Story of a School Building Renovation

Bartlett High School

Webster, Massachusetts
Webster Public Schools
Superintendent Ruthann Goguen, Ed. D.
The Bartlett High School shares a campus with the Webster Middle School to the north, which has its own designated parking lot and bus drop-off loop. The site is bounded to the north, south, east and west by single and multi-family residential properties. The school complex is surrounded by a matrix of native canopy trees, primarily mixed Oak, Maple, and White Pine. It appears at the time of the school’s construction; large areas of existing woodland were preserved during construction. These areas of woodland enhance the character of the campus, shade the building, and should be preserved.
Our Vision for Educational Programming

Expansion of K-12 Programming ensures cohesiveness and alignment for student opportunities across the district.

• Emphasis on College and Career Readiness
• Moving away from a traditional high school model:
  • Innovation Pathways: Advanced Manufacturing & Healthcare and Human Assistance
• Expanding existing programs to provide students more hands-on and relevant learning experiences that they can build upon:
  • Dual Enrollment
  • Internships
  • Industry Credentialing
  • Project Lead the Way
  • Courses designed in collaboration with industry partners
Why We Need To Change Programming

- Education has changed
- Students have changed
- Job market has changed

• Students need industry experience prior to graduation in order to enter the workforce and earn a living wage.
• The traditional high school model of preparing students for the college experience is outdated.
• About 25% of BHS students go directly into the workforce and most do not go into high wage jobs.
• College costs are significant, and knowing your area of interest will maximize tuition dollars spent.
• If we change our programming, we will improve our student retention.

Educational Vision

Innovation Cluster
Educational Vision

Teacher Planning and Development

• The district has updated curriculum and instructional materials with the most up to date resources and continues to provide ongoing support and professional development.
• The district is in the process of a Literacy Reset.
• Bartlett has redesigned all English courses.
• Bartlett was recently awarded the GLEAM grant (6-12).
• Bartlett has hired Literacy Coaches to provide adolescent literacy support to teachers.
• Statewide System of Support provides an additional layer of assistance.
• Bartlett teachers have a common planning period by department.

This Renovation Provides the Opportunity To:
• Maximize the effectiveness of ongoing curriculum enhancements and professional teacher development through the creation of proposed “Classroom Neighborhoods.”
• Support more teacher collaboration by providing the learning spaces they need to create more project-based learning and interdisciplinary lessons, as well as examine student work and calibrate assessments.
Teacher Planning and Development

Changes in our educational programming are already well underway:

- Teachers are enrolled in the Project Lead the Way Academies.
- We have budgeted for curriculum development with industry partners.
- We have hired an Innovation Pathways Project Manager.
- High quality professional development is focused on:
  - Ensuring equitable access to all students
  - College and career readiness
  - Using researched based curriculum resources
  - Using data to inform instructional practices
Early childhood programming:
- Inclusive early learning opportunities for children ages 3-5
- Substantially separate programming for intensive special needs students
- Treatment area for related service providers and outside play/learning space
- Internship and training opportunities for high school students

The district’s commitment to maintaining students in their “home” school by providing specialized “in-house” programming:
- Post graduate vocational programming (18-22)
- Life Skills
- Quest (social-emotional / drop-out prevention)
- Resource Rooms and Academic Support Labs

Webster has different needs than the State Average:

<table>
<thead>
<tr>
<th></th>
<th>% of District</th>
<th>% of State</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Language not English</td>
<td>16.2</td>
<td>23.4</td>
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<tr>
<td>English Language Learner</td>
<td>10.8</td>
<td>10.5</td>
</tr>
<tr>
<td>Students With Disabilities</td>
<td>22.8</td>
<td>18.7</td>
</tr>
<tr>
<td>High Needs</td>
<td>71.4</td>
<td>51.0</td>
</tr>
<tr>
<td>Economically Disadvantaged</td>
<td>62.4</td>
<td>36.6</td>
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</tbody>
</table>

Selected Population (2020-21)
**District**
The district office and other additional program will be located near one another. This allows for a separate entrance for the community with ease of access to these programs.

**Academic**
The core academic spaces include dedicated instructional spaces, breakout spaces and special education space. The academic wing will be in close proximity to the administration and guidance while also maintaining a close relationship with innovation spaces.

