

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



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THE CLIMATE IMPERATIVE

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



80%



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.

Action 2.5: Removal of Barriers to Increased Insulation

“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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Importance of Exterior Insulation

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



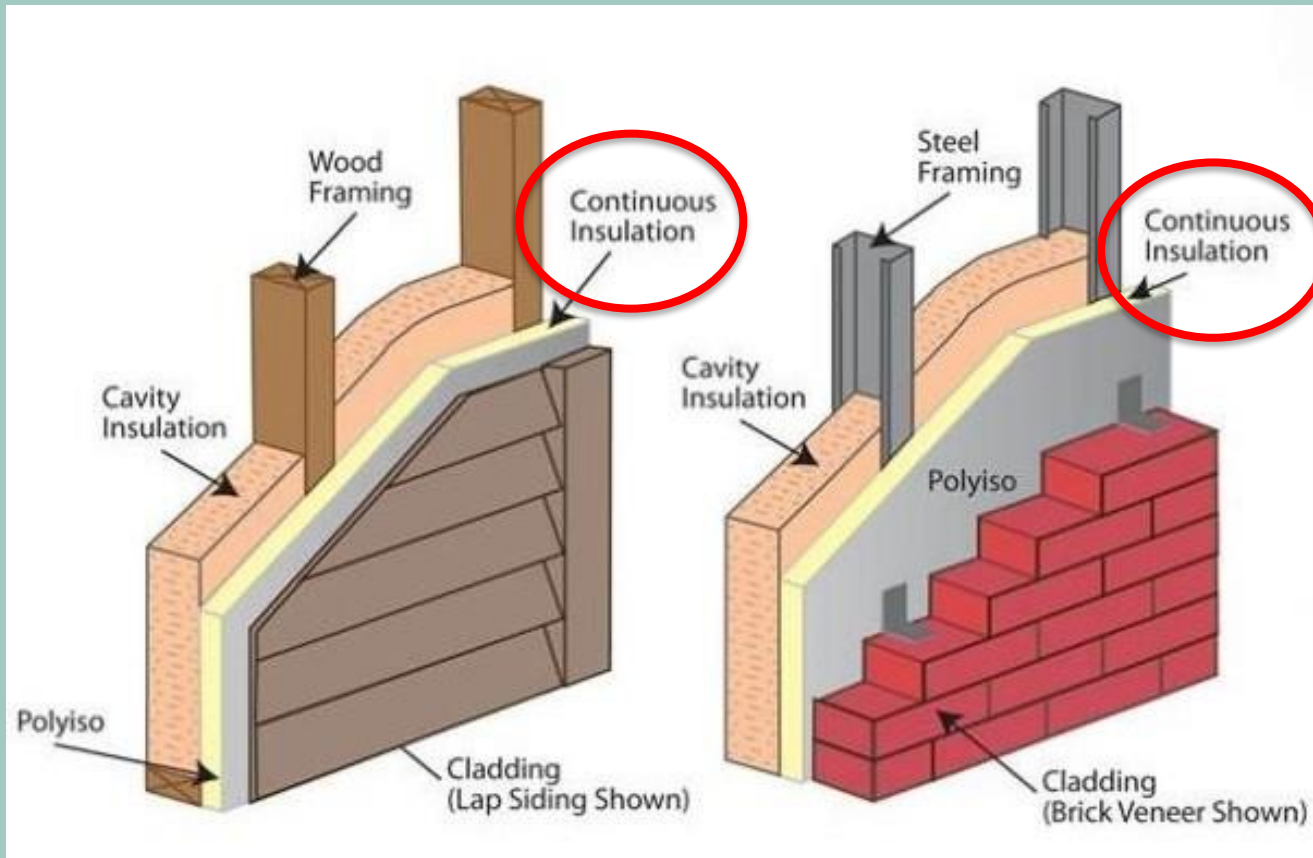
Thermal bridging in a wood-framed house



Reduced thermal bridging with continuous exterior insulation



What is Exterior Insulation?



