CITY OF CAMBRIDGE
TOBIN MONTESSORI AND VASSAL LANE UPPER SCHOOLS PROJECT
12/02/2019

CITY COUNCIL/SCHOOL COMMITTEE ROUND TABLE
AGENDA
02 DECEMBER 2019

7:30 - 7:50 p.m.
Introductions
Presentation
  • Program
  • Goals and Principles
  • Option Drivers
  • Design Options
  • Option Comparison
  • Look Ahead

7:50 - 8:30 p.m.
Discussion
PROJECT ELEMENTS

Program
- Tobin Montessori School
- Vassal Lane Upper School
- Self-Contained Special Education
- Special Start
- Preschool & Community School

Performance
- Net Zero Emissions

Site
- Soil Management
- Municipal Storm Water
- Sports Fields & Playgrounds
WHAT WE HEARD
APRIL COMMUNITY MEETING FEEDBACK

- Roof Greenhouse
- Centered on Site
- Traffic
- Scale
- Tree Protection
- Minimize Impact During Construction
- Community Access
- All Ages and Abilities
- Safety & Security
- Life-cycle Carbon
- Demolition
- Fence
- Athletic Fields and Courts
- Bike and Pedestrian Routes
- Bicycle Connections
- Enrollment
- Courtyards
- Engaged Process
- Welcoming Playgrounds
- Underground Parking
- Natural Materials
- Sustainability
- Principles of Montessori
- Shade
- Vibration Monitoring
- Good Landscaping
- Spirit of Existing School
- Special Start
- Architectural ‘Look’
- Pollinator Garden
- Embodied Carbon
- Site Maintenance
# PROGRAM CAPACITY

**MAXIMUM NUMBER OF STUDENTS (UPDATED 12/02/2019)**

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>GRADES</th>
<th>EXISTING</th>
<th>PROPOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Services Preschool</td>
<td>PreK</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>Tobin School</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montessori</td>
<td>PreK – 5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>312</td>
<td>336</td>
</tr>
<tr>
<td>Special Start</td>
<td>PreK</td>
<td>14</td>
<td>75</td>
</tr>
<tr>
<td>*Substantially Sub</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separate Special Ed</td>
<td>K – 5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Vassal Lane Upper School</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Program</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; – 8&lt;sup&gt;th&lt;/sup&gt;</td>
<td>300</td>
<td>450</td>
</tr>
<tr>
<td>*Sheltered English Immersion</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; – 8&lt;sup&gt;th&lt;/sup&gt;</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>*Substantially Sub</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separate Special Ed</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; – 8&lt;sup&gt;th&lt;/sup&gt;</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td><strong>All Programs</strong></td>
<td></td>
<td><strong>725</strong></td>
<td><strong>1,184</strong></td>
</tr>
</tbody>
</table>

*Note: In reality the Substantially Sub Separate Special Ed Students and the Sheltered English Immersion Students are not additive. They will almost always be in the 450 due to the need to schedule and mainstream with the general population. These students do, however, need program homerooms which appears to inflate the total capacity.*
PROGRAM ELEMENTS
COMMUNITY AND DISTRICT-WIDE

• Auditorium
• Gyms
• Assembly Spaces
• Science Department
• Office of Student Services -- offices and testing center
• Storage and Shop
## Facility Space Program

