10-Year Educational and Facilities Master Plan

A4LE LearningSCAPES 2017
Introduction
Q: The single most important element needed?
A: An Actionable Framework

Clear educational goals and guiding principles —

Certainty from Pre-K to grade 12 that informs priorities for action

134 School Buildings
127 Schools
56,000 Students
<table>
<thead>
<tr>
<th>SMMA</th>
<th>Mass Insight</th>
<th>New Vista</th>
<th>SMMA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MGT</strong></td>
<td>National Leader &amp; Large Urban Districts</td>
<td>Local Insight – 40+ Years of BPS Knowledge</td>
<td>Visioning &amp; 21st Century Leadership</td>
</tr>
<tr>
<td><strong>PARSONS BRINKERHOFF</strong></td>
<td>Facility Assessment</td>
<td>Funding Options</td>
<td></td>
</tr>
<tr>
<td><strong>SMMA</strong></td>
<td>60 Years Young</td>
<td>180 Person Integrated Design Firm</td>
<td>Most MA School Experience in last 20 years</td>
</tr>
</tbody>
</table>
BPS Masterplan: Five Components

- Educational Planning
- Demographics
- Educational & Facilities Assessment
- Community Engagement
- Financial Planning
City of Boston
What should the master plan be?

Healthy Environments
Community engagement tool kit
Equity
Database
Fix Transportation
Universa I Learning
Create Coherence
Educational Plan for 21st Century
Innovate
Work orders
Neighborhoods
Access to Technology
Demographics

Boston Historical Population Trends

In order to estimate projected BPS enrollment, we first needed to understand Boston’s historical population trends.

1. The population of Boston is growing.
2. However, growth is occurring among older segments of the population, not among younger segments.
3. Additionally, fewer children are being born in Boston.
Findings: Overall Population

1. Boston’s population is growing but...

Source: U.S. Census Bureau.
Findings: Birth Rate and Kindergarten Enrollment

3. Fewer children are being born.

![Historical Live Births Graph](image-url)
**BPS Historical Enrollment Trends**

Understanding BPS’s historical enrollment trends:

1. The proportion of K-12 students enrolled in BPS has been declining over time because:
   a. Boston is growing older and fewer children are being born
   b. Charter growth is impacting BPS’ capture rate

2. The number of Pre-K students in BPS has increased over time because BPS has gained Pre-K market share.

3. However, BPS is historically losing students between grades 5 and 8 with some restoration of enrollment in grade 9.

4. Demand for schools and enrollment varies by neighborhood.
**Recommendation**

Maximize MSBA funding potential

The City of Boston is not getting an equitable return from the MSBA.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Number</th>
<th>Unit</th>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>Boston State Overall Tax Contribution</td>
<td>20%</td>
<td>% of total MA overall tax receipts</td>
<td>Boston Redevelopment Authority</td>
</tr>
<tr>
<td>Boston State Sales Tax Contribution</td>
<td>10%</td>
<td>% of total MA sales tax receipts</td>
<td>Boston Redevelopment Authority</td>
</tr>
<tr>
<td>Boston K-12 Schools</td>
<td>7%</td>
<td>% of total MA K-12 schools</td>
<td>MA Dept of Education &amp; Secondary Education</td>
</tr>
<tr>
<td>Boston Student Enrollment</td>
<td>6%</td>
<td>% of total MA enrollment</td>
<td>MA Dept of Education &amp; Secondary Education</td>
</tr>
<tr>
<td>Boston portion of FY15 MSBA funding</td>
<td>1.2%</td>
<td>% of projected FY15 MSBA Grant allocations</td>
<td>FY15 MSBA Budget Presentation ($611M in FY15 grants); FY14 City of Boston CAFR (Avg. of $7M in MSBA receipts from FY15-19)</td>
</tr>
<tr>
<td>Equitable FY15 MSBA funding share for Boston</td>
<td>$37M</td>
<td>2015 Dollars; millions</td>
<td>6% of $611M in FY15 MSBA grants</td>
</tr>
</tbody>
</table>
**Recommendation**

*Alternative delivery should be a key component of BPS’ financial plan*

P3s and joint development can:

- Accelerate project delivery
- Decrease costs, and
- Leverage strategic opportunities to increase revenue potential

<table>
<thead>
<tr>
<th>Concept</th>
<th>Description</th>
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| Public-Private Partnership    | • Procure one or several new facilities using a design-build-maintain (DBM) or design-build-finance-maintain (DBFM) structure  
                               | • Influx of private funds can accelerate delivery  
                               | • Transfer delivery and maintenance risk to private sector  
                               | • Significant lifecycle efficiencies                                                                                                                                                              |
| Joint Development             | • Optimize strategic opportunities for use of real estate assets  
                               | • Land Lease/Sale: lease/sell land or development rights to a developer  
                               | • In return for any up front fees from a sale, or recurring fees from a lease, the developer will typically help with construction costs of a new facility  
                               | • This holds significant potential given increased developer interest surrounding the Olympic bid                                                                                                       |
**WSP/PB has helped clients identify new funding sources**

