UMass Boston Utilities – Now and Then:

What do we have?
What do we need?
When do we need them?

Presentation to the Academic Council
April 19, 2012
25-Year Master Plan Framework
• Key Infrastructure Improvements Reflected in the Master Plan
  • Create new campus utility loop to accommodate Substructure and Science Center demolition
  • Reconfigure University Drive loop road to two-way to improve current access and to provide new connections on the north end of campus
  • Provide reliable and redundant utilities to support research and teaching
UMass Boston Utilities

Salt Water Pump House

Utility Plant

Switchgear Building

Existing

Cutover June 2012
<table>
<thead>
<tr>
<th>UMass Boston Utilities</th>
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<tbody>
<tr>
<td><strong>Cooling</strong></td>
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<tr>
<td>Chiller</td>
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<tr>
<td>Chilled Water Pumps</td>
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<tr>
<td>Condensing Water Pumps</td>
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<tr>
<td>Filter/Heat Exchangers</td>
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<tr>
<td><strong>Electrical</strong></td>
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<tr>
<td>Switchgear</td>
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<tr>
<td>Motor Control Center</td>
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<td>Emergency Generator x11</td>
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<tr>
<td><strong>Water</strong></td>
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<tr>
<td>Domestic water pumps</td>
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<td>Fire Pumps</td>
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<td><strong>Heating</strong></td>
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<td>Boilers</td>
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<td>Hot Water Pumps</td>
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<td><strong>Natural Gas</strong></td>
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UMass Boston Chilled Water Requirements

*Existing Utility Plant – 25 Year Master Plan*

**Current – Summer 2013**

- Existing Utility Plant
  - Total Plant Capacity = 3,000 Tons
    - Campus Center
    - Healey
    - Quinn
    - Science Center
    - Utility Plant
      - Switch Gear Building

  - Total Plant Load = 3,000 Tons

**Summer 2013 – Fall 2014**

- Existing Utility Plant with Modifications, New 2,000 Ton Cooling Tower, and New/Renovated Building Loads
  - Total Plant Capacity = 6,000 Tons
    - Integrated Sciences Complex
    - General Academic Building 1
    - Data Center

  - Sub-Load = 2,800 Tons
    - Campus Center
    - Healey
    - Quinn
    - Science Center
    - Utility Plant
      - Switch Gear Building

  - Total Plant Load = 5,800 Tons

**Winter 2015 and Beyond**

- Existing Utility Plant, New/Renovated Building Loads, and Removal of Science Center
  - Total Plant Capacity = 6,000 Tons
    - Integrated Sciences Complex
    - General Academic Building 1
    - Data Center
    - Residential Building 1
      - 708

  - Sub-Load = 720 Tons
    - Campus Center
    - Healey
    - Quinn
    - Science Center
    - Utility Plant
      - Switch Gear Building

- Total Plant Load = 5,888 Tons

Legend:
- Existing
- New

April 19, 2012
UMass Boston Chilled Water Requirements

*Proposed Tri-Generation Plant – 25 Year Master Plan*

**Summer 2016 and Beyond**

- **Master Plan Tri-Generation Plant with Cooling Towers**
  - (3) – 2,000 Ton Cooling Towers
  - Rejects 4,000 Tons with redundancy

**Total Plant Capacity = 4,000 Tons**

- Tri-Generation Plant
- General Academic Building 2
- General Academic Building 3
- General Academic Building 4
- Clark Addition
- Calf Pasture Pump Station

**25 Year Master Plan Campus Chilled Water Requirements**

- **Existing Utility Plant Load = 6,000 Tons**
- **Proposed Tri-Generation Plant Load = 4,000 Tons**

**Total Campus Load = 10,000 Tons**

*Important Note:*
UMass Boston's 25 Year Master Plan builds multiple new buildings and renovates others. A new Tri-Generation Plant is proposed to provide the cooling capacity required for the new and renovated buildings as well as building additions. It is important that the existing Utility Plant and Salt Water Pump House (with condenser water ΔT of 10°F for limited hours) remain on-line in conjunction with the proposed Tri-Generation Plant in order to serve the Master Plan.

Legend:
- New

April 19, 2012
Deferring Science Center Demolition: Some Implications

- Utility loop will need to be redesigned in order to reconnect to Science Center, resulting in code upgrades to Science Center mechanical equipment.
- Science Center deferred maintenance projects will need to be undertaken if building stays in use.
- Reuse of Science Center elevator machines to replace outmoded machines in Wheatley or McCormack will be delayed.
- These projects and upgrades will draw limited funds away from other programmatic space changes and utility upgrades.
- Campus credibility with neighbors, permitting authorities and elected officials could be called in question when we defer central design principles of the approved Master Plan.
Deferring Science Center Demolition: Some Implications

Quadrangle vs Plaza