THE PATH TO A
NET ZERO
CAMBRIDGE



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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Yard Exceptions for Added Exterior Insulation (22.43.2)

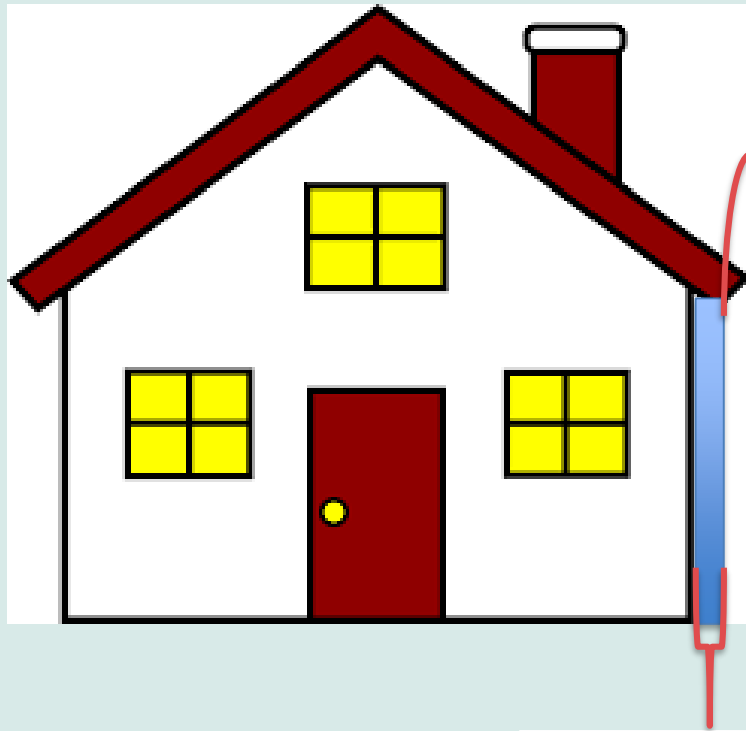
2010 Zoning Amendment:

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)



at least 7'2"

PROPERTY LINE

Up to 4" added thickness



Technical Study

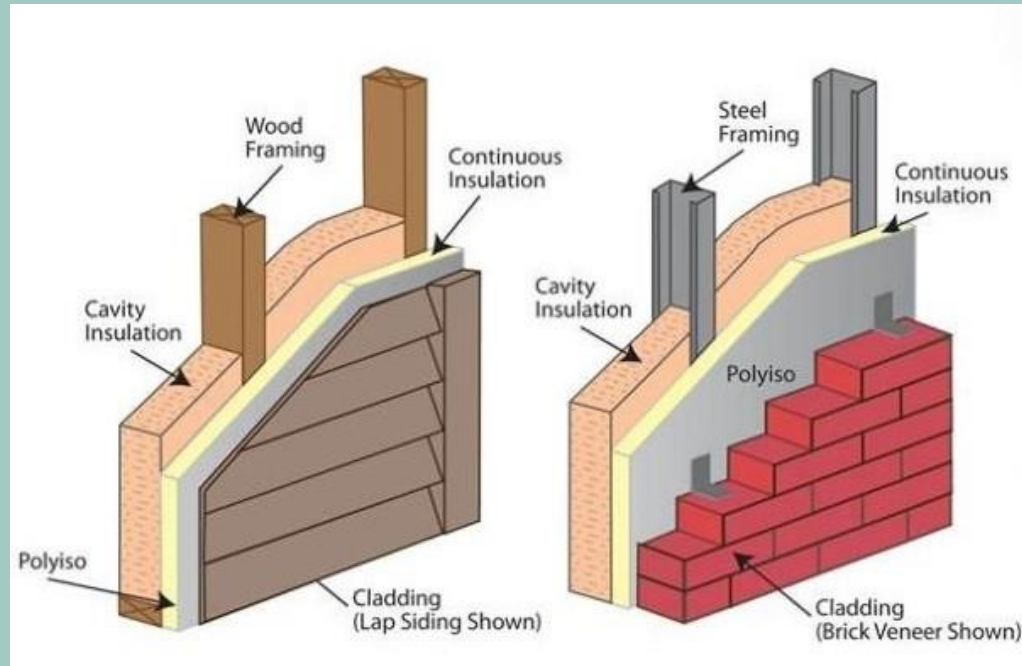
2015 Net Zero Action Plan recommended revisiting

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

Exterior Wall Type	# of Properties	% of Total Properties
Clapboard	2,876	33.8%
Wood shingle/shake	2,249	26.4%
Aluminum vinyl	1,841	21.6%
Brick	526	6.2%
Asbestos shingle	483	5.7%
Stucco	168	2.0%
Asphalt shingle	145	1.7%
Brick veneer	98	1.2%
Concrete block	31	0.4%
Stone veneer	14	0.2%
Metal/glass	12	0.1%
Stone	4	0.05%



