



Arlington High School

Analysis of Programmatic Needs

Arlington, Massachusetts

February, 2014

HMFH Architects, Inc.

130 Bishop Allen Drive

Cambridge, MA 02139

t 617 432 2200

f 617 876 9775

www.hmfh.com



Table of Contents – Analysis of Programmatic Needs

1 Introduction

2 Arlington High School Use and Condition

3 Educational Program and Space Needs

Size and Configuration of School
Quantity and Quality of Educational Spaces
Technology and Other Necessary Features
Adjacencies and Size
Program Space Needs

4 Security and Safety

5 The Future

6 Third Party Validation of Needs

7 SOI and Funding

8 Conclusion

Appendix

- A. Circulation Diagram
- B. Non-HS Space Use Diagram
- C. HS Program Space Use Diagram
- D. Safety/ Security Issues Diagram

1- Introduction

Arlington High School is a large complex (nearly 400,000 square feet) centrally located in the community. Its main façade fronts onto Massachusetts Avenue, set back from the road by a green space with mature trees. At the rear of the complex are several athletic fields (baseball, softball, football, and track and field). The school building has expanded several times since the original 1914 six-story school house. And in the 100 years of its existence general and special education, technology, sustainability, building codes, and accessibility requirements, have all greatly changed and evolved. All of these have an impact on the ability of a facility to function as it is intended and as it needs to, to serve its occupants into the future.

The Town of Arlington has begun to identify the physical plant upgrade requirements through a capital assessment report developed by On-site Insight. This report has identified maintenance upgrades to be made over a 20-year period. The scope identified includes replacement of exterior windows and doors, interior and exterior lighting, and mechanical systems. The scope includes two new elevators and restoration of the clock steeple. The estimated costs for the work identified, in today's dollars, is \$32.4 million. The report notes that it does not include costs for upgrades associated with building code issues or structural changes, nor does it include significant hazardous material abatement. Over a twenty-year period the report identifies flooring upgrades, roof replacement, and locker replacement. The report identifies a through-slab water infiltration problem, but only includes costs to study the problem.

It is clear that due to its age, the complex requires significant upgrades to (or replacement of) all of the building systems and finishes. This is because either they are obsolete, not in working order, and a drain on energy and maintenance resources, or because they simply do not comply with current code standards for accessibility, plumbing fixture quantities, structural implications, or hazardous material abatement. A significant renovation of the facility would require meeting, wherever reasonable, all of the current code requirements. The On-site Insight capital assessment report assumes that the physical plant needs are solved incrementally over two decades. If the Town of Arlington chooses to upgrade the facility in this manner it will likely not trigger a full upgrade per the current code, but it will also not qualify for Massachusetts School Building Authority (MSBA)/ State assistance to help pay for the costs to renovate the high school. The MSBA has historically chosen to invest the State's funds responsibly, after thorough investigation of the facility's needs. The MSBA puts a strong emphasis on school buildings meeting the educational needs of the community. Replacements of the roof, lockers, and mechanical systems will improve the physical plant but will not improve the educational quality of the school.

The goals of this report are two-fold: first, is to establish the educational space conditions and needs of the aging facility; and second, is to inform the completion of the Statement of Interest (SOI) to be submitted to MSBA for consideration to participate in the State's funding assistance program. Through the use of diagrams, first-person stories, and the high school's most recent NEASC (New England Associate of Schools and Colleges) report, this report will show how the spaces and configuration of the existing school building are an impediment to effective teaching and learning. It is agreed by all that the systems and finishes are beyond their useful lives and require upgrades, but we will show that it is more than just these that need to be fixed. Ultimately, a feasibility study will be required to identify the building and educational needs, as well as the possible solutions to fulfill these needs so that Arlington High School can proudly serve its community for the coming decades.

