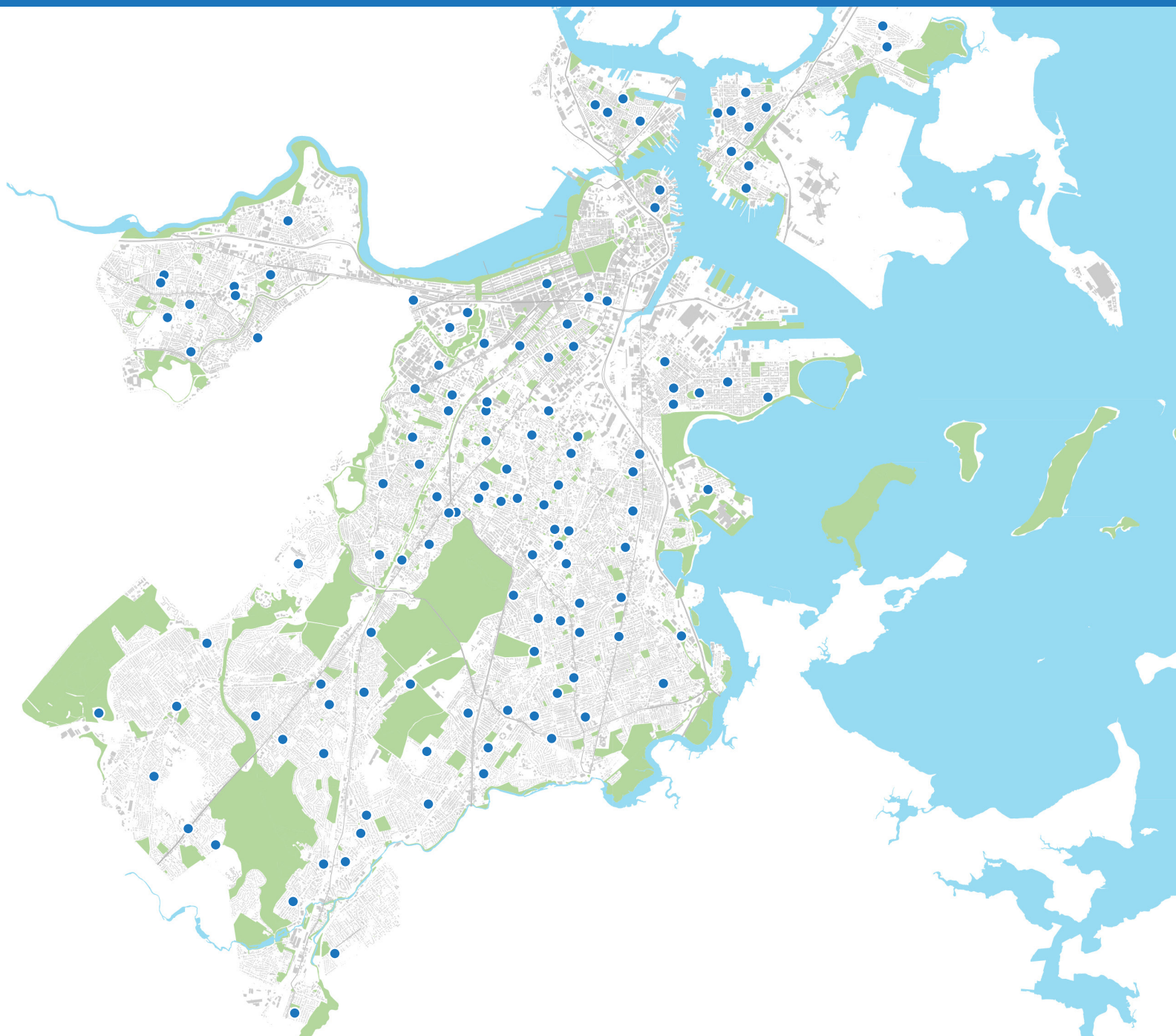


Build **BPS**

10-Year Educational and Facilities Master Plan

Josiah Quincy Upper School



SMMA | Symmes Maini & McKee Associates
MGT
WSP | Parsons Brinckerhoff

SMMA

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Summary

Included in this report are assets that were collected during the facility master plan process. Each school's report package contains an At-A-Glance summary report, Facility Evaluation Criteria sheets, and site plan(s).

Site plans are included to illustrate the context of the building in relationship to the city, neighborhood, and other adjacent amenities and parcels.

The At-A-Glance summary sheets include general information about each school building including school data, such as population and grade structure, etc., site and building data, tax assessor's information, community uses, Department of Education (DESE) information, Operational Data, and Cost model information for repairs and renovations.

The Facility Evaluation Criteria sheets are the facility assessment team's findings at each school building including building physical assets, sites, and educational facility effectiveness. Between April 25 and June 22, 2016, the assessment team visited all of the Phase 3 school buildings.

Josiah Quincy Upper School

Site Aerial

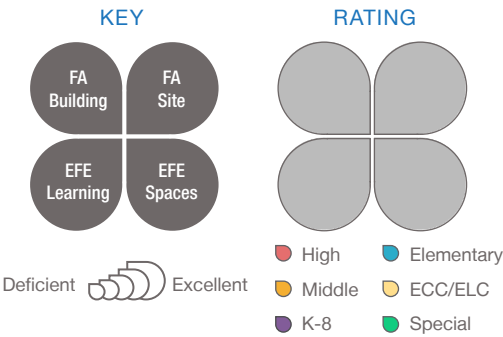


At a Glance:

Quincy, Josiah Upper School

152 Arlington St Boston, MA 02116

DOE ID: 350565



BPS School Data

Historic Bldg. Name:	Josiah Quincy Upper School
Current Bldg. Name:	Quincy, Josiah Upper School
Year Founded:	2020
Operation Hours:	8:40 AM 3:40 PM
School Type:	Not Assessed
Typology:	High School
Grade Span:	6-12
Building Gross Floor Area:	80,364
Total GSF	80,364