**Community**
The community wing will cluster the auditorium, cafeteria and gym. This allows for a central community space that can remain separate from the rest of the school.
Flansburgh
Kent Kovacs, Vice President, AIA, LEED AP
Design Strategies
Design Strategies

Bartlett High School Building Project  Webster, MA

Key
1. District Offices  7. Band
4. Cafeteria  10. Administration
5. Art  11. Media Center

To Athletic Fields

Overly Large Cafeteria

Land Locked Classrooms
Design Strategies

- INFILL COMPONENT
- SECONDARY COMPONENT
- MAJOR COMPONENT

10,000 SF Between Expansion Joints
4,000 SF Between Expansion Joints
30,000 SF in Natural Structural Break
**Benefits of Existing Structure**

- The structure is steel framed and the typical lateral load resisting system is concentric braced frames. It is easier to modify the steel framed structure for the proposed renovations and reinforce the lateral load resisting system to resist seismic loads even though it was not originally designed to resist seismic loads.

- The existing foundations are shallow reinforced concrete footings and walls and it is easier to replace column footings or underpin these foundations if required.

- Exterior wall and column foundations are lower than 4’-0” feet from existing finish grade at the proposed cafeteria location thus the existing slab on grade can be lowered without impacting the exterior wall foundations.

- Typical Existing column spacing is 25 to 28 feet which allows dunnage platforms to be constructed to supported roof top equipment and photovoltaic panels as the existing roof structure does not have adequate capacity to support the additional loads. The existing columns and footings have some reserve capacity to support additional loads.

- It is easier in steel framed structures to accommodate new openings in the floors for mechanical shafts or light wells.
• Existing brick veneer and exterior wall assembly will remain.
• 3” Mineral wool insulation will be added to inboard side of exterior walls to improve thermal performance.
• Existing windows will be replaced due to deteriorated condition and poor thermal performance.
• 6” Rigid foam insulation will be added to roof deck to improve thermal performance.
• 24.4% Glazing to total facade area ratio.
Bartlett High School Building Project
Webster, MA

186,000 SF

4,600 SF
1,350 SF
(+-) 110,000 SF
161,000 GSF
186,000 SF

Design Strategies

445 Student Enrollment

Default Program

Proposed Program
Community Program 1,350 SF
Pre-K Program 4,600 SF
District Offices 7,250

Existing Program

Bartlett High School Building Project Webster, MA
Design Strategies

Acrylic model is created to see the existing program layout and aid in doing test fits of proposed program.

Options 1 & 2
184,630 sf (+3,000 sf mech. penthouses)
Options 1 and 2 keep all of the existing building mass. Option 2 moves interior walls around to better align with the educational plan.

Excess of 26,630 sf beyond proposed program of 158,000 gross square feet.

Option 3
158,000 sf (+3,000 sf mech. penthouses)
Option 3 removes the interior classrooms in B and C building, as well as the cafeteria.

Aligns with proposed program of 158,000 gross square feet.

Option 4
158,000 sf (+3,000 sf mech. penthouses)
Option 4 will remove the internal classroom, the cafeteria and a portion of C-Building. A new addition would be added to C-building.

Aligns with proposed program of 158,000 gross square feet.
Option Three is a straightforward and strong option that maintains and renovates 86% of the existing building, while also supporting the district vision for distinct building wings (District, Academic and Community), optimizing the adjacencies of key spaces, and providing clear circulation pathways and community gathering areas throughout the building.
Classroom neighborhoods have well-located and flexible extended learning areas, as well as 3-dimensional connectivity to the lower level.

Each neighborhood clusters a 300 sf teacher planning space, a 150 sf student seminar and a 400 sf special education Inclusion Learning Lab for greater teacher/student access.
Design Strategies
Design Strategies

- New Parking Lot
- Pre-K Playground
- Entrance Plaza
- Entrance Plaza
- Poland Street
- Existing Middle School Parking Lot
- Existing Staff Parking Lot
- 103 Spaces
- Existing Woodland
- Existing Woodland
- Existing Woodland
- New Concession Stand
- Fields to be reconfigured
- Overall Site Plan
- Lake Parkway
- Renovated Bartlett High School
Design Strategies

