City of Cambridge
Getting to Net Zero Action Plan

Article 5 Exterior Insulation
Amendments

October 17, 2019
Agenda

- Net Zero Action Plan Background
- Exterior Insulation Background
- Zoning Proposal Overview
Agenda

• **Net Zero Action Plan Background**
• **Exterior Insulation Background**
• **Zoning Proposal Overview**
1. THE CLIMATE IMPERATIVE

Climate change poses a growing set of risks and challenges to cities.

Combating climate change needs to start locally.

Buildings generate over 80% of Cambridge’s total greenhouse gas emissions.

That is why it is Cambridge’s aim to achieve **NET ZERO EMISSIONS** from buildings.

Residents, universities, businesses and the City are collaborating to address the immediacy of the climate imperative.
“Develop an approach to remove barriers in the Zoning Ordinance to **enable the addition of exterior insulation** with the purpose of improving the energy efficiency of buildings in built-out compact residential neighborhoods in a manner sensitive to historic preservation principles.”
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• Net Zero Action Plan Background
• **Exterior Insulation Background**
• Zoning Proposal Overview
Importance of Exterior Insulation

Continuous insulation is a proven energy efficiency measure that leads to significant energy savings by reducing “thermal bridging”

Thermal bridging in a wood-framed house

Reduced thermal bridging with continuous exterior insulation
What is Exterior Insulation?
Example of Exterior Insulation
Exterior Insulation Benefits

Energy Star estimates that approximately **20% reductions in energy used for heating and cooling needs** could be realized if existing structures were to perform continuous insulation retrofits.

As approximately **60% of Cambridge’s building energy consumption is attributed to heating and cooling**, these potential savings could make **significant reductions in the City’s carbon emissions** across the building sector.

For existing buildings, **exterior insulation is often the least disruptive way to improve the energy performance** without requiring extensive renovations which interrupt use of the interior space.
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2010 Zoning Amendment:

Existing buildings can encroach into required setback to add external insulation if:

• Thickness of exterior wall not increased more than 4” compared to existing
• Resulting wall plane no closer than 7’-2” to nearest property line (unless district setbacks are less)
Article 22.43.2 Illustrated (not to scale)

- Up to 4” added thickness
- at least 7’2”
2015 Net Zero Action Plan recommended revisiting

2017 technical study evaluated:

• Performance and compatibility of potential insulation approaches within current ordinance

• Technical options to achieve increased exterior insulation during retrofits to residential buildings in Cambridge
Question 1: Is 4” of additional insulation enough?

Yes for some building types, no for others.
## Residential Buildings in Cambridge by Cladding Type

<table>
<thead>
<tr>
<th>Exterior Wall Type</th>
<th># of Properties</th>
<th>% of Total Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clapboard</td>
<td>2,876</td>
<td>33.8%</td>
</tr>
<tr>
<td>Wood shingle/shake</td>
<td>2,249</td>
<td>26.4%</td>
</tr>
<tr>
<td>Aluminum vinyl</td>
<td>1,841</td>
<td>21.6%</td>
</tr>
<tr>
<td>Brick</td>
<td>526</td>
<td>6.2%</td>
</tr>
<tr>
<td>Asbestos shingle</td>
<td>483</td>
<td>5.7%</td>
</tr>
<tr>
<td>Stucco</td>
<td>168</td>
<td>2.0%</td>
</tr>
<tr>
<td>Asphalt shingle</td>
<td>145</td>
<td>1.7%</td>
</tr>
<tr>
<td>Brick veneer</td>
<td>98</td>
<td>1.2%</td>
</tr>
<tr>
<td>Concrete block</td>
<td>31</td>
<td>0.4%</td>
</tr>
<tr>
<td>Stone veneer</td>
<td>14</td>
<td>0.2%</td>
</tr>
<tr>
<td>Metal/glass</td>
<td>12</td>
<td>0.1%</td>
</tr>
<tr>
<td>Stone</td>
<td>4</td>
<td>0.05%</td>
</tr>
</tbody>
</table>
Question 1: Is 4” of additional insulation enough?

RECOMMENDATION

Most wall assembly types could include continuous exterior insulation with increased thickness of 8” or less.
Question 2: Is 7’2” a reasonable setback requirement?
## Setbacks of Existing Residential Buildings in Cambridge

<table>
<thead>
<tr>
<th>Distance to Nearest Property Line (approx.)</th>
<th>% of Existing Residential Buildings (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 1’</td>
<td>63%</td>
</tr>
<tr>
<td>More than 2’</td>
<td>51%</td>
</tr>
<tr>
<td><strong>More than 3’</strong></td>
<td><strong>41%</strong></td>
</tr>
<tr>
<td>More than 4’</td>
<td>33%</td>
</tr>
<tr>
<td>More than 5’</td>
<td>27%</td>
</tr>
<tr>
<td>More than 6’</td>
<td>22%</td>
</tr>
<tr>
<td><strong>More than 7’</strong></td>
<td><strong>18%</strong></td>
</tr>
<tr>
<td>More than 8’</td>
<td>15%</td>
</tr>
<tr>
<td>More than 9’</td>
<td>12%</td>
</tr>
<tr>
<td>More than 10’</td>
<td>10%</td>
</tr>
</tbody>
</table>

*Source: CDD analysis using Cambridge GIS data, 2017. ALL FIGURES APPROXIMATE*
Question 2: Is 7’2” a reasonable setback requirement?

RECOMMENDATION
Changing the minimum buffer from **7’-2” to 3 feet** would allow many more buildings to comply, while maintaining setbacks typical of existing neighborhoods.
Question 2: Is 7’2” a reasonable setback requirement?
## Current v. Proposed Zoning

<table>
<thead>
<tr>
<th></th>
<th>Current Zoning</th>
<th>Proposed Zoning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum reduction in existing setback (as-of-right)</strong></td>
<td>4 inches</td>
<td>8 inches</td>
</tr>
<tr>
<td><strong>Minimum resulting distance from property line (as-of-right)</strong></td>
<td>7 feet 2 inches, or required setback if less</td>
<td>3 feet, or required setback if less</td>
</tr>
<tr>
<td><strong>Allowed variations (special permit)</strong></td>
<td>None</td>
<td>Variations allowed with BZA special permit approval</td>
</tr>
</tbody>
</table>
Current Rules Illustrated (not to scale)

Up to 4” added thickness

at least 7’2”
Proposed Rules Illustrated (not to scale)

- Up to 8" added thickness
- at least 3'
Considerations

- Many existing buildings do not conform to setback standards in zoning
- Alterations often require variances, which can be costly and time-consuming for small property owners
- Greater zoning flexibility is one way the City can help encourage positive change
- Limitations should be set to provide case-by-case review where necessary, but not so limiting that it discourages improvements
Moving Forward

- **Planning Board** public hearing: **October 29**\textsuperscript{th} at 7 p.m.
- **Ordinance Committee** public hearing: **November 12**\textsuperscript{th} at 1 p.m.
- **Net Zero Action Plan** webpage: [https://www.cambridgema.gov/netzero](https://www.cambridgema.gov/netzero)
- **Zoning Amendments** webpage: [https://www.cambridgema.gov/CDD/zoninganddevelopment/Zoning/Amendments](https://www.cambridgema.gov/CDD/zoninganddevelopment/Zoning/Amendments)