2- Arlington High School Use and Condition

The high school is nearly 400,000 gross square feet, much larger than the MSBA guidelines would suggest it needs to be, but there are extenuating circumstances that make significant portions of the space unusable by the high school program. The complex comprises multiple buildings of different generations, added onto over the years to accommodate student enrollment and programmatic needs. The buildings include Fusco House (1914),

Collomb House (1937), and Downs House (1960s). Due in part to its size and mostly due to its configuration a higher-than typical portion of the space is taken up by circulation, both in corridors and stairwells. There are 5,740 linear feet of corridor circulation and 20 sets of stairs. See Appendix A for the circulation diagram. Not only does this add to the total size of the building, it is one of the main reasons why it is difficult both to supervise students in the building and it is difficult to create a sense of place and community for the students and faculty. The net-to-gross square foot factor is the total (gross) building square feet divided by the usable (net) program square feet. This ratio is an expression of how much of the building is programmatic rooms versus circulation, toilets, and other support spaces. The high school's net-to-gross is approximately 1.77; a typical ratio for new construction is 1.50. A lower ratio indicates a more efficient building layout.

In comparison to the MSBA guidelines, the high school has 33,900 square feet in use for physical education and athletics, the guidelines would plan for 23,900 square feet for this program only. It is possible to obtain financial assistance to renovate the existing spaces, but it would not be possible to reconstruct the same, large, amount of space that is currently at the high school.

There are other programs that occupy the high school beyond those that serve the high school directly. There are town offices, town's facilities and custodial offices, the town's pre-school program, the school district's administrative offices, and the LABBB Collaborative Program. There are areas of the building that are used as storage space for other services and there is an area that has been deemed off-limits to occupants and is used for storage. The building has many underground spaces and therefore there is no opportunity to provide natural light to these areas. All told the approximate square footage usage is as follows:

| | |
|--|-----------|
| Town Use | 6,800 SF |
| School/Town Facilities | 4,600 SF |
| Pre-School Program | 16,600 SF |
| School District Use (includes METCO Program) | 16,700 SF |
| LABBB Collaborative Program | 9,900 SF |
| Community/ School Storage | 10,300 SF |

For a diagram of these spaces, see Appendix B.

The Feasibility Study phase will need to assess these uses in conjunction with the high school and the town space needs in order to identify the best location for them. When the above programs and the extensive circulation square footage are combined, the net remaining area for the high school program is approximately 207,000 usable square feet.

The complex has just one, antiquated elevator and for a school building of this size, it does not provide adequate and equal accessibility, in that it is not convenient for the intended users and it does not provide access to all of the building's floor levels.

A thorough renovation-only of the facility would include (and in part has been identified in the On-site Insight report):

- Mechanical systems replacement
- *Electrical system upgrades including an increase to the quantity of power outlets (need to eliminate the extensive use of extension cords)
- Light fixture replacement
- *Plumbing upgrades and/or replacement, including fully modernized and accessible toilet facilities, and an increase in quantity of locations and fixtures
- *Solve the water infiltration issue
- *Security upgrades
- *Technology upgrades and integration, including wireless service
- *Audio/visual systems upgrades, including new PA system, simulcast ability, telephones throughout the school, sound systems at Auditorium and Gymnasium, and Auditorium/Stage lighting

- Hazardous material abatement
- Roof replacement
- Exterior door replacement and *tie-in to the security alarm system
- Exterior window replacement
- Finishes replacement including:
 - flooring (abate and remove remaining vinyl asbestos tile (VAT), replace all with new)
 - *ceiling treatment (provide with high acoustic and reflectance quality)
 - *wall surfaces (provide durable protection, paint all)
 - fixed casework (*include upgrades to plumbing as appropriate)
 - *teaching surfaces (white-boards and tack-boards)
 - *auditorium seating (replace and provide accessibility)
 - corridor lockers and athletic lockers
 - *athletic locker room upgrades
- *Accessibility upgrades throughout
- Three new elevators

*Note: these are not included in the scope (or they are minimally included) outlined in the On-site Insight report.

