take the five-credit Accelerated-level (AC) Biology course because only one section of the course (with 24 students) could be accommodated.
        - Six (6) College Preparatory (CP) students were turned away from the five-credit CP Biology course
        - Seventeen (17) students were turned away from the five-credit CP Chemistry course
        - Anatomy and Physiology course was a five-credit offering and is presently offered as a four-credit course due to space and lack of personnel.
        - All students who desired enrollment in five-credit courses and could not get into them were offered four-credit courses in the same subject.
    - The number of sections of five-credit Science Labs has decreased in the past few years. At the same time the variety and breadth of science courses has increased. The two are related, for as the variety of courses increases the rooms suitable for these courses remains the same and five-credit Science Labs have been reduced to accommodate the new courses. The number of five-credit Science Labs cannot be increased without additional dedicated space. The current unmet course demand is: Biology, then Chemistry, followed by Physics.

- Students are able to get their desired courses in other areas of the Core Curriculum (Math, English, Languages, and Social Studies). These courses do not require specialized spaces.

- Business Course Demand Exceeds Availability: One hundred (100) students were turned away from Business classes due to a lack of space and teachers. These courses do not require specialized spaces.

- Elective Course Demand Exceeds Availability: Two hundred (200) students were turned away from "Foods" and "Digital Photo" courses due to lack of space and teachers. These courses require specialized spaces.

- Effect of Future Student Population Growth on Space Needs
  The only available estimate of the number of students in the high school assumes the population of the three towns does not change in the future. This is an unrealistic assumption and does not contemplate housing growth or housing turn-over in the towns. . At the recommendation of the Task Force, the NRSD School Committee contracted with an outside vendor to prepare a ten-year enrollment forecast for NRHS and the elementary schools in Lancaster, Bolton, and Stow. Delivery of this forecast is expected in late April, 2016.

- Effect of Curriculum Changes on Space Needs
  Growth and expansion of new courses is not defined or constrained by any plan. It is a year-to-year decision, based upon student demand, and governed by the requirements for graduation determined by the NRSD School Committee. It is impossible to determine the future space needs without knowing the classes that will be offered, even with a stable population. In recent years the growth of courses has occurred within the Core Curriculum (Science, Math, English, Language, and Social Studies) and Electives.

  Changes in the curriculum reduce the scheduling flexibility when any new class needs specialized space. This happens independently of changes in student population, although student population growth magnifies scheduling issues.

  Growth in new areas of the curriculum is both in depth and breadth of classes. Not only are additional sections of existing classes added, the range of courses is growing.
  - Courses such as Computer Science, Fine and Performing Arts, and Wellness require specialized spaces.
  - There is no permanent broadcasting studio for student use. This restricts course offerings in the Journalism program.

- Additional space is needed to initiate Alternative Education Programming, which is directed at students who struggle in a traditional course setting. These students generally do not have disciplinary issues and are not necessarily SPED students.
- Additional space would be needed to initiate new programs requiring specialized space. An example: Early Education programs which provide students with courses in Child Care, pre-school education and Life Skills.

Summary of Overcrowding Issues

There is an *immediate* need for nine (9) new general-purpose classrooms and one (1) additional science laboratory for the present student population and current scope of the core course offerings. (The "temporary" classrooms, installed for the 2015-2016 school year, are calculated as part of the current classrooms.) This does not address growth in core course class offerings.

Section 2 - Science classrooms

- Science classrooms are small (40% smaller than current school building standards), with lab work space that is awkward and configurations that severely limit the curriculum and experiments that can be conducted in these rooms. The small class space limits the type of work that teachers can plan for students, barely providing enough space for students to be arranged in rows (the tight space impairs the ability of Science teachers to create collaborative activities). There are significant problems with venting and the configuration of safety equipment. **(CRITICAL)**
- The equipment in the science labs varies from room to room, restricting the range of laboratory experiments to specific rooms. This limits course offerings. **(IMPORTANT)**
- Only one lab contains a chemical fume hood. Experimental offerings could be increased if all labs had a fume hood. **(IMPORTANT)**
- All labs but one have window exhaust fans, installed after building construction, that leak cold air in the winter. **(IMPORTANT)**
- Central heating is uneven in the science labs. Teachers sometimes send students to get their coats for class, resulting in loss of teaching time and far from optimum class environment for learning. **(IMPORTANT)**
- Fixed layout of lab tables and location of cabinetry impede collaboration among students. **(RECOMMENDED)**

Section 3 - Current Curriculum

- **Special education and regular education support programs** – Learning Center classes occur in two different rooms, and can become particularly crowded, limiting the ability of special education teachers to provide individualized support in a quiet and structured setting. **(CRITICAL)**
- **Art classes** – NRHS has three small art spaces, and size/quality of space negatively impacts the art classes. The art studio is a converted interior classroom with no natural light or storage space. The ceramics room has minimal storage space and is not directly connected to the kiln and storage room. Printmaking and silk-screening is in a tight space and with minimal storage capacity. All three rooms are small and can only hold minimal equipment. Each art room needs to be specialized, which constrains room availability and usage (for example, we can only run a finite number of ceramics classes because of the space available). The space and quality of all three rooms is not conducive to artistic creativity and collaboration.
  - Art classrooms not ventilated, preventing use of oil paints and other volatile substances. **(IMPORTANT)**
  - Art classrooms too small for all students to use easels. **(IMPORTANT)**
  - Some art classrooms lack enough sinks or any sinks at all. **(RECOMMENDED)**
  - Only one supply closet for three classrooms. **(DESIRABLE)**
  - Inadequate space to display student work. **(DESIRABLE)**
  - Only one ceramic kiln available for seven ceramics classes, resulting in delays in students' ability to complete assignments. **(DEFER)**
  - One art classroom has only artificial light. **(DEFER)**
- **Performing arts classes** – NRHS has a growing theater arts program, but all classes have to be scheduled in the auditorium, which receives heavy usage by other groups.
  - During Concert seasons and Fall Play/Spring Musical seasons, the use of the stage negatively impacts theater arts classes that also need stage space. **(RECOMMENDED)**
  - Theater Arts classes share auditorium space with Drama Club and RAD (Rape, Aggression, Defense) classes. Inappropriate to schedule theater arts classes at same time as RAD. Both classes oversubscribed and require specialized space. **(RECOMMENDED)**
  - No direct route to auditorium from main entrance or academic classrooms. **(DEFER)**
  - Auditorium not set up to provide direct feed of televised events. **(DEFER)**
  - Auditorium common storage space used by Theater Arts classes, Drama Club, Spring Musical, and RAD classes. **(DEFER)**
  - Insufficient instructional space designed for the depth and breadth of Music offerings. **(RECOMMENDED)**
  - Band room limited to fifty-student capacity by fire code regulations, which limits course enrollment. For musical ensembles, such as Concert Band, only one section of the class is scheduled each semester. Thus, the room size limits the number of students who can take the course. **(RECOMMENDED)**

- **Computer science and journalism classes** – In the past few years, computer science and journalism offerings have been added, but the limited appropriate computer lab space means that computer science and journalism classes in many cases have had to be scheduled in general-use labs, which means that other teachers in the building are constrained in their ability to access computer labs for classwork. **(RECOMMENDED)**
- **Transitions program** - sited in the former faculty room because of space constraints (and is far from an ideal space). **(RECOMMENDED)**
- **Academic Support Center** is in the back of our Media Center, and the small size of the ASC limits the number of students who can access it. **(RECOMMENDED)**
- **English Language Learners program** – The ELL space is in a converted office in the Media Center, but has to be used as small-group instruction space. It is necessary to hang curtains in this space to maintain privacy. **(RECOMMENDED)**
- **Emergency Medical Technician (EMT) Program** Storage of EMT equipment and training material is in a roof-access /mechanical space (room 403A, 403B). **(DEFER)**