EXISTING WOODLAND

EXISTING WOODLAND

BUS DROP-OFF

RECONFIGURED PARKING LOT

EXISTING WOODLAND

CAFETERIA

SPILL-OUT AREA

NEW ACCESSIBLE / ATHLETIC EVENT PARKING

25 SPACES

EXISTING MIDDLE SCHOOL PARKING LOT

EXISTING STAFF PARKING LOT

103 SPACES

LOADING DOCK ENTRANCE PLAZA

PRE-K PLAYGROUND

EXISTING

EXISTING

EXISTING

NEW CONCESSION STAND

EXISTING FIELDS TO BE RECONFIGURED

OVERALL SITE PLAN

LAKE PARKWAY

RENOVATED BARTLETT HIGH SCHOOL

PARENT DROP-OFF
Design Strategies

Bartlett High School Building Project
Webster, MA
Design Strategies

...Quality Education

Bartlett High School Building Project
Webster, MA
Design Strategies
Design Strategies
Cost Effectiveness

Kent Kovacs, Vice President, AIA, LEED AP
## Cost Effectiveness

<table>
<thead>
<tr>
<th>Option</th>
<th>Total Gross SF</th>
<th>Square Feet of Renovated Space (cost*/sf)</th>
<th>Square Feet of New Construction (cost*/sf)</th>
<th>Site, Building Takedown, Haz Mat. Cost*</th>
<th>Estimated Total Construction** (cost*/sf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Repair: 1</td>
<td>184,630 sf</td>
<td>184,630 sf ($255.53/sf)</td>
<td>N/A</td>
<td>$3,740,364</td>
<td>$50,919,763 ($276/sf)</td>
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<tr>
<td>(Renovation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Does not include Construction Contingency</strong></td>
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<tr>
<td>2</td>
<td>187,630 sf</td>
<td>187,630 sf ($346.86/sf)</td>
<td>N/A</td>
<td>$10,689,972</td>
<td>$75,771,600 ($404/sf)</td>
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<tr>
<td>(Renovation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>District’s Preferred Solution</strong></td>
</tr>
<tr>
<td>3***</td>
<td>161,000 sf</td>
<td>161,000.00 sf ($374.33/sf)</td>
<td>N/A</td>
<td>$10,947,610</td>
<td>$71,215,208 ($442/sf)</td>
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<tr>
<td>(Renovation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>District’s Preferred Solution</strong></td>
</tr>
<tr>
<td>4</td>
<td>161,000 sf</td>
<td>131,000.00 sf ($370.56/sf)</td>
<td>30,000 sf ($672.89/sf)</td>
<td>$12,123,910</td>
<td>$80,854,898 ($502/sf)</td>
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<tr>
<td>(Add/Reno)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>District’s Preferred Solution</strong></td>
</tr>
<tr>
<td>5</td>
<td>158,000 sf</td>
<td>N/A</td>
<td>158,000 sf ($461.39/sf)</td>
<td>$17,037,292</td>
<td>$89,936,641 ($569/sf)</td>
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<tr>
<td>(New)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>District’s Preferred Solution</strong></td>
</tr>
</tbody>
</table>

* Marked up Construction Cost
** Does not include Construction Contingency
*** District’s Preferred Solution
All Costs Reflect 6/15/21 Cost Estimate Provided by PM&C
## Cost Effectiveness

<table>
<thead>
<tr>
<th></th>
<th>SITE</th>
<th>DEMOLITION/ HAZMAT</th>
<th>BUILDING</th>
<th>TOTAL</th>
</tr>
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<tbody>
<tr>
<td><strong>Renovation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Option 3)</td>
<td>$8.5 M</td>
<td>$1.8 M</td>
<td>$60.9 M</td>
<td>$71.2 M</td>
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<tr>
<td><strong>New Build</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Option 5)</td>
<td>$12.8 M</td>
<td>$4.2 M</td>
<td>$72.9 M</td>
<td>$89.9 M</td>
</tr>
<tr>
<td><strong>Cost Delta</strong></td>
<td>$4.3 M</td>
<td>$2.4 M</td>
<td>$12 M</td>
<td>$18.7 M</td>
</tr>
</tbody>
</table>

*$18.7 million in Construction Cost savings*

Note: Modular Classrooms will be required for Option 3, costs are included in Project Costs
## Cost Effectiveness