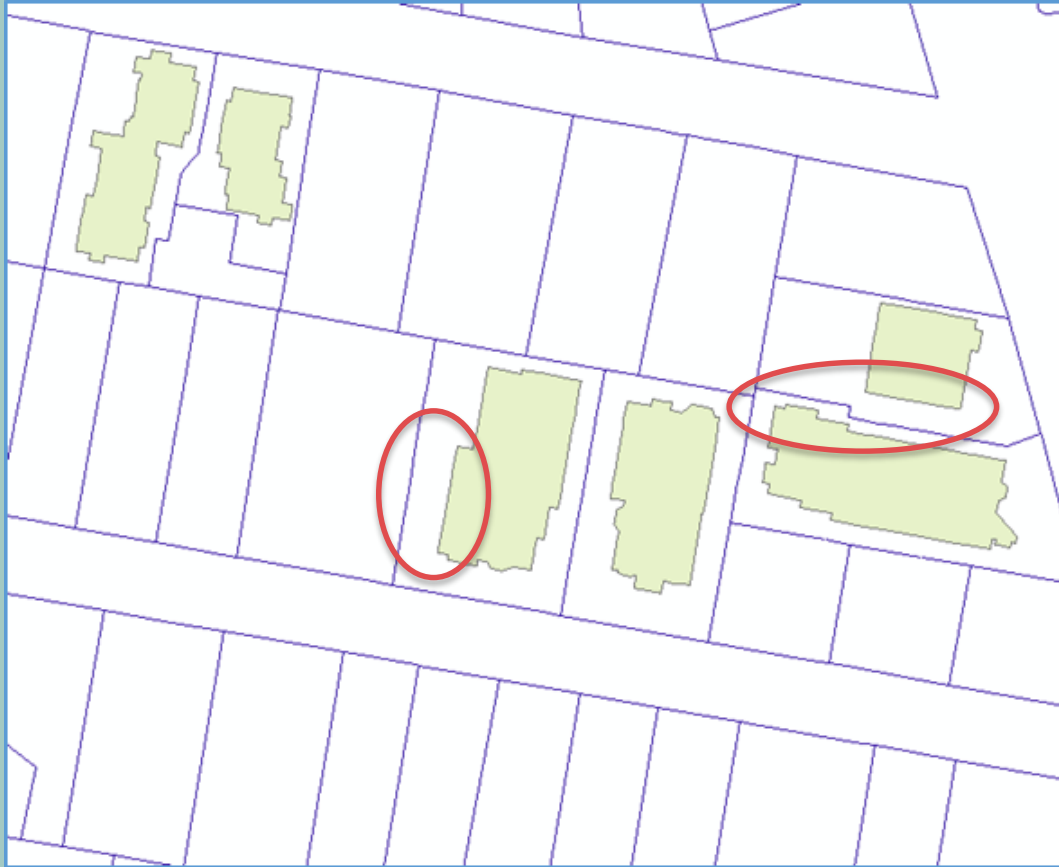
Question 1: Is 4" of additional insulation enough?

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

Distance to Nearest Property Line (approx.)	% of Existing Residential Buildings (approx.)
More than 1'	63%
More than 2'	51%
More than 3'	41%
More than 4'	33%
More than 5'	27%
More than 6'	22%
More than 7'	18%
More than 8'	15%
More than 9'	12%
More than 10'	10%

