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WORKING GROUP

University of Connecticut

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**Context**

The University of Connecticut began as an agricultural school in 1881, training students in mechanical arts and technology with an emphasis on agricultural science. The school evolved over the next 35 years, offering a four-year degree program in mechanical engineering and expanding to include civil and electrical engineering by 1935. Today, the School of Engineering offers undergraduate degrees in 12 engineering fields and Masters and Ph.D. degrees in nine engineering fields through its seven departments in Biomedical Engineering, Chemical & Biomolecular Engineering, Civil & Environmental Engineering, Computer Science & Engineering, Electrical & Computer Engineering, Materials Science & Engineering, and Mechanical Engineering. Since its inception, the School of Engineering has continued to provide innovative cutting-edge research and education supported by public and private funding. The Next Generation Connecticut STEM initiative has inaugurated a significant wave of growth at the University of Connecticut School of Engineering which must be supported by adequate teaching and research space now and in the future.

**Process**

The participants of the Working Group, the key individuals involved in developing the report, are representatives from the University of Connecticut School of Engineering, University Planning, Design and Construction, and Payette (an architectural firm located in Boston, Massachusetts). Using the framework of the 2015 Campus Master Plan, the Working Group developed a list of objectives to guide this Master Plan’s growth yet allow for strategic realignment to suit funding and departmental priority shifts:

- Determine if the School of Engineering footprint is currently sufficient or deficient
- Forecast faculty growth and projected student enrollment over the next five to seven years
- Determine the assignable square feet (ASF) required for the future population growth based on the University planning metrics
- Offer implementation opportunities to accommodate the projected growth

**Adequacy of Existing Facilities to Meet Present Programmatic Need**

To understand the spatial autonomy of each building, the Consultant Team reviewed the existing floor plans, calculated the amount of assignable square feet per building (usable assignable space) by department and space type. After reviewing all of the collected data and visiting each building, the team determined the School of Engineering space currently accommodates today’s needs with no vacancy.

It was noted by the team that the Longley and Depot D Buildings are in poor condition and require either extensive renovation or replacement. The exterior envelopes of Longley and Depot D are showing signs of age and distress, the building systems are at the end of their life cycle and the space type adjacencies are inefficient because the spaces were filled based on vacancy, not strategic planning. If these buildings are removed from the space inventory, the School of Engineering would require an additional 39,762 ASF to meet the present need.

**Growth of Faculty and Students**

Faculty and student projections are based on enrollment history and predicted growth due to emerging trends. The faculty is anticipated to increase by six to seven members per year over the next five years, for a total of 31 additional faculty members by 2023. The School of Engineering is anticipated to grow by 420 graduate students and 720 undergraduate students to a total enrollment of 5,178 students by 2023. Administrative staff positions will grow incrementally to support the increase in academic and research population.

**Growth to Accommodate Future Population**

At the end of the Fall 2018 semester, there will be no available space in the School of Engineering. To accommodate the projected growth and requested space needs, the Working Group anticipates that by 2023 the School of Engineering will require 324,920 total assignable square feet for research laboratories, core laboratories, teaching space, office space, student space, general support, and strategic vacancy space—54,865 ASF more than the 270,055 ASF currently existing today, which includes Longley and Depot D. If Longley and Depot D are removed from the inventory, the need would grow from 54,865 ASF to 94,627 ASF.

**Options**

There are multiple options to meet the School of Engineering projected space needs.

- **Recapture the vacated space in the Engineering II and Arthur B. Bronwell Hall after the Materials Science and Engineering teaching laboratories are relocated to Science 1 in 2022 and the CLAS Biology laboratories are relocated to Gant in 2023, respectively (7,431 ASF).**
- **Reconfigure space in the Information Technologies Engineering Building and Babbidge Library sub-basement to increase usable square footage in line with the Master Plan’s metrics (6,700 ASF).**
- **Capture the unallocated space in the proposed Science 1 Building design and reassign the space to the School of Engineering Mechanical Engineering department (12,000 ASF).**

The following are opportunities within existing spaces:

- Strategically-place additions on Engineering II, United Technologies Engineering Building, and/or Center for Clean Energy & Engineering building.
- Replace the Longley Building and Depot D.

It should be noted that Longley is a major research center for the School of Engineering and industry partners and that Longley and Depot D are in very poor condition. Both require significant renovation or replacement.
### Planning Assumptions for Projected Growth

<table>
<thead>
<tr>
<th>Population Types</th>
<th>2023 Total Projected</th>
<th>2018 Total Existing</th>
<th>Projected Growth Delta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty lines</td>
<td>221</td>
<td>188</td>
<td>+33 *</td>
</tr>
<tr>
<td>Graduate enrollment</td>
<td>1,178</td>
<td>758</td>
<td>+420</td>
</tr>
<tr>
<td>Undergraduate enrollment</td>
<td>4,000</td>
<td>3,280</td>
<td>+720</td>
</tr>
<tr>
<td>Research group size</td>
<td>PI+5</td>
<td>PI+4</td>
<td>+1</td>
</tr>
</tbody>
</table>

* Faculty projected growth: (24) research faculty and (9) teaching faculty

### Space Needs: Projected Growth and Strategic Vacancy Only

<table>
<thead>
<tr>
<th>Space Types</th>
<th>2023 Total Projected ASF</th>
<th>2018 Total Existing ASF</th>
<th>Projected Growth Delta ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Labs (with Support)</td>
<td>135,328</td>
<td>118,328</td>
<td>+17,000</td>
</tr>
<tr>
<td>Core Labs</td>
<td>23,673</td>
<td>20,173</td>
<td>+3,500</td>
</tr>
<tr>
<td>Teaching Space (with Support)</td>
<td>50,109</td>
<td>39,609</td>
<td>+10,500</td>
</tr>
<tr>
<td>Office Space (with Support)</td>
<td>81,793</td>
<td>68,928</td>
<td>+12,865</td>
</tr>
<tr>
<td>Student Space</td>
<td>17,479</td>
<td>12,479</td>
<td>+5,000</td>
</tr>
<tr>
<td>General Support</td>
<td>10,538</td>
<td>10,538</td>
<td>0</td>
</tr>
<tr>
<td>Strategic Vacancy</td>
<td>6,000</td>
<td>0</td>
<td>+6,000</td>
</tr>
</tbody>
</table>

Total ASF Space Needs: 324,920

Table 1.2: Space needs by space type with the Longley and Depot D buildings remaining as is

### Space Needs: Projected Growth, Strategic Vacancy and Replacement of Longley and Depot D

<table>
<thead>
<tr>
<th>Space Needs</th>
<th>2023 Total Projected ASF</th>
<th>2018 Total Existing ASF</th>
<th>Delta ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Projected Growth and Strategic Vacancy ASF</td>
<td>324,920</td>
<td>270,055</td>
<td>+54,865</td>
</tr>
<tr>
<td>Replacement of Longley and Depot D</td>
<td>+1,982</td>
<td>-37,780</td>
<td>+39,762</td>
</tr>
</tbody>
</table>

Total ASF Space Needs: 326,902

Table 1.3: Summary of space needs including projected growth, strategic vacancy, and replacement of the Longley and Depot D buildings
2. EXISTING CONDITIONS ANALYSIS
2.1 Building Summary

The School of Engineering consists of seven departments and multiple research centers occupying space in three buildings on the Depot Campus dedicated to research facilities and student clubs and seven academic buildings on the Storrs Campus with a cumulative total of 270,055 assignable square feet.

**Depot Campus**
- Center for Clean Energy & Engineering (C2E2)
- Depot D (DD)
- Longley Building (LONG)

**Storrs Campus**
- Arthur B. Bronwell Hall (ABB)
- Engineering II (E2)
- Engineering & Science Building (ESB)
- Franklin L. Castleman Building (FLC)
- Homer Babbidge Library (HBL)
- Information Technologies Engineering (ITE)
- United Technologies Engineering Building (UTEB)

**Departments:**
- Biomedical Engineering (BME)
- Chemical & Biomolecular Engineering (CBE)
- Civil & Environmental Engineering (CEE), which includes the Environmental Engineering program
- Computer Science & Engineering (CSE)
- Electrical & Computer Engineering (ECE)
- Mechanical Engineering (ME), which includes the Management & Engineering for Manufacturing (MEM) program
- Materials Science & Engineering (MSE), not included in this study with the exception of space in C2E2 and ESB

**Centers and Programs:**
- Center for Career Development
- Center for Clean Energy Engineering (C2E2)
- Connecticut Transportation Institute (CTI)

**Engineering Diversity & Outreach Center (EDOC)**

**Engineering Technical Services (ETS)**

**Offices:**
- Booth Engineering Center of Advanced Technology (BECAT), included in CSE and ECE
- Continuing and Distance Engineering Education (CDEE)
- Deanery
- Undergraduate Office
Total:

270,055 Assignable Square Feet occupied by the School of Engineering (2018)

Depot Campus:
49,713 SoE ASF

Storrs Campus:
220,342 SoE ASF

Figure 2.1: University of Connecticut Campuses located in Mansfield, CT (source: Google Maps)
### Departmental Area by Building (ASF)

<table>
<thead>
<tr>
<th>Departments</th>
<th>Depot Campus</th>
<th>Storrs Campus</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C2E2</td>
<td>DD</td>
<td>LONG</td>
</tr>
<tr>
<td>BME</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CBE</td>
<td>3,483</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CEE</td>
<td>0</td>
<td>1,129</td>
<td>623</td>
</tr>
<tr>
<td>CSE</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ECE</td>
<td>993</td>
<td>0</td>
<td>2,448</td>
</tr>
<tr>
<td>ME &amp; MEM</td>
<td>2,933</td>
<td>4,302</td>
<td>2,006</td>
</tr>
<tr>
<td>MSE &amp; C2E2 *</td>
<td>4,524</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CTI</td>
<td>0</td>
<td>1,285</td>
<td>17,135</td>
</tr>
<tr>
<td>SoE Administration **</td>
<td>0</td>
<td>0</td>
<td>8,852</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,933</td>
<td>6,716</td>
<td>31,064</td>
</tr>
</tbody>
</table>