<table>
<thead>
<tr>
<th>Client/ Project</th>
<th>Details</th>
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</table>
| Sound Transit (Seattle) Long-Range Financial Plan Development and Ballot Measure | • PB led consultant team for $18B financial plan  
• 2007: State legislature issued directive to develop joint regional roads and transit package  
• 2008: PB & Sound Transit crafted package leading to adoption of 15-year, $18B plan |
| Massachusetts DOT Service Plaza Study | • PB currently helping MassDOT maximize revenue from highway rest area real estate assets  
• Preliminary recommendations include use of sponsorships, advertising, and P3 |
Boston and BPS’s new reality

Mayor Walsh elected to office in 2013.

Superintendent Chang hired in Spring 2015.

Imagine Boston 2030 Master Plan launched in Summer 2015.

Metro Boston: Top 5 highest real estate and construction costs in nation.
BPS’s prior “Master Planning” efforts

- 1993 Wallace Floyd Report (Inventory + Condition Analysis)
- 1995/96 Community Learning Centers: Blue Ribbon Commission’s School Buildings Capital Master Plan
- 2012 MSBA Core Projects – 3 New High Schools
- 2013 BPS Revised Assignment Policy (MIT)
- 2014 Boston Foundation + BPS
  - The Path Forward: School autonomy and its implications for the future of Boston’s Public Schools
- 2014/15 McKinsey Report: City of Boston, (BPS)
BPS’s Environment

- Top urban district nationally
- Part of Great Cities Consortium (“who we measure ourselves against”)
- National model for Pre-K education (K1 + K2)
BPS Approach
Scope & Budget Challenges

Pilot Study
- Test methodologies
- What matters?
- Team building
- Data discovery
BPS Approach: Pilot Study

Looked at very different types of schools

1. Historic building with a 2009 addition & community use space – (Boston Public Library branch)
2. Split campus inclusion school (K-12)
3. 1970’s open plan building
   - Designed as a technical high school (never used)
   - Open plan junior high
   - Recent elementary school
   - K-8 school with community use space – (public pool)
BPS Approach: Pilot Study
Burke High School
BPS Approach: Pilot Study

Burke High School
**BPS Approach : Pilot Study**

**Burke High School**

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**MSBA Space Summary - High Schools**

### Burke High School

<table>
<thead>
<tr>
<th>room type</th>
<th>existing conditions</th>
<th>•room NFA</th>
<th># of RMS</th>
<th>area totals</th>
<th>% dif.</th>
<th>MSBA guidelines</th>
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<tr>
<td><strong>Dining &amp; Food Service</strong></td>
<td></td>
<td>7,192</td>
<td>3</td>
<td>3,106</td>
<td>-17%</td>
<td>7,384</td>
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<tr>
<td>Cafeteria / Student Lounge / Breakfast Room</td>
<td></td>
<td>7,192</td>
<td>3</td>
<td>3,106</td>
<td>-17%</td>
<td>7,384</td>
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<tr>
<td>Lunch / Snack Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Other</strong></td>
<td></td>
<td>3,165</td>
<td>1</td>
<td>3,165</td>
<td></td>
<td>0</td>
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<tr>
<td>Family Center</td>
<td>533</td>
<td>1</td>
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<tr>
<td>Student Activities</td>
<td>365</td>
<td>1</td>
<td>365</td>
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<tr>
<td>ROTC Office</td>
<td>140</td>
<td>1</td>
<td>140</td>
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<tr>
<td>ROTC Classroom</td>
<td>495</td>
<td>3</td>
<td>1,485</td>
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<td>Public Library / Community Center</td>
<td>21,271</td>
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*Note: Public Library Space NOT included in MSF or GSF values below*

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<td>Total Building Net Floor Area (NFA)</td>
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<td>116,757</td>
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<td>Proposed Student Capacity / Enrollment</td>
<td></td>
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<td>782</td>
<td>782</td>
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<tr>
<td>Total Building Gross Floor Area (GFA)²</td>
<td></td>
<td>215,200</td>
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<tr>
<td>Total School Gross Floor Area (GFA)²</td>
<td></td>
<td>185,850</td>
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<td>161,874</td>
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<td>Growing factor (GFA/NFA)</td>
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<td>1.71</td>
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<td>1.50</td>
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*Indicated deficiency cumulatively*
Pilot Study
Locus Plan
BPS Approach: Pilot Study