### Area Comparison

<table>
<thead>
<tr>
<th>Program</th>
<th>Existing GSF</th>
<th>Proposed GSF</th>
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</thead>
<tbody>
<tr>
<td>Human Services</td>
<td>5,291</td>
<td>31,380</td>
</tr>
<tr>
<td>Preschool</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community School</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobin Lower School</td>
<td>36,878</td>
<td>60,600</td>
</tr>
<tr>
<td>Vassal Lane Upper School</td>
<td>33,059</td>
<td>63,300</td>
</tr>
<tr>
<td>Shared Spaces</td>
<td>44,625</td>
<td>120,800</td>
</tr>
<tr>
<td>Learning Commons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gyms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dining</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auditorium, Performing Arts &amp; Visual Arts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPS District Wide</td>
<td>8,317</td>
<td>22,300</td>
</tr>
<tr>
<td>Building Total</td>
<td>+/-128,170</td>
<td>298,380</td>
</tr>
<tr>
<td>Underground Parking</td>
<td>0</td>
<td>+/- 55,000</td>
</tr>
<tr>
<td>Grand Total</td>
<td>+/- 128,1701</td>
<td>353,380</td>
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</tbody>
</table>
OUTDOOR PROGRAM

PROGRAM ON-GRADE

- Playgrounds
- Sports Field
- Off-street Parking
- Bus and Car Drop-off/Pick-up
- Bicycle Connection
- Emergency Vehicle Access
- Tree Protection
SITE INFRASTRUCTURE

• 1.25 Million Gallon Storm Water Tank
• Bioswales and Rain Gardens
• Solar Panels
• Geothermal Wells (if used)
• Parking and Circulation

2070 Storm Surge and Precipitation Flooding
GOALS & PRINCIPLES
DESIGN GOALS

1. COMMUNITY ASSET
   - Provide a campus respectful of neighborhood and traffic impacts, providing public open space amenities

2. RESILIENCE
   - Include regional, local, and on-site storm water management with a building above the future flood plain

3. SUSTAINABILITY
   - Design for net zero emissions and target net zero energy and a healthy environment
EDUCATION DESIGN PRINCIPLES

IDENTITY & ARRIVAL FOR EACH PROGRAM
Create an identity and front door for each program

A HEART FOR EACH PROGRAM
Offer a hierarchy of spaces supporting developmental needs of each school

ORGANIZE THE CAMPUS FOR EFFICIENT SHARING
Draw a healthy balance between school program and shared spaces
EDUCATION DESIGN PRINCIPLES

7. DIVERSITY OF OPEN SPACE FOR EACH PROGRAM & AGE
   - Provide developmentally appropriate opportunities for active, experiential, reflective learning and socialization

8. EACH PROGRAM HAS EASY ACCESS TO THE OUTDOORS
   - Connect learning spaces with readily accessible outdoor spaces designed for learning, recreation, and socialization

9. CREATE A LOCUS OF LIFE-LONG LEARNING
   - Create a locus for students and teachers, and support professional development for teachers on- and off-site
OPTION DRIVERS
SITE UNDERSTANDING

VALUABLE TREES
ACCESS AND PARKING
OPTIMAL MASSING FOR NEIGHBORHOOD
CLIMATE RESPONSIVENESS

Energy Use in Buildings Shifting - More Cooling, Less Heating

Cooling Degree Days (CDD)  Heating Degree Days (HDD)

2010 2015 2030 2070
EXISTING TRAFFIC VOLUMES

**Morning Drop-Off Accumulations**

<table>
<thead>
<tr>
<th>Time</th>
<th>Tobin Montessori</th>
<th>Vassal Lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:15 - 7:25 AM</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7:25 - 7:35 AM</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>7:35 - 7:45 AM</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>7:45 - 7:55 AM</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7:55 - 8:05 AM</td>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>

**Afternoon Pick-Up Accumulations**

<table>
<thead>
<tr>
<th>Time</th>
<th>Tobin Montessori</th>
<th>Vassal Lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:25 - 1:35 PM</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>1:35 - 1:45 PM</td>
<td>26</td>
<td>3</td>
</tr>
<tr>
<td>1:45 - 1:55 PM</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>1:55 - 2:05 PM</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2:05 - 2:15 PM</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>2:35 - 2:45 PM</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>2:45 - 2:55 PM</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>2:55 - 3:05 PM</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3:05 - 3:15 PM</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Peak Cars**