* MSE space in C2E2 to remain
** School of Engineering Administration includes EDOC, ETS, CDEE, Deanery and Undergraduate Office

### Building Area by Space Type (ASF)

<table>
<thead>
<tr>
<th>Space Types</th>
<th>Depot Campus</th>
<th>Storrs Campus</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C2E2</td>
<td>DD</td>
<td>LONG</td>
</tr>
<tr>
<td>Research Labs</td>
<td>4,374</td>
<td>0</td>
<td>14,844</td>
</tr>
<tr>
<td>Core Labs</td>
<td>4,257</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Teaching Space</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Office</td>
<td>3,302</td>
<td>0</td>
<td>6,122</td>
</tr>
<tr>
<td>Student Spaces ***</td>
<td>0</td>
<td>5,431</td>
<td>1,246</td>
</tr>
<tr>
<td>General Support ****</td>
<td>0</td>
<td>1,285</td>
<td>8,852</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11,933</td>
<td>6,716</td>
<td>31,064</td>
</tr>
</tbody>
</table>

** Table 2.1: Existing (2018) department area per building
* MSE space in C2E2 to remain
** School of Engineering Administration includes EDOC, ETS, CDEE, Deanery and Undergraduate Office
*** Student spaces include gathering, study and club space
**** General Support includes all School of Engineering-assigned building support space, such as general storage
2.2 Space Conditions

The School of Engineering led a tour of each building to provide the Consultant Team with a general understanding of their function, condition attributes and challenges.

The buildings were categorized into three groups:

**Good Condition (110,755 ASF)**
No significant infrastructure upgrades are forecasted, but there will be minor modifications to customize laboratories for future faculty.

- Center for Clean Energy & Engineering (C2E2, 2002)
- Engineering & Science Building (ESB, 2017)
- Information Technologies Engineering (ITE, 2003)

**Fair Condition (121,520 ASF)**
Four buildings are in fair condition; the building systems are approaching the end of their service life, and the buildings require major renovation.

- Arthur B. Bronwell Hall (ABB, 1968)
- Engineering II (E2, 1959)
- Franklin L. Castleman Building (FLC, 1939 & 1995)
- United Technologies Engineering Building (UTEB, 1987)

**Unacceptable Condition (37,780 ASF)**
Two buildings are in very poor condition and require extensive renovation or replacement. The buildings were part of the Mansfield Training School and do not have the level of infrastructure required to support research or their current space types. Due to the age and types of construction, their exterior envelopes are showing signs of age and distress, and their mechanical systems are beyond their useful life expectancy. The buildings are close to being uninhabitable.

- Depot D (DD)
- Longley Building (LONG, 1951)
2.3 Space Observations

The following additional observations and recommendations were discussed as part of the Master Plan:

• The School of Engineering’s “front door” is unclear.
• There is a need to provide flexible, adaptable student spaces to encourage collaboration, strengthen community and celebrate diversity.
• Incremental renovations over time have led to a poor organization of departmental and space type adjacencies within the buildings.
• Many of the existing research buildings have long, double loaded corridors; there is an opportunity to increase views into lab space and install multi-media displays to highlight past and current projects.

Figure 2.4: Lack of informal student gathering space
Figure 2.5: Typical corridor
Figure 2.6: Instructional laboratory
Figure 2.7: High technology laboratory on the Depot Campus
3. SPACE NEEDS ANALYSIS
3.1 Methodology

The School of Engineering Master Plan is a dynamic five year planning document to provide a framework to guide aspirational growth and development.

The Consultant Team created a space inventory of each building broken down by area, space type and department.

After the Working Group understood the qualitative and quantitative presence of the School of Engineering and the existing number of faculty, staff and students enrolled in the undergraduate and graduate programs were confirmed by the School of Engineering, the Working Group established a few baseline assumptions:

- This Master Plan’s timeline spans from the fall of 2017 semester to the end of the 2023 spring semester.
- There are currently 188 faculty members of the School of Engineering:
  - 28 teaching faculty
  - 160 research faculty
- The current graduate student enrollment is 758 with 538 students involved in research.
- The current total undergraduate enrollment is 3,280.
- The School of Engineering backfill projects are assumed to have been completed by the Fall 2018.
- MSE research space (2,123 ASF high bay) in C2E2 will remain.
- The Innovation Partnership Building is not referenced in this report.

### Definitions

- **ASF**: Assignable Square Feet – Area assigned to, or available for assignment to, an occupant or specific use
- **GSF**: Gross Square Feet – Total area of a building including walls, mechanical rooms, corridors and stairs
- **ASF/GSF Ratio**: Building efficiency as a percentage of space within a building that is assignable
- **Research Station**: An area within a lab assigned to a graduate student or research assistant
- **PI**: Principal Investigator - Research faculty member
- **PI + #**: The average number of graduate and undergraduate students assigned per PI
- **FTE**: Full-Time Equivalent (for office occupants)

### Space Type Metrics

<table>
<thead>
<tr>
<th>Space Type</th>
<th>ASF per FTE</th>
<th>Office Type/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Labs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computational (Office type space)</td>
<td>60</td>
<td>Research station</td>
</tr>
<tr>
<td>Wet (Bench type space)</td>
<td>160</td>
<td>Research station</td>
</tr>
<tr>
<td>Hybrid (Instrumentation focused)</td>
<td>180</td>
<td>Research station</td>
</tr>
<tr>
<td>Offices:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department Chair/ Director</td>
<td>150</td>
<td>Private office</td>
</tr>
<tr>
<td>Faculty (Teaching and Research)</td>
<td>120</td>
<td>Private office</td>
</tr>
<tr>
<td>Research Scientist</td>
<td>120</td>
<td>Private office</td>
</tr>
<tr>
<td>Lab Manager</td>
<td>120</td>
<td>Private office</td>
</tr>
<tr>
<td>Visiting/Adjunct Faculty</td>
<td>80</td>
<td>Private or shared office</td>
</tr>
<tr>
<td>Admin Staff (senior)</td>
<td>100</td>
<td>Private office</td>
</tr>
<tr>
<td>Admin Staff</td>
<td>80</td>
<td>Open workstation</td>
</tr>
<tr>
<td>Post Doc</td>
<td>80</td>
<td>Shared office or open workstation</td>
</tr>
<tr>
<td>Graduate Student w/research space</td>
<td>30-35</td>
<td>Open workstation (included in research lab metric)</td>
</tr>
<tr>
<td>Graduate Student w/o research space</td>
<td>35</td>
<td>Hoteling workstation (1 per 10 students)</td>
</tr>
<tr>
<td>Undergraduate Student (admin work)</td>
<td>20</td>
<td>Open workstation for payroll positions</td>
</tr>
<tr>
<td>Conference Space</td>
<td>20</td>
<td>Allocation per FTE</td>
</tr>
<tr>
<td>Office Service (file, copy, storage)</td>
<td>10% additional</td>
<td>10% of total office + conference space</td>
</tr>
</tbody>
</table>

Table 3: Space type metrics

Note: UConn guideline metrics with refined research types are in line with national space standards
### 3.2 Faculty and Student Populations

The projections of future growth were discussed in depth by the Working Group. The School of Engineering reviewed three different hiring proposals: aggressive, medium and slow. Based on past trends and known upcoming faculty recruitment, the medium growth model was identified to estimate the needs of the School with the exception of CSE and ME, which utilize an aggressive growth model. By 2023, the faculty size is projected to increase by 18%:

- (9) New Teaching Faculty
- (24) New Research Faculty

The graduate student count is anticipated to rise to a total of 1,178, of which 828 are expected to require research space. Undergraduate student enrollment is projected to total 4,000. Administrative staff positions grow incrementally to support the increase in academic and research population.

Space need projections for 2023 are calculated based on future growth numbers. The assignable square feet required to support the 2023 projected faculty, staff and student growth is determined by multiplying the number of people by the space type metrics.

If the School of Engineering grows as forecasted in the Master Plan, the impact on the University’s ability to provide housing, dining, parking and centrally scheduled classes must be considered.

The following tables provide a summary of the projections.

#### Faculty Lines

<table>
<thead>
<tr>
<th>Departments</th>
<th>Current Faculty (2018)</th>
<th>Projected Faculty (2023)</th>
<th>Total Growth (2023)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Teaching</td>
<td>Research</td>
<td>Total</td>
</tr>
<tr>
<td>BME</td>
<td>5</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>CBE</td>
<td>3</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>CEE</td>
<td>4</td>
<td>28</td>
<td>32</td>
</tr>
<tr>
<td>CSE</td>
<td>6</td>
<td>30</td>
<td>36</td>
</tr>
<tr>
<td>ECE</td>
<td>0</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>ME &amp; MEM</td>
<td>10</td>
<td>26</td>
<td>36</td>
</tr>
<tr>
<td>C2E2</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>CTI</td>
<td>0</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>28</td>
<td>160</td>
<td>188</td>
</tr>
</tbody>
</table>

Growth: 33 faculty (+18%)

#### Graduate Student Enrollment

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrolled Group Size</td>
<td>In Labs</td>
</tr>
<tr>
<td>758</td>
<td>538</td>
</tr>
<tr>
<td></td>
<td>1,178</td>
</tr>
<tr>
<td>Growth: 420 (+55%)</td>
<td></td>
</tr>
</tbody>
</table>

#### Undergraduate Student Enrollment

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrolled Group Size</td>
<td>In Labs</td>
</tr>
<tr>
<td>3,280</td>
<td>828</td>
</tr>
<tr>
<td>Growth: 720 (+20%)</td>
<td></td>
</tr>
</tbody>
</table>
3.3 Space Type Projections

The following pages are a breakdown of each space type; including a description, existing space inventory, metrics used and projected growth. The metrics associated with the different space types are in line with national space standards as well as those at peer universities and form the basis for projections of future need. See Section 5.3 Space Needs Analysis for prototypical room diagrams.