Schools Housed per Building or Buildings per School

Building Name:	
Schools:	Population:
Quincy, Josiah Upper School	507
Total:	507

Tax Values as of 2015

Tax Parcel ID:	501259000
Tax Parcel Type:	902
Tax Land Usage:	E
Tax Building Value:	Unknown
Tax Land Value:	\$54,611,800
Tax Total Value:	\$54,611,800
Tax Gross Area:	Unknown
Tax Floors:	Unknown
Tax Living Area:	Unknown
Compliance Trigger:	Unknown

Site and Building Data

Neighborhood by BPDA:	Bay Village
Year Built:	2020
Renovations:	N/A
Property Status:	Part Leased
Site Size (acres):	0.89

Shelter:
COMMENT:

Susceptible to Climate Change
Now:
by 2100:

Mass Historic Status
Inventory:
Register:
COMMENT:

Community Uses

Community Use Spaces:	
Community Building Rating:	Not Assessed
Community Site Rating:	Not Assessed

Documentation

Plans
CAD plans, site plans

*Indicates Shared Building

At a Glance:

Quincy, Josiah Upper School

DOE Data

Student Data

SY 2015-2016 Total Enrollment 507

Enrollment by Grade

PreK:	0
K:	0
1st:	0
2nd:	0
3rd:	0
4th:	0
5th:	0
6th:	144
7th:	79
8th:	65
9th:	59
10th:	40
11th:	55
12th:	53
Special:	12

ENERGY Data

Energy Use

kWh:	\$175,280
Annual Electricity Cost:	\$26,312
Therms:	26,518
Annual Gas Cost:	\$37,424
Water (ft ³):	27,050
Annual Water Cost:	\$3,225
Total Annual Costs:	\$66,961

Energy Use Intensity (EUI)
(kBtu/SF/year):

sEUI (kBtu/student/year):

Energy Efficiency (total energy
lost/SF/year):

Note:

All energy costs are provided by BPS. Schools that share buildings are not itemized by school.

Cost Model Legend

School Name	
2015-2016 Enrollment	Exist GSF
Capacity	Year Built
Massachusetts Historical Status	

*Shown on Existing Building Data ONLY

Costs were evaluated not with a detailed cost estimate but with a heuristic cost model based on collected data, which was limited.

This means this cost model is not a substitute for an actual cost estimate and on a school by school basis, we expect that the heuristic cost model may deviate from a more standard cost estimate. As such, variances, including outliers, are expected.

Scenario Legend

	Repairs ONLY
	Renovations
	Project Cost

Existing Building Data

Educational Typology

Assumptions:

- Where two buildings share a site the costs for both reflect values for the entire building and are not itemized by school.
- Compliance values indicate the threshold of costs at which full compliance with state codes for accessibility, life safety, seismic and lateral improvements would be required. The value is 30% of the taxed assessed value of the building.
- Resilience costs cover the relocation of key electrical and mechanical equipment above basement, first floors in flood prone sites.
- For other information/qualification refer the Report Section 4.
- Capacity figures based on Massachusetts 963 CMR GSF/student values.

Quincy, Josiah Upper School	
507	80,364
357	2020
Inventory: Register:	

Repairs Only

Building	\$651,820
Site	\$200,000
Total Repair Costs	\$851,820

Renovation

Repair Costs (from above)	\$851,820
Renovation	\$13,411,880
Resiliency	0
Program Upgrades	\$4,219,110
Total	\$18,482,810
Total Repair and Renovation Costs	\$18,482,810

*Indicates Shared Building

SCHOOL: NAME: Quincy, Josiah Upper School
HISTORICAL SCHOOL NAME: Josiah Quincy Upper School

ID: 350565
SCHOOL ENROLLMENT: 507
BUILDING ENROLLMENT: 497
SITE VISIT DATE: Site Analysis Only
ASSESSMENT STATUS: Not Assessed

1. Facility Evaluation Criteria

Physical Analysis:

RATING CATEGORY

☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Major investments in the last 20 years?

☐ YES ☐ NO

COMMENT:

Roof:

Membrane

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Space on roof for solar

☐ YES ☐ NO

COMMENT:

Façade

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Windows

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Boilers

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Heating Distribution Systems

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Ventilation Distribution Systems

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Electrical Service

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Existing Photovoltaics

☐ YES ☐ NO

COMMENT:

Life Safety:

Means of Egress

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Fire Protection (sprinklers)

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Fire Alarm

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Security:

Entry Sequence

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Lighting Quantity/Control

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Toilets & Fixtures

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Plumbing Distribution Systems

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Accessibility

NEEDS ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

*Indicates Shared Building

SCHOOL: NAME: Quincy, Josiah Upper School
HISTORICAL SCHOOL NAME: Josiah Quincy Upper School

ID: 350565
SCHOOL ENROLLMENT: 507
BUILDING ENROLLMENT: 497
SITE VISIT DATE: Site Analysis Only
ASSESSMENT STATUS: Not Assessed

Structural System:
Signs of Deterioration:

Roof	☐ YES	☐ NOT OBSERVED	COMMENT:
Floor	☐ YES	☐ NOT OBSERVED	COMMENT:
Walls/Columns	☐ YES	☐ NOT OBSERVED	COMMENT:
Foundations	☐ YES	☐ NOT OBSERVED	COMMENT:
Façade	☐ YES	☐ NOT OBSERVED	COMMENT:
Is the lateral system identifiable?	☐ YES	☐ NOT OBSERVED	COMMENT:

Overall Building Condition Rating

☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
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SCHOOL: NAME: Quincy, Josiah Upper School
HISTORICAL SCHOOL NAME: Josiah Quincy Upper School

ID: 350565
SCHOOL ENROLLMENT: 507
BUILDING ENROLLMENT: 497
SITE VISIT DATE: Site Analysis Only
ASSESSMENT STATUS: Not Assessed

Community:

Mass Historical Commission Status:

Inventory of Historic Assets

☐ LISTED☐ NOT LISTED

COMMENT:

State Register of Historic Places

☐ LISTED☐ NOT LISTED

Emergency Shelter

☐ YES☐ NO

COMMENT:

Community Use Spaces

☐ YES☐ NO

COMMENT:

Building suitability for school use?