**Peak Buses**
Ambient Sound Survey (Current)
• Sources are traffic and human activity
• Levels are within city ordinance limits
  Nighttime: <50 dBA
  Daytime: <60 dBA

• Measured Levels
  ① 37-46 dBA
  ② 42-57 dBA
  ③ 46-59 dBA
EXISTING BUILDING

Concrete Structure
Concrete Block Infill
Limited Windows, Views
Angular Rooms
Aged Systems and Finishes
DESIGN OPTIONS
OPTION 1: RENOVATION / ADDITION
GYM REMOVED, ADDITION TO NORTH

• Re-uses Existing Building
• Buses on Vassal Lane
• Cars on Concord Ave
• Service and Parking at Site Interior
• Playing Fields on East Side
OPTION 2: WINGS
BUILDING ORIENTED AROUND A COURTYARD

- All New Building
- On-site Drive Aisle for Buses and Cars
- Service and Parking at Site Interior
- Playing Fields on South Side
OPTION 3: PAVILIONS
SCHOOLS CONNECTED BY COMMON SPACE

• All New Building
• On-site Drive Aisle for Buses and Cars
• Service and Parking at Site Interior
• Playing Fields on West Side
OPTION COMPARISON

RENOVATION / ADDITION

WINGS

PAVILIONS
FRONTAGE
COMMUNITY PRESENCE

RENOVATION / ADDITION
WINGS
PAVILIONS
SETBACK
COMMUNITY PRESENCE

RENOVATION / ADDITION  WINGS  PAVILIONS
OPEN SPACE

RENOVATION ADDITION: 5.4 ACRES  WINGS: 5.4 ACRES  PAVILIONS: 5.2 ACRES

GOAL = 5 ACRES PROTECTED
MASSING

RENOVATION / ADDITION

WINGS

PAVILIONS

3 story  2 story  1 story
COMMUNITY SPACE
COMMUNITY PRESENCE

RENOVATION / ADDITION

WINGS

PAVILIONS

GYMNASium
CAFETERIA
AUDITORIUM
SITE CIRCULATION
PEDESTRIAN / BICYCLE

RENOVATION / ADDITION
WINGS
PAVILIONS

CONCORD AVENUE
ALPINE STREET
VASSAL LANE

BICYCLE
PEDESTRIAN
SITE CIRCULATION
VEHICULAR

RENOVATION / ADDITION

WINGS

PAVILIONS

PERKINS EASTMAN  TOBIN MONTESSORI/VASSAL LANE SCHOOLS PROJECT
PICK-UP PARKING
AFTERNOON PEAK

EXISTING CONDITION
PICK-UP PARKING
AFTERNOON PEAK

RENOVATION / ADDITION

EXISTING CONDITION

PAVILIONS

WINGS

NORTH
SUSTAINABILITY STUDIES

ENERGY LOAD – CAMBRIDGE SCHOOL

Annual End-Use Breakdown by Energy Consumption (MMBtu)

- Plug Loads: 28%
- E grip: 13%
- Kitchen Equipment: 13%
- Ext LGT: 1%
- DOM Hot WTR: 2%
- Pumps & Auxiliaries: 9%
- FANS: 14%
- Heating & Cooling: 18%
- Elevators: 2%

EUI: 22 kBtu/SqFt/Yr

PHOTOVOLTAIC POTENTIAL

- 95,000 SF PV Panel Area to Meet Energy Needs on Site

OUTDOOR COMFORT

- 110,000 SF Ave Building Footprint

CARBON FOOTPRINT

- Renovation + Addition: 41,600 MT CO2e
- New Construction: 38,300 MT CO2e
NEXT STEPS
LOOK AHEAD

December 2019
Stakeholder and Community Meetings

January 2020
Preferred Option Selected

February 2020
Stakeholder Meetings

March 2020
Feasibility Study Complete
HUMAN BY DESIGN- PASSIONATE ABOUT WHAT WE DO...HERE’S WHY