Lessons Learned

- Far more complicated than we first imagined.
- Some exciting things happening across the system educationally.
- State of facilities was alarming.
- Hard to see any logical patterns.
- Needed to do an intermediate phase to test methodology.
- High level of frustration evident within the system.
Community Engagement
Branding
Assets
Outreach

Data & Display
Querying & analysis
BuildBPS
Boston Public Schools
10-Year Educational and Facility Master Plan

General Overview
The Facility Master Plan (FMP) will provide a
framework for institutional reforms and capital investments
for Boston Public Schools facilities. The focus of the FMP
will be to illustrate capital planning opportunities based
on various elements of data and create an implementation
strategy that will be carried out over a 10-year timeline.

Aspirations & Objectives
Optimize Facility Operations
Support Access to Learning
Build for Flexibility
Embrace Environmental Stewardship
Incorporate the "New Learning" Concept
Improve Community Pride and Ownership

About BuildBPS
BuildBPS is designed to guide capital investment over
the next 10 years in an evolutionally, flexible, and
innovative manner. The plan is based on a comprehensive
analysis of existing facilities and a strategic framework
that will help address the needs of Boston Public Schools.

We want to hear from you.
Please provide your feedback on the plan and
suggest areas for improvement.

This is not just about constructing
ewell-constructed
buildings. It's about creating
opportunities for learning and
innovation in our schools.

RFP Respondents:
Please refer to the RFP for specific
requirements and deadlines.

BPS Superintendent
Please provide your feedback on the plan and
suggest areas for improvement.

Boston Public Schools
10-Year Educational
and Facility Master Plan

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Educational Assessments
Elements of the Educational Planning

- Visioning
- Educational assessments of all schools
  - Establishing criteria
- Grade configurations
- Portfolio
- Comparisons to other communities
- Identifying criteria for an Educational Plan
**BPS Approach: Phase 2**

- 19 Schools reviewed, less in depth than Phase 1
- Building and educational criteria set
- Multiple person teams for all schools (SMMA & MGT)
- Projects selected to span typologies and grade structure
- Traditional assessment process

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Name</th>
<th>Type</th>
<th>Address</th>
<th>BPS Historic Name</th>
<th>District Region</th>
<th>Age</th>
<th>SDR</th>
<th>Built</th>
<th>Reno date</th>
<th>Area</th>
<th>Pop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/20/16</td>
<td>8:00 AM</td>
<td>Team will meet at main office to interview custodical staff and Principal and briefly tour building together</td>
<td></td>
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<tr>
<td>8:30 AM</td>
<td></td>
<td>East Boston High School</td>
<td>High</td>
<td>96 White St, East Boston</td>
<td>East Boston</td>
<td></td>
<td>1926</td>
<td>2002</td>
<td>242505</td>
<td>1372</td>
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<tr>
<td>11:00 AM</td>
<td></td>
<td>Team will reconvene to discuss findings and meet with staff for any follow-up questions</td>
<td>Lunch</td>
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<td>12:00 PM</td>
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<tr>
<td>1:30 PM</td>
<td></td>
<td>Mildred A. Bradley</td>
<td>Elementary</td>
<td>110 Beechmont Rd, East Boston</td>
<td>East Boston</td>
<td></td>
<td>1926</td>
<td>33126</td>
<td>296</td>
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<td>2:00 PM</td>
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<td>Team will reconvene to discuss findings and meet with staff for any follow-up questions</td>
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<tr>
<td>8:30 AM</td>
<td></td>
<td>William/McGinley South End</td>
<td>Special</td>
<td>96 Warren Ave, Boston, McGinley</td>
<td>North East Boston</td>
<td></td>
<td>1939</td>
<td>78525</td>
<td>92</td>
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<tr>
<td>2:00 PM</td>
<td></td>
<td>Wakefield / Prescott</td>
<td>K-8</td>
<td>55 School St, Charlestown, Warren /</td>
<td>Charlestown</td>
<td></td>
<td>1903</td>
<td>59338</td>
<td>542</td>
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Visioning

**Charge:** Work with the superintendent’s leadership team to align priorities for modernizing school facilities with BPS’s educational vision

- (8) 2-3 hour Visioning session
- Superintendents Guiding Values
  - Equity
  - Coherence
  - Innovation
**BPS Approach: Phase 3**

- 107 Schools / 114 building reviewed, less in-depth than Phase 2
- Building and educational criteria tweaked
- Break-neck schedule, 3-5 schools reviewed per day, late April – mid June
- SMMA & MGT split educational assessments
- Same team for building assessments
- Survey Monkey used for recording
# Criteria for an Educational Assessment

