Breaking Down Barriers: Unlocking the Potential of Weatherization and Electrification in Massachusetts Homes

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ABSTRACT

Massachusetts has lofty emissions reductions goals, calling for weatherization improvements as well as electrification of significant portions of the residential housing stock. This paper explores barriers to electrification and weatherization which typically include health and safety issues and electrical hazards, such as knob and tube wiring, combustion safety issues, mold, asbestos, structural problems, and vermiculite. The financial cost and logistical complexity of remediating these barriers can delay or even prevent the implementation of weatherization or electrification measures, resulting in missed opportunities for energy savings.

Understanding why customers decide to mitigate or not mitigate barriers enables utilities to design more effective programs. This research characterized the types and frequencies of barriers across variables such as building type, dwelling type, and geographic distribution. The study also examined how contractors identify and communicate these barriers to customers, investigated customer motivators for mitigating barriers, and analyzed the energy savings potential of homes by building vintage. Research activities included analyzing building audit and program data, interviewing implementation vendors and contractors, conducting a participant survey and participant interviews, and running building simulations using ResStock.

The findings informed strategies to improve barrier mitigation efforts by analyzing trends in barrier types, customer motivations, and remediation costs and timelines. Results show that costs vary substantially by barrier type and severity, with structural issues having the highest average costs. Cost consistently emerged as the primary obstacle to mitigation, while safety, comfort, and eligibility for weatherization and electrification incentives were key motivators for those who proceeded with remediation.

Background

Customers may face obstacles to installing weatherization or electrification measures in their home, which are commonly referred to as pre-electrification and pre-weatherization barriers. Nationally, the median housing age exceeds 40 years, and older homes tend to be less energy-efficient while requiring more frequent repairs, upgrades, and renovations (Zhao 2026). This is particularly relevant in the Northeast, where the housing stock is among the oldest in the country, with New York having the oldest owner-occupied homes at 64 years, followed by Massachusetts and Rhode Island at 59 years (Zhao 2026).

For homes undergoing weatherization upgrades, initial deferrals are often driven by envelope-related issues such as roof leaks or damage, floor damage, and foundation damage (Farrell et al. 2025). For electrification upgrades, older homes often require electrical panel and wiring upgrades and may lack sufficient space for new equipment (Bastian and Cohn 2022). It is estimated that approximately 31% of U.S. single-family