Section 4 – Wellness (Physical Education/Athletics)

- Wellness Classes – Students in their Junior and Senior years are offered a variety of wellness classes (e.g., RAD, Total Body Workout, CrossFit, Strength and Conditioning), but limited specialized physical education space (e.g., no fitness room or separate weight room) means that on rainy days or in the winter, there may be four Wellness classes scheduled in the same gym, and some classes move into the hallways in order to have sufficient room to conduct the class. **(CRITICAL)**
- **Wellness Classes** - In addition, the Health and Wellness classes switch between three different academic classrooms because there are not enough available rooms to have one consistent Health and Wellness space. **(IMPORTANT)**

Athletic Training Room

- Too small, no room for dividers. Used by male and female athletes. **(CRITICAL)**
- Only two training tables. Need a training taping station due to the number of athletes that are taped each day. **(CRITICAL)**
- Physical therapy and rehabilitation done in hallway outside of lower gym and custodial area due to lack of open space in training room. **(IMPORTANT)**
- Plymetric physical therapy done in hallway. **(IMPORTANT)**
- Should be closer to athletic facilities. **(RECOMMENDED)**
- Small ice machine and water distribution resource. Home and visiting sports teams lined up into hallway to get water and ice before athletic events. **(DESIRABLE)**
- Ice machine is old and gives off lots of heat, making the training room too warm throughout the year. **(DEFER)**
- Need clothes washer and dryer for athletics (towels, cloths, ace bandages, uniforms, etc.) **(DEFER)**

Other Indoor Athletic Space Concerns

- Boys' and girl's locker rooms poorly ventilated. **(CRITICAL)**
- Occasional sewer backups into athletic storage area in basement. **(CRITICAL)**
- Occasional sewer backups into athletic storage area in basement. **(CRITICAL)**
- Room with sewer cleanout pipe filled with athletic equipment, making it difficult to deal with sewer blockages quickly. **(CRITICAL)**
- Weight-lifting cage
  - (in upper gym) too small. Students move weights out of cage to create more effective circuit. Wood flooring unsuitable for weights. **(CRITICAL)**
  - No sound barrier/absorber to block sound of clashing metal, affecting ability to have effective gym class in upper gym when weight training class in session. Noise from weight-lifting cage makes coaching basketball and other sports difficult during school time and at team practices after school. **(CRITICAL)**
- Indoor Track team practices running, starts (using starting blocks) and hurdles in hallways. **(IMPORTANT)**

- Indoor track uses the auditorium foyer for circuit training (sit-ups, push ups, lunges with weights, wall sits, wall balls, etc.) and the weight cage for lifting. **(IMPORTANT)**
- Cross-country and alpine ski teams practice in the cafeteria (including running in the hallways and set up their circuit training in the cafeteria). **(IMPORTANT)**
- Due to lack of space, teams rotate on a schedule to have practice between 2:30 PM and 9:00 PM each day in the winter. **(IMPORTANT)**
- Cheerleading teams and wrestling teams must practice in the lower gym as that is where both teams store their mats. **(IMPORTANT)**
- Cheerleading team, Cross-country Ski team, Downhill Ski team all practice in wrestling practice room due to presence of large, heavy floor mats. **(IMPORTANT)**
- Visitors Locker Room
  - Looks like a dump. Interior includes two bathroom stalls, urinal, one shower stall, two benches, and three storage lockers (which are not enough space for all of the equipment). **(IMPORTANT)**
  - Used as main locker room for baseball (in the spring), ice hockey (in the winter), and golf (club storage) and soccer (in the fall). **(IMPORTANT)**
  - Each Nashoba team using the Visitors Locker Room must remove all their equipment when visiting teams (football, boys basketball, girls basketball) come to Nashoba because this is the locker room for those opposing teams to use. **(IMPORTANT)**
- Girls' locker room has insufficient number of lockers. **(RECOMMENDED)**
- Insufficient storage areas for sports equipment. Loading/Shipping dock used for storage of large items. **(RECOMMENDED)**
- Male referees use the coaches' office in boys' locker room to dress and prepare for games. **(DESIRABLE)**
- Female referees use the Physical Education teacher's office because there is no coaches' room in the girls' locker room. **(DESIRABLE)**
- Female athletes do not use weight cage outside of Wellness classes, probably due to crowded conditions. **(DESIRABLE)**

Section 5 - Student Support

Guidance

- No conference room in Guidance Office. **(CRITICAL)**
- Parents cannot enter guidance area without visibility to all students in waiting room. Parents should be able to meet guidance department staff without student(s) knowing they are there. **(CRITICAL)**
- Record-keeping vault is too small for file-keeping as mandated by law. Footprint of fireproof file cabinet is two feet by four feet. File cabinet not secure. **(CRITICAL)**
- Waiting area for students next to office secretary. Students hear office secretary greet callers (including parents) over the phone and hear secretary answer questions posed by callers. **(CRITICAL)**
- General lack of privacy for discussions with students, parents, outside counselors, and other situations. **(CRITCAL)**
- No office for use by providers of special counseling services hired by NRSD to deal with special student issues. **(IMPORTANT)**
- No room(s) for college interviewers to use for meetings with student applicants. **(RECOMMENDED)**
- Career counselor is separated from guidance department by hallway. **(DESIRABLE)**
- No carrels with internet connections for use by student to research colleges and other post-high-school opportunities. **(DESIRABLE)**

Section 6 - Administration

- **Conference Room**,
  - Only one Conference Room in the school, which seats ten (10) people, maximum. Too small for central office staff meetings or STAT (Student Teacher Assistance Team) meetings of 15 people. There is a projector and a projection screen in the room. **(CRITICAL)**
  - Next to the Principal's office leading to issues with privacy. **(CRITICAL)**
  - Frequently used for counseling, MCAS testing, special education testing, etc., which means students sitting next door to a private meeting between an administrator and parents (which is in Principal's office). **(CRITICAL)**
- **Teacher collaboration space**: No ad hoc collaboration space available for teachers. **(CRITICAL)**
- **Student "cooling off" space** currently whatever vacant room available in Special Education space. Better to have "cooling off" room located with central office administrators. **(CRITICAL)**
- **School Resource Officer** (police on site) has no office. **(IMPORTANT)**
- No office for possible future **Dean of Students (RECOMMENDED)**
- **Principal's and Assistant Principal's offices**: Used as meeting space or student support space by the general population. This leads to concerns with privacy and program integrity, especially for students who need a secluded space to work. **(RECOMMENDED)**
- U.P.S. deliveries are made to the front office. No place to store teachers' materials until teacher can pick them up. **(DESIRABLE)**
- Storage room doubles as "kitchen space" in main office: sufficient for a coffee maker, sink, and microwave. Bathroom is attached. **(DESIRABLE)**
- Stationary Closet – shares duty as location for some computer servers **(DESIRABLE)**

Athletic Administrator's Office

- The Athletic Administrator's office is used for storage of sports uniforms and some sports equipment due to lack of other suitable storage space. **(DESIRABLE)**
- Office too small for meetings: three people can meet in the office if one of them stands. **(DESIRABLE)**
- Unable to conduct interviews for coaching positions because the office is not able to accommodate enough people. **(DESIRABLE)**
- No waiting area for students/coaches/parents to walk into before meeting with the athletic director. Lack of privacy. Numerous interruptions while in meetings in the office as you open the door and walk right into the office (where a meeting could be taking place). **(DESIRABLE)**
- Needs an area to plug-in and charge scoreboards (either in this office or another area). Outdoor wireless scoreboards need to be charged each day to be ready for games. Currently, this takes place all over the office. **(DEFER)**
- Trophies and plaques stacked in office due to lack of display space. Need more trophy display cases and someplace to put them. **(DEFER)**