This long list is indicative of the age and condition of the facility and not all items are included in the On-site Insight report. Many school systems throughout the Commonwealth have buildings in just such need, but in the case of Arlington High School, where the facility has historic value, community presence, and serves many essential needs, it is imperative that every effort be made not only to “fix” the building but to bring it to a state where it can meet the community’s and the educational needs for the next 50 years. Arlington has the unique opportunity at this time to thoroughly assess the high school’s needs and to put every resource possible into creating a place for 21st century learning from the 20th century school-house.

3- Educational Program and Space Needs

Size and Configuration of School

The high school has been identified as “confusing” by students, faculty, and visitor alike. Even for those that have cause to enter the school on a regular basis, directions are required. The size of the school is generous and therefore has provided opportunities over the years to be useful to meet town space needs, but its size is one of the factors that cause it to be confusing. Furthering the sense of confusion is the configuration; due to the many additions over the years, there are several continuous loop corridors on multiple levels and some portions of the school are one, four, and five levels high. Additionally, there are two floor levels that are half underground, located along the full length of the Massachusetts Avenue façade; this lack of day-light adds to the disorientation.

Should a student have to get from their World Language class on the fifth floor of Fusco over to their Math class at the far end of the Downs Building, they need to all but run (and likely actually run) to reach their next class on time. The length of travel is extensive and at times excessive. Many students pass through the central library space as a cut-through path, which is quite disruptive for those working in the library. It is a given that large buildings will generate longer lengths of travel, but due to the current configuration, there is very little opportunity to restructure the program space layout to create a more condensed circulation path for the student’s school day. For a diagram of the school’s circulation layout, see Appendix A.

The school programs are currently arranged departmentally and, due to the overall size of the facility, some of the programs are at a great distance from one another, creating silos and inhibiting communication and collaboration between the educators. For a diagram of the program layout, see Appendix C. Teaching and learning have changed significantly in the past two decades, let alone the last ten decades, collaboration is essential today. Teachers need to be able to meet to discuss interdisciplinary teaching plans and the students in their charge.

Due to its size and its configuration, great efforts have been made to create a sense of place in Arlington High School, a sense of community. The building does not lend itself to supporting these efforts. The building is confusing at best and does not engender a whole school spirit.

Quantity and Quality of Educational Spaces

Over the years, spaces have been repurposed, re-invented, re-configured, expanded, and divided. Every school year walls are added and taken down; what may have been a right-size classroom one year then becomes two undersized classrooms the next school year. The MSBA guidelines provide for general classrooms sized between 825-950 square feet. Of all the general classrooms in the high school, only 23% meet the minimum of this guideline. Further, the majority of the specialty classrooms do not meet the guidelines. Science rooms are greatly undersized; the average room is 1,000 square feet; per the guidelines the rooms should be 1,440 square feet and this is with an assumed maximum enrollment of 23 students per class; Arlington's Science class size, 40% of science classes exceed 23 students with many classes in the range of 28-30. In the case of the Science program, the undersized rooms are more than crowded, they are unsafe. Science lab experiments require space and free circulation to ensure safe procedures; the high school labs do not have enough space to provide this. The only way to alleviate the overcrowding within the current science classrooms is to provide additional classrooms.

In addition to the undersized spaces causing overcrowding difficulties, there are many classrooms with physical obstructions that hinder the ability of the teachers to teach and the students to learn. There are large columns in six classrooms, another four classrooms have been divided (out of necessity) into irregular shapes, meaning that students cannot see the front marker board and the teacher cannot see some students. A classroom was divided into two, but it is not acoustically separated, making teaching and learning difficult in the two areas. These conditions inhibit different modes of teaching and learning.

As described by one teacher:

The columns create a "challenge." It is because of them that a ceiling-mounted projector cannot be installed and used in her classroom. Therefore she needs to write much more on the white board, having to do and undo information throughout the period. This results in loss of teaching and learning time; she estimates it costs them two to three minutes every class period, this in turn results in 8 - 12 hours per school year.