### Construction Materials Comparison - Estimated Truck Trips and Trucking Distance Saved

<table>
<thead>
<tr>
<th>Material</th>
<th>Renovation</th>
<th>New Construction</th>
<th>Renovation Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concrete</strong></td>
<td>40 Truck Trips / 1,100 Miles</td>
<td>270 Truck Trips / 7,000 Miles</td>
<td>230 Truck Trips / 5,900 Miles</td>
</tr>
<tr>
<td><strong>Steel Framing</strong></td>
<td>10 Truck Trips / 9,300 Miles</td>
<td>50 Truck Trips / 44,700 Miles</td>
<td>40 Truck Trips / 35,400 Miles</td>
</tr>
<tr>
<td><strong>Brick Veneer</strong></td>
<td>20 Truck Trips / 2,100 Miles</td>
<td>110 Truck Trips / 11,200 Miles</td>
<td>90 Truck Trips / 9,100 Miles</td>
</tr>
<tr>
<td><strong>Demolition</strong></td>
<td>60 Truck Trips / 4,800 Miles</td>
<td>840 Truck Trips / 67,000 Miles</td>
<td>780 Truck Trips / 62,200 Miles</td>
</tr>
</tbody>
</table>
RFS

Chad Monterose, Senior Project Manager
Building System Selection Process - Steps to a High Performance Building

**Step 1**
Minimize Building Loads
- Optimal Square Footage
- Orientation and Massing Studies
- Envelope Optimization
- Mixed-mode Ventilation
- Demand-control Ventilation
- Daylight Harvesting
- Window “Kill” Switches

**Step 2**
Maximize Component Energy Efficiencies
- High COP Heating Systems
- HVAC System Types by Program Area
- Ventilation Energy Recovery
- Premium Efficient Lighting/ Lighting Controls
- Premium Efficient Motors/ Motor Controls
- Intelligent BAS

**Step 3**
Consider On-site Renewable Energy Production
- Photovoltaic
- Solar Thermal
- Biomass
- Wind
- Biofuel

**Step 4**
Minimize Building Energy Consumption
- User Group Education/ Awareness
- Non-traditional Heating/ Cooling Operating Parameters
- Energy Star Equipment
- Detailed Measurement and Verification, and Response
Considerations When Analyzing Existing Buildings

1. Existing System / MEP Space Needs
   - Potential reuse of existing system
   - Are existing MEP spaces (e.g. penthouses, basement) adequate?

2. Existing Structural Constraints
   - Floor-to-floor heights
   - Space limitations

3. Existing Building Envelope
   - Energy code compliance
   - Thermal comfort of occupants

4. Fixed Solar Orientation
   - Existing building’s solar orientation impacts HVAC requirements

5. Fire Rating / Code Compliance with MEP Distribution

6. Replacing Existing U/S Systems (Plumbing/Electrical)

7. Existing Utility/Service Limitations
Bartlett High School Existing MEP Conditions
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Heating Source</th>
<th>Cooling Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Boilers and DX Units</td>
<td>Gas-Fired Condensing Boilers</td>
<td>Packaged and Split Air-Cooled DX Units</td>
</tr>
<tr>
<td>B.1, B.2</td>
<td>Boilers and Chillers</td>
<td>Gas-Fired Condensing Boilers</td>
<td>B.1: Standard-Efficiency Air-Cooled Chillers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B.2: High-Efficiency Air-Cooled Chillers</td>
</tr>
<tr>
<td>C.1</td>
<td>Air-Source Heat Pumps w/ Supplemental Boilers</td>
<td>VRF Air-Source Heat Pumps w/ Supplemental</td>
<td>VRF Air-Source Heat Pumps</td>
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<tr>
<td></td>
<td></td>
<td>Gas-Fired Condensing Boilers</td>
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</tr>
<tr>
<td>(All Electric)</td>
<td></td>
<td>Resistance heat</td>
<td></td>
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<tr>
<td>D</td>
<td>Ground-Source Heat Pumps</td>
<td>Ground-Source Heat Pumps</td>
<td>Ground-Source Heat Pumps</td>
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<tr>
<td>(All Electric)</td>
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<td></td>
</tr>
<tr>
<td>E</td>
<td>Ground-Source Heat Pumps w/ Air-Source Heat Pumps</td>
<td>Ground-Source Heat Pumps w/ Air-Source</td>
<td>Ground-Source Heat Pumps</td>
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<tr>
<td></td>
<td></td>
<td>Heat Pumps</td>
<td></td>
</tr>
</tbody>
</table>