Source: CDD analysis using Cambridge GIS data, 2017. ALL FIGURES APPROXIMATE



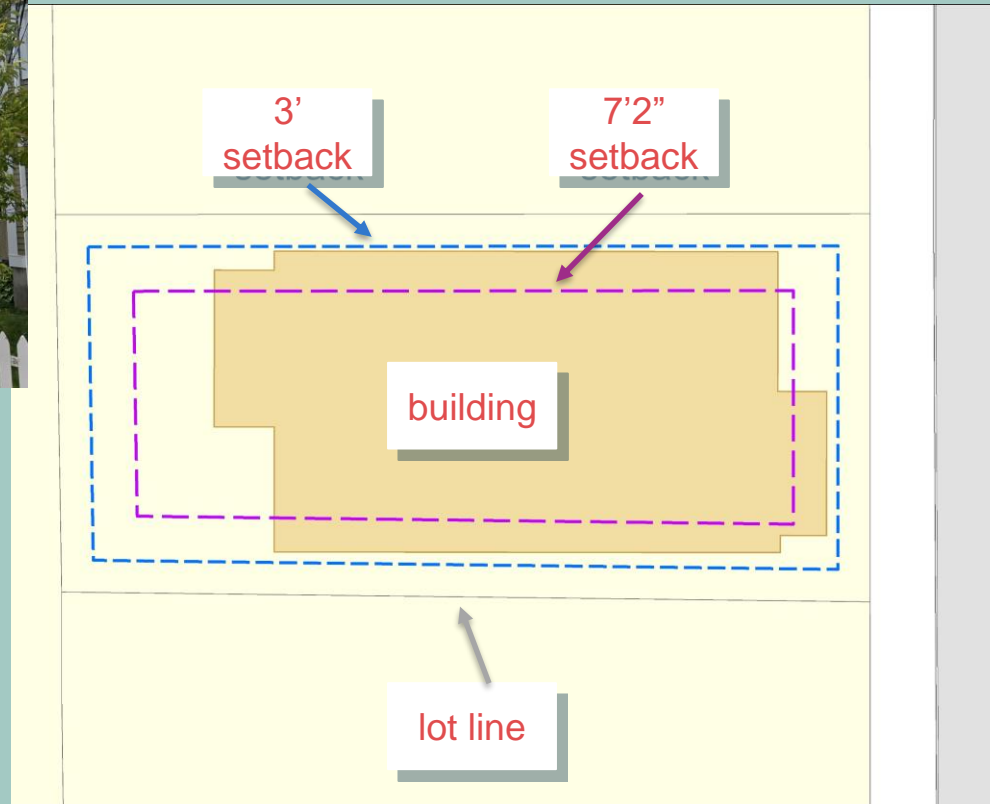
Question 2: Is 7'2" a reasonable setback requirement?

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?

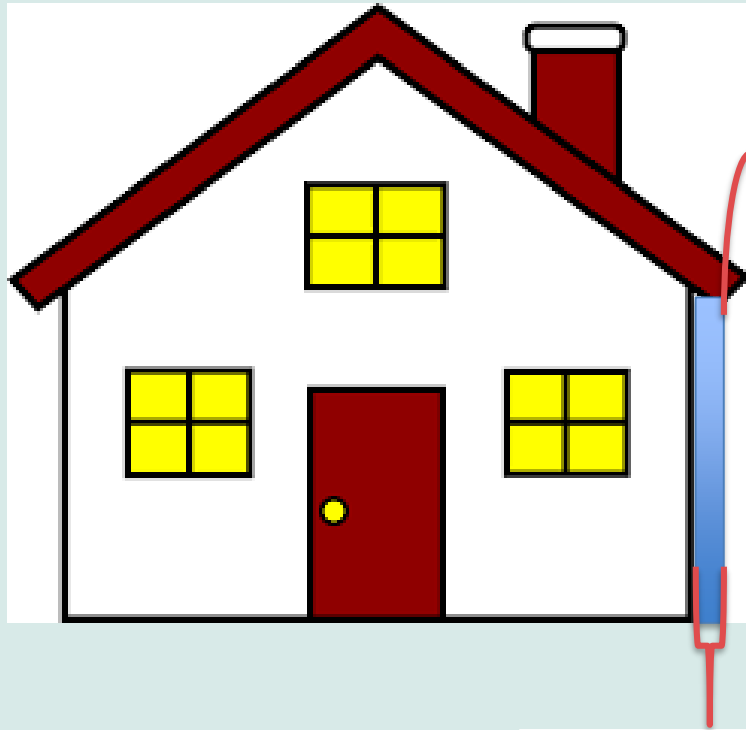


Current v. Proposed Zoning

	Current Zoning	Proposed Zoning
Maximum reduction in existing setback (as-of-right)	4 inches	8 inches
Minimum resulting distance from property line (as-of-right)	7 feet 2 inches, or required setback if less	3 feet, or required setback if less
Allowed variations (special permit)	None	Variations allowed with BZA special permit approval



Current Rules Illustrated (not to scale)