## Learning Environments

### Educational Facility Effectiveness: Learning Environments (EFE: LE)

<table>
<thead>
<tr>
<th>Educational Facility Effectiveness: Learning Environments (EFE: LE)</th>
<th>Rating Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilation</td>
<td><img src="#" alt="Excellent" /> <img src="#" alt="Good" /> <img src="#" alt="Fair" /> <img src="#" alt="Poor" /> <img src="#" alt="Deficient" /></td>
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<tr>
<td>Natural Daylighting</td>
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<tr>
<td>Lighting Quality</td>
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<td>Air Quality</td>
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<tr>
<td>Acoustical</td>
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<td>Technology</td>
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<tr>
<td>Power</td>
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<td>Wireless</td>
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<tr>
<td>Interactive</td>
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<td>Furniture</td>
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<tr>
<td>Finishes</td>
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</tr>
<tr>
<td>Environment (inviting/stimulating/comfortable):</td>
<td><img src="#" alt="Excellent" /> <img src="#" alt="Good" /> <img src="#" alt="Fair" /> <img src="#" alt="Poor" /> <img src="#" alt="Deficient" /></td>
</tr>
<tr>
<td>Adjacencies of Learning Environments:</td>
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<tr>
<td>Outdoor Classrooms</td>
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</tr>
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</table>

### Overall EFE: LE Rating

| Overall EFE: LE Rating | ![Excellent](#) ![Good](#) ![Fair](#) ![Poor](#) ![Deficient](#) |
# Criteria for an Educational Assessment

## Space

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Quantity</th>
<th>MSBA Area</th>
<th>Actual Area</th>
<th>Adequacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-K (K0/K1)</td>
<td>3</td>
<td>1200</td>
<td>600/970</td>
<td></td>
</tr>
<tr>
<td>Kindergarten (K2)</td>
<td>0</td>
<td>1200</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Classroom (General Education) Gr. 1-5</td>
<td>17</td>
<td>960</td>
<td>450/760/160/10</td>
<td></td>
</tr>
<tr>
<td>Classroom (General Education) Gr. 6-8</td>
<td>20</td>
<td>960</td>
<td>700/830</td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>5</td>
<td>1200</td>
<td>780/880/160/20</td>
<td></td>
</tr>
<tr>
<td>Special Education:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self Contained</td>
<td>2</td>
<td>960</td>
<td>700/820</td>
<td></td>
</tr>
<tr>
<td>Resource of Small Group</td>
<td>2</td>
<td>560</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Art Classroom Gr. 1-5</td>
<td>1</td>
<td>1200</td>
<td>960</td>
<td></td>
</tr>
<tr>
<td>Art Classroom Gr. 6-8</td>
<td>0</td>
<td>1500</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Music Classroom</td>
<td>1</td>
<td>1200/1600</td>
<td>1070</td>
<td></td>
</tr>
<tr>
<td>Vocations and Technology</td>
<td>0</td>
<td>1200/1210</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Gymnasium</td>
<td>1</td>
<td>6600</td>
<td>4700</td>
<td></td>
</tr>
<tr>
<td>Media Center</td>
<td>2</td>
<td>2680</td>
<td>1310</td>
<td></td>
</tr>
<tr>
<td>Cafeteria</td>
<td>1</td>
<td>1970</td>
<td>4850</td>
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</tr>
<tr>
<td>Stage</td>
<td>1</td>
<td>1000</td>
<td>640</td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>varies</td>
<td>5/10</td>
<td>TOTAL: 640</td>
<td></td>
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<tr>
<td>Administration &amp; Guidance</td>
<td>varies</td>
<td>5/10</td>
<td>TOTAL: 640</td>
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<tr>
<td>AC Tech Network Room</td>
<td>0</td>
<td>260</td>
<td>0</td>
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<tr>
<td>Other:</td>
<td></td>
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<td></td>
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<tr>
<td>Auditorium</td>
<td>1</td>
<td>4250</td>
<td></td>
<td></td>
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<tr>
<td>Dance</td>
<td>1</td>
<td>870</td>
<td></td>
<td></td>
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<tr>
<td>Parent Center</td>
<td>1</td>
<td>210</td>
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</table>

### Educational Facility Effectiveness: Spaces (EFE)

<table>
<thead>
<tr>
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<td>Parent Center</td>
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<td></td>
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</tbody>
</table>
Criteria for an Educational Assessment

- Engaged learning
- Differentiated learning
- Cognitively demanding tasks
- Equitable access to rigorous curriculum
- Vision of 21st century digital learning
The Portfolio