*Fuel use noted above relates to mechanical equipment only.*
**Building Systems Process**

**Mechanical Systems Zoning Diagram**

- **DOAS units supplying “B” Wing zones located in existing mechanical penthouse**
- **DOAS units supplying “A” Wing zones located in existing mechanical penthouse**
- **Existing District Office system to remain and be connected to new**
- **DOAS & AHU units supplying “C” Wing zones located on roof**
- **Existing basement level to accommodate new equipment**
The Green Engineer
Chris Schaffner, Founder & CEO
### LEED v4 for BD+C: Schools
#### Project Checklist

<table>
<thead>
<tr>
<th>Category</th>
<th>Credit</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td><strong>Integrative Process</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sustainable Sites</strong></td>
<td></td>
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<tr>
<td></td>
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<tr>
<td><strong>Indoor Environmental Quality</strong></td>
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<td><strong>Energy and Atmosphere</strong></td>
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<tr>
<td><strong>Materials and Resources</strong></td>
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#### Project Information
- **Project Name:** Webster Bartlett High School
- **Date:** 7/1/21

#### Scoring Table

<table>
<thead>
<tr>
<th>Credit</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Storage and Collection of Recyclables</td>
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</tr>
<tr>
<td>Construction and Demolition Waste Management Planning</td>
<td>Required</td>
</tr>
<tr>
<td>Building Life-Cycle Impact Reductive Impact</td>
<td>Required</td>
</tr>
<tr>
<td>BPDG - Environmental Product Declarations</td>
<td>Required</td>
</tr>
<tr>
<td>Building Product Disclosure and Optimization - Sourcing of Raw Materials</td>
<td>Required</td>
</tr>
<tr>
<td>Building Product Disclosure and Optimization - Material Ingredients</td>
<td>Required</td>
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<tr>
<td>Construction and Demolition Waste Management</td>
<td>Required</td>
</tr>
<tr>
<td>Minimum Indoor Air Quality Performance</td>
<td>Required</td>
</tr>
<tr>
<td>Environmental Tobacco Smoke Control</td>
<td>Required</td>
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<tr>
<td>Minimum Acoustic Performance</td>
<td>Required</td>
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<tr>
<td>Enhanced Indoor Air Quality Strategies</td>
<td>Required</td>
</tr>
<tr>
<td>Low-Emitting Materials</td>
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<tr>
<td>Construction Indoor Air Quality Management Plan</td>
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<tr>
<td>Indoor Air Quality Assessment</td>
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<td>Thermal Control</td>
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<tr>
<td>Interior Lighting</td>
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<tr>
<td>Daylight</td>
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<tr>
<td>Quality Views</td>
<td>Required</td>
</tr>
<tr>
<td>Acoustic Performance</td>
<td>Required</td>
</tr>
<tr>
<td>Innovation: Responsible Purchasing - Lamps</td>
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<tr>
<td>Innovation: TBD</td>
<td>Required</td>
</tr>
<tr>
<td>Innovation: Pilot - Integrative Analysis of Building Materials</td>
<td>Required</td>
</tr>
<tr>
<td>Innovation: Exemplary Performance (EDI)</td>
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<td>Innovation: TBD</td>
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<tr>
<td>LEED Accredited Professional</td>
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<tr>
<td>Building Life-Cycle Impact Reduction (RP@2)</td>
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<tr>
<td>Surrounding Density and Diverse Uses (RP@4)</td>
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<tr>
<td>High Priority Site (RP@8)</td>
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<tr>
<td>Enhanced Efficiency in the Use of Water (RP@2)</td>
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<tr>
<td>Renewable Energy Production (RP@2)</td>
<td>Required</td>
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<tr>
<td>Building Life-Cycle Impact Reduction (RP@2)</td>
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</tbody>
</table>

**Maximum Possible Points:** 110
Sustainability

Building and Site Improvements

Sustainable Design measures:

• Partial demolition and interior renovations to improve building use

• Building reuse – mitigates environmental impact of building

• Building systems replacements to increase energy efficiency
  • High performance equipment
  • Lighting upgrades