The obstructed and irregular shaped rooms make up 20% of the teaching spaces. For a diagram showing these spaces, see Appendix C.

The high school is already experiencing overcrowding in the classrooms and it does not have sufficient classrooms for the number of teachers in the building. As the number of teachers is expanded to respond to very large class sizes, it will increasingly be difficult to schedule classes into existing classrooms, some of which are already booked for every period.

Based on a five year weighted average to measure continuity rates from grade to grade, the Arlington Public Schools are anticipating significant space pressure at both the Middle and the High School buildings. Since 2000, the district has grown 24%, from 4,165 to 5,157 students. Much of this growth has been concentrated at the elementary level. Projecting forward in time, using current continuity rates, the High School enrollment of 1,254 is projected to rise to 1,375 in five years, and 1,660 in ten years.

Beyond the sizes, configurations, and quantities of the educational spaces there are environmental issues that make the spaces both uncomfortable and distracting to teach and learn in, such as indoor air quality, temperature extremes and lack of control, and problematic incidences with mice and wasps.

The On-site Insight report does not address any of these space issues.

Technology and Other Necessary Features

There are many features that are necessary to support high school education, many of which did not exist when the school (and its additions) was constructed. Accessing today's technology is essential for teachers and students. The following are a number of the key education-related and learning-environment related features today's high school requires:

- Ceiling-mounted projectors: the columns in some classrooms do more than disrupt sightlines; they hinder the ability to utilize this essential teaching tool. In addition some ceilings are designed in such a manner that it is not feasible to mount a projector or wire the classroom appropriately for such devices.
- Wireless access: the physical construction of the buildings hinders wireless access and requires a more costly solution to achieve ("block walls, block signals").
- Telephones: for security, telephones are required in every teaching space.
- PA system: the current system is outdated, does not access all of the building, creating a safety risk, and is extremely jarring to the occupants.
- Simulcast ability: the ability to broadcast to multiple areas of the building creates wide-reaching opportunities for learning.
- Sinks and eyewash/ shower stations: a sufficient quantity of sinks, appropriately located, is required for sanitary, safety, and project-based learning; operating eyewash/ shower stations are required at all Science classrooms.
- Flexible, movable furnishings: Science classroom furniture is bolted to the floors creating a rigid and often inappropriate classroom layout.
- Audio/Video space: access to learning and using today's current technologies is essential for the high school student.
- Electrical outlets: an increased access to electrical power is necessary; currently many extension cords and power strips are being used creating unsafe conditions leading to shortages in the system.
- Acoustic needs: many spaces are acoustically challenged, causing disruptions and making learning difficult; the Music program spaces do not have appropriate acoustic treatment; the rooms adjacent to the Cafeteria are interrupted by noise; the Language Lab needs appropriate acoustics. Old Hall is a loud, echo-filled, challenging space to occupy, coupled with the noises clearly heard from the space below used for band practice and wrestling practice.
- Auditorium sound and lighting systems: the systems are aged and require replacement.
- Equipment: throughout the various program spaces much of the equipment used by the teaching staff is outdated or does not exist (fume hoods, appliances, etc.)
- Air conditioning: the school is used year-round and air conditioning is essential and, at minimum, the Library, Auditorium, and Administrative areas should have air conditioning.
- Borrowed lights and glazing: part of the confusion of the complex is due to the lack of visual connection between spaces.

The On-site Insight report does not address any of these education-related features.

Adjacencies and Size

Adjacency requirements between program spaces and services are often not met, due in part to the generous size and spread-out nature of the facility and also due to not having adequate room in a designated area of the building to accommodate the full program. In most cases the locations of the various departments are quite removed from one another and therefore it "does not encourage collaboration and support." Additionally, there are minimal spaces that allow for teachers (of similar and dissimilar subjects) to meet and collaborate. Even though the intent is for like programs to be grouped together, in several instances, and because of required growth of either or both the program's needs or enrollment, this has not been possible. The Music program is on three different levels, making collaboration and circulation difficult; students travel up and down stairs with their instruments, and stage sets are made in a distant space, un-assembled and then are hauled to the Stage in pieces to be reassembled. The Family and Consumer Sciences program is also spread out on several levels and, ideally,

the program would be adjacent to both the childcare space and the Pre-School program, but with the school's current configuration this is not possible.