☐ YES☐ NO

COMMENT:

Community Building Rating

Excellent

Good

Fair

Poor

Deficient

2. Site Evaluation Criteria

RATING CATEGORY

 Excellent  Good  Fair  Poor  Deficient

Physical Analysis:

Is the site susceptible to climate change? ☐ YES ☐ NO **BY 2100** ☐ YES ☐ NO

Major investments in the last 10 years? ☐ YES ☐ NO

COMMENT:

Is the building expandable on current site? ☐ YES ☐ NO

Parking Quality **NEEDS BY 2050** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Neighborhood Streets **NEEDS** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Drop Off/Pick Up Routes **NEEDS** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Walkways/Curbs/Sidewalks **NEEDS** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

MAAB/ADA Accessibility **NEEDS** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Site Lighting **NEEDS** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Fencing **NEEDS** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Drainage **NEEDS** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Play areas **NEEDS** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Walls/Slopes **NEEDS** ☐ Adequate ☐ Minor ☐ Moderate ☐ Replace ☐ Not Present

Overall Site Condition Rating  Excellent  Good  Fair  Poor  Deficient

*Indicates Shared Building

Community:

Mass Historical Commission Status

Inventory of Archeological Assets (Site Review)

☐ RESEARCHED☐ NOT RESEARCHED

COMMENT:

Accessible to Mass Transit?

☐ YES☐ NO

COMMENT:

Bikable?

☐ YES☐ NO

COMMENT:

Walkable?

☐ YES☐ NO

COMMENT:

Site suitability for school use?

☐ YES☐ NO

COMMENT:

Overall Community Site Rating

Excellent

Good

Fair

Poor

Deficient

3. Educational Analysis

Building originally designed as:	☐ HS	☐ JHS	☐ MS	☐ K-8	☐ ES	☐ EEC
The grade configuration this school is best suited to:						
Pre-K to 1	☐ YES	☒ NO	7 to 8	☐ YES	☒ NO	COMMENT: Not assessed.
Pre-K to 3	☐ YES	☒ NO	6 to 12	☐ YES	☒ NO	
Pre-K to 5	☐ YES	☒ NO	7 to 12	☐ YES	☒ NO	
Pre-K to 6	☐ YES	☒ NO	9 to 12	☐ YES	☒ NO	
4 to 6	☐ YES	☒ NO				
6 to 8	☐ YES	☒ NO				

Educational Facility Effectiveness: Learning Environments (EFE: LE)	RATING CATEGORY				
	☒ Excellent	☒ Good	☐ Fair	☐ Poor	☐ Deficient
Ventilation	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Natural Daylighting	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Lighting Quality	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Air Quality	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Acoustical	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Technology					
Power	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Wireless	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Interactive	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Furniture	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Finishes	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Environment (inviting/stimulating/comfortable):	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Adjacencies of Learning Environments:	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Outdoor Classrooms	☐ Excellent	☐ Good	☐ Fair	☐ Poor	☐ Deficient
Overall EFE: LE Rating	☒ Excellent	☒ Good	☐ Fair	☐ Poor	☐ Deficient
COMMENT:					

*Indicates Shared Building

The site includes:

Play Grounds/Areas

☐ YES ☐ NO

COMMENT:

Accessible

☐ YES ☐ NO

COMMENT:

Play Fields

☐ YES ☐ NO

COMMENT:

Can the building change typology easily?

☐ YES ☐ NO

COMMENT:

Can the building be transformed educationally
to serve 21st C needs?

☐ YES ☐ NO

COMMENT:

Can the building serve as swing space?

☐ YES ☐ NO

COMMENT:

Is the building between 85% to 115%
utilization rate?

☐ YES ☐ NO

COMMENT:

*Indicates Shared Building

Assessment Team Scoring Rubric

Educational and Facilities Assessment Approach

Led by architects, engineers, and educational planners from SMMA and its consultants, and in partnership with each school principal, the team conducted both a facility assessment (to take inventory of the building layout and condition) and an educational assessment (to determine the adequacy of spaces for the educational programs offered) in each building.

The following report outlines the team organization, methodology and approach taken to assess the Boston Public School portfolio over the 2015/16 summer and school year.

Overall Assessment

Categories and criteria were strategically selected for assessment based on stated objectives, past experience, and nature of the BPS portfolio of buildings. Ultimately, the E+FA team created a customized “BPS methodology” which encompassed approximately 75 areas of criteria. The criteria was then organized within four main categories focused on the facility, site, educational learning environments and spaces. Two other categories were also included focused on community criteria.

Facility Assessment – Building

Facilities varying in terms of age, design, construction methods, and materials were reviewed to determine the condition of the district's portfolio. Building assessments were performed to determine existing components and/or systems' conditions at a specific point in time. The resulting information was then used to guide recommendations regarding maintenance, renovation, and/or replacement.

Facility Assessment – Site

The site evaluation team performed assessments at each school facility in the district's portfolio. These assessments considered the quality, condition and capacity of the various exterior spaces of the facility. These spaces included, landscaped, educational, recreational, vehicular and pedestrian areas. This field effort was also complimented with a detailed study and research of the sites from web-based resources. The resulting information was then used to guide recommendations regarding maintenance, renovation, and/or replacement.

Educational Facility Effectiveness – Learning Environments

The quality of physical environments has direct impact on educational outcomes. This analysis considers both inherent building characteristics and introduced equipment (e.g., furniture and technology), as well as the physical appearance and condition. These qualitative factors influence students' comfort and ability to concentrate on tasks, teacher and student health, absenteeism and retention—ultimately having an impact on overall performance.

Educational Facility Effectiveness – Spaces

This metric compares the sizes of educational spaces to Massachusetts 963 CMR guidelines for 21st century teaching and learning in new capital projects. This quantitative analysis is important for establishing the level of adequacy of the existing spaces for educational delivery. It also indicates whether a facility is deficient/missing dedicated educational spaces normally found in buildings of its grade level and typology.

Additional Assessment Data

The community assessment data was informational only, and not weighted in the overall scoring methodology.

Assessment Team Scoring Rubric

Community – Building

The Community –Building assessment included several categories including historical value, emergency shelter status, and use of community and school within/without the buildings. Historical value reviewed the historic inventory and register status of the building. Because schools are often the largest structure in a neighborhood, the City has designated certain facilities as emergency shelters. Additionally, several schools are directly connected to community centers or utilize adjacent neighborhood facilities for athletics and enrichment. Also considered was whether the community utilized the building after hours or on weekends.