- 1885 - Current
- 83 schools built prior to WW II, 65%

- Late 60’s- 70’s Building Boom – Open Plan
- 11 schools, 21%
Small Schools

- Small size of buildings
- Single strand
- No art, music, library, cafeteria, gym, proper Special Ed., other in some combination
- Student toilets only in basement
- Using basement space for T&L
Challenges:
- 23 grade configurations
- Consistency of curriculum and educational delivery
- Student movement – jockeying for a better school
- Academic opportunity gaps - accelerated programs
  - Advanced Work Class, grades 4 - 6
  - Exam schools 7-12
- Lack of Pathways from K - 12
Grade Configurations - Future
Going from 23 to 5

- ECC and ELC
- K1-6
- K-8
- 7-12
- 9-12

Challenges:
- Expand ECC and ELC schools
- Where does Pre-K go? Where do they belong?
- Do paired K-8’s remain?
- Add grades 7 & 8 to already small high schools
- All new schools to fit within new configurations
School Choice vs. Assignment

Washington Irving Middle, 6th Grade Students
Actual Feeder Schools: where did the students come?

Washington Irving 6th Grade

- Bates Elementary 15%
- Sumner Elementary 15%
- Hennigan Elementary 11%
- Ellis Elementary 5%
- Haley Elementary 5%
- New To Boston Public Schools 8%
- Mattahunt Elementary
- Young Achievers K–8
- Grow Elementary
- E. Greenwood Leadership
- Mather Elementary
- Mildred Avenue K–8
- Edison K–8
- BTU K–8 Pilot
- Dearborn Middle
- Jackson/Mann K–8
- Hernandez K–8
- Harvard/Kent Elementary
- Winthrop Elementary
Choice and Assignment
Pathways
Special Education

- Autism (18 schools)
- Emotional impairment, including fragile (26 schools)
- Severe intellectual impairment (2 schools)
- Mild intellectual impairment (17 schools)
- Moderate intellectual impairment (11 schools)
- Multiple disabilities (5 schools)
- Physical impairment (3 schools)
- Sensory impairment – hearing (1 school)
- Sensory impairment – vision (1 school)
- Specific learning disability (27 schools)
Early childhood and universal Pre-K
High school curriculum
Special education
ELL, English Learners – dual language, SEI, SLIFE
Reduce student movement
Good options, close to home
Capacity: Starting with McKinsey

BPS review suggested massive school closures

Consultant recommends BPS shut and sell up to 50 schools, slash central administration and increase student/teacher ratios

An outside audit of Boston Public Schools concludes the system needs to close and sell off between 30 and 50 of its 125 schools and make a wide range of staffing changes to balance its books and get BPS back on track towards bringing test scores up.
Capacity: Starting with McKinsey

Timeline and Methodology

- March 2015: McKinsey report came out which developed a capacity of 92,950 students
- August 2015: SMMA and BPS execute contract
  - Count every classroom (except resource rooms)
  - “A” size classrooms: 21-30 students
  - “B” size classrooms: 12 students
  - Did not consider “missing” programs
  - Did not consider special education “2nd seats”
  - Did not consider educational vision target for students per classroom
Capacity: Considerations
What is the right number of students in a facility

- “Seats” – Inclusion and 2nd seats
- Class size: target vs. allowable maximum by contract
- Support spaces (2nd seats)
- Utilization rates (differ by typology)
- Program offerings (educational vision vs. current)
- Grossing factors change based on construction date
- MSBA funding requirements
- Neighborhood school capacity vs. where students live
Capacity: 4 Different Methods

Capacity Methodologies

- McKinsey Report: 92,950
- BTU/Current Programmatic Range: 80,994
- Current Use: 65,220
- 21st Century Educational: 69,098

Enrollment: 55,997
Capacity: BTU/Current Programmatic Range

Methodology

- Creates a range
  - MSBA standard target class sizes and BTU contract maximums
- 90% utilization factor added to MS, 85% for HS
- Does not consider missing program spaces for enrichment or educational Vision
- Does not take into account reduced student numbers for:
  - academically talented or slow academic achievers, Structured English Immersion (SEI) classes, Bilingual Classes, and ESL classes with or without a paraprofessional
- Dedicated substantially – separate classrooms are not included in the classroom totals

### Students per Classroom Values for Current Programmatic Capacity

<table>
<thead>
<tr>
<th>Grades</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>LOW</td>
</tr>
<tr>
<td>K0, K1 (Pre-K)</td>
<td>15</td>
</tr>
<tr>
<td>K2</td>
<td>18</td>
</tr>
<tr>
<td>Elementary: grades 1–5</td>
<td>23</td>
</tr>
<tr>
<td>K–8: grades 1–8</td>
<td>24</td>
</tr>
<tr>
<td>Middle: grades 6–8</td>
<td>24</td>
</tr>
<tr>
<td>High 6/7–12</td>
<td>24</td>
</tr>
<tr>
<td>High 9–12</td>
<td>24</td>
</tr>
</tbody>
</table>
Capacity: Current Use