Food Service

- Need seating area for food allergies isolated from general lunch area. **(CRITICAL)**
- Fire alarm and emergency voice announcements cannot be understood in the cafeteria due to acoustics and sound levels. **(CRITICAL)**
- Limited cafeteria seating drives four lunch periods of twenty-two minutes each. Short lunch period creates stress for students, instead of providing break from school stress. More cafeteria seating would allow three lunch periods of longer duration. (**IMPORTANT)**

School Psychologist

Located in a small office space in the Media Center that adjoins a computer lab. There is a gap in the walls between the two spaces that was filled in with foam so that the Psychologist could conduct testing and have private conversations with parents in office. (Frequently uses the Principal's office for testing or meetings). School Psychologist hangs curtains in the windows (which look out on the Media Center) to maintain privacy. **(DESIRABLE)**

Speech/Language Pathologist

This office – which also is used for one-on-one meeting space with students – is in a converted closet formerly used to house computer servers. **(RECOMMENDED)**

Section 7 - Mechanical Systems

- Home team **boys and girls locker rooms** (in the basement) are - by far - the biggest air quality problem in NRHS. The air distribution units pull in "fresh air" from inside the **Upper Gym** and distributes it to the locker rooms. Using air a second time leads to stale and unhealthy conditions within the locker rooms during the busy athletic seasons. **(CRITICAL)**
- **Waste Treatment -** Sometimes the septic system backs up into the home team locker rooms. **(CRITICAL)**
- **Security Cameras -** Not all exterior doors have security cameras. Interior security cameras only in common areas (hallways and stairways), but not all common areas. **(CRITICAL)**
- Throughout the school, there is an air gap between the outer skin of the building and the exterior walls of the classrooms. This air gap is not a sealed space and thus provides no insulation. Thus, the exterior walls of the classroom quickly transfer the outside temperature to the inside of the classroom and the wall heaters cannot keep up with the heating demands on very low temperature days. Furthermore, on sub-zero temperature evenings the boilers have to run in "building occupied" mode in order to keep the building warm enough to prevent pipe freezing (added utility costs and wear on the systems). In the **Science labs**, fixed benches are set against the exterior walls. Students feel this cold air coming off the walls, which affects their comfort in the room. Compounding this problem, there is lots of leakage in the ductwork of the science wing. Each year, part of the annual maintenance budget for NRHS addresses this ductwork. **(IMPORTANT)**
- Air handler for **school kitchen** pulls in outside air. It is tied into heating system but could not keep up with super-cold weather this past winter (2014-2015). Exhaust fans pull out warmed kitchen air and must be on when the kitchen is active. **(DESIRABLE)**
- One HVAC unit serves the **Drafting (computer) lab (room 403B), Administration offices and Guidance offices.** The Drafting lab should have its own HVAC unit due to the heat produced from the desktop computers. **(DESIRABLE)**
- **Room 224** (computer lab) also overheats due to heat from the desktop computers used in that room. **(DESIRABLE)**
- A single HVAC unit serves the **Media Center and the classrooms below it**. However, there are different heating and cooling needs on each level. Windows in the Media Center result in a lot of solar heat gain, which is not the case in the classrooms below. Temperature on the Media Center windows sometimes reaches 140ºF. Added heat from the student use of computers in the Media Center and the school computer servers located there makes this problem worse. **(DESIRABLE)**
- All three **Art** rooms are served by the same HVAC unit. **(DESIRABLE)**
- **Kitchen Appliances -** Food preparation equipment is original to building. Grease trap is undersized for this school population. Cooler in kitchen is 40 years old. **(DEFER)**
- **General Status of Fans, Compressor, and Pumps -** Lifetimes of NRHS mechanical devices are approaching "end of life". This is mostly fans, compressors, and pumps of various sizes throughout the school. Normal lifetime is 10-12 years. Last major upgrade of these devices was the 2000-2002 renovation. Replacement of these system components

included in the long-term maintenance and capital projects plans presented to NRHS Space Needs Task Force. **(DEFER)**

- **Roof Leaks**
  - Above Guidance Offices is a major leak that is being worked on, but due to the design of the addition it is difficult to track the leak between the two ceilings. Currently this leak is quiet. **(IMPORTANT)**
  - Roof over the cafeteria, kitchen and machine shop degraded severely. Most HVAC equipment on this roof. In order to replace this roof the HVAC units will need to be disconnected and the roof installed. This should be coordinated with the replacement of HVAC units. The present protocol is to patch this area when there is an active leak. **(IMPORTANT)**
  - Above Science Labs a thermal scan resulted in an "OK" status for that roof, but it is more than 35 years old. **(DEFER)**
- **Storage** – There is a lot of money in the form of equipment for school classes and activities that is stored in hallways, under stairs, in stairwells, or the loading/shipping docks. In part, this is because large storage areas have been converted specialized teaching spaces. Any remedy to current space problems should consider storage needs for the curriculum and activities and provide economical solutions. **(DEFER)**
- **Underutilized Space** – There is much more square footage in the Boys' Locker Room and the Girls' Locker Room than is currently used. This space should be reallocated to meet other needs. **(DEFER)**
- **Media Room (Library)** – This area has been carved up for many different purposes. Not all these spaces are properly configured. The area should be rationalized and remodeled to suit its purpose as a learning commons. **(DEFER)**

APPENDIX A

Space Needs Grouped by Category

Appendix A contains the identical information from the main body of the report, just reorganized and sorted based on the five (5) categories (Critical, Important, Recommended, Desirable, and Defer), rather than area of the building.

The categories are:

- **Critical** - Areas affecting health, safety, legal, or accreditation
- **Important** - Areas where benefits to most students are large and easy to understand
- **Recommended** - Areas where benefits are not spread across all students
- **Desirable** - Should be addressed but are not directly affecting student performance
- **Defer** - Should be addressed if the successor group to this Task Force can do so economically

Appendix A is presented to aid understanding the space needs issues. We present all the "Critical" items grouped together and the same is true for space need issues labeled "Important", "Recommended", "Desirable", and "Defer". The list of space needs issues is exactly the same as in the *Detailed Exposition of NRHS Space Needs* section and the explanations are exactly the same. Only the order of presentation is different from that section.

Appendix A - Space Issues Categorized as "Critical"

Critical - Areas affecting health, safety, legal, or accreditation

Section 1 – Overcrowding (CRITICAL)

- NRHS student population is 110% of classroom capacity. There is a shortage of available classrooms affecting about 100 students each period **(CRITICAL)**
- Loss of Building Capacity
  The classroom utilization percentage recommended by the Massachusetts School Building Authority is 85%. NRHS classroom utilization rate is 93% of available classrooms. This does not include the 100 students without a classroom each period. (See Appendix B for more detail about classroom utilization.) After the renovation of NRHS in 2002, the school was believed to be large enough to accommodate a student population of 1250. Despite having a population of only 1087 in the 2014-2015 school year, the school is seriously overcrowded with about one hundred (100) students using the auditorium hallway as their study hall due to lack of classrooms. The Media Center is used for students without homeroom classrooms when a "Homeroom" is required.

  This overcrowding is due to the removal of six general purpose classrooms (accommodating a total of 120 -150 students) for specialized uses.