Community – Site

The Community – Site assessment included the broad categories of transportation access and neighborhood elements. Transportation access considered the condition of the adjacent streets, the ability of students and adults to bicycle and walk to the school, and the accessibility of bus and rail transit. Neighborhood elements considered the school's proximity to community, civic, educational, commercial and athletic facilities.

Primary vs. Secondary Criteria

As noted, each category includes several criteria items comprising areas within the buildings and sites that were regarded as important in determining the overall state of the facility. Within each of the four main categories, these assessment criteria have been categorized into primary and secondary considerations.

The primary considerations are weighted by a factor of three (3), to differentiate the elements that (1) require significant time to repair or replace, (1) construction costs greater than the singular element's cost factor, and (1) create a construction challenge (degree of difficulty) to repair. The weighted scoring allows for the most critical criteria to establish the overall scores and not be overly influenced by important, but more readily repairable/replaceable elements.

Facility Assessment – Building

Facilities varying in terms of age, design, construction methods, and materials were reviewed to determine the condition of the district's portfolio. Building assessments were performed to determine existing components and/or systems' conditions at a specific point in time. The resulting information was then used to guide recommendations regarding maintenance, renovation, and/or replacement.

Facility assessment criteria were categorized and weighted into primary and secondary considerations, as determined by the BuildBPS management team. The weighted scoring allowed for the most critical criteria to establish the overall rating, while not be overly influenced by important but more readily repairable/replaceable elements.

Primary considerations, in many instances, affect multiple other facility criteria and systems, and are deeply systemic relative to their repair or replacement. Primary considerations included:

- **Life Safety:** Means of Egress
- **Life Safety:** Fire Alarm
- **Security:** Entry Sequence
- **Accessibility**
- **Heating Distribution Systems**
- **Ventilation Distribution Systems**
- **Plumbing Distribution Systems**

Assessment Team Scoring Rubric

- **Structural Systems** (consisting of the following components):

Roof framing: This is the horizontal framing consisting of decking, slabs, joists, beams, trusses, etc.

Floor framing: This is the horizontal framing consisting of decking, slabs, joists, beams, trusses, etc.

Walls and columns: These are the vertical elements that hold up the floors and roof structures.

Foundations: Foundations occur at the base of the building and transfer the weight of the building onto the underlying soils.

Facades: These are the outside walls of the building including many non-structural elements (doors, windows, insulation, vapor barriers, etc.) that are part of the weather enclosure for the building.

Lateral System: The lateral system in a building is the structural system that keeps the building from falling over when it is subjected to horizontal loads such as wind and earthquake forces.

Secondary considerations often consist of singular systems, and are more “standalone” in their repair or replacement. Buildings can typically remain occupied if the necessary work can be completed over the course of a summer. It should be noted that many secondary considerations are related to primary ones, and that their repair or replacement may only result in temporary or limited operational benefits for the building. Secondary considerations included:

Electrical Service	Boilers
Roof Membrane	Toilets and Fixtures
Façade	Life Safety: Fire Protection: Sprinklers
Lighting Quantity & Control	Windows

There were additional evaluation criteria listed that were not included in either the primary or secondary categories. These items were included for reference or to note a particular condition, as well as for cost modeling. Refer to E+FA Dashboard for a full listing of criteria.

Criteria Rating Hierarchy

The facility assessment building evaluations used a quintile classification hierarchy as defined below:

- **Adequate:** System or element is in new or like-new condition and functioning optimally; only routine maintenance and repair is needed.
- **Minor:** System or element functioning reliably; routine maintenance and repair is needed.
- **Moderate:** System or element functioning minimally. Repair or replacement of some or all components is needed.
- **Replace:** System or element is non-functioning, not functioning as designed, or is unreliable. Repair or replacement of some or all components is needed
- **Not Present:** System or element is non-existent, non-functioning, not functioning as designed, or is unreliable. Replacement is needed.

Assessment Team Scoring Rubric

1. Facility Evaluation Criteria

Major investments in the last 20 years? (> \$5 Mil) – Yes/No; Information provided by BPS: Comments, if applicable. Criteria included as a reference to note any recent upgrades to buildings. Any portions of the facility that have received investments were evaluated per their current condition.

Roof

- **Roof Membrane:** Condition status noted for the roofing material and flashings. What is the roofing material? What is its condition? How is it adhered? What is the condition of the substrate? Is there deterioration? What is the percentage of patching?
- **Roof – Space for Solar:** Yes/No; Comments, if applicable. Space on roof for solar: Do relatively flat areas exist for possible future solar panels? It should be noted that the roof structure was not reviewed for structural capacity. Criteria noted; however, presence or absence of photovoltaic panels did not impact overall building condition.

Façade: Condition status noted for the exterior wall material(s). What is the façade material? If brick or concrete masonry unit (CMU), is any spalling or disintegrating? What is the condition of the mortar? What percentage of it is failing? Is there any obvious movement or structural cracking? If the façade is made of a prefabricated panel system, what is its surface condition? Is the surface or caulking deteriorating? What is the attachment system and its condition? Is there any movement in the panels?

Windows: Condition status noted. Are the windows transparent? What percentage of the windows are translucent in the school? Do they comprise a single or double pane of glass? Have their seals failed? Are their mechanical systems working? Does their hardware work? Are there any obvious alignment failures? Do they have closing-limiter devices?

Boilers: Condition status noted. Have boilers upgraded fuel type and heating media? Water or steam? Review of any maintenance records or inspections.

Heating Distribution Systems: Condition status noted. Piping condition, type, and apparent corrosion reviewed.

Ventilation Distribution Systems: Condition status noted. Location and appearance of exhaust fans. Location and appearance of air-conditioning equipment. Condition of ductwork.

Electrical Service: Condition status noted. Review of available capacity. Review of location and appearance of electrical service and meter age.

Existing Photovoltaics: Are there any present? Yes/No; Criteria noted however presence or absence of photovoltaic did not impact overall building condition.

Life Safety

- **Means of Egress:** Condition status noted. Are there proper smoke and/or fire doors? Do the mechanical hold-open devices work? Are there illuminated exit signs and are they in the proper location? Is the path of egress direct and unencumbered? Is there a proper number of exits with regard to the facility population?
- **Fire Protection (Sprinklers):** Condition status noted. Type and age of system and components. Review of maintenance records and certifications, if available.
- **Fire Alarm:** Condition status noted. Type, age, and appearance of systems. Review of available testing records.