Research Labs

In order to develop a more accurate assessment of research space needs, three different lab types were defined, each with a different space metric; each metric aligns with other State Universities:

- **Computational**: Office type space, small desktop set-ups (60 ASF per research station)
- **Wet Bench**: Lab space with central workbenches and perimeter support benches, storage and equipment (160 ASF per research station)
- **Hybrid**: Large equipment set-ups and workbench (180 ASF per research station)

In addition to allocations for the wet bench and hybrid lab types, which include dedicated lab space and write-up areas for graduate student researchers, an additional 25% is added to account for shared instrumentation support and other research service functions.

Currently, the average number of graduate students assigned to a Principal Investigator is four (PI+4). The projected space metrics will be PI+5. See Tables 3.5 and 3.6.
Research Lab Type Distribution

<table>
<thead>
<tr>
<th>Departments</th>
<th>2018 Existing Lab Type Distribution</th>
<th>2023 Projected Lab Growth</th>
<th>2023 Total Projected Labs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comp.</td>
<td>Wet</td>
<td>Hybrid</td>
</tr>
<tr>
<td>BME</td>
<td>3</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>CBE</td>
<td>3</td>
<td>14</td>
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</tr>
<tr>
<td>CEE</td>
<td>5</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>CSE</td>
<td>29</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>ECE</td>
<td>8</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>ME &amp; MEM</td>
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<td>10</td>
<td>8</td>
</tr>
<tr>
<td>C2E2</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>CTI</td>
<td>1</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>55</td>
<td>48</td>
</tr>
</tbody>
</table>

Table 3.5: Existing and projected research lab type distribution per department
Note: The projected research laboratory types include both lab and write-up office space.

Space Needs Analysis: Research Labs

<table>
<thead>
<tr>
<th>Research Lab Space Type (including Grad Write-Up Space &amp; Research Support)</th>
<th>2018 # of Research Labs</th>
<th>2018 Total Existing ASF</th>
<th>2023 PI+5 ASF Metric (+25% Lab Support)</th>
<th>2023 # of New Research Labs</th>
<th>2023 Projected Growth ASF with Support</th>
<th>2023 Subtotal Projected ASF</th>
<th>Removal of Longley ASF</th>
<th>Replacement of Longley ASF with Support</th>
<th>2023 Total Projected Growth ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computational</td>
<td>57</td>
<td>25,938</td>
<td>300</td>
<td>(375)</td>
<td>13</td>
<td>4,875</td>
<td>30,813</td>
<td>-621</td>
<td>375</td>
</tr>
<tr>
<td>Wet</td>
<td>55</td>
<td>50,879</td>
<td>800</td>
<td>(1,000)</td>
<td>2</td>
<td>2,000</td>
<td>52,879</td>
<td>-616</td>
<td>1,000</td>
</tr>
<tr>
<td>Hybrid/Equipment</td>
<td>48</td>
<td>41,511</td>
<td>900</td>
<td>(1,125)</td>
<td>9</td>
<td>10,125</td>
<td>51,636</td>
<td>-13,607</td>
<td>15,750</td>
</tr>
<tr>
<td>Total ASF</td>
<td>160</td>
<td>118,328</td>
<td>24</td>
<td>17,000</td>
<td>135,328</td>
<td>-14,844</td>
<td>17,125</td>
<td>137,609</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.6: Existing and projected space needs for research labs
Note: The PI+5 metrics will apply only to Growth; the existing labs are to remain PI+4.
If the existing Research Lab space is adjusted to the PI+5 metrics, an additional 12,047 ASF is needed.
The 2023 Total Projected Growth ASF includes replacing the Longley and Depot D assignable square footage; there is no research lab space in Depot D.
Core Labs

Core labs are defined as facilities that are shared by multiple departments, or specialty spaces that provide a unique resource.

The projection of future needs includes a high bay space and a lab for a future research initiative. Both labs are envisioned as flexible open work areas with available electrical, data and gas utility infrastructure for connections to individual equipment items. The future high bay lab would be similar to the existing high bay space in C2E2. Both would provide a specialty capability with high end instrumentation that would be too expensive for individual researchers to purchase and maintain.

<table>
<thead>
<tr>
<th>Core Lab (Building)</th>
<th>Department Assigned to</th>
<th>2018 Total Existing ASF</th>
<th>2023 Projected Growth ASF</th>
<th>2023 Total Projected ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Bay Lab (C2E2)</td>
<td>Multiple (C2E2)</td>
<td>4,257</td>
<td>0</td>
<td>4,257</td>
</tr>
<tr>
<td>Structures High Bay Lab (FLC)</td>
<td>CEE</td>
<td>2,712</td>
<td>0</td>
<td>2,712</td>
</tr>
<tr>
<td>Machine Shop (E2)</td>
<td>ME</td>
<td>872</td>
<td>0</td>
<td>872</td>
</tr>
<tr>
<td>Computer Labs (E2 &amp; ITE)</td>
<td>Deanery</td>
<td>4,171</td>
<td>0</td>
<td>4,171</td>
</tr>
<tr>
<td>Foundation in Engineering (UTEB)</td>
<td>Deanery</td>
<td>2,351</td>
<td>0</td>
<td>2,351</td>
</tr>
<tr>
<td>Machine Shop (FLC)</td>
<td>ETS</td>
<td>5,810</td>
<td>0</td>
<td>5,810</td>
</tr>
<tr>
<td>High Bay Lab</td>
<td>Unassigned</td>
<td></td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Core Lab</td>
<td>Unassigned</td>
<td></td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Total ASF</td>
<td></td>
<td>20,173</td>
<td>3,500</td>
<td>23,673</td>
</tr>
</tbody>
</table>

Table 3.7: Existing and projected space needs for core labs

Figure 3.5: Existing C2E2 high bay core lab

Figure 3.6: Core lab example at Cornell University (source: Payette)
Teaching Space

Teaching laboratories, senior design and underclassmen project spaces are included in the Teaching Space program type.

In order to accommodate the anticipated increase in undergraduate students, one additional teaching laboratory of each type will be required.

In addition, project space for underclassmen has been provided. This includes open build areas with work benches along with adjoining rooms for supplies and secure storage. The existing available project space can only accommodate seniors.

### Space Needs Analysis: Teaching Space

<table>
<thead>
<tr>
<th>Teaching Space Type (including Support)</th>
<th>2018 Total Existing ASF</th>
<th>2023 Projected Growth ASF</th>
<th>2023 Total Projected ASF</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computational Teaching Lab</td>
<td>8,313</td>
<td>1,500</td>
<td>9,813</td>
<td>New lab: 50 seats</td>
</tr>
<tr>
<td>Wet Teaching Lab</td>
<td>9,684</td>
<td>1,500</td>
<td>11,184</td>
<td>New lab: 30 seats</td>
</tr>
<tr>
<td>Hybrid/Equipment Teaching Lab</td>
<td>11,581</td>
<td>1,500</td>
<td>13,081</td>
<td>New lab: 30 seats</td>
</tr>
<tr>
<td>Senior Design Space</td>
<td>10,031</td>
<td>2,000</td>
<td>12,031</td>
<td></td>
</tr>
<tr>
<td>Underclassmen Student Project Space</td>
<td>0</td>
<td>4,000</td>
<td>4,000</td>
<td>4 at 1,000 ASF</td>
</tr>
<tr>
<td>Total ASF</td>
<td>39,609</td>
<td>10,500</td>
<td>50,109</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.8: Existing and projected space needs for teaching space
Office Space

Office space includes all faculty and staff offices, hoteling space for graduate students without research space (Master of Engineering, or MENG, students), conference rooms and office service (file, copy and storage space). Write-up areas for graduate students are included in research lab space calculations.

Acknowledging that existing office layouts and assignments are unlikely to change significantly in the near-term, the existing (2018) office area will be used as the starting point to which future growth will be added incrementally.

The undergraduate student allocation is for workstation space for undergraduates with payroll positions working in offices.