- Effects of Current Overcrowding Upon Students

- Approximately one hundred students each period are scheduled for Study Halls in the auditorium hallway: a large space with lighting suitable for a hallway but not designed for prolonged and intensive study. Most of these students transition to the Media Center, causing overcrowding in the Media Center. Teachers use the Media Center as a formal classroom and students use it as a study hall. Other students that remain in the auditorium hallway use portable tables. Cooperative work between students and solitary study are difficult in the auditorium hallway.

- There are at least ten (10) teachers who do not have dedicated rooms and must travel to different rooms with a cart containing all of their teaching materials. The effect of this is to reduce the actual "face time" spent teaching each day. If a traveling teacher requires two extra minutes at the beginning of each class to distribute material and two minutes at the end of each class to collect the material, there is a loss of "face time" of four minutes per class. A class period is 46 minutes, so this loss of "face time" is equivalent of missing one class every twelve (12) days of the school year. Also, this adversely affects opportunities for students to interact with their teacher before or after class

- Science Lab Demand Exceeds Availability: Four-credit science courses meet every school day. Five-credit science courses meet every day and have a second period (the Lab period) every fourth day. Six-credit courses meet every day and have a second period (the Lab

period) every other day. Four-credit science courses do laboratory work in class; but the hands-on laboratory work is more extensive in the five-credit and six-credit courses.

- In the 2014-2015 school year:
  - Twenty-two (22) students were denied the opportunity to take the five-credit Accelerated-level (AC) Biology course because only one section of the course (with 24 students) could be accommodated.
  - Six (6) College Preparatory (CP) students were turned away from the five-credit CP Biology course
  - Seventeen (17) students were turned away from the five-credit CP Chemistry course
  - Anatomy and Physiology course was a five-credit offering and is presently offered as a four-credit course due to space and lack of personnel.
  - All students who desired enrollment in five-credit courses and could not get into them were offered four-credit courses in the same subject.
- The number of sections of five-credit Science Labs has decreased in the past few years. At the same time the variety and breadth of science courses has increased. The two are related, for as the variety of courses increases the rooms suitable for these courses remains the same and five-credit Science Labs have been reduced to accommodate the new courses. The number of five-credit Science Labs cannot be increased without additional dedicated space. The current unmet course demand is: Biology, then Chemistry, followed by Physics.

- Students are able to get their desired courses in other areas of the Core Curriculum (Math, English, Languages, and Social Studies). These courses do not require specialized spaces.

- Business Course Demand Exceeds Availability: One hundred (100) students were turned away from Business classes due to a lack of space and teachers. These courses do not require specialized spaces.

- Elective Course Demand Exceeds Availability: Two hundred (200) students were turned away from "Foods" and "Digital Photo" courses due to lack of space and teachers. These courses require specialized spaces.

- <u>Effect of Future Student Population Growth on Space Needs</u>
  The only available estimate of the number of students in the high school assumes the population of the three towns does not change in the future. This is an unrealistic assumption and does not contemplate housing growth or housing turn-over in the towns. . At the recommendation of the Task Force, the NRSD School Committee contracted with an outside vendor to prepare a ten-year enrollment forecast for NRHS and the elementary schools in Lancaster, Bolton, and Stow. Delivery of this forecast is expected in late April, 2016.

- Effect of Curriculum Changes on Space Needs
  Growth and expansion of new courses is not defined or constrained by any plan. It is a year-to-year decision, based upon student demand, and governed by the requirements for graduation determined by the NRSD School Committee. It is impossible to determine the future space needs without knowing the classes that will be offered, even with a stable population. In recent years the growth of courses has occurred within the Core Curriculum (Science, Math, English, Language, and Social Studies) and Electives.

  Changes in the curriculum reduce the scheduling flexibility when any new class needs specialized space. This happens independently of changes in student population, although student population growth magnifies scheduling issues.

  Growth in new areas of the curriculum is both in depth and breadth of classes. Not only are additional sections of existing classes added, the range of courses is growing.
  - Courses such as Computer Science, Fine and Performing Arts, and Wellness require specialized spaces.
  - There is no permanent broadcasting studio for student use. This restricts course offerings in the Journalism program.
  - Additional space is needed to initiate Alternative Education Programming, which is directed at students who struggle in a traditional course setting. These students generally do not have disciplinary issues and are not necessarily SPED students.
  - Additional space would be needed to initiate new programs requiring specialized space. An example: Early Education programs which provide students with courses in Child Care, pre-school education and Life Skills.

Summary of Overcrowding Issues

There is an *immediate* need for nine (9) new general-purpose classrooms and one (1) additional science laboratory for the present student population and current scope of the core course offerings. (The "temporary" classrooms, installed for the 2015-2016 school year, are calculated as part of the current classrooms.) This does not address growth in core course class offerings.

Section 2 - Science classrooms

- Science classrooms are small (40% smaller than current school building standards), with lab work space that is awkward and configurations that severely limit the curriculum and experiments that can be conducted in these rooms. The small class space limits the type of work that teachers can plan for students, barely providing enough space for students to be arranged in rows (the tight space impairs the ability of Science teachers to create collaborative activities). There are significant problems with venting and the configuration of safety equipment. **(CRITICAL)**

Section 3 - Current Curriculum

- **Special education and regular education support programs** – Learning Center classes occur in two different rooms, and can become particularly crowded, limiting the ability of special education teachers to provide individualized support in a quiet and structured setting. **(CRITICAL)**

Section 4 – Wellness (Physical Education/Athletics)

- **Wellness Classes –** Students in their Junior and Senior years are offered a variety of wellness classes (e.g., RAD, Total Body Workout, Crossfit, Strength and Conditioning), but limited specialized physical education space (e.g., no fitness room or separate weight room) means that on rainy days or in the winter, there may be four Wellness classes scheduled in the same gym, and some classes move into the hallways in order to have sufficient room to conduct the class. **(CRITICAL)**

Athletic Training Room

- Too small, no room for dividers. Used by male and female athletes. **(CRITICAL)**
- Only two training tables. Need a training taping station due to the number of athletes that are taped each day. **(CRITICAL)**

Other Indoor Athletic Space Concerns

- Boys' and girl's locker rooms poorly ventilated. **(CRITICAL)**
- Occasional sewer backups into athletic storage area in basement. **(CRITICAL)**
- Occasional sewer backups into athletic storage area in basement. **(CRITICAL)**
- Room with sewer cleanout pipe filled with athletic equipment, making it difficult to deal with sewer blockages quickly. **(CRITICAL)**
- Weight-lifting cage
  - (in upper gym) too small. Students move weights out of cage to create more effective circuit. Wood flooring unsuitable for weights. **(CRITICAL)**
  - No sound barrier/absorber to block sound of clashing metal, affecting ability to have effective gym class in upper gym when weight training class in session. Noise from weight-lifting cage makes coaching basketball and other sports difficult during school time and at team practices after school. **(CRITICAL)**

Section 5 - Student Support

Guidance

- No conference room in Guidance Office. **(CRITICAL)**
- Parents cannot enter guidance area without visibility to all students in waiting room. Parents should be able to meet guidance department staff without student(s) knowing they are there. **(CRITICAL)**
- Record-keeping vault is too small for file-keeping as mandated by law. Footprint of fireproof file cabinet is two feet by four feet. File cabinet not secure. **(CRITICAL)**
- Waiting area for students next to office secretary. Students hear office secretary greet callers (including parents) over the phone and hear secretary answer questions posed by callers. **(CRITICAL)**
- General lack of privacy for discussions with students, parents, outside counselors, and other situations. **(CRITCAL)**