Assessment Team Scoring Rubric

Security

- **Entry Sequence:** Most, if not all, schools have a camera/buzzer system at their main entrance. By today's standards, that is not adequate. Proximity of the main entrance to the main office is essential. This allows for direct observation of the entire person, as well as control of their movements.
- **Lighting Quality/Control:** Observed light level at the working surface (not measured) combined with the type of light fixture for an even dispersion of light for general academic tasks as well as for use of technology. Condition status noted. What is the lighting system? How are the lights controlled? Where is the lighting control located? Is the lighting system uniform within the space being reviewed? What is the percentage of units not working?

Toilets and Fixtures: Condition status noted. Fixture locations and appearance. Maintenance and cleanliness of fixtures and flow of fixtures.

Plumbing Distribution Systems: Condition status noted. Review of piping type, apparent corrosion, and equipment, including presence or absence of water heater & back-flow preventer.

Accessibility: Is the facility compliant with the Americans with Disabilities Act of 1990? Are there adequate ramps, lifts, and elevators? Can every space in the facility be accessed by anyone with a disability? Is the door hardware compliant and does it maintain proper distance from a perpendicular wall? Are water fountains and other hallway obstacles compliant? Are toilet facilities compliant?

Structural Systems

The assessment team conducted visual inspections only to look for signs of deterioration. No exploratory demolition, removing finishes, or viewing above ceilings was conducted. There were areas that were hard to reach, off limits, or obscured by other systems that prohibited view of the structure. Each of the criteria listed below is considered as it relates to the structural elements of the building.

A “**Yes**” comment in the assessment indicates that we observed signs of deterioration. A “**Not Observed**” comment in the assessment indicates that we either did not observe any distress in the structural element or were not able to observe the element due to the aforementioned limitations. Therefore, a “Not Observed” does not necessarily mean that there is no distress present. Notes in the “**Comments**” section of the assessment are typically provided when the team observed signs of deterioration.

- **Roof structural framing:** Because the framing is covered by roofing, observations are usually made from below. Water leaks are a common cause of damage to roof framing so part of the visual assessment is to look for signs of water damage. With wood framed structures, this can be mold or rotting wood. In structures with metal deck, it can be rusting of the deck and in concrete structures it can be cracks with rust stains or spalled concrete. Spalled concrete is where a section of concrete has broken off. This is usually caused by water penetrating into concrete through small cracks causing the steel reinforcing to rust and expand putting outward pressure on the concrete and causing it to break off.

Assessment Team Scoring Rubric

- **Floor structural framing:** Common signs of deterioration in floors can be cracks in floors finishes (such as terrazzo), cracks in the bottom of concrete slabs or beams, water damage similar to that in roofs and longitudinal cracks (or checks) in wood framing. Cracks in floor finishes while cosmetically objectionable is not necessarily an indication of a structural failure. There are several causes for cracks in wood framing members (joists or beams) and it does not necessarily mean the member is structurally inadequate.
- **Walls/columns:** Walls are typically framed with masonry, concrete, or wood or light gage metal studs with varying finishes. Columns typically consist of steel, concrete, or wood posts and can also be masonry piers. Common signs of deterioration in concrete and masonry walls are cracks in the walls. Usually the cracks run vertically (bottom to top) although in masonry walls the cracks often follow the mortar joints between the masonry units. Cracks in walls can be caused by many factors: shrinkage in the wall due to changes moisture or temperature, movement of the supporting structure, or stresses in the wall caused by other loads. Concrete columns can have spalled concrete, wood posts can have longitudinal cracks (similar to floor members) and masonry piers can have cracks similar to walls.
- **Foundations:** There are numerous types of foundations including shallow spread footings (concrete pads) and deep foundations such as caissons and piles that extend deep into the ground. Foundations generally include concrete components and are located below ground – making the system difficult to observe without performing some excavation. Some common signs of deterioration in foundations are cracks in foundation walls and areas where there has been vertical movement indicating that there may have been some settlement of the structure over time. The causes of the cracks are similar to those described for walls and it is common for structures to undergo some settlement over time.
- **Facades:** The structural components of the façade are typically the wall structure (see “Walls” above) but can also include the structural framing for overhangs or other horizontal elements that are part of the walls. Like roof framing, moisture is a common cause for distress in facades. Common signs of distress are spalled concrete, cracks in concrete or masonry walls, and rusting steel members such as angle lintels over window and door openings in masonry walls. As discussed previously, some of these signs of deterioration do not necessarily indicate a structural deficiency and might only require maintenance.
- **Identifiable Lateral System:** There are several types of lateral load-resisting systems such as steel braced frames or shear walls consisting of concrete or masonry walls. Often, steel braced frames are buried inside walls making them difficult to identify and it can also be difficult to determine if a masonry wall is a shear wall or just a partition wall. In addition, it is not possible to determine the structural adequacy of shear walls or braced frames without an in-depth investigation and it should be noted that many masonry walls in older buildings have little or no reinforcing. Common signs of distress in concrete and masonry shear walls are similar to those described for walls above.

Overall Facility Condition

Each of the assessment items is categorized into primary and secondary considerations as determined by the BPS executive team. The primary considerations are weighted by a factor of (3) in order to differentiate the elements that (1) require significant time to repair or replace, (1) construction costs greater than the singular element's cost factor, and (1) create a construction challenge (degree of difficulty) in order to repair. The weighted scoring allows for the most critical criteria to establish the Overall scores and not be overly influenced by important but more readily repaired/replaced elements

Assessment Team Scoring Rubric

Community

Mass Historical Commission Status: Yes/No; Comment, if applicable. Criteria will inform opportunities and constraints for modifying the existing building to meet changing physical demands for a 21st century learning environment.

- **Inventory of Historic Assets:** Yes/No; Comment, if applicable. Is the building “Listed” on the State’s Inventory of Historic Assets? Criteria will inform opportunities and constraints for modifying the existing building to meet changing physical demands for a 21st century learning environment.
- **State Register of Historic Places:** Yes/No; Comment, if applicable. Is the building “Listed” on the State’s Register of Historic Places? Criteria will inform opportunities and constraints for modifying the existing building to meet changing physical demands for a 21st century learning environment.