In thinking about adjacency needs, we need to also address the needs of differentiated instruction (team teaching, project-based learning, one-on-one instruction, and individual learners). Differentiated instruction requires spaces of varied size as well as adjacencies to the corresponding program. Small-group rooms and break-out spaces allow for differentiated instruction; currently Arlington does not have purposeful smaller teaching spaces to promote flexibility in teaching and learning. As well as the limited large and small group spaces for classrooms, there is also a deficit of spaces for support services such as guidance and special education.

Support services, such as toilet facilities, shared storage rooms and faculty workrooms are few and far between, which has a significant impact in a building of this size. Per the Massachusetts Plumbing Code, the current number of occupants at the high school would require the following toilet facilities, properly distributed per floor: male students = seven toilets plus seven urinals; female students = 20 toilets; adult males = four toilets, adult females = five toilets. Separate toilet facilities are required at the Auditorium equal to five toilets plus five urinals for males and 15 toilets for females. Similarly, separate facilities are required at the Gymnasium equal to seven toilets plus seven urinals for males and 20 toilets for females. Therefore, per the Code, the total fixture count would be: 23 male toilets, 19 male urinals, and 60 female toilets. (This calculation does not include the facilities that are also required at the Nurse, Administration, Pre-School, and Daycare areas.) Currently there are 24 male toilets, 29 male urinals, and 28 female toilets. Based on the current school population, the facility is greatly deficient and this does not include the anticipated increase in enrollment.

Additionally, student services such as guidance, social work, METCO, and administrative oversight, would benefit from an analysis identifying their best locations. In some instances they need to be readily accessible throughout the building while in others, for privacy and comfort, need to be a bit more tucked away.

The location of spaces is not so easily solvable as to just relocate programs; each program has specific spatial requirements (size, features, etc.), and as it is, many of the current spaces are used for multiple programs and do not provide the necessary features, and therefore the whole of the programmatic needs will need to be assessed and addressed in the future Feasibility Study.

The On-site Insight report does not address any of the program adjacency and room size needs.

Program Space Needs

In the above text we have identified existing space deficits, including size, quantity, configuration, obstructions, technology and other necessary features, and location within the school building, what have not been identified are the additional educational spaces required (others desired) to continue to allow Arlington High School to achieve excellent academic results.

Following are the presently known missing and/or inadequate educational spaces, the Feasibility Study process will result in a comprehensive understanding of the needs.

- Science requires: additional classrooms and specifically Biology classrooms
- A flexible modern library "learning commons" to serve as central meeting, collaboration, study, support, and presentation space.
- Culinary Arts requires: additional instruction space and lab space, and increased size to the current Family and Consumer Science (FACS) rooms
- Special Education requires: Occupational Therapy, Physical Therapy, and Speech & Language dedicated spaces and more secure counseling spaces
- Music requires: a dedicated Instrumental Music classroom adjacent to the rest of the music program, Auditorium/Stage need wing space, fly space, and orchestra pit, and scene shop adjacency
- Visual Arts: a dedicated studio arts space
- Physical Education requires: Health classroom and Dance studio (and desires a Swimming Pool for both the athletics department and for wider community use)

- School-wide: meeting rooms, collaboration spaces, and small group rooms, there are no meeting spaces that can comfortably accommodate the faculty or large groups of students for collaborative work; an outdoor classroom
- An adequate Cafeteria that is easily able to be supervised and will accommodate the increased enrollment

The On-site Insight report does not address any of these additional educational space needs.