Methodology

- Developed by City of Boston
- Classroom use based on statue quo
- 90% utilization factor added to middle school classrooms
  85% utilization factor added to high school classrooms
- Does not consider missing program for enrichment or educational Vision
- Considers classrooms size
- Dedicated substantially-separate classrooms are included in the classroom totals
- Considers special education and ELL – but not as 2\textsuperscript{nd} seats
- GSF of building had no impact on overall capacity
Capacity: 21st Century Educational Methodology

- Uses MSBA standards
- MSBA standards assume 8% student population is SPED (BPS is 19.5% but moving towards inclusion)
- Assumes 1.5 grossing factor
- Assumes incorporation of dedicated space for enrichment
- Allows schools to be compared equally based upon GSF
- Dedicated non-school spaces were removed from GSF (including natatoriums, community centers, unusable space)
- Meets standards required for state funded construction projects
### Capacity: By Typology

**Methodology**

- Capacity must be viewed by typology in the short term

#### Enrollment by Typology

<table>
<thead>
<tr>
<th>Type</th>
<th>Enrollment SY15/16</th>
<th># of Seats</th>
<th>+/-</th>
<th>% at Capacity</th>
<th># of Seats</th>
<th>+/-</th>
<th>% at Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Learning</td>
<td>979</td>
<td>976</td>
<td>-3</td>
<td>100%</td>
<td>1,230</td>
<td>251</td>
<td>80%</td>
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<tr>
<td>Elementary</td>
<td>15,546</td>
<td>14,234</td>
<td>-1,312</td>
<td>109%</td>
<td>17,827</td>
<td>2,281</td>
<td>87%</td>
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<tr>
<td>K-8</td>
<td>16,517</td>
<td>14,579</td>
<td>-1,938</td>
<td>113%</td>
<td>19,712</td>
<td>3,195</td>
<td>84%</td>
</tr>
<tr>
<td>Middle</td>
<td>2,641</td>
<td>3,467</td>
<td>826</td>
<td>76%</td>
<td>4,594</td>
<td>1,953</td>
<td>57%</td>
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<tr>
<td>High</td>
<td>12,707</td>
<td>13,266</td>
<td>579</td>
<td>96%</td>
<td>17,102</td>
<td>4,395</td>
<td>74%</td>
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<tr>
<td>Exam</td>
<td>5,585</td>
<td>4,998</td>
<td>-587</td>
<td>112%</td>
<td>5,610</td>
<td>25</td>
<td>100%</td>
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<tr>
<td>Special</td>
<td>1,119</td>
<td>1,152</td>
<td>33</td>
<td>97%</td>
<td>1,326</td>
<td>207</td>
<td>84%</td>
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<tr>
<td>Vocational</td>
<td>903</td>
<td>2,804</td>
<td>1,901</td>
<td>32%</td>
<td>1,698</td>
<td>795</td>
<td>53%</td>
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<tr>
<td>Total</td>
<td>55,997</td>
<td>55,497</td>
<td>-500</td>
<td>101%</td>
<td>69,098</td>
<td>13,101</td>
<td>81%</td>
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</table>
### Capacity: By Neighborhood

#### Methodology

<table>
<thead>
<tr>
<th></th>
<th>Enrollment SY15/16</th>
<th>21st Century Educational Capacity</th>
<th>Current Use Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td># of Seats</td>
<td>+/-</td>
</tr>
<tr>
<td>Early Learning</td>
<td>196</td>
<td>158</td>
<td>-38</td>
</tr>
<tr>
<td>Elementary</td>
<td>3,583</td>
<td>3,266</td>
<td>-317</td>
</tr>
<tr>
<td>K-8</td>
<td>2,217</td>
<td>2,321</td>
<td>104</td>
</tr>
<tr>
<td>Middle</td>
<td>519</td>
<td>641</td>
<td>122</td>
</tr>
<tr>
<td>High</td>
<td>1,896</td>
<td>2,109</td>
<td>213</td>
</tr>
<tr>
<td>Exam</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Special</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vocational</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>8,411</td>
<td>8,484</td>
<td>83</td>
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<tr>
<td>Total Students Residing in Neighborhood</td>
<td>11,821</td>
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<tr>
<td>Difference</td>
<td>-3,410</td>
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</tbody>
</table>
Data Management
Assessments and Data Management

In the Beginning

1. RFP called for the data deliverable to be importable into an existing Maximo database
2. Indus was included in Interview to filter data for live input in the field
3. Project data was collected by SMMA staff in excel to serve as data backbone
4. Phase 1, 2, and 3 data and deliverables were different
5. Team was still unsure about what the final deliverable was going to be
**Status Quo**