Projected needs for future office space are based on the metrics outlined in Table 3.1: Space Type Metrics.
### Space Needs Analysis: Office Space

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty (Research and Teaching)</td>
<td>188</td>
<td>29,231</td>
<td>120</td>
<td>33</td>
<td>3,960</td>
<td>33,191</td>
<td>Incl. in staff</td>
<td>1,760</td>
<td>34,951</td>
</tr>
<tr>
<td>Department Chair/Director (included in Faculty)</td>
<td>8</td>
<td>Incl. in faculty</td>
<td>120</td>
<td>2</td>
<td>240</td>
<td>240</td>
<td>Incl. in staff</td>
<td>0</td>
<td>240</td>
</tr>
<tr>
<td>Research Scientists and Lab Managers</td>
<td>2</td>
<td>Incl. in staff</td>
<td>120</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>Incl. in staff</td>
<td>0</td>
<td>240</td>
</tr>
<tr>
<td>Visiting/Adjunct Faculty</td>
<td>8</td>
<td>Incl. in faculty</td>
<td>80</td>
<td>0</td>
<td>0</td>
<td>Incl. in faculty</td>
<td>0</td>
<td>0</td>
<td>Incl. in faculty</td>
</tr>
<tr>
<td>Admin Staff (senior)</td>
<td>52</td>
<td>Incl. in staff</td>
<td>100</td>
<td>900</td>
<td>900</td>
<td>2,200</td>
<td>Incl. in staff</td>
<td>1,300</td>
<td>2,200</td>
</tr>
<tr>
<td>Admin Staff</td>
<td>59</td>
<td>24,608</td>
<td>80</td>
<td>800</td>
<td>25,408</td>
<td>-5,386</td>
<td>1,120</td>
<td>21,142</td>
<td></td>
</tr>
<tr>
<td>Post Doc</td>
<td>24</td>
<td>1,437</td>
<td>80</td>
<td>1,040</td>
<td>2,477</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2,477</td>
</tr>
<tr>
<td>Graduate Student w/o research space (hoteling)*</td>
<td>0</td>
<td>35 (35 stations)</td>
<td>1,225</td>
<td>1,225</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1,225</td>
</tr>
<tr>
<td>Undergraduate Student (admin work)</td>
<td>50</td>
<td>Incl. in staff</td>
<td>20</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>0</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>Conference Space</td>
<td>8,007</td>
<td>20</td>
<td>(67 FTE)</td>
<td>1,340</td>
<td>9,347</td>
<td>0</td>
<td>840</td>
<td>10,187</td>
<td></td>
</tr>
<tr>
<td>TA student office hour space</td>
<td>0</td>
<td>350</td>
<td>(5 rooms)</td>
<td>1,750</td>
<td>1,750</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1,750</td>
</tr>
<tr>
<td>Office Service (file, copy, storage)</td>
<td>5,645</td>
<td>+10%</td>
<td>1,170</td>
<td>6,815</td>
<td>-736</td>
<td>802</td>
<td>6,881</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total ASF</strong></td>
<td><strong>383</strong></td>
<td><strong>68,928</strong></td>
<td><strong>67</strong></td>
<td><strong>12,865</strong></td>
<td><strong>81,793</strong></td>
<td><strong>-6,122</strong></td>
<td><strong>5,822</strong></td>
<td><strong>81,493</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Graduate student hoteling space calculated as 35 ASF per student, one for every ten students.

Note: The 2023 Total Projected Growth ASF includes replacing the Longley and Depot D assignable square footage; there is no office space in Depot D.
Student Space

Student spaces focus on undergraduate needs and include gathering/break space, study rooms and student club work space. In order to accommodate the projected rise in undergraduate student enrollment, increases are identified for each of these spaces.

### Space Needs Analysis: Student Space

<table>
<thead>
<tr>
<th>Student Space Type</th>
<th>2018 Total Existing ASF</th>
<th>2023 ASF Metric</th>
<th>2023 # of New Spaces</th>
<th>2023 Projected Growth ASF</th>
<th>2023 Subtotal Projected ASF</th>
<th>Removal of Longley &amp; Depot D ASF</th>
<th>Replacement of Longley &amp; Depot D ASF</th>
<th>2023 Total Projected ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Rooms</td>
<td>2,156</td>
<td>400</td>
<td>2</td>
<td>800</td>
<td>2,956</td>
<td>-623</td>
<td>623</td>
<td>2,956</td>
</tr>
<tr>
<td>SoE Club Project Space</td>
<td>6,055</td>
<td>1,000</td>
<td>2</td>
<td>2,000</td>
<td>8,055</td>
<td>-6,055</td>
<td>6,055</td>
<td>8,055</td>
</tr>
<tr>
<td>SoE Club Office Space</td>
<td>0</td>
<td>100</td>
<td>2</td>
<td>200</td>
<td>200</td>
<td>0</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>Break Space</td>
<td>4,268</td>
<td>500</td>
<td>2</td>
<td>1,000</td>
<td>5,268</td>
<td>0</td>
<td>0</td>
<td>5,268</td>
</tr>
<tr>
<td>Computer/Work Space</td>
<td>0</td>
<td>500</td>
<td>2</td>
<td>1,000</td>
<td>1,000</td>
<td>0</td>
<td>0</td>
<td>1,000</td>
</tr>
<tr>
<td>Total ASF</td>
<td>12,479</td>
<td>10</td>
<td>5,000</td>
<td>17,479</td>
<td>-6,678</td>
<td>6,678</td>
<td></td>
<td>17,479</td>
</tr>
</tbody>
</table>

Table 3.10: Existing and projected space needs for student space

*Note: New student space needs determined with input from the Working Group.*

*Note: The 2023 Total Projected Growth ASF includes replacing the Longley and Depot D assignable square footage.*

---

Figure 3.11: Informal break space example at University of Massachusetts, Amherst (source: Payette)

Figure 3.12: Student club space example (source: Payette)
General Support

General Support includes all non-department assigned building support space, including:
- ETS general storage space
- CTI storage in Depot D
- Server storage closet in Engineering II

No additional support space has been added in the future projections with the assumption that current service facilities will be able to accommodate future activity.

<table>
<thead>
<tr>
<th>Space Category</th>
<th>2018 Total Existing ASF</th>
<th>2023 New ASF</th>
<th>2023 Subtotal Projected ASF</th>
<th>Removal of Longley &amp; Depot D ASF</th>
<th>Replacement of Longley &amp; Depot D ASF</th>
<th>2023 Total Projected ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Support</td>
<td>10,538</td>
<td>0</td>
<td>10,538 (No Change)</td>
<td>-10,137</td>
<td>10,137</td>
<td>10,538 (No Change)</td>
</tr>
</tbody>
</table>

Table 3.11: Existing and projected space needs for general support

Note: The 2023 Total Projected Growth ASF includes replacing the Longley and Depot D assignable square footage.
Strategic Vacancy

The Dean of the School of Engineering requested Strategic Vacancy space to be able to respond to requests for short-term laboratory swing space. Examples of uses for strategic vacancy include:

- Accommodation of research grant and industry sponsored research initiatives;
- Readily available space to house newly recruited faculty researchers or allow for episodic growth of junior faculty;
- Temporary relocation space for current researchers to enable updates and renovations to existing labs.

<table>
<thead>
<tr>
<th>Space Category</th>
<th>2018 Total Existing ASF</th>
<th>2023 New ASF</th>
<th>2023 Total Projected ASF</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Vacancy</td>
<td>0</td>
<td>6,000</td>
<td>6,000</td>
<td>+ 4-5% of all research space</td>
</tr>
</tbody>
</table>

Table 3.12: Projected space needs for strategic vacancy

Figure 3.13: UConn National Institute for Undersea Vehicle Technology
(source: UConn Innovation Portal)
## 3.4 Total Space Needs

The following are the space needs for the School of Engineering:

- **Projected Growth and Strategic Vacancy:**
  The projected space to support the growth for the School of Engineering over the next five years is 48,865 ASF. With an additional 6,000 ASF of enabling Strategic Vacancy laboratory swing space, the total is 54,865 ASF.

- **Replacement of Longley and Depot D:**
  A total of 37,780 ASF of occupied space in the Longley and Depot D buildings is in poor condition; both buildings are in need of extensive renovation or replacement. If replaced, utilizing the proposed PI+5 metrics, the area would increase by an additional 1,982 ASF to a total of 39,762 ASF.

### Space Needs: Projected Growth and Strategic Vacancy Only

<table>
<thead>
<tr>
<th>Space Types</th>
<th>2018 Total Existing ASF</th>
<th>2023 Total Projected ASF</th>
<th>Delta ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Labs (with Support)*</td>
<td>118,328</td>
<td>135,328</td>
<td>+17,000</td>
</tr>
<tr>
<td>Core Labs</td>
<td>20,173</td>
<td>23,673</td>
<td>+3,500</td>
</tr>
<tr>
<td>Teaching Space (with Support)</td>
<td>39,609</td>
<td>50,109</td>
<td>+10,500</td>
</tr>
<tr>
<td>Office Space (with Support)**</td>
<td>68,928</td>
<td>81,793</td>
<td>+12,865</td>
</tr>
<tr>
<td>Student Space</td>
<td>12,479</td>
<td>17,479</td>
<td>+5,000</td>
</tr>
<tr>
<td>General Support</td>
<td>10,538</td>
<td>10,538</td>
<td>0</td>
</tr>
<tr>
<td>Strategic Vacancy***</td>
<td>0</td>
<td>6,000</td>
<td>+6,000</td>
</tr>
<tr>
<td><strong>Total ASF Space Needs</strong></td>
<td>270,055</td>
<td>324,920</td>
<td>+54,865</td>
</tr>
</tbody>
</table>

**Table 3.13: Space needs by space type**

* If existing research space is calculated based on the PI+5 group size metric, an additional 12,000 ASF is needed.

** No adjustments to office ASF for existing faculty; incremental growth only

*** Total Projected ASF can be adjusted by eliminating or reducing the Strategic Vacancy ASF

### Space Needs: Replacement of Longley and Depot D

<table>
<thead>
<tr>
<th>Space Needs</th>
<th>2018 Total Existing ASF</th>
<th>2023 Total Projected ASF</th>
<th>Delta ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement of Longley and Depot D</td>
<td>-14,844</td>
<td>+17,125</td>
<td>0</td>
</tr>
<tr>
<td>Total Projected Growth and Strategic Vacancy ASF</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total ASF Space Needs</td>
<td>-37,780 (without Longley and Depot D)</td>
<td>+39,762 (with Longley and Depot D replaced)</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 3.14: Space needs for the replacement of Longley and Depot D**

### Space Needs: Projected Growth, Strategic Vacancy and Replacement of Longley and Depot D

<table>
<thead>
<tr>
<th>Space Needs</th>
<th>2018 Total Existing ASF</th>
<th>2023 Total Projected ASF</th>
<th>Delta ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Projected Growth and Strategic Vacancy ASF</td>
<td>270,055</td>
<td>324,920</td>
<td>+54,865</td>
</tr>
<tr>
<td>Replacement of Longley and Depot D</td>
<td>-37,780</td>
<td>1,982</td>
<td>+39,762</td>
</tr>
<tr>
<td><strong>Total ASF Space Needs</strong></td>
<td>232,275 (without Longley and Depot D)</td>
<td>326,902 (with Longley and Depot D replaced)</td>
<td>+94,627</td>
</tr>
</tbody>
</table>

**Table 3.15: Summary of space needs including projected growth, strategic vacancy, and demolition and replacement of the Longley and Depot D buildings**
4. OPPORTUNITIES
4.1 Organization

The majority of the School of Engineering’s space is located within a series of buildings (UTEB, E2, ABB and FLC) located adjacent to each other on the Storrs Campus. Within these buildings is the School of Engineering Administration and almost all of the School’s student project space and core labs. Coincidentally, these buildings are in the same physical condition (fair condition), offering opportunities for quantitative and qualitative improvements.