4- Security and Safety

The school building as configured today, after a century of additions, renovations, and on-the-fly repurposing of spaces, poses a safety and security challenge. From the principal:

While Arlington High School remains a safe environment that is primarily because of the nature of our student body and the vigilance of administration. The problems created for monitoring access to the building and supervising “attractive nuisance” spaces in the building create a burden on administration and a distraction to many students.

There are greater than 50 exterior doors. This fact alone is a security challenge, but is compounded because none of the doors are tied to a security alarm system, and it is virtually impossible to secure the school building either during or off school hours. It is common knowledge that students can use a rock or whatever is available to prop open doors for their return either later that night or over the weekend. Further, those that wish to do harm could get into the building to do so. There are long stretches of hallway without occupied spaces and therefore without supervision. There are 20 stairwells, the majority of which are rarely used, that are known hang-out/hiding place for students. Even in stairs that are used regularly, students can hang-out at the very top or very bottom without detection. See safety/security issues diagram in Appendix D.

Currently it is a challenge to have a timely and efficient lockdown or shelter in place of the school.

Due to the configuration of the school complex, there are no orientation mechanisms and it is easy to become lost and disoriented; it is sometimes a challenge to find the best egress path and in an emergency this could be dangerous. There are many, seemingly, dead-end hallways. Although there are no actual dead ends, many hallways seem as if they are, and pose a danger in an emergency.

In addition to there being too few toilet rooms with too few fixtures for the population, the majority of them are located at the very end of hallways, sometimes beyond the paired hall doors and within the stair well. These are not regularly supervised and pose numerous threats and at the very least, maximize insecurities. We understand that due to the physical, deteriorating conditions as well as the isolated locations of the toilet facilities, that there are students who will not use the facilities throughout the entire school day. This is not a healthy situation.

There are too many isolated, unsecure areas at Arlington High School.

Within the classrooms there are dangers and security risks as well. All of the classrooms that have been identified to have poor sightlines between teacher and student (because of columns or irregular shaped rooms) pose a risk. The Library, which is irregular in shape, has multiple columns, and multiple entry and egress points; there is simply no way for adults to monitor the entire space. This is also true for the Cafeteria. The Cafeteria forms a large “U” shape and is obstructed in the middle. The bottom of the “U” has open archways that provide unobstructed access to and from the rest of the building.

During lunch periods, monitors have to be stationed to see as much of the space at once as is possible. Additionally, while the Cafeteria is centrally located within the school, it is on a floor level that, beyond the lunch

periods, has low traffic patterns with no staff adjacent, and students can linger undetected unless staff are assigned to sweep through and supervise.

Without classroom telephones, there is “no room-to-room communication.” Due to the lack of a fully integrated public address system, the ability to communicate an emergency situation to the entire school is poor. Similarly, and as it was designed, there are three separate fire alarm systems for the three “separate” buildings (they are deemed separate per the construction of fire separation walls), but this means whole areas of the building would not be aware of an emergency in another area of the building. The school administration has had to develop procedures for communicating and activating multiple alarms in an emergency.

Many classrooms teachers have resorted to the use of power extension cords that, by their nature, are strung across the floors. The result is that teachers do not use technology as readily and tripping is a hazard to students and equipment. The Science classrooms use equipment and chemicals in crowded conditions, many in rooms without proper safety stations. Ultimately, students are denied the learning experience if the conditions are deemed too unsafe. Gas shut-offs for some science labs are located in the adjoining rooms, making this safety measure less effective. Accident rates in science labs have been directly associated to both crowding and class size. However, without additional and larger labs, Arlington High School is unable to reduce the class sizes further.

None of the items identified in this section of the report would be remedied if only the On-site Insight report’s level of maintenance work were to be done.

5- The Future

Arlington High School was constructed for a different time in education than what is expected today, let alone what will be required into the foreseeable future. 21st century schools are all about technology, interconnectedness, collaboration, interaction, hands-on learning and making, experiences, teamwork, and interpersonal skills. The excellent teaching staff at the high school knows this and accomplishes much within the constraints of the antiquated facility. It is time to look to the future and to make every effort to create an environment that supports the dynamic teaching and at Arlington High School.