Section 6 - Administration

- **Conference Room**,
  - Only one Conference Room in the school, which seats ten (10) people, maximum. Too small for central office staff meetings or STAT (Student Teacher Assistance Team) meetings of 15 people. There is a projector and a projection screen in the room. **(CRITICAL)**
  - Next to the Principal's office leading to issues with privacy. **(CRITICAL)**
  - Frequently used for counseling, MCAS testing, special education testing, etc., which means students sitting next door to a private meeting between an administrator and parents (which is in Principal's office). **(CRITICAL)**
- **Teacher collaboration space**: No ad hoc collaboration space available for teachers. **(CRITICAL)**
- **Student "cooling off" space** currently whatever vacant room available in Special Education space. Better to have "cooling off" room located with central office administrators. **(CRITICAL)**

Food Service

- Need seating area for food allergies isolated from general lunch area. **(CRITICAL)**
- Fire alarm and emergency voice announcements cannot be understood in the cafeteria due to acoustics and sound levels. **(CRITICAL)**

Section 7 - Mechanical Systems

- Home team **boys and girls locker rooms** (in the basement) are - by far - the biggest air quality problem in NRHS. The air distribution units pull in "fresh air" from inside the **Upper Gym** and distributes it to the locker rooms. Using air a second time leads to stale and unhealthy conditions within the locker rooms during the busy athletic seasons. **(CRITICAL)**
- **Waste Treatment -** Sometimes the septic system backs up into the home team locker rooms. **(CRITICAL)**

- **Security Cameras -** Not all exterior doors have security cameras. Interior security cameras only in common areas (hallways and stairways), but not all common areas. **(CRITICAL)**

Appendix A - Space Issues Categorized as "Important"

Important - Areas where benefits to most students are large and easy to understand

Section 2 - Science classes

- The equipment in the science labs varies from room to room, restricting the range of laboratory experiments to specific rooms. This limits course offerings. **(IMPORTANT)**
- Only one lab contains a chemical fume hood. Experimental offerings could be increased if all labs had a fume hood. **(IMPORTANT)**
- All labs but one have window exhaust fans, installed after building construction, that leak cold air in the winter. **(IMPORTANT)**
- Central heating is uneven in the science labs. Teachers sometimes send students to get their coats for class, resulting in loss of teaching time and far from optimum class environment for learning. **(IMPORTANT)**

Section 3 - Current Curriculum

- **Art classes** – NRHS has three small art spaces, and size/quality of space negatively impacts the art classes. The art studio is a converted interior classroom with no natural light or storage space. The ceramics room has minimal storage space and is not directly connected to the kiln and storage room. Printmaking and silk-screening is in a tight space and with minimal storage capacity. All three rooms are small and can only hold minimal equipment. Each art room needs to be specialized, which constrains room availability and usage (for example, we can only run a finite number of ceramics classes because of the space available). The space and quality of all three rooms is not conducive to artistic creativity and collaboration.
  - Art classrooms not ventilated, preventing use of oil paints and other volatile substances. **(IMPORTANT)**
  - Art classrooms too small for all students to use easels. **(IMPORTANT)**

Section 4 – Wellness (Physical Education/Athletics)

- Wellness Classes - In addition, the Health and Wellness classes switch between three different academic classrooms because there are not enough available rooms to have one consistent Health and Wellness space. **(IMPORTANT)**

Athletic Training Room

- Physical therapy and rehabilitation done in hallway outside of lower gym and custodial area due to lack of open space in training room. **(IMPORTANT)**
- Plymetric physical therapy done in hallway. **(IMPORTANT)**

Other Indoor Athletic Space Concerns

- Indoor Track team practices running, starts (using starting blocks) and hurdles in hallways. **(IMPORTANT)**
- Indoor track uses the auditorium foyer for circuit training (sit-ups, push ups, lunges with weights, wall sits, wall balls, etc.) and the weight cage for lifting. **(IMPORTANT)**

- Cross-country and alpine ski teams practice in the cafeteria (including running in the hallways and set up their circuit training in the cafeteria). **(IMPORTANT)**
- Due to lack of space, teams rotate on a schedule to have practice between 2:30 PM and 9:00 PM each day in the winter. **(IMPORTANT)**
- Cheerleading teams and wrestling teams must practice in the lower gym as that is where both teams store their mats. **(IMPORTANT)**
- Cheerleading team, Cross-country Ski team, Downhill Ski team all practice in wrestling practice room due to presence of large, heavy floor mats. **(IMPORTANT)**
- Visitors Locker Room
  - Looks like a dump. Interior includes two bathroom stalls, urinal, one shower stall, two benches, and three storage lockers (which are not enough space for all of the equipment). **(IMPORTANT)**
  - Used as main locker room for baseball (in the spring), ice hockey (in the winter), and golf (club storage) and soccer (in the fall). **(IMPORTANT)**
  - Each Nashoba team using the Visitors Locker Room must remove all their equipment when visiting teams (football, boys basketball, girls basketball) come to Nashoba because this is the locker room for those opposing teams to use. **(IMPORTANT)**

Section 5 - Student Support

Guidance

- No office for use by providers of special counseling services hired by NRSD to deal with special student issues. **(IMPORTANT)**

Section 6 - Administration

- **School Resource Officer** (police on site) has no office. **(IMPORTANT)**

Food Service

- Limited cafeteria seating drives four lunch periods of twenty-two minutes each. Short lunch period creates stress for students, instead of providing break from school stress. More cafeteria seating would allow three lunch periods of longer duration. (**IMPORTANT)**

Section 7 - Mechanical Systems

- Throughout the school, there is an air gap between the outer skin of the building and the exterior walls of the classrooms. This air gap is not a sealed space and thus provides no insulation. Thus, the exterior walls of the classroom quickly transfer the outside temperature to the inside of the classroom and the wall heaters cannot keep up with the heating demands on very low temperature days. Furthermore, on sub-zero temperature evenings the boilers have to run in "building occupied" mode in order to keep the building warm enough to prevent pipe freezing (added utility costs and wear on the systems). In the **Science labs**, fixed benches are set against the exterior walls. Students feel this cold air coming off the walls, which affects their comfort in the room. Compounding this problem, there is lots of leakage in the ductwork of the science wing. Each year, part of the annual maintenance budget for NRHS addresses this ductwork. **(IMPORTANT)**
- **Roof Leaks**

- Above Guidance Offices is a major leak that is being worked on, but due to the design of the addition it is difficult to track the leak between the two ceilings. Currently this leak is quiet. **(IMPORTANT)**
- Roof over the cafeteria, kitchen and machine shop degraded severely. Most HVAC equipment on this roof. In order to replace this roof the HVAC units will need to be disconnected and the roof installed. This should be coordinated with the replacement of HVAC units. The present protocol is to patch this area when there is an active leak. **(IMPORTANT)**

Appendix A - Space Issues Categorized as "Recommended"

Recommended - Areas where benefits are not spread across all students

Section 2 - Science classes

- Fixed layout of lab tables and location of cabinetry impede collaboration among students. **(RECOMMENDED)**