The remaining School of Engineering buildings (ESB, ITE and HBL) are contemporary laboratories and, therefore, do not offer the same development opportunities. Due to these factors, this Master Plan recommends focusing near-term improvements on UTEB, E2, and ABB.

The Depot D building is currently used for student clubs and storage; these spaces should be relocated to the Storrs Campus. The Longley Building is occupied primarily by the Connecticut Transportation Institute (CTI); due to its large parking demand and vast number of municipal visitors, CTI would ideally remain on the Depot Campus.
4.2 Space Opportunities

The projected growth space needs for the School of Engineering can be met by recapturing vacant space in the Arthur B. Bronwell Hall (ABB) and Engineering II (E2) buildings at the completion of the Gant renovation project in 2023 and Science 1 building in 2022, reorganizing space in the Information Technologies Engineering Building (ITE) and the sub-basement of Babbidge Library (HBL) and capturing unallocated space in Science 1.

With the exception of CTI space, replacing the Longley Building and Depot D ASF would require additions to existing buildings on the Storrs Campus.

The following goals have driven the recommended opportunities:

- Clearly establish FLC as the School’s “front door” by collocating the Office of the Dean administrative offices, Engineering Financial Services and Continuing and Distance Engineering Education (CDEE) while increasing their visibility
- Refocus buildings on a specific department where appropriate
- Create continuous zones of similar space types for flexible expansion (e.g. placing labs adjacent to each other without any other space type interrupting them)
- Utilize buildings to their highest and best use
- Celebrate science on display

The following is a list of potential options to meet the 2023 School of Engineering Projected Growth and Strategic Vacancy space needs. The total space identified exceeds the need, providing some flexibility in choosing which opportunities to implement.

### Opportunities with New Construction: With Existing Longley & Without Depot D

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Available ASF</th>
<th>Projected ASF</th>
<th>Delta ASF</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Adjusted ASF (with all opportunities in existing buildings and without Depot D)</td>
<td>292,218</td>
<td>324,920</td>
<td>+32,702</td>
<td>32,702 ASF needed beyond all opportunities in existing buildings, including replacing Depot D</td>
</tr>
<tr>
<td>E2 Addition</td>
<td>+21,620</td>
<td>324,920</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UTEB Addition</td>
<td>+21,800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2E2 Addition</td>
<td>+1,880</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2: Opportunities to address the remaining projected growth and strategic vacancy space needs with new construction assuming the Longley Building is to remain as is and the Depot D building is vacated

### Opportunities within Existing Buildings: With Existing Longley & Without Depot D

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Available ASF</th>
<th>Projected ASF</th>
<th>Delta ASF</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ASF</td>
<td>270,055 (2018 Existing)</td>
<td>324,920</td>
<td>+54,865</td>
<td>Projected ASF is Projected Growth and Strategic Vacancy space need</td>
</tr>
<tr>
<td>Recapture ABB CLAS Biology Space</td>
<td>+4,403</td>
<td></td>
<td></td>
<td>Gant North completion in 2023 or Gant West in 2021</td>
</tr>
<tr>
<td>Recapture E2 MSE Teaching Lab Space</td>
<td>+3,028</td>
<td></td>
<td></td>
<td>Science 1 completion in 2023 or Gant West in 2021</td>
</tr>
<tr>
<td>Reconfigure ITE</td>
<td>+2,800</td>
<td></td>
<td></td>
<td>Can occur anytime (efficiency increase, not space addition)</td>
</tr>
<tr>
<td>Reconfigure HBL</td>
<td>+3,900</td>
<td></td>
<td></td>
<td>Can occur anytime (2,900 ASF from efficiency increase)</td>
</tr>
<tr>
<td>Recapture Longley TIP space</td>
<td>+2,748</td>
<td></td>
<td></td>
<td>Relocate to IPB</td>
</tr>
<tr>
<td>Capture Science 1 unallocated space for Mechanical Engineering department</td>
<td>+12,000</td>
<td></td>
<td></td>
<td>Not entire ME department, Science 1 completion in 2022</td>
</tr>
<tr>
<td>Total Adjusted ASF (with Opportunities)</td>
<td>298,934</td>
<td>324,920</td>
<td>+25,986</td>
<td></td>
</tr>
<tr>
<td>Vacate Depot D</td>
<td></td>
<td>-6,716</td>
<td></td>
<td>Relocate student clubs and storage to Storrs Campus</td>
</tr>
<tr>
<td>Total Adjusted ASF (without Depot D)</td>
<td>292,218</td>
<td>324,920</td>
<td>+32,702</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.1: Opportunities to address the projected growth and strategic vacancy space needs within existing School of Engineering buildings assuming the Longley Building is to remain as is and the Depot D building is vacated

4. Opportunities
The following are opportunities for 45,300 ASF of new construction additions to School of Engineering-occupied buildings:

<table>
<thead>
<tr>
<th>Building</th>
<th>ASF Add*</th>
</tr>
</thead>
<tbody>
<tr>
<td>E2</td>
<td></td>
</tr>
<tr>
<td>Wings Demolition</td>
<td>-6,980</td>
</tr>
<tr>
<td>Large Addition</td>
<td>+28,600</td>
</tr>
<tr>
<td>Net ASF</td>
<td>+21,620</td>
</tr>
</tbody>
</table>

Table 4.3: E2 possible opportunity area tabulation with a large addition
* All numbers are approximate.

<table>
<thead>
<tr>
<th>Building</th>
<th>ASF Add*</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTEB</td>
<td></td>
</tr>
<tr>
<td>Addition</td>
<td>+21,800</td>
</tr>
<tr>
<td>Net ASF</td>
<td>+21,800</td>
</tr>
</tbody>
</table>

Table 4.4: UTEB possible opportunity area tabulation
* All numbers are approximate.

<table>
<thead>
<tr>
<th>Building</th>
<th>ASF Add*</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2E2</td>
<td></td>
</tr>
<tr>
<td>Addition</td>
<td>+1,880</td>
</tr>
<tr>
<td>Net ASF</td>
<td>+1,880</td>
</tr>
</tbody>
</table>

Table 4.5: C2E2 possible opportunity area tabulation
* All numbers are approximate.

Figure 4.2: Aerial view of the proposed addition to E2

Figure 4.3: Aerial view of the proposed addition to UTEB

Figure 4.4: Site diagram of the proposed addition to C2E2
Opportunities within Existing Buildings: Without Longley & Depot D

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Available ASF</th>
<th>Projected ASF</th>
<th>Delta ASF</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ASF (2018 Existing)</td>
<td>270,055</td>
<td>324,920</td>
<td>+54,865</td>
<td>Projected ASF is Projected Growth and Strategic Vacancy space need</td>
</tr>
<tr>
<td>Recapture ABB CLAS Biology Space</td>
<td>+4,403</td>
<td></td>
<td></td>
<td>Gant North completion in 2023 or Gant West in 2021</td>
</tr>
<tr>
<td>Recapture E2 MSE Teaching Lab Space</td>
<td>+3,028</td>
<td></td>
<td></td>
<td>Science 1 completion in 2022</td>
</tr>
<tr>
<td>Reconfigure ITE</td>
<td>+2,800</td>
<td></td>
<td></td>
<td>Can occur anytime (efficiency increase, not space addition)</td>
</tr>
<tr>
<td>Reconfigure HBL</td>
<td>+3,900</td>
<td></td>
<td></td>
<td>Can occur anytime (2,900 ASF from efficiency increase)</td>
</tr>
<tr>
<td>Recapture Longley TIP space</td>
<td>+2,748</td>
<td></td>
<td></td>
<td>Relocate to IPB</td>
</tr>
<tr>
<td>Capture Science 1 unallocated space for</td>
<td>+12,000</td>
<td></td>
<td></td>
<td>Not entire ME department, Science 1 completion in 2022</td>
</tr>
<tr>
<td>Mechanical Engineering department</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Adjusted ASF (with Opportunities)</td>
<td>298,934</td>
<td>324,920</td>
<td>+25,986</td>
<td>Relocate student clubs and storage to Storrs Campus</td>
</tr>
<tr>
<td>Vacate Depot D</td>
<td>-6,716</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Adjusted ASF (without Depot D)</td>
<td>292,218</td>
<td>324,920</td>
<td>+32,702</td>
<td>1,982 ASF additional space needed to replace Longley at idealized PI+5</td>
</tr>
<tr>
<td>Demolish Longley</td>
<td>-31,064</td>
<td>+1,982</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Adjusted ASF (with all opportunities in existing buildings)</td>
<td>261,154 (without Longley and Depot D replaced)</td>
<td>326,902</td>
<td>+65,748</td>
<td>65,748 ASF needed beyond all opportunities in existing buildings, including replacing Longley and Depot D</td>
</tr>
</tbody>
</table>