School buildings need clear way-finding and be navigable by all, student and visitor alike. Schools need to have spaces in a variety of sizes that are adjacent to one another to provide appropriate space for differentiated learning styles. The spaces need to be flexible in terms of variety of sizes, and a level of consistency among the amenities. The teaching spaces need to be supported by today’s teaching tools, such as ceiling projectors, wireless, and the like. Schools must achieve these goals in an environment that is at the same time, inviting, open, secure, and supervised.

When thinking of any building today, but perhaps most especially buildings used for educating students, we need to be planning sustainably, using our existing resources wisely, and thinking even further into the future about what else may need to be accommodated on the high school site. Designing sustainably means with the outdoor, as well as the indoor, environment in mind, while creating a long-lasting, low-maintenance, well-planned facility to accommodate flexibility and growth.

Schools need to be safe and secure havens for all that enter. Simple things like signage, color, exposure to natural light, connection through views to nature and the surroundings, combine to create a secure, understandable environment in which today’s and tomorrow’s student learn and grow. These are possible to achieve within a thorough, thoughtful renovation, but they need to be planned for and supported by the community’s resources in order for the high school to best support the youth of Arlington into the coming decades.

6- Third Party Validation of Needs

The New England Association of Schools and Colleges (NEASC) has placed Arlington High School on “warning” status for its accreditation. NEASC cites the following concerns:

- “Poor condition of the facility limits staff’s ability to implement curriculum”
- “Insufficient number, size and layout of classrooms”
- “Insufficient size and poor design of science labs”
- “Crowding in science labs creating hazardous conditions”
- “Need for increased availability of a full range of technology”
- “Closure of a classroom due to environmental concerns”

The full report is available to the public for review.

The Department of Elementary and Secondary Education (DESE) is requiring particular data collection format and submission methods from the district and Arlington is unable to meet the requirements due to the high school’s inability to incorporate infrastructure and technology upgrades throughout the school. This inability is due to the physical construction of the existing school, the walls are mainly of concrete block and in many locations it has been difficult and costly to upgrade the infrastructure.

7- SOI and Funding

This report along with information from the high school faculty and staff, the school district administration, the Town’s facilities manager, the On-site Insight report, the NEASC report, and other material will be used to respond to the MSBA Statement of Interest (SOI) thoroughly. The SOI will address the following aspects of the facility’s needs:

- “elimination of existing overcrowding”
- “prevention of loss of accreditation”
- “prevention of future overcrowding”
- “replacement or renovation of systems to increase energy conservation”
- “replacement of, or addition to, obsolete buildings to provide a full range of programs”

SOI Summary

The following issues are of major concern for Arlington High School:

- Major heating, ventilation, electrical, fire detection, and plumbing systems need to be replaced
- All other building systems are antiquated and energy inefficient
- No air conditioning and therefore unable to accommodate summer programs
- Hazardous material abatement
- Proper exterior wall insulation
- Toilet room quantity, locations, and condition are inadequate; fixtures are antiquated
- Poorly functioning drinking fountains
- Electrical system is not adequate to support the technology needs
- Windows are single-pane, energy inefficient with clouded glazing and poor operability
- Minimal access for the physically handicapped; only one elevator that does not reach one of the floor levels and is in need of replacement; one elevator is not adequate for this size facility
- Poor roof condition
- Worn flooring throughout
- Inadequate Science facilities
- The Library is irregular shaped with many obstructions making it a difficult space to supervise

- Undersized Instrumental Music Room that is acoustically inadequate
- Cafeteria is at capacity now, the projected increase in enrollment will require and increase to four lunch periods
- Antiquated PA system that does not reach everywhere
- No telephones for teacher use in an emergency
- Most existing conditions do not meet the Massachusetts Architectural Access Board requirements, such as stair risers, hand- and guardrails, hardware, plumbing fixtures, casework, Auditorium seating, etc.
- Current overcrowding
- Future expected overcrowding