Section 3 - Current Curriculum

- **Art classes** – NRHS has three small art spaces, and size/quality of space negatively impacts the art classes. The art studio is a converted interior classroom with no natural light or storage space. The ceramics room has minimal storage space and is not directly connected to the kiln and storage room. Printmaking and silk-screening is in a tight space and with minimal storage capacity. All three rooms are small and can only hold minimal equipment. Each art room needs to be specialized, which constrains room availability and usage (for example, we can only run a finite number of ceramics classes because of the space available). The space and quality of all three rooms is not conducive to artistic creativity and collaboration.
  - Some art classrooms lack enough sinks or any sinks at all. **(RECOMMENDED)**
- **Performing arts classes** – NRHS has a growing theater arts program, but all classes have to be scheduled in the auditorium, which receives heavy usage by other groups.
  - During Concert seasons and Fall Play/Spring Musical seasons, the use of the stage negatively impacts theater arts classes that also need stage space. **(RECOMMENDED)**
  - Theater Arts classes share auditorium space with Drama Club and RAD (Rape, Aggression, Defense) classes. Inappropriate to schedule theater arts classes at same time as RAD. Both classes oversubscribed and require specialized space. **(RECOMMENDED)**
  - Insufficient instructional space designed for the depth and breadth of Music offerings. **(RECOMMENDED)**
  - Band room limited to fifty-student capacity by fire code regulations, which limits course enrollment. For musical ensembles, such as Concert Band, only one section of the class is scheduled each semester. Thus, the room size limits the number of students who can take the course. **(RECOMMENDED)**
- **Computer science and journalism classes** – In the past few years, computer science and journalism offerings have been added, but the limited appropriate computer lab space means that computer science and journalism classes in many cases have had to be scheduled in general-use labs, which means that other teachers in the building are constrained in their ability to access computer labs for classwork. **(RECOMMENDED)**
- **Transitions program** - sited in the former faculty room because of space constraints (and is far from an ideal space). **(RECOMMENDED)**
- **Academic Support Center** is in the back of our Media Center, and the small size of the ASC limits the number of students who can access it. **(RECOMMENDED)**

- **English Language Learners program** – The ELL space is in a converted office in the Media Center, but has to be used as small-group instruction space. It is necessary to hang curtains in this space to maintain privacy. **(RECOMMENDED)**

Section 4 – Wellness (Physical Education/Athletics)

Athletic Training Room

- Should be closer to athletic facilities. **(RECOMMENDED)**

Other Indoor Athletic Space Concerns

- Girls' locker room has insufficient number of lockers. **(RECOMMENDED)**
- Insufficient storage areas for sports equipment. Loading/Shipping dock used for storage of large items. **(RECOMMENDED)**

Section 5 - Student Support

Guidance

- No room(s) for college interviewers to use for meetings with student applicants. **(RECOMMENDED)**

Section 6 - Administration

- No office for possible future **Dean of Students (RECOMMENDED)**
- **Principal's and Assistant Principal's offices**: Used as meeting space or student support space by the general population. This leads to concerns with privacy and program integrity, especially for students who need a secluded space to work. **(RECOMMENDED)**

Speech/Language Pathologist

This office – which also is used for one-on-one meeting space with students – is in a converted closet formerly used to house computer servers. **(RECOMMENDED)**

Appendix A - Space Issues Categorized as "Desirable"

Desirable - Should be addressed but are not directly affecting student performance

Section 3 - Current Curriculum

- **Art classes** – NRHS has three small art spaces, and size/quality of space negatively impacts the art classes. The art studio is a converted interior classroom with no natural light or storage space. The ceramics room has minimal storage space and is not directly connected to the kiln and storage room. Printmaking and silk-screening is in a tight space and with minimal storage capacity. All three rooms are small and can only hold minimal equipment. Each art room needs to be specialized, which constrains room availability and usage (for example, we can only run a finite number of ceramics classes because of the space available). The space and quality of all three rooms is not conducive to artistic creativity and collaboration.
  - Only one supply closet for three classrooms. **(DESIRABLE)**
  - Inadequate space to display student work. **(DESIRABLE)**

Section 4 – Wellness (Physical Education/Athletics)

Athletic Training Room

- Small ice machine and water distribution resource. Home and visiting sports teams lined up into hallway to get water and ice before athletic events. **(DESIRABLE)**

Other Indoor Athletic Space Concerns

- Male referees use the coaches' office in boys' locker room to dress and prepare for games. **(DESIRABLE)**
- Female referees use the Physical Education teacher's office because there is no coaches' room in the girls' locker room. **(DESIRABLE)**
- Female athletes do not use weight cage outside of Wellness classes, probably due to crowded conditions. **(DESIRABLE)**

Section 5 - Student Support

Guidance

- Career counselor is separated from guidance department by hallway. **(DESIRABLE)**
- No carrels with internet connections for use by student to research colleges and other post-high-school opportunities. **(DESIRABLE)**

Section 6 - Administration

- U.P.S. deliveries are made to the front office. No place to store teachers' materials until teacher can pick them up. **(DESIRABLE)**
- Storage room doubles as "kitchen space" in main office: sufficient for a coffee maker, sink, and microwave. Bathroom is attached. **(DESIRABLE)**
- Stationary Closet – shares duty as location for some computer servers **(DESIRABLE)**

Athletic Administrator's Office

- The Athletic Administrator's office is used for storage of sports uniforms and some sports equipment due to lack of other suitable storage space. **(DESIRABLE)**
- Office too small for meetings: three people can meet in the office if one of them stands. **(DESIRABLE)**
- Unable to conduct interviews for coaching positions because the office is not able to accommodate enough people. **(DESIRABLE)**
- No waiting area for students/coaches/parents to walk into before meeting with the athletic director. Lack of privacy. Numerous interruptions while in meetings in the office as you open the door and walk right into the office (where a meeting could be taking place). **(DESIRABLE)**

School Psychologist

Located in a small office space in the Media Center that adjoins a computer lab. There is a gap in the walls between the two spaces that was filled in with foam so that the Psychologist could conduct testing and have private conversations with parents in office. (Frequently uses the Principal's office for testing or meetings). School Psychologist hangs curtains in the windows (which look out on the Media Center) to maintain privacy. **(DESIRABLE)**

Section 7 - Mechanical Systems

- Air handler for **school kitchen** pulls in outside air. It is tied into heating system but could not keep up with super-cold weather this past winter (2014-2015). Exhaust fans pull out warmed kitchen air and must be on when the kitchen is active. **(DESIRABLE)**
- One HVAC unit serves the **Drafting (computer) lab (room 403B), Administration offices and Guidance offices.** The Drafting lab should have its own HVAC unit due to the heat produced from the desktop computers. **(DESIRABLE)**
- **Room 224** (computer lab) also overheats due to heat from the desktop computers used in that room. **(DESIRABLE)**
- A single HVAC unit serves the **Media Center and the classrooms below it**. However, there are different heating and cooling needs on each level. Windows in the Media Center result in a lot of solar heat gain, which is not the case in the classrooms below. Temperature on the Media Center windows sometimes reaches 140ºF. Added heat from the student use of computers in the Media Center and the school computer servers located there makes this problem worse. **(DESIRABLE)**
- All three **Art** rooms are served by the same HVAC unit. **(DESIRABLE)**

Appendix A - Space Issues Categorized as "Defer"

Defer - Should be addressed if the successor group to this Task Force can do so economically