Table 4.6: Opportunities to address the projected growth space needs within existing School of Engineering buildings assuming the Longley Building is demolished and the Depot D building is vacated

Opportunities with New Construction: Without Longley & Depot D

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Available ASF</th>
<th>Projected ASF</th>
<th>Delta ASF</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Adjusted ASF (with all opportunities in existing buildings and without Depot D and Longley)</td>
<td>261,154</td>
<td>326,902</td>
<td>+65,748</td>
<td>Longley existing ASF has been removed from the available ASF</td>
</tr>
<tr>
<td>E2 Addition</td>
<td>+21,620</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UTEB Addition</td>
<td>+21,800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2E2 Addition</td>
<td>+1,880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Adjusted ASF (with Opportunities)</td>
<td>306,454</td>
<td>326,902</td>
<td>+20,448</td>
<td>20,448 ASF deficit without replacing the Longley Building</td>
</tr>
</tbody>
</table>

Table 4.7: Opportunities to address the remaining projected growth and strategic vacancy space needs with new construction assuming the Longley Building is demolished and the Depot D building is vacated

4.3 Conclusion

The School of Engineering is projected to grow by 33 new faculty, 420 graduate students, and 720 undergraduate students. The School faces two space need issues: the quantity of space needed per growth projections and the quality of the existing Longley and Depot D buildings. If the School grows per the Master Plan projections, 54,865 ASF is needed to meet this growth. Ideally, Longley and Depot D are replaced, adding a need for 39,762 ASF, for a grand total space need for the School of Engineering of 94,627 ASF.

There are opportunities in existing School of Engineering-occupied buildings to increase efficiency and add space, but this will not satisfy the total projected space needs; additional new space as new construction is required.

The projected growth, strategic vacancy, and replacement of Depot D space needs can be met with opportunities in existing buildings and strategically-placed new construction additions on E2, UTEB, and C2E2. If all opportunities in the Master Plan are implemented, there will be a surplus of space as compared to the 2023 needs, offering flexibility in opportunity options and implementation. However, if existing space in the Longley Building and Depot D are removed from the School of Engineering footprint and not replaced, the opportunities noted within this Master Plan (utilizing existing space and new construction) will not meet the projected 2023 needs.
5.1 Site Analysis

Figure 5.1: Aerial photo of Depot Campus  
(base image source: Google Maps)
Figure 5.2: Aerial photo of Storrs Campus
(base image source: Google Maps)
Campus Circulation: Vehicular

The following site diagrams illustrate the current circulation patterns around the School of Engineering buildings, noting future changes suggested by the 2015 Campus Master Plan.

Figure 5.3: Storrs Campus vehicle circulation
Campus Circulation: Pedestrian

The future north-south pedestrian landscape axis is envisioned to connect to a potential green space on North Eagleville Road.
### 5.2 Existing Conditions Analysis

#### School of Engineering Building Space Inventories

##### Arthur B. Bronwell Hall (ABB)

<table>
<thead>
<tr>
<th>2018 Existing ASF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level</strong></td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Space Type</strong></th>
<th><strong>All</strong></th>
<th><strong>SoE-Only</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Labs</td>
<td>8,992</td>
<td>8,174</td>
</tr>
<tr>
<td>Core Labs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Teaching Space</td>
<td>11,987</td>
<td>7,956</td>
</tr>
<tr>
<td>Office Space</td>
<td>5,189</td>
<td>4,767</td>
</tr>
<tr>
<td>Student Space</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>General Support</td>
<td>738</td>
<td>64</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26,907</strong></td>
<td><strong>20,961</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Department</strong></th>
<th><strong>All</strong></th>
<th><strong>%</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>14,759</td>
<td>55%</td>
</tr>
<tr>
<td>CBE</td>
<td>1,252</td>
<td>5%</td>
</tr>
<tr>
<td>CEE</td>
<td>2,909</td>
<td>11%</td>
</tr>
<tr>
<td>CSE</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ECE</td>
<td>1,461</td>
<td>5%</td>
</tr>
<tr>
<td>ME &amp; MEM</td>
<td>516</td>
<td>2%</td>
</tr>
<tr>
<td>MSE &amp; C2E2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CTI</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SoE Administration</td>
<td>64</td>
<td>0</td>
</tr>
<tr>
<td>Unassigned</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>5,946</td>
<td>22%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26,907</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

---

**Figures 5.5-7:** Existing Level 1, 2, and 3 plan diagrams.

---

**Tables 5.1-3:** ABB 2018 existing ASF inventory.
Engineering II (E2)

### 2018 Existing ASF

<table>
<thead>
<tr>
<th>Level</th>
<th>All</th>
<th>SoE-Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>12,069</td>
<td>8,550</td>
</tr>
<tr>
<td>2</td>
<td>11,992</td>
<td>11,992</td>
</tr>
<tr>
<td>1</td>
<td>17,838</td>
<td>16,424</td>
</tr>
<tr>
<td></td>
<td><strong>41,899</strong></td>
<td><strong>39,966</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Space Type</th>
<th>All</th>
<th>SoE-Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Labs</td>
<td>12,647</td>
<td>12,647</td>
</tr>
<tr>
<td>Core Labs</td>
<td>2,798</td>
<td>2,798</td>
</tr>
<tr>
<td>Teaching Space</td>
<td>12,738</td>
<td>9,710</td>
</tr>
<tr>
<td>Office Space</td>
<td>11,240</td>
<td>11,240</td>
</tr>
<tr>
<td>Student Space</td>
<td>420</td>
<td>420</td>
</tr>
<tr>
<td>General Support</td>
<td>2,056</td>
<td>151</td>
</tr>
<tr>
<td></td>
<td><strong>41,899</strong></td>
<td><strong>36,966</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Department</th>
<th>All</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>138</td>
<td>0</td>
</tr>
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<td>CBE</td>
<td>11,221</td>
<td>27%</td>
</tr>
<tr>
<td>CEE</td>
<td>140</td>
<td>0</td>
</tr>
<tr>
<td>CSE</td>
<td>156</td>
<td>0</td>
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<tr>
<td>ECE</td>
<td>224</td>
<td>1%</td>
</tr>
<tr>
<td>ME &amp; MEM</td>
<td>18,264</td>
<td>44%</td>
</tr>
<tr>
<td>MSE &amp; C2E2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CTI</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SoE Administration</td>
<td>6,823</td>
<td>16%</td>
</tr>
<tr>
<td>Unassigned</td>
<td>3,028</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>1,905</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td><strong>41,899</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Tables 5.4-6: E2 2018 existing ASF inventory
United Technologies Engineering Building (UTEB)

2018 Existing ASF

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<thead>
<tr>
<th>Level</th>
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</tr>
</thead>
<tbody>
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<td>2,338</td>
<td>2,190</td>
</tr>
<tr>
<td>4</td>
<td>6,827</td>
<td>6,827</td>
</tr>
<tr>
<td>3</td>
<td>6,432</td>
<td>6,432</td>
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<tr>
<td>2</td>
<td>6,597</td>
<td>6,597</td>
</tr>
<tr>
<td>1</td>
<td>5,829</td>
<td>3,185</td>
</tr>
<tr>
<td></td>
<td>28,022</td>
<td>25,230</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Space Type</th>
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<th>SoE-Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Labs</td>
<td>12,505</td>
<td>12,505</td>
</tr>
<tr>
<td>Core Labs</td>
<td>2,351</td>
<td>2,351</td>
</tr>
<tr>
<td>Teaching Space</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Office Space</td>
<td>10,060</td>
<td>10,060</td>
</tr>
<tr>
<td>Student Space</td>
<td>314</td>
<td>314</td>
</tr>
<tr>
<td>General Support</td>
<td>2,642</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>28,022</td>
<td>25,230</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Department</th>
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<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CBE</td>
<td>10,324</td>
<td>37%</td>
</tr>
<tr>
<td>CEE</td>
<td>0</td>
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<tr>
<td>CSE</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ECE</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ME &amp; MEM</td>
<td>12,555</td>
<td>45%</td>
</tr>
<tr>
<td>MSE &amp; C2E2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CTI</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SoE Administration</td>
<td>2,351</td>
<td>8%</td>
</tr>
<tr>
<td>Unassigned</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>2,642</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>28,022</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 5.11: Existing Level 1 plan diagram
Figure 5.12: Existing Level 2 plan diagram
Figure 5.13: Existing Level 3 plan diagram
Figure 5.14: Existing Level 4 plan diagram
Figure 5.15: Existing Level 5 plan diagram

Tables 5.7-9: UTEB 2018 existing ASF inventory
Franklin L. Castleman Building (FLC)

### 2018 Existing ASF

<table>
<thead>
<tr>
<th>Level</th>
<th>All</th>
<th>SoE-Only</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>7,079</td>
<td>7,079</td>
</tr>
<tr>
<td>2</td>
<td>11,551</td>
<td>8,010</td>
</tr>
<tr>
<td>1</td>
<td>23,274</td>
<td>23,274</td>
</tr>
<tr>
<td></td>
<td>41,904</td>
<td>38,363</td>
</tr>
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</table>

<table>
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<tr>
<th>Space Type</th>
<th>All</th>
<th>SoE-Only</th>
</tr>
</thead>
<tbody>
<tr>
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<td>6,123</td>
<td>6,123</td>
</tr>
<tr>
<td>Core Labs</td>
<td>8,522</td>
<td>8,522</td>
</tr>
<tr>
<td>Teaching Space</td>
<td>12,827</td>
<td>12,827</td>
</tr>
<tr>
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<td>10,345</td>
<td>10,345</td>
</tr>
<tr>
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<td>546</td>
<td>546</td>
</tr>
<tr>
<td>General Support</td>
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<td>0</td>
</tr>
<tr>
<td></td>
<td>41,904</td>
<td>38,363</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
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</tr>
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</tr>
<tr>
<td>CEE</td>
<td>23,976</td>
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<td>ECE</td>
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<td>0</td>
</tr>
<tr>
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<td>MSE &amp; C2E2</td>
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<tr>
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<tr>
<td></td>
<td>41,904</td>
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</table>