Funding

Ultimately a Feasibility Study will need to be completed to fully understand the construction costs and project costs for the scope of work that is required to renovate Arlington High School and improve the educational spaces and overall environment of the facility. Prior to the Feasibility Study phase and working with MSBA, the Town of Arlington will need to establish an approximate scope and budget within which to plan for the pending project costs. The actual costs will not be finalized until after Feasibility Study and Schematic Design phases are complete and the Town signs its Project Funding Agreement with MSBA, at which time the Town will know its exact share of the costs.

In an effort to put rough cost numbers to the level of work outlined above, we offer comparison statistics:

A review of MSBA past high school renovation and addition project construction costs reveal the average cost per square foot for construction-only, excluding the extreme high and low end projects, is \$198. (Please note: we do not have detailed knowledge of the extent of the work completed for these projects.) To this, add a rough mark-up of 20% for soft costs (all the costs required that are not part of the actual construction), the average project cost is \$238 per square foot. The MSBA projects were bid between 2009 and 2013. Assuming the mean year was 2011 and if the Arlington High School were to bid mid-year 2016 and using an average yearly escalation factor of 3%, the project cost is \$276 per square foot. Based on the size of the existing school, the project cost would be approximately \$100M.

As a second check, we compared the recently completed Cambridge Rindge and Latin School, a renovation of a similar size high school. The scope of work included many similar items to those needed in Arlington, but with minimal reconfiguration of spaces. The project was completed in 2011 with \$238 cost per square foot. Assuming Arlington High School project would be complete by 2018, and adding the yearly escalation to the project cost, the cost per square foot would \$293. Based on the size of the existing school, the project cost would be approximately \$110M.

There are many factors that are unknown at this early stage. Project costs could range from \$90M to \$130M, or even higher. Until the true investigative work is completed in the Feasibility Study process, we will not know the exact scope and therefore the exact costs. But what we can ascertain from the information on the MSBA website and the information in this Analysis report is that the work required to restore Arlington High School to take on the challenge of 21st century learning within a facility that meets today's requirements, operates efficiently, and is a welcoming, safe environment, will surely be greater than \$32.4M.

If Arlington's reimbursement factor of approximately 52% were to be applied to a \$130M project cost, the Town's share would be approximately \$62,400,000. While this is a substantial sum, it would encompass all of the foreseeable needs of the high school facility. The alternative is to spend the sum (it too is a substantial sum) proposed in the On-site Insight report but achieve very little.

8- Conclusion

In conclusion, beyond the physical deterioration and aged condition, the school is inadequate to meet the current and future educational needs. Meeting accessibility and other standard code requirements are essential upgrades that are not fully covered in the maintenance assessment by On-site Insight. Physical constraints of size, location, and amenities continue to create barriers to teaching and learning. Safety concerns due to the school's layout and configuration are of mounting concern.

The teaching and learning environments are restricted by overcrowding, inappropriate number and/or sizes of rooms required for the particular task; and rooms of irregular shapes and interrupted by columns that create obstructed views, inhibit learning and cause safety concerns. Science rooms are inadequate size creating cramped conditions, and feature obstructed views that cause an unsafe environment. The general sprawl of the multi-generational, multi-level complex creates confusion, discomfort, safety and security concerns.

The school Principal simply stated, the school has "inadequate instructional spaces," is in need of improved and expanded specialty spaces, has "technology challenges," "impedes innovative, teaming, or collaborative teaching," and is "unsupervisable." He notes that the current quality of programming is due, in large part to the excellent instructional staff. As the economy improves and surrounding communities restore the quality of their facilities and equivalent, Arlington High School will need to restore its school in order to attract and keep its first-class faculty and programs.

The Town of Arlington has the opportunity now to make the substantive improvements to the facility and its educational spaces to appropriately accommodate future generations of learners.