Emergency Shelter: Yes/No; Comment, if applicable. The City of Boston provided a list of all shelters to SMMA. Criteria noted and considered as part of the overall community building score.

Community-Use Spaces: Yes/No; Comment, if applicable. These were determined after speaking with school administration during site visits. Community spaces attached to schools were also considered. Criteria noted and considered as part of the overall community building score.

Building Suitability for School Use: Yes/No; Comment, if applicable. Considered any major life-safety concerns for suitability. Criteria will inform opportunities and constraints for modifying the existing building.

Overall Community Building Rating

This is a judgment on the part of the reviewer(s) that takes into account all aforementioned factors, as well as amenities located in proximity to school sites and access to public transportation.

Assessment Team Scoring Rubric

2. Site Evaluation Criteria

The site evaluation team performed assessments at each school facility in the district's portfolio. These assessments considered the quality, condition and capacity of the various exterior spaces of the facility. These spaces included, landscaped, educational, recreational, vehicular and pedestrian areas. This field effort was also complimented with a detailed study and research of the sites from web-based resources. The resulting information was then used to guide recommendations regarding maintenance, renovation, and/or replacement.

The diverse scope of site elements for schools vary in their relative impact to education and school operations. Primary considerations are elements that have large impacts to education and/or incur substantial impact to improve or repair.

Primary Considerations:

MAAB/ADA Accessibility	Walkways/Curbs/Sidewalks
Play Areas	Drainage
Parking Quality	

Secondary Considerations:

Drop-Off/Pick-Up Routes	Walls & Slopes
Site Lighting	Fencing
Neighborhood Streets	

Criteria Rating Hierarchy

The site evaluations were judged on a scale as defined below:

- **Adequate:** Element is functioning well, and only requires routine maintenance.
- **Minor:** Element is functioning, and requires both repair and routine maintenance.
- **Moderate:** Element is functioning minimally, and requires substantial repair by a specialist.
- **Replace:** Element is not functioning correctly, and requires replacement.
- **Not Present:** Element does not exist or completely failed. This element should be replaced and/or provided. In some instances (e.g. parking, walls/slopes and fencing) this element is not required.

Evaluation Criteria

Physical Analysis

Is the Site Susceptible to Climate Change? Yes/No; Comments, if applicable. The site is susceptible to climate change and sea-level rise over the next 50 years if it is located within the 100-year flood zone and/or within 5 feet (vertical) of Mean Annual Higher-High Water (MHHW). The site is susceptible to climate change and sea-level rise over the next 100 years if it is located within 7.5 feet (vertical) of MHHW. Criteria will inform opportunities and constraints for modifying the existing building.

Major Investments in the Last 10 Years (>\$5 Mil.)? Yes/No; Comments, if applicable. Criteria included as a reference, to note any recent upgrades to buildings and sites. Any portions of the facility that have received investments were evaluated as their current condition.

Is the Building Expandable on the Current Site? Yes/No; Comments, if applicable. The building is structurally and educationally capable of logically expanding on its current site and meeting the educational vision goals and potential program requirements for a 21st century school. Expansion can be horizontal, vertical, or infill, depending on the building's configuration.

Assessment Team Scoring Rubric

Parking Quality: Quality of vehicle paving and quantity of parking spaces considered. This element may not be required if “Not Present”.

Neighborhood Streets: Condition of roadway, sidewalks, and accessible elements considered.

Drop-Off/Pick-Up Routes: Segregation of buses, private vehicles, parking, and neighborhood traffic considered. Both on-site and off-site routes considered. This element may not be required if “Not Present”.

Walkways/Curbs/Sidewalks: Quality of all pedestrian spaces considered.

ADA/MAAB Accessibility: Availability, location and condition of accessible routes considered. The accessible routes connect building entrances, handicap parking, public streets and site facilities. Accessibility is considered “Not Present” if there is no accessible building entrance.

Site Lighting: Condition and location of lighting considered.

Fencing: Condition of fencing and gates of various types considered. This element may not be required if “Not Present”.

Drainage: Surface ponding, water quality structures, and condition of visible infrastructure considered.

Play Areas: Play structures, surfacing, courts, athletic fields, and outdoor classrooms considered. This element may not be required if “Not Present”.

Walls and slopes: Condition of retaining walls and stabilized slopes considered. This element may not be required if “Not Present”.

Overall Site Condition: The considerations are weighted by factors of (3) and (1), to differentiate between elements that are easily remedied or replaced and those that require significant time and cost, and create construction challenges (degree of difficulty) to repair. The primary and secondary considerations are listed under each assessment category above. The overall site condition is a combination of all weighted factors.

The SMMA team comprised multiple professional architects, civil engineers, landscape architects, and educational planners that cross-checked data.

Community

Mass Historical Commission Status

Inventory of Archeological Assets (Site Review): Researched/Not Researched; Comment, if applicable. Criteria will inform opportunities and constraints for modifying the existing building. In some cases, data may not be available.

Accessible to Mass Transit: Building is located within a 0.7-mile walking distance from the nearest Blue, Red, Orange, and/or Green Line MBTA station, or is located within 2 blocks (1000 feet) of at least 2 stops on bus lines of regular frequency (at least every 10 minutes, during rush hour and mid-afternoon). Criteria noted and considered as part of the overall community building score.

Bikability

- Wide sidewalks and/or low-traffic streets
- Adjacent to or within a residential neighborhood, without crossing busy & wide (4+ lanes) streets
- Not located on a steep street

Facility is considered bikable for “adults only” if within 4 miles of multiple residential neighborhoods, without riding on busy streets that lack dedicated bike areas. Criteria noted and considered as part of the overall community building score.

Assessment Team Scoring Rubric

Walkability

- Consistent, accessible sidewalks with crosswalks
- Adjacent to or within a residential neighborhood, without crossing wide (4+ lanes) streets

Facility is considered walkable for “adults-only” if within 1 mile of residential neighborhoods, with consistent sidewalks. Criteria noted and considered as part of the overall community building score.