Figure 5.16: Existing Level 1 plan diagram
Figure 5.17: Existing Level 2 plan diagram
Figure 5.18: Existing Level 3 plan diagram

Tables 5.10-12: FLC 2018 existing ASF inventory

5. Appendix
### 2018 Existing ASF

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<td>9,512</td>
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### Space Type

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<td>18,223</td>
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</tr>
<tr>
<td></td>
<td><strong>61,330</strong></td>
<td><strong>51,084</strong></td>
</tr>
</tbody>
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### Department

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<tr>
<td>CBE</td>
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<td>0</td>
</tr>
<tr>
<td>CEE</td>
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<tr>
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<tr>
<td>MSE &amp; C2E2</td>
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<td><strong>61,330</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

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**Notes:**
- **Tables 5.13-15:** ITE 2018 existing ASF inventory
- **Figure 5.19:** Existing Level 0 plan diagram
- **Figure 5.20:** Existing Level 1 plan diagram
- **Figure 5.21:** Existing Level 2 plan diagram
- **Figure 5.22:** Existing Level 3 plan diagram
- **Figure 5.23:** Existing Level 4 plan diagram
### 2018 Existing ASF

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<td>Core Labs</td>
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<td>General Support</td>
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<td>186</td>
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<td>34,469</td>
<td>13,748</td>
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<table>
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<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>129</td>
<td>0</td>
</tr>
<tr>
<td>CBE</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CEE</td>
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</tr>
<tr>
<td>CSE</td>
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<td>ECE</td>
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<td>ME &amp; MEM</td>
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<td>0</td>
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<tr>
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<td>0</td>
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<tr>
<td>CTI</td>
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**Figure 5.24: Existing Level A plan diagram**

*Tables 5.16-18: HBL 2018 existing ASF inventory*
## Engineering & Science Building (ESB)

### 2018 Existing ASF

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<td>1</td>
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<td><strong>33,990</strong></td>
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<tr>
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<td>Office Space</td>
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<td>General Support</td>
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<td>0</td>
</tr>
<tr>
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<td><strong>35,282</strong></td>
<td><strong>33,990</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>All</th>
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</tr>
</thead>
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<td>CEE</td>
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<td>ECE</td>
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<tr>
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</tr>
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<td>CTI</td>
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<td>0</td>
</tr>
<tr>
<td>SoE Administration</td>
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<td>0</td>
</tr>
<tr>
<td>Unassigned</td>
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</table>

### Figures
- Figure 5.25: Existing Level 1 plan diagram
- Figure 5.26: Existing Level 4 plan diagram
- Figure 5.27: Existing Level 5 plan diagram

*Tables 5.19-21: ESB 2018 existing ASF inventory*
Center for Clean Energy & Engineering (C2E2)

2018 Existing ASF

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<td>0</td>
</tr>
<tr>
<td>General Support</td>
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<td>0</td>
</tr>
</tbody>
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<table>
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<th>%</th>
</tr>
</thead>
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<td>0</td>
</tr>
<tr>
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</tr>
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<td>0</td>
</tr>
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<tr>
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</tr>
<tr>
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<td>4,524</td>
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<tr>
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11,933 100%

Figure 5.28: Existing Level 1 plan diagram

Tables 5.22-24: C2E2 2018 existing ASF inventory
### 2018 Existing ASF

#### Level

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#### Space Type

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<td>31,064</td>
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#### Department

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<tr>
<td>CTI</td>
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<td>51%</td>
</tr>
<tr>
<td>SoE Administration</td>
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<td>26%</td>
</tr>
<tr>
<td>Unassigned</td>
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<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>2,748</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>33,812</td>
<td>100%</td>
</tr>
</tbody>
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Tables 5.25-27: LONG 2018 existing ASF inventory  
Figure 5.29: Existing Level 1 plan diagram  
Figure 5.30: Existing Level 2 plan diagram
### 2018 Existing ASF

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<td>Teaching Space</td>
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<td>6,716</td>
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<th>%</th>
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</thead>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CBE</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CEE</td>
<td>1,129</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ME &amp; MEM</td>
<td>4,302</td>
<td>51%</td>
</tr>
<tr>
<td>MSE &amp; C2E2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CTI</td>
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<td>0</td>
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</tr>
<tr>
<td></td>
<td>8,505</td>
<td>100%</td>
</tr>
</tbody>
</table>

---

*Figure 5.31: Existing Level 1 plan diagram*

*Tables 5.28-30: DD 2018 existing ASF inventory*
School of Engineering Research Centers

The majority of the School of Engineering research centers are located on the Depot Campus. The Connecticut Transportation Institute (CTI) and the Center for Clean Energy & Engineering (C2E2) are the largest centers on the Campus. CTI works with the Connecticut Department of Transportation in multidisciplinary research, education and promoting transportation safety. C2E2 is a multidisciplinary center developing clean, efficient energy systems.

The Storrs Campus has primarily department-assigned research centers; the Booth Engineering Center for Advanced Technology (BECAT) is located in the sub-basement of Babbidge Library, and the Synchrony Financial Center of Excellence in Cybersecurity is located in the Information Technologies Engineering Building.

Figure 5.32: Depot Campus research centers
School of Engineering Core Labs

Core labs are defined as facilities that are shared by multiple departments, or specialty spaces that provide a unique resource. These include the Deanery-managed computer labs and Foundation in Engineering lab space and department-assigned high bay lab and machine shop spaces.

Figure 5.33: Storrs Campus core labs
Registrar Classrooms

Centrally scheduled classrooms located within the School of Engineering buildings are typically scheduled for School of Engineering courses. In UTEB, every course scheduled in its classrooms is for School of Engineering students.

Depot Campus
No classrooms

Figure 5.34: Storrs Campus Registrar classrooms
School of Engineering Building Assignable-to-Gross Efficiency

Building assignable-to-gross efficiency measures the usable (assignable) floor area, as opposed to non-assignable (gross) area.

E2, ABB and FLC are organized along a central double-loaded corridor with offices on one side and laboratories on the opposite side producing maximum efficiency.

On the Depot Campus, the Longley Building is encumbered by a large percentage of the building being uninhabitable; this reduces the usable assignable area significantly. C2E2 is highly efficient, utilizing a double-loaded corridor organization and exterior mechanical systems. There is insufficient data for Depot D on the Depot Campus.

As the School of Engineering is a partial-occupant of ESB and HBL, their efficiencies are not shown.

**Depot Campus**

**C2E2**: 72%

**LONG**: 38% due to uninhabitable space
5.3 Space Needs Analysis

Figure 5.36: Computational lab module for PI+5 (60 ASF per lab workstation: lab and write-up) (Total computational lab ASF per PI: 300 ASF)

Figure 5.37: Wet lab module for PI+5 research group size (160 ASF per lab workstation: 130 lab + 30 write-up ASF) (Total wet lab ASF per PI: 800 ASF)

Figure 5.39: Hybrid lab module for PI+5 research group size (180 ASF per lab workstation: 150 lab + 30 write-up ASF) (Total hybrid lab ASF per PI: 900 ASF)

No separate graduate student write-up space is provided for computational labs.

Figure 5.38: Grad student write-up space for PI+5 research group size (160 ASF per lab workstation: 130 lab + 30 write-up ASF)

Figure 5.40: Grad student write-up space for PI+5 research group size (180 ASF per lab workstation: 150 lab + 30 write-up ASF)
5.4 Opportunities by Building

The following pages are a breakdown of observations and opportunities for each building. The opportunities provide options to meet the projected space needs.

Arthur B. Bronwell Hall (ABB)
Storrs Campus

Observations & Opportunities

Organization

- ABB will remain focused on biomedical engineering and CEE computation laboratories.
- In 2023, the College of Liberal Arts and Sciences Biology laboratories located on the first floor of ABB are planned to move into the newly-renovated Gant Science Complex (+4,403 ASF).
- The plan-north lab zone would benefit from a reorganization. A clean plan organization increases optimization, grouping similar space types for modularization and flexible expansion. This will also remove non-lab space from the lab zone that underutilizes the building, such as conference or graduate student write-up space.

Offices

- The building has the physical capacity for 26 offices if the office zone is renovated to leave all existing offices as is, bisect all double-wide offices and remove all non-office space types. This will support the forecasted BME faculty and nine CEE faculty.

Summary

With all of the possible opportunities at ABB, an additional 4,403 ASF could be added to the School of Engineering, satisfying BME growth and providing space for another department, such as CEE.

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Area Add</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAS Laboratories recaptured</td>
<td>+4,403</td>
</tr>
<tr>
<td>Net SoE ASF change</td>
<td>+4,403</td>
</tr>
</tbody>
</table>

Table 5.31: ABB possible opportunity area tabulation

Figure 5.47: View of ABB from Glenbrook Road (source: UConn Maps)
Observations & Opportunities

Organization

• Ideally, E2 will be refocused on chemical and biomolecular engineering. The ME Department also has a large amount of space in E2, but given its connection to UTEB it is appropriate to remain interdisciplinary.
• Reassign the MSE teaching labs in E2 to the School of Engineering in 2022 at the completion of the Science 1 Building (3,028 ASF).
• The building would benefit from a reorganization to create better efficiency and utilization of the existing spaces.

Building Opportunities

• The Undergraduate Office is located on the second floor; the building is tasked with creating a welcoming experience for prospective students.