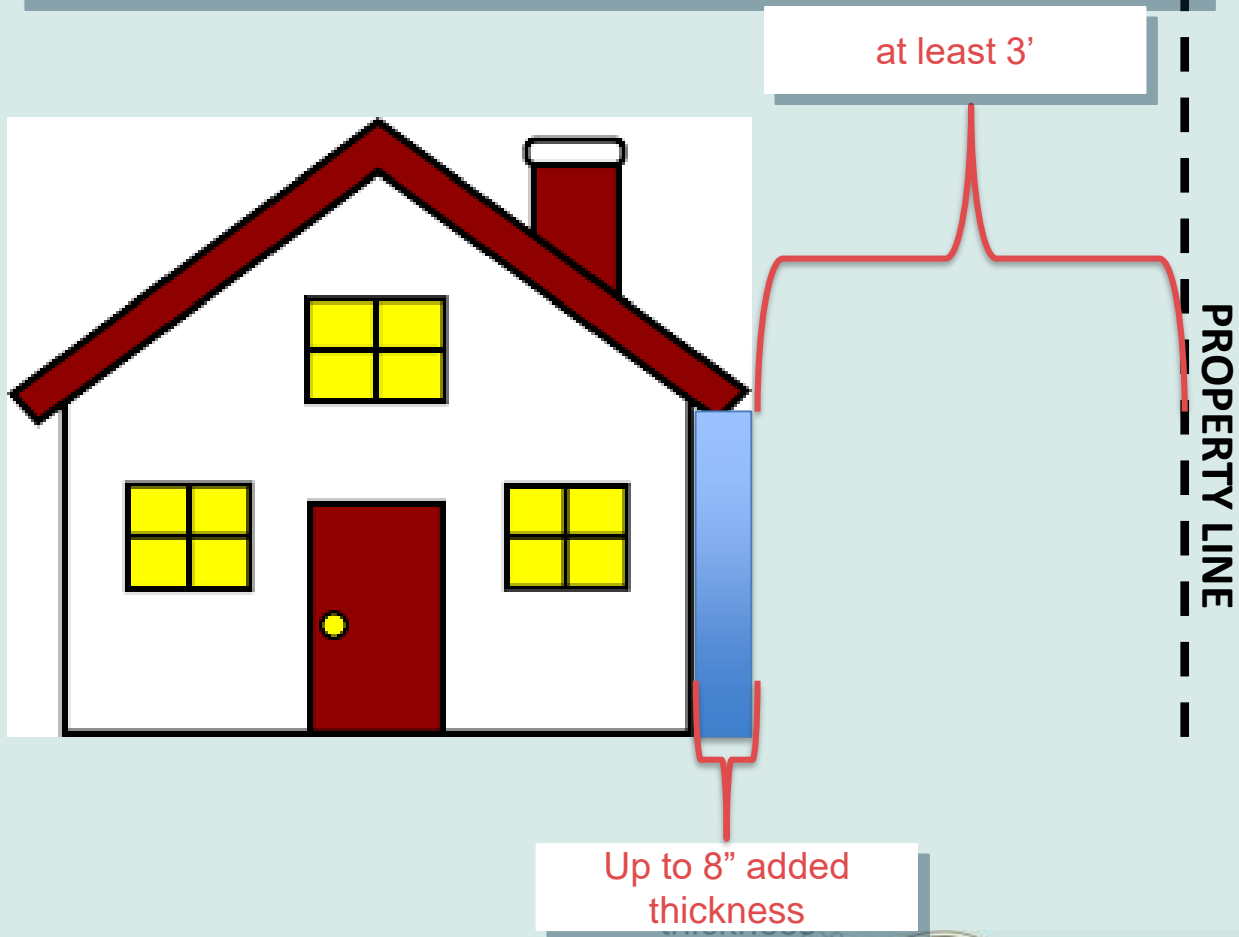
at least 7'2"

PROPERTY LINE

Up to 4" added thickness



Proposed Rules Illustrated (not to scale)



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 29th** at 7 p.m.
- **Ordinance Committee** public hearing: **November 12th** at 1 p.m.
- **Net Zero Action Plan** webpage:
<https://www.cambridgema.gov/netzero>
- **Zoning Amendments** webpage:
<https://www.cambridgema.gov/CDD/zoninganddevelopment/Zoning/Amendments>