**RFP and Interview**

Indus Software (Collection Tool)
- Proprietary software
- Costs associated with data hosting
- Data could not be extrapolated from software
- Software did not coalesce with Maximo

Maximo (Database used by BPS)
- BPS has not maintained data
- Data requested in RFP did not coordinate with existing Maximo fields
Thinking Outside the Data Box

- Collected in Survey Monkey
- Free software, required Wi-Fi connections/hot spots but could also work offline
- Data entry performed in the field on a tablet
- Data can be exported into excel format
- BPS owns data and can manipulate it easily
Assessments and Data Management

Phase 2:
- 19 Schools
- Data collected with Survey Monkey
- Space analysis, program current use plans and MSBA space comparison plans developed
- Small Reports
  - Facility Evaluation Criteria Sheets
  - School At-A-Gland
  - In-design merge fields
  - Short Text summary

Takeaways:
- Time consuming – less than Phase 1, but still too long
- Deliverable: Individual school summary reports and database
- Space analysis/current use plans – not within the fee
Data Management Challenges

- 2 years as one point in time: August 2015 - March 2017
- Data from multiple source
- Could not verify all of the data
- School information changed over Sys
  - October 1st to December 1st – 500 students disappeared?
- Schools in 2 different buildings and 2 schools sharing a building
  - Unique identifier?
- Calibrating the team
The Validity of Data
Which data point is correct?

Example:
McCormack Middle School
- BPS Facilities: 234,000 GSF
- BPS provided to MSBA: 115,941 GSF
- Insurance Information: 234,625 GSF
- Tax Assessors Database: 168,445 GSF
- SMMA measured CADD files: 107,137

Dever Elementary School
- BPS Facilities: 130,036 GSF
- BPS provided to MSBA: 75,892 GSF
- Insurance Information: 168,445 GSF
- Tax Assessors Database: 75,892 GSF
Owning the Data

Lessons Learned Along the Way

- Unexpected man-hours, role became full time position
- Trust the team members
- Who checks the data manager?
- How do we QC a database?
- Know the deliverable in advance
Data Doesn’t Lie

- General Information, Facility Assessments and Educational Assessments yielded 34,363 cells of data in 626 different categories.
- What is the data telling us?
- How do we use the data as a tool to tell the story?
From Excel to Dashboard

What did that mean for the data we had already collected?

- GeoJSON – new to SMMA
- Data formatting must work with coding language – reformatting
- Data visualizations were limited to the data that was collected
- Data must be paired with Dashboard fields
The Dashboard: Visualizing Data
Capacity as a Visualization

The Boston Redevelopment Authority (BRA) and BPS have extensive data/mapping resources available for analysis and discovery. When applied to the problem of the intersecting values associated with improving schools and facilities that meet current and future guidelines while maintaining minimum effective utility, this data/mapping can be an effective tool for supporting neighborhoods and families.

Are the schools appropriately sized and located to serve students, families, and the community?

- East Boston
- Dorchester
- Burke
- Mattapan
- Dorchester
Dashboard?
Dashboard?
Dashboard?
Dashboard
The Big Idea
The Big Idea

- BPS Operations Data
- BERDO: Energy Utility Data
- City Tax Assessment Data
- Student Assignment Data
- Maps+ Transportation Data
- National Education Data
Goals

Organization and Asset Management

Data Visualization and Analysis Tools

Communications and Transparency
Arc of Awareness

Redefining the Deliverable

TIME

AWARENESS

FINAL REPORT

CONTRACT COMPLETE
The Clover

Facilities Assessment–Building:
This category of the assessment considered the physical condition of the buildings, in terms of age, design, construction methods, and materials. Building assessments also determined existing components and/or systems’ conditions at a specific point in time.

Facilities Assessment–Site:
This category considered the quality, condition, and capacity of the various exterior spaces of the facilities. These spaces include landscaped, educational, recreational, vehicular, and pedestrian areas. The on-site evaluation was complemented by detailed study/research of the sites from web-based resources.

Educational Facility Effectiveness–Learning Environments:
This category considered the quality of the physical environment inside the buildings, both in terms of inherent building characteristics and introduced equipment (e.g., furniture and technology), as well as the physical appearance and condition of each.

Educational Facility Effectiveness–Spaces
This category compared the sizes of educational spaces to Massachusetts 963 CMR1 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 in, or missing, dedicated educational spaces normally found in buildings of its grade level and typology.
Planning Principles & Taking Action

1. Leverage real-time facility assessment data to prompt and validate investment choices.

2. Create school environments that promote student and staff safety and well-being.

3. Align building capacity to enrollment and demographic trends citywide.

4. Improve the match between educational programs and their facilities.
Planning Principles & Taking Action

5. Maximize the energy efficiency of BPS facilities.

6. Focus new school construction primarily in high-growth neighborhoods with limited options for site expansion.

7. Focus initial school renovation and expansion projects primarily in neighborhoods where school building sites can be expanded and where swing space is available.
Planning Principles & Taking Action

8. Expand K1 seats in neighborhoods where the estimated supply of high-quality seats does not meet demand, in accordance with analysis from the universal PreK policy development process.