• Ventilation system upgrades for improved indoor air quality

• Interior finish materials replacement for improved indoor air quality

• Site improvements to address rainwater management; native and adaptive landscaping and outdoor area uses
Elements of Building’s GHG Impact

- Transport
- Construction
- Building Systems
- Land Cover Change
- Materials
- Solid Waste
- Water
Annual Global CO₂ Emissions

- **28%** Building Operations
- **11%** Building Materials & Construction

Sustainability

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Data Sources: Global ABC Global Status Report 2018, EIA
Sustainability

Nauset Regional High School Renovation/Addition
Estimated Lifetime GHG (MTCO2e) Savings vs. BOD (Option 1)

Virtually no difference in emissions between the hybrid option and the all-electric option.

Analysis courtesy of Vanderweil Engineers
Embodied Carbon

*Embodied carbon* - Greenhouse gases that are emitted to construct our buildings

*Initial embodied carbon*—the impacts associated with extracting, manufacturing, and transporting materials to the jobsite.

*Operational carbon* – Greenhouse gas emissions associated with the use phase of the building – primarily energy consumption, but can include transportation, maintenance and replacement cycles of finishes

“Carbon” is used to indicate all greenhouse gas emissions, not just carbon dioxide.
Sustainability

Total Carbon Emissions of **Single Building**

_Global Average Building Carbon Footprint: Business as Usual_

---

**Embodied Carbon**

+/-50%

**Operational Carbon**

+/-50%

Sustainability

Day 1

Materials Embodied Energy
Operational Energy Impact

Year 100

Embodied Impact
Operational Energy Impact

More Efficient Building

Materials Embodied Impact
Operational Energy Impact

Sustainability

Annual Global CO₂ Emissions

- **Other**: 23%
- **Building Operations**: Concrete (11%)
- **Industry**: Steel (10%)
- **Transportation**: Aluminum (2%)

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Data Sources: Global ABC Global Status Report 2018, EIA

Bartlett High School Building Project
Webster, MA
Where is the Embodied Carbon?

“Structural systems almost always comprise the largest source of embodied carbon in the building—up to 80%, depending on the building type” – Environmental Building News
Benefits of Existing Buildings Reuse

- Limits use of new materials, and associated environmental impacts
- Reduced site disturbance
- Reduces amount of waste sent to landfills (approximately 90% of Construction waste sent to landfills is from demolition of existing buildings)
- Preserves existing embodied carbon, reduces new carbon emissions
- Preserves cultural heritage
- Reduces project cost
Embodied Carbon + Life Cycle Assessment

- Consumption of embodied energy consumed from ‘cradle to gate’
- Overall reduced environmental impact can be estimated through a comparison to a similar new build project, a Life Cycle Assessment
MSBA Incentive
John Jumpe, Director of Project Management
Incentive Points Offered for School Renovation Projects

Major Reconstruction or Reno / Reuse

(up to 5 points)
MSBA Incentives

Incentive Points (0-5)

From Module 4 – Schematic Design

Up to five (5) incentive percentage points may be allocated for a renovation project that requires no new construction. Less than five (5) incentive percentage points may be allocated on a sliding scale that relates the percentage of gross square feet of renovated space to the total gross square feet of the total project. For example, if 50% of the total gross square feet of the complete project is renovated area, 2.5 incentive percentage points would be awarded.
Energy Efficiency (0 or 2)

**NE-CHPS:**

- Renovation projects require roughly 15-20% fewer total points to achieve "Verified" and "Leader" compared to new;
- Pre-requisite points typically apply to "scope of work" areas only;
- Materials re-use category is targeted to renovation projects;
- Several categories make exceptions / lower point requirements for renovation projects (controllability of systems, views, interlock systems, site selection).
LEED-S:

- Energy performance requirements are lower for renovation projects;
- "Building Life-Cycle Impact Reduction" allows for existing building and material reuse;
- Projects that incorporate part of an existing building for reuse may apply the reused portion toward the achievement of MR Credit Construction and Demolition Waste Management;
- Several categories make exceptions / lower point requirements for renovation projects (Minimum Indoor Air Quality Performance, Naturally Ventilated Spaces of projects registered as historic buildings).
Questions?

Contact: MSBA assigned Project Manager

John F Jumpe Jr.
Director of Project Management
John.Jumpe@massschoolbuildings.org