Core Labs

• Per Group discussion, it is desired to relocate the machine shop currently in E2 to FLC, combining it with the larger core machine shop.

Offices

• E2 currently has 19 faculty offices, short of the future CBE need (23 faculty). The need can be met either with a minor renovation or reassigning faculty into advisor offices.

Student Space

• Currently underutilized, the east wing high bay space with an overhead door would be better suited as student project space. Infilling the existing corridor could create a large flexible open space (+440 ASF).
Courtyard Infill

The existing open courtyard between the two E2 wings provides an infill opportunity, possibly for flexible high bay Strategic Vacancy space. Its central location lends itself to being a shared resource. This addition could create 4,100 ASF.

Summary 1 (Courtyard Infill)

With all of the possible opportunities at E2, an additional 7,568 ASF could be available to the School of Engineering.

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Available</th>
<th>Area Add*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture MSE teaching labs</td>
<td>+3,028</td>
<td></td>
</tr>
<tr>
<td>Plan-east wing renovation</td>
<td></td>
<td>+440</td>
</tr>
<tr>
<td>Courtyard infill</td>
<td></td>
<td>+4,100</td>
</tr>
<tr>
<td>Net SoE ASF change</td>
<td>+3,028</td>
<td>+4,540</td>
</tr>
</tbody>
</table>

Table 5.32: E2 possible opportunity area tabulation with a courtyard infill

* All numbers are approximate.
Large Addition
Both existing wings provide high bay space; if removed, the open area offers an opportunity to create a large addition. A three-story plus penthouse addition could add 28,600 ASF.

Summary 2 (Large Addition)
With all of the possible opportunities at E2, an additional 24,648 ASF could be available to the School of Engineering.

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Available</th>
<th>Area Add*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture MSE teaching labs</td>
<td>+3,028</td>
<td></td>
</tr>
<tr>
<td>Wings Demolition</td>
<td>-6,980</td>
<td></td>
</tr>
<tr>
<td>Large Addition</td>
<td>+28,600</td>
<td></td>
</tr>
<tr>
<td>Net SoE ASF change</td>
<td>+3,028</td>
<td>+21,620</td>
</tr>
</tbody>
</table>

* All numbers are approximate.

Table 5.33: E2 possible opportunity area tabulation with a large addition

Figure 5.50: Section view of proposed addition
Figure 5.51: Aerial view of the proposed addition to E2
Observations & Opportunities

Organization

- Ideally, UTEB will be refocused on mechanical engineering. The CBE Department also has a large amount of space in UTEB, but given its connection to E2, it is appropriate to remain interdisciplinary.

Research Labs

- Grad student write-up and conference space within the inner lab zone is recommended to move to the office perimeter. This will give daylight to this office space and use the lab zone to its highest and best use: research lab space.

Offices

- UTEB has the physical capacity for 46 offices if the Level 3 double-wide faculty offices are bisected to match Levels 2 and 3. This will satisfy the future ME forecasted growth of 44 faculty.

Addition

- An addition could be located at the northwest corner and could add 20,500 ASF. In addition, the existing courtyard could be enclosed to create a skylit student gathering space, adding 1,300 ASF for a total of 21,800 ASF.

Summary

With all of the possible opportunities at UTEB, an additional 21,800 ASF could be added to the School of Engineering. This will satisfy the ME and CBE growth, provide student space and could allow for ECE growth space not able to fit in ITE and HBL.

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Area Add*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addition</td>
<td>+21,800</td>
</tr>
<tr>
<td>Net SoE ASF change</td>
<td>+21,800</td>
</tr>
</tbody>
</table>

Table 5.34: UTEB possible opportunity area tabulation

* All numbers are approximate.
Observations & Opportunities

Organization

• Ideally, FLC will remain focused on the Office of the Dean administrative offices and civil and environmental engineering. As all CEE research, teaching and office space (both currently and with future growth) will not fit in the existing FLC building, Bronwell Hall is recommended as a secondary building for CEE, namely the CEE grad student write-up, office and research space.
• The Engineering Financial Services is ideally located adjacent to the Office of the Dean administrative offices.

Building Opportunities

• Future development beyond the existing building is not possible due to site constraints.
• As the home of the Deanery, FLC is tasked with creating a welcoming experience for prospective students.

Office

• There are currently 28 occupied offices within the building; it cannot support the future projected growth forecasted for the CEE department. Additional faculty offices are recommended to be located in ABB.
• The graduate student space on Level 2 is recommended to move to ABB to allow for Deanery administrative office space expansion.

Summary

Opportunities in FLC will not satisfy all of the CEE growth space, needing to overflow into another School of Engineering building, such as ABB.
Information Technologies
Engineering Building (ITE)
Storrs Campus

Observations & Opportunities

Organization
- ITE will likely remain focused on computer science and electrical engineering. The growth space need of CSE and ECE exceeds the capacity of ITE.

Research Labs
- An analysis of existing lab workstation counts suggests most labs are underutilized; by increasing station density, it may be possible to gain a theoretically available 2,800 ASF.
- The existing labs are underutilized with computational laboratories and graduate write-up spaces; these spaces are recommended to be relocated to HBL.

Office
- The current configuration of faculty offices cannot meet the future need of CSE and ECE (total projected growth of 82 combined). With only 61 existing faculty offices, future faculty will likely need to be located in another building. Staff and office support space are recommended to be assessed.
- Per School of Engineering feedback, the CSE department office is in need of expansion.

Summary
With all of the possible opportunities in ITE, an additional 2,800 ASF could be added to the School of Engineering. This will not satisfy the CSE and ECE expected growth requirements.

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Available*</th>
<th>Area Add*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency increase</td>
<td>+2,800</td>
<td></td>
</tr>
<tr>
<td>Net SoE ASF change</td>
<td>+2,800</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 5.35: ITE possible opportunity area tabulation
* All numbers are approximate.
**Observations & Opportunities**

**Organization**
- Ideally, HBL will be refocused on computer science and electrical engineering.
- It is desired to move ETS out of HBL and consolidate the group in E2 (970 ASF relocated).
- It is desired to move CDEE to FLC (570 ASF relocated).

**Building Opportunities**
- With ETS and CDEE ideally moving out of HBL, there is an opportunity to reorganize the floor plan to increase usable square feet and provide spaces in line with the Master Plan's metrics (+3,900 ASF).

**Summary**

With all of the possible opportunities at HBL, an additional 3,900 ASF could be added to the School of Engineering. This will not satisfy the CSE or ECE forecasted growth.

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Available*</th>
<th>Area Add*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corridor layout</td>
<td></td>
<td>+1,000</td>
</tr>
<tr>
<td>Efficiency increase</td>
<td>+2,900</td>
<td></td>
</tr>
<tr>
<td>Net SoE ASF change</td>
<td>+2,900</td>
<td>+1,000</td>
</tr>
</tbody>
</table>

*All numbers are approximate.*

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Figure 5.56: View of HBL from Fairfield Way (source: John Phelan)

Figure 5.57: Possible more efficient program zone (orange) layout
Engineering & Science Building (ESB)
Storrs Campus

Observations & Opportunities

Organization
- ESB is an interdisciplinary building.

Summary
ESB will likely continue to be fit-out for future hires. This report does not recommend any changes be made to this building. The unassigned labs could satisfy the growth for BME, CBE and ECE.

Figure 5.58: View of ESB from the quad (source: UConn R. O’Neill Lab)
Center for Clean Energy & Engineering (C2E2)
Depot Campus

Observations & Opportunities

Organization
- C2E2 will remain focused on the C2E2 research center.

Building Opportunities
- The building is currently 72% assignable-to-gross area efficient, unlikely to become more efficient with any renovation. The building is very efficient and well-organized.
- The building is landlocked by the building’s gas storage to the northeast, Weaver Road to the east and parking lot aisle to the south. The building could be extended north.

Addition
- The existing high bay lab zone could be extended north. At 75% efficient, +1,880 ASF could be added.

Summary
With all of the possible opportunities at C2E2, an additional 1,880 ASF could be added to the School of Engineering. This will satisfy the C2E2 growth.

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Area Add*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addition</td>
<td>+1,880</td>
</tr>
<tr>
<td>Net SoE ASF change</td>
<td>+1,880</td>
</tr>
</tbody>
</table>

Table 5.37: C2E2 possible opportunity area tabulation
* All numbers are approximate.
Longley Building (LONG)
Depot Campus

Observations & Opportunities

Organization
• If possible, the Technology Innovation Program (TIP) space could be consolidated in its two primary locations (Advanced Technology Laboratory and the Cell and Genome Sciences Building), and the space be recaptured to the School of Engineering (2,748 ASF).

Building Opportunities
• Any renovations will require the building be brought up to the current building code. A 2013 study suggested the cost to renovate the building too costly due to existing mold, asbestos, building systems, envelope, restroom and egress issues. The building does not have an elevator and is not fire-proofed.

Replacement
• Longley is recommended to be replaced. Idealized at a PI+5 research group for all current occupants, a replacement building would be 31,064 ASF. Further study will need to take place.

Summary
It is not recommended to renovate the Longley Building, ideally replacing it and designing it specifically for CTI.

Opportunity Area Add

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Area Add</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIP space recaptured</td>
<td>+2,748</td>
</tr>
<tr>
<td>Net SoE ASF change</td>
<td>+2,748</td>
</tr>
</tbody>
</table>

Table 5.38: Longley possible opportunity area tabulation
Depot D (DD)
Depot Campus

Observations & Opportunities

Building Opportunities

- Due to the physical condition of the existing building and its remoteness, it is not recommended to divert funding to renovate the building for the School of Engineering student clubs and storage.

Summary

Depot D’s space is recommended to be relocated to the Storrs Campus (6,716 ASF).

Figure 5.62: View of Depot D main entrance