Site suitability for school use? Yes/No, Comment if applicable. Considers overall site conditions, overall community rating, and size of site.

Overall Building – Community Condition:

This is the professional judgment on the part of the reviewer(s), taking into account all aforementioned factors and with consideration of nearby neighborhood, community, educational, and athletic facilities. Criteria noted and considered as part of the overall community building score.

Assessment Team Scoring Rubric

3. Educational Analysis

Educational Facility Effectiveness (EFE)

The quality of physical environments has direct impact on educational outcomes. This analysis considers both inherent building characteristics and introduced equipment (e.g., furniture and technology), as well as the physical appearance and condition. These qualitative factors influence students' comfort and ability to concentrate on tasks, teacher and student health, absenteeism and retention—ultimately having an impact on overall performance.

Building environments also affect overall rating. In those cases, “fixed” elements that are not easily remedied and have a direct impact on teaching and learning weigh more heavily than those that can be easily altered. The more impactful components are referred to as primary considerations. Secondary considerations can be updated or supplemented more easily.

Primary considerations:

Ventilation	Natural Daylighting
Lighting Quality	Air Quality
Acoustical	Environment (Inviting/Stimulating/Comfortable)

Similar to the physical facility narrative, in many instances, the EFE-LE primary considerations affect multiple other criteria and systems, and are deeply systemic in their repair or replacement. Buildings may need to be unencumbered of students (i.e., vacant) for the duration of the work, depending on the upgrades required.

Secondary considerations:

Technology: Power	Technology: Wireless
Technology: Interactive	Furniture
Finishes	Adjacencies of Learning Environments
Outdoor Classrooms	

Again, similar to the physical facility narrative, secondary considerations often consist of singular systems, and are more “standalone” in their repair or replacement. They may also change frequently, with the evolving landscape of educational pedagogy, and should support a building that can adapt flexibly at relatively lower costs. Many secondary-consideration upgrades may be able to be performed internally by facilities personnel or with arranged contracts.

Criteria Rating Hierarchy

The educational facility effectiveness assessment for learning environments used a quintile classification hierarchy as defined below:

- **Excellent:** Elements meet needs for 21st century teaching and learning
- **Good:** Elements contribute to teaching and learning
- **Fair:** Elements somewhat interfere with teaching and learning
- **Poor:** Elements detract from or interfere with teaching and learning
- **Deficient:** Non-existent or inoperable systems or elements

Assessment Team Scoring Rubric

Evaluation Criteria

Building Originally Designed As: Over time, many school buildings have changed the grades they serve. Knowing their original use quickly provides some insight into space types and building appointments.

The Grade Configuration to Which This School [Building] Is Best Suited: The types, numbers, and sizes of spaces, as well as the sites, may influence the building's future use.

Ventilation: Fresh air is an important component for good brain activity and overall student performance. An even distribution of ventilated air is also important. Is mechanical ventilation provided? What appears to be the quality of the system?

Natural Daylighting: This is viewed as a better quality of light than electrical lighting. What appears to be the quantity/quality of the natural light?

Lighting Quality: Observed light level at the working surface (not measured) combined with the type of light fixture for an even dispersion of light for general academic tasks as well as for use of technology.

Air Quality: Different ventilation systems provide varying levels of outdoor air percentages and filtration (e.g., unit ventilators vs. central air ventilation vs. no mechanical ventilation provided). What appears to be the quality being provided by the mechanical system? Scientific measurements were not taken.

Acoustical: The proper balance between voice reinforcement and sound absorption impacts "speech intelligibility." This includes both internal space performance and outside noise. Does the space appear to have appropriate acoustical properties for teaching and learning?

Technology

- **Power:** Are there sufficient electrical outlets to support a future technology-rich classroom/school? Are they properly distributed throughout the space?
- **Wireless:** Are there sufficient access points throughout the school to support a 1:1 technology environment? Is the building served by fiber optic wiring? Is the main distribution room (i.e., server room) air-conditioned, to help ensure system reliability?
- **Interactive:** Do the classrooms and other teaching spaces have working interactive technology, such as interactive marker boards and document cameras?

Furniture: Different educational-delivery models can be reinforced by furniture type and flexibility. Is the furniture light enough in weight to be flexibly arranged? Is it ergonomic, comfortable, and in good condition?

Finishes: What is the condition of the wall/floor and ceiling finishes? Both physical and aesthetic conditions were considered.

Environment (Inviting/Stimulating/Comfortable): Is this a building that is aesthetically pleasing? One in which students and teachers feel comfortable and want to spend time, day after day?

Adjacencies of Learning Environments: Do classrooms and other learning environments have a relationship to each other that promotes collaboration, communication, and other aspects of 21st century teaching and learning? Do the spaces promote interdisciplinary learning?

Outdoor Classrooms: Outdoor classrooms afford students the opportunity to learn in different ways, sometimes involving nature and hands-on activities. Is one or more present?

Assessment Team Scoring Rubric

Overall EFE – BA Rating

The considerations are weighted by factors of (3) and (1) in order to differentiate between elements that are easily remedied or replaced and those that require significant time, cost, and create a construction challenge (degree of difficulty) in order to repair. The primary and secondary considerations for each assessment category are listed under each assessment category above. The overall facility condition is a combination of all weighted factors.

It should be noted that, a good reference for these building components issues is: Schneider, M. 2002, Do School Facilities Affect Academic Outcomes?, National Clearinghouse for Educational Facilities.

The Site includes

Playgrounds/Play Areas: Are there hard surface play areas on the school site? Play structures that are age-appropriate to the school children? What is their condition?

Accessible: Are the play areas, including the ground surface/material, accessible to children with handicaps? What is their condition?

Play Fields: Are soft (e.g., grass) play fields or areas on the school site? What is their condition?

Flexibility in Building Typology: Can the building serve alternative grade levels or support a special needs-focused curriculum?

Educational Transformation to Support 21st Century Needs: Is the building construction flexible enough to allow for renovations that, for example, change room sizes, change or upgrade mechanical and electrical systems, and accommodate alternative educational-delivery methods (e.g., project-based learning [PBL])? This can often be the difference between a modern steel-frame building and interior masonry-bearing wall construction.