9. Develop program and building utilization plans in neighborhoods that are not projected for high-growth among youth populations and have excess building capacity.

10. Optimize the geographic distribution of BPS high schools.
Planning Principles

Principle #8: Expand K1 Seats

K0-K1 Classrooms
SY 2015-2016

Baldwin 142
E. Boston 194
Elion/Parks 193
Haynes 175
Lee Academy of the Field 196
West Zone 93

CAPACITY
570 total classrooms - all buildings shown
665 students/classroom = 2,048 students capacity
153 classrooms
80% EOC, non-Midland Mann
144 students/classroom = 2,448 students capacity

EOC/ELC
307 students K0-K1 in 6 buildings
250 students K2 in 6 buildings
205 students grades 1-6 buildings
264 students grades 2 in 6 buildings
21 students grades 3 in Elion/Parks
51 students grades 4 in Elion/Parks

Non-EOC/ELC
2,409 students K0-K1 in 60 buildings

Legend
Schools w/PreK CR’s
# = Number of CR’s

EOC/ELC Dedicated
K-5
K-9
K-12
Planning Principles
Principle #10: Optimize the Geographic Distribution of High Schools

- Improve utilization by centering in city
- Locate close to transit hubs
- Add capacity in the southern half of the city
- Leverage successful and in-demand programs
Planning Principles
High School and High School Redesign

Pilot: STEM
Exam: City-wide
Charter: CTE/Vocational
Academy: Innovation
Inclusion: Magnet
Planning Principles

Principle #10: Optimize the Geographic Distribution of High Schools
Planning Principles
Principle #10 High Schools

- 19,195 students
- 31 schools in 29 buildings
- 619 students per school
Planning Principles
Principle #10 High Schools

- 18,550 students grades 9-12
- 23 schools in 20 buildings
Planning Principles
Principle #10 Optimize the Geographic Distribution of High Schools
- Harvard Life Sciences & Boston College
- St. Elizabeth’s Medical Center
- Harvard Business School & New Balance, WEEI, WGBH
- Why? Offers a multi-building campus opportunity
Taking Action
Action #5 Prototyping and Community Engagement

- Allston / Brighton 2016
Taking Action
Action #5 Prototyping and Community Engagement

- 2026 Map
Commit $1 billion to Boston’s school buildings to catalyze long-term investment.

Establish an office dedicated to managing BuildBPS investments and projects.

Implement a robust community collaboration process to guide ongoing and long-term decision making.
Taking Action

4. Invest in new school furniture and technology, to promote 21st century learning and teaching methodologies.

5. Undertake several “prototype” projects, to model standards from the BPS educational vision.
Taking Action

Action #4 Invest in new school furniture and technology

- Modernize all environments
- Portable reusable/relocatable
- Improve space utilization where possible
- Prepare for technology and 1:1
Taking Action
Action #5 Prototyping and Community Engagement

- Roxbury Case Study
Taking Action

Action #5 Prototyping and Community Engagement

- Roxbury Case Study
Taking Action
Action #5 Prototyping and Community Engagement

- Roxbury Case Study
Taking Action
Precedent Examples: Community Engagement

- Atlanta Case Study
Taking Action

Precedent Examples: Community Engagement

- Somerville Case Study
Taking Action
Option Examples: Community Engagement
Taking Action
Option Examples: Community Engagement
Taking Action
Option Examples: Community Engagement

10-Year FMP:
Model 3a: Blended Portfolio

6-8 Middle Schools

Special Schools (K-12) Population Projections

Population
K-12 Population Projections
2014 39,400 students
2025 43,000 students
K-6 Population Projections
2018 14,141 students
2025 15,804 students
T-12 High Schools Population Projections
2018 24,258 students
2025 26,010 students
6-12 High Schools Population Projections
2018 21,614 students
2025 23,366 students

High School Population Models

Thematic Comprehensive High School for Consideration
- Health and Life Sciences and Business (Milone & Johnson)
- Transportation, Hospitality, Technology (East Boston)
- Geospatial/Environmental Sciences, Climate Studies (Route 16 - High School)
- Physical Sciences, Arts, Occupational Science and Arts (Boston Technical)
- Building Trades Sciences, Construction Management (Engin/Arch/Wright)

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Taking Action
Option Examples: Community Engagement
Thank You!