Section 3 - Current Curriculum

- **Art classes** – NRHS has three small art spaces, and size/quality of space negatively impacts the art classes. The art studio is a converted interior classroom with no natural light or storage space. The ceramics room has minimal storage space and is not directly connected to the kiln and storage room. Printmaking and silk-screening is in a tight space and with minimal storage capacity. All three rooms are small and can only hold minimal equipment. Each art room needs to be specialized, which constrains room availability and usage (for example, we can only run a finite number of ceramics classes because of the space available). The space and quality of all three rooms is not conducive to artistic creativity and collaboration.
  - Only one ceramic kiln available for seven ceramics classes, resulting in delays in students' ability to complete assignments. **(DEFER)**
  - One art classroom has only artificial light. **(DEFER)**
- **Performing arts classes** – NRHS has a growing theater arts program, but all classes have to be scheduled in the auditorium, which receives heavy usage by other groups.
  - No direct route to auditorium from main entrance or academic classrooms. **(DEFER)**
  - Auditorium not set up to provide direct feed of televised events. **(DEFER)**
  - Auditorium common storage space used by Theater Arts classes, Drama Club, Spring Musical, and RAD classes. **(DEFER)**
- **Emergency Medical Technician (EMT) Program** Storage of EMT equipment and training material is in a roof-access/mechanical space (rooms 403A, 403B). **(DEFER)**

Section 4 – Wellness (Physical Education/Athletics)

- Ice machine is old and gives off lots of heat, making the training room too warm throughout the year. **(DEFER)**
- Need clothes washer and dryer for athletics (towels, cloths, ace bandages, uniforms, etc.) **(DEFER)**

Section 6 - Administration

Athletic Administrator's Office

- Needs an area to plug-in and charge scoreboards (either in this office or another area). Outdoor wireless scoreboards need to be charged each day to be ready for games. Currently, this takes place all over the office. **(DEFER)**
- Trophies and plaques stacked in office due to lack of display space. Need more trophy display cases and someplace to put them. **(DEFER)**

Section 7 - Mechanical Systems

- **Kitchen Appliances -** Food preparation equipment is original to building. Grease trap is undersized for this school population. Cooler in kitchen is 40 years old. **(DEFER)**
- **General Status of Fans, Compressor, and Pumps -** Lifetimes of NRHS mechanical devices are approaching "end of life". This is mostly fans, compressors, and pumps of various sizes throughout the school. Normal lifetime is 10-12 years. Last major upgrade of these devices was the 2000-2002 renovation. Replacement of these system components included in the long-term maintenance and capital projects plans presented to NRHS Space Needs Task Force. **(DEFER)**
- **Roof Leaks**
  - Above Science Labs a thermal scan resulted in an "OK" status for that roof, but it is more than 35 years old. **(DEFER)**
- **Storage** – There is a lot of money in the form of equipment for school classes and activities that is stored in hallways, under stairs, in stairwells, or the loading/shipping docks. In part, this is because large storage areas have been converted specialized teaching spaces. Any remedy to current space problems should consider storage needs for the curriculum and activities and provide economical solutions. **(DEFER)**
- **Underutilized Space** – There is much more square footage in the Boys' Locker Room and the Girls' Locker Room than is currently used. This space should be reallocated to meet other needs. **(DEFER)**
- **Media Room (Library)** – This area has been carved up for many different purposes. Not all these spaces are properly configured. The area should be rationalized and remodeled to suit its purposes. **(DEFER)**

APPENDIX B –NRHS Classroom Utilization and Class Sizes 2015-16

Overcrowding not only causes the symptoms explained earlier in this report, it makes curriculum development difficult and limits student growth due to limited curriculum. This section, Appendix B, provides a full explanation of this condition and its effects.

For the 2015-16 school year, the total enrollment (as of 10/13/15) is 1067 students. These students are educated in 33 general education classrooms, four multi-use computer labs, 10 science classrooms, a variety of specialized classrooms (band room, chorus room, theater, three arts classrooms, and a foods classroom), and a variety of special education and alternative education classrooms.

"Classroom utilization" is a metric used to describe classroom use in a building; for example, 100% classroom utilization means that every room is being used every period during the school day.

Schools want a reasonably high classroom utilization number, which indicates that resources are being used efficiently. However a room utilization rate that runs too high means that some courses are scheduled at times which do not match with student requests.

It can be thought of as an advanced game of musical chairs, in which the chairs have different colors and the players can only sit in a chair of a specific color. If you have more than enough chairs of each color, when the music stops everyone gets a seat; but if you have too few chairs, and the colors of the chairs don't match the colors of the players, and players are left standing.

Limited classroom availability creates a scheduling domino effect that constrains when classes can be scheduled and therefore whether or not students can get the classes they want or need. And, as the utilization rate rises incrementally above 90%, the negative ramifications for scheduling increase exponentially.

The MSBA (Massachusetts School Building Authority) recommends that high schools maintain an 85% utilization rate. This strikes a balance between having enough space for flexibility in scheduling and making efficient use of resources. The current utilization of general education classrooms at Nashoba is 93.5%. This means that, across all 33 general classrooms and 10 science classrooms for seven daily periods, classrooms are occupied 93.5% of the time.

In order to bring this utilization rate down to the 85% recommended by the MSBA, Nashoba would need 4 additional general education classrooms (three additional classrooms would produce an 85.7% utilization rate, and four additional classrooms produce an 83.3% utilization rate), and one additional science classroom.

Separately from the general-use classrooms and the science labs, the four multi-use computer labs are currently at an 85.7% utilization rate, and the specialized classrooms are currently below an 85% utilization rate.

One possible approach to managing the lack of classroom space would be to have larger class sizes, thus decreasing the number of classrooms required. This could, however, have significant negative impacts on quality of instruction. To provide some context for any discussions about class sizes, the following table lists class size averages in our core academic departments for the 2015-16 school year.

Class size averages for the 2015-16 NRHS school year

	Avg. class size	% fewer than 18	% 22 or more	% 26 or more
English	19.1	39.7%	32.4%	7.4%
SS	19.4	35.2%	32.4%	11.3%
Math	21.4	27.8%	51.9%	24.1%
Science	20.0	29.3%	56.9%	0.0%
FLD	18.2	43.6%	23.1%	7.7%

Electives classes are more likely to take place in specialized spaces that could not double as core academic spaces. For example, teaching a math class in the band room or an art room would be highly problematic and have a significant impact on quality of instruction. For this reason, lower utilization rates in some of our electives spaces do not serve to counteract the high utilization rate in our general academic classrooms.

Class sizes in electives classes range depending on the class and special circumstances. For example, Ceramics classes are capped at 18 and Metalworking is capped at 16 because of access to equipment, whereas the concert band class has 50 students. Wellness classes can range from 30+ students in a section (currently there are five wellness sections with 30 or more students) to as small as 8 students in a section (Total Body Workout); these ranges are based in part on student choice and in part on a class assignment process designed to maximize student enrollment in preferred classes. Smaller class sizes are allowed in a few instances (i.e., fewer than 10) to accommodate student needs or to support newer classes and programs. For example, enrollment in theater arts classes may go below 10 students because it is a newer program. However, there are not classes of fewer than 10 students if running the class could lead to higher class sizes in other areas.

In addition to the number of students in academic classes, there are students who are "unassigned" in a given period. Students are required to take at least 25 credits of coursework in a given year, which allows up to 11% of a student's schedule to be unassigned. Unassigned students report to study hall in one of three different spaces: freshmen report to a Study Skills room, and upperclassmen report to either the Media Center or the auditorium foyer, which are supervised by licensed staff members. Nashoba averages 22 unassigned freshmen each period and 78

unassigned upperclassmen each period, with ranges in a given period from as low as 55 total unassigned students (freshmen and upperclassmen) to as high as 144 unassigned students.

Conclusion

In the Executive Summary we state: **There is an immediate need for nine (9) new general-purpose classrooms and one (1) additional science laboratory for the present student population and current scope of the core course offerings. (The "temporary" classrooms, installed for the 2015-2016 school year, are calculated as part of the current classrooms.)**

Driving the calculation for nine new classrooms are (1) the excess student population and (2) the very high classroom utilization. The excess student population of 100 students requires five general-purpose classrooms (at 20 students each). To bring classroom utilization down to the state-recommended 85% requires four additional classrooms. Therefore, the total number of general-purpose classrooms needed is nine.