Can the Building Serve as Swing Space?: (Assumes the building is otherwise unoccupied.) The ability to use the building for educational purposes for the temporary relocation of a school population during a period of renovation or construction.

Utilization Rate: Is the building's utilization rate 85% or higher? Classrooms at 85% utilization are considered at capacity. Rates higher than 85% show levels of overcapacity and overcrowding.

Assessment Team Scoring Rubric

4. Educational Facility Effectiveness – Spaces

The Educational Facility Effectiveness – Spaces (EFE-S) metric compares the sizes of educational spaces to Massachusetts 963 CMR guidelines for 21st century teaching and learning in new capital projects. This quantitative analysis is important for establishing the level of adequacy of the existing spaces for educational delivery. It also indicates whether a facility is deficient/missing dedicated educational spaces normally found in buildings of its grade level and typology.

Primary considerations often affect core curriculum and include:

- Classrooms (Depending on Typology, These Include Pre-K and Kindergarten)
- Teacher Planning
- Small Group
- Science
- Art
- Music
- Vocations and Technology
- Media Center
- Cafeteria

Secondary considerations may allow for district flexibility in programming and community resources outside the traditional building environment, and include:

- Gymnasium (Because this program space Is sometimes served by local community spaces)
- Gymnasium Options
- Auditorium
- Stage
- Medical
- Administration & Guidance
- Air Conditioned Technology Network Room

Other considerations

- Special Education: Self-Contained
- Special Education: Resource or Small Group

Note: If a school has a special education program, its quantity of spaces will vary. Also, some substantially separate programs do not require full-size classrooms to be effective. For this reason, special education was considered differently than typical classroom spaces.

Assessment Team Scoring Rubric

Criteria Rating Hierarchy

The educational facility effectiveness assessment for spaces used a quintile classification hierarchy as defined below:

- **Excellent:** Exceeds Massachusetts 963 CMR NSF guidelines (+10% or greater)
- **Good:** School facilities are appropriate to house current enrollment and educational program. NSF meets Massachusetts 963 CMR guidelines (-10% to +10%)
- **Fair:** School facilities appear to be adequately sized for current enrollment and educational program. NSF somewhat less than Massachusetts 963 CMR (-10% to -20%)
- **Poor:** School facilities may not be adequately sized for current enrollment and educational program. Net square footage (NSF) at least 20% less than Massachusetts 963 CMR guidelines
- **Deficient:** Dedicated space does not exist.

Narratives

The team considered the long-term goals relative to each building's capability of supporting BPS' educational vision for 21st century learning and teaching.

Engaged Learning

Engaging with the curriculum, applying it to an authentic context. Making connections between content areas and values/curiosity and interest. Finding connections to the community, making a difference. Public and tangible products. Selective and intentional engagement, agency in how one keeps focused and takes breaks.

- The building (is/is not) comfortable to learn in.
- The building (has/lacks) appropriate temperature control and ventilation.
- The building (has/lacks) a space that can be used as a flexible learning commons for collaborative learning and presentations.
- The building (makes use/does not make use) of public space for teaching and learning.
- The building (provides/lacks) display space for student work to reinforce student accomplishments.
- The building (provides/lacks) space for teacher collaboration and planning.

Differentiated Learning

Acknowledging different learning styles, how to understand one's own (self-knowledge). Flexibility that is occurring in instruction, plus flexibility in how people show that learning.

- Classrooms (are/are not) large enough to support Universal Design for Learning (UDL), including the ability to create learning zones.
- The building (has/lacks) breakout spaces for differentiated/personalized learning and special education.
- The furniture in the building (can be/has difficulty being) flexibly arranged.

Assessment Team Scoring Rubric

Cognitively Demanding Tasks/Programs

- The classroom environment (is/is not) sufficiently flexible to allow for different teaching and learning styles.
- Building (supports/lacks) learning environments that support music.
- Building (supports/lacks) learning environments that support art.
- Building (supports/lacks) learning environments that support physical activity/education.
- The building environment (supports/does not support) STEM adequately.
- The building (provides/lacks) space to experiment, create and collaborate.
- The building (has/lacks) performance/presentation space.
- Based on location and proximity to community resources and public transportation, teachers and students (can/have difficulty) access(ing) the City as a learning tool.

Equitable Access to a Rigorous Curriculum

Access is the core issue. What is meant at different grade levels regarding a minimum number of rigorous courses? Drill down in a detailed way, identifying benchmarks that align to equitable access. Example: If one wants students in calculus by the end of high school, then completion of algebra must be benchmarked.

- The building (is part of/is not clearly) an equitable pathway from K through 12.
- The teaching and learning spaces (are/are not) operated and maintained equitably.
- The building (is secure/lacks adequate security) for a safe environment for learning.
- The building (has/lacks) a welcoming and coherent entry sequence.
- The building (provides/lacks) space for de-escalation and sensory calming.

Vision of 21st Century Digital Learning

Anytime, anywhere learning, often related to “**distance learning**,” but can also be from anywhere within the school building, campus, or home. Best accomplished with portable technology, either personal (BYOD – bring your own device) or school-supplied; it can extend the learning process within or beyond the school day.

The building has internet infrastructure for all classrooms and public spaces, including a fiber optic backbone, switches, and wireless access points. The system is likely insufficient to support 1:1 or laptop-based standardized testing.

- The building (is/is not) flexible and expandable.
- The building (does/does not) connect on multimedia platforms for cross-disciplinary programming.
- Digital arts and media integral to more traditional Science, Technology, Engineering, and Math (STEM) initiatives.
- More recent goals include the incorporation of the arts and creative elements of education embodied in STE(Arts)M.

Assessment Team Scoring Rubric

Overall EFE Rating

Massachusetts School Building Authority (MSBA) Areas are based on current enrollment within school. Actual areas were determined by measuring CADD plans provided by BPS.

SMMA did not field-measure the buildings, but verified general conformity with existing conditions by measuring spot values to determine the rough accuracy of CADD drawings.

- **Excellent:** Elements meet needs for 21st Century teaching and learning.
- **Good:** Elements contribute to teaching and learning.
- **Fair:** Elements somewhat interfere with teaching and learning.
- **Poor:** Elements detract from or interfere with teaching and learning.
- **Deficient:** Non-existent or inoperable systems or elements.