Appendix C – Curriculum and Programming Goals

High School Space Impact on Current and Future Innovative Programming (2015-16)

Current Innovative Programming[1]	Impact of Space Constraints	Future Programming Plans	Future Space Needs
Humanities—The high school has worked to expand interdisciplinary offerings within Humanities and across Humanities and other disciplines, such as Science. The Freshman World Humanities course, Epidemiology course, and Maritime Science Course are examples. The Journalism program has expanded in the last three years from one class of Journalism 1 to four sections of Journalism, including an introductory and advance course, and the focus of the course has expanded from a study of journalism to the production of web-based weekly broadcasts.	Current interdisciplinary classes that pair Humanities with Science are run in generic Science classrooms, which can prevent other Science classes from running concurrently. The Journalism broadcasts are filmed in a small office space that lacks the appropriate equipment and set-up for expansion.	Within the Humanities, the high school would like to continue to explore interdisciplinary opportunities. The high school would also like to expand the Journalism program, creating connections with the larger community and developing students' technical skills with print, video, and web-based broadcasting.	In order to continue to expand interdisciplinary offerings, especially offerings that include Science, the high school needs additional general use classrooms and at least one additional Science classroom. In order to develop a full, comprehensive Journalism program, the high school needs a broadcasting studio and sufficient space.

[1] For the purposes of this document, "current innovative programming" is defined as new courses or programs that have been introduced within the last five years.

Appendix C – Curriculum and Programming Goals

High School Space Impact on Current and Future Innovative Programming (2015-16)

Current Innovative Programming[1]	Impact of Space Constraints	Future Programming Plans	Future Space Needs
Fine and Performing Arts—The high school has added multiple courses in the visual arts, such as Printmaking and Silkscreening and Digital Photography. The high school has built a Theater Arts program that includes acting and technical courses, along with Theater Dance and Movement. In Wellness the high school has added electives for upperclassmen such as Crossfit, and expanded the RAD (Rape Aggression Defense) program. In Music, the high school has added new courses such as World Percussion, increased enrollment in Band classes, and expanded Music Technology and Music Theory offerings.	The tight space and poor quality of the art rooms are not conducive to artistic creativity and collaboration. Limited computer lab space already constrains technology-based courses, such as Digital Photography and Music Technology. Theater Arts classes are currently run in the auditorium, which is also used by other classes and by outside groups during the day. The high school does not have a dance space to accommodate the Theater Dance and Movement course, which takes place in the auditorium. RAD classes also take place in the auditorium because there is no other space available, which creates conflicts with Theater Arts classes. The Band room and music practice rooms are small and make it challenging to increase enrollment and accommodate student practice needs, and limited instrument storage will constrain the ability to expand Band programs (such as marching band).	There are plans to add an advanced Digital Photography course and to continue to expand Theater Arts offerings. In Wellness, the high school would like to build a true dance program, and to offer specialized courses, such as RAD, to larger groups of students. In Music, the plan is to add a marching band and continue to increase the variety of band and music courses offered.	To appropriately support existing fine arts offerings, the high school needs art spaces that are sufficiently large and that provide appropriate lighting and work space. In order to expand digital art opportunities, the high school needs additional space that can accommodate sophisticated software programs (generally desktop-based computer labs). There is need for expanded space to accommodate the range of planned Wellness classes, along with a dance-appropriate space. In order to accommodate curricular expansion in band and music, the high school needs larger classroom, practice, and storage spaces.

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Appendix C – Curriculum and Programming Goals

High School Space Impact on Current and Future Innovative Programming (2015-16)

Current Innovative Programming[1]	Impact of Space Constraints	Future Programming Plans	Future Space Needs
STEM—The high school has added new Science courses, both interdisciplinary (as mentioned under Humanities) and Science-specific, such as Forensics. The high school has also developed multiple Computer Science courses.	Specialized Science courses are run in generic Science classrooms, which can prevent other Science classes from running concurrently. The high school has limited computer labs and programming-friendly classrooms available to keep up with the demand for technology-based courses.	The high school plans to continue to offer new specialized Science courses, such as Bioethics. Within Computer Science, the high school is planning to offer an Advanced Placement course and to expand the availability of introductory courses.	The high school needs additional Science lab space to accommodate expanded offerings, and additional computer lab (or programming-friendly) spaces to support the growing Computer Science program.
Business, Technology, and Applied Arts—The high school has expanded Business program offerings, to include new courses such as Marketing and Community Partnerships, and the DECA after-school program has grown exponentially. Within Technology, the high school has added a host of new courses to reflect current trends and interests: Video Game Design, Introduction to Digital Creativity with Adobe, 3D Computer Modeling and Animation, and Robotics.	Student enrollment requests for Business classes have increased dramatically over the last three years, and the high school has added personnel; but because of space limitations, it is challenging to find appropriate classroom spaces for those courses to meet. The limited number of computer labs constrains the high school's ability to offer technology-based courses at the most convenient times.	In the Business program, the high school plans to continue to expand course offerings to meet with the growing demand among students. The high school plans to continue to expand course offerings in Technology as well, adding advanced versions of introductory courses (e.g., Advanced Video Game Design) and adding new courses as technologies develop.	The high school needs additional general use classrooms to accommodate increased course requests in Business. In order to accommodate existing demand for computer-based courses and to support expanded curricular offerings in Technology, the high school needs additional computer lab space that allows for the use of sophisticated software.

[1] For the purposes of this document, "current innovative programming" is defined as new courses or programs that have been introduced within the last five years.

Appendix C – Curriculum and Programming Goals

High School Space Impact on Current and Future Innovative Programming (2015-16)

Current Innovative Programming[1]	Impact of Space Constraints	Future Programming Plans	Future Space Needs
Alternative Education and Curriculum Support— The high school has a small but important population of students who struggle in a traditional high school setting, and the high school is developing alternative education offerings to meet this population's needs. The high school has also introduced a Math curriculum support course to help students who have deficits in their Math skills. The Media Center has become an area where students can collaborate with access to various technologies, and where teachers can bring their classes to access technology and flexible learning spaces.	Alternative education programs require dedicated space; this year the high school is using a general education classroom, which limits overall classroom availability. Curriculum support courses necessarily require small enrollment to allow for individualized attention, but the high school's current high room utilization rate (93+%) makes it challenging to find space to accommodate courses of this nature. Because the high school averages 100 students unassigned each period, the Media Center is used as an alternative study hall space for students, which negatively impacts the opportunities for students to use the space effectively to collaborate and for teachers to use the space for flexible learning activities.	The high school plans to expand alternative education opportunities to an increasing population of students, developing a full program. In addition, the high school plans to expand curriculum support courses in additional subject areas besides Math, such as a writing support course. The Media Center is attempting to create a "learning commons" environment, in which students and staff can access flexible spaces to conduct small –group work, conduct individual study projects, and explore multi-media content.	The high school needs additional general classroom space to accommodate expanded curriculum support courses. In order to provide a high-quality alternative education program, the high school needs sufficient and appropriate space, which would include access to vocational resources (food preparation, building tools, etc.). Curriculum support courses necessarily require small enrollment to allow for individualized attention, but the current high room utilization rate (93+%) makes it challenging to impossible to find space to accommodate additional courses of this nature. The high school needs a larger and more appropriately configured Media Center to support a "learning commons" vision.

[1] For the purposes of this document, "current innovative programming" is defined as new courses or programs that have been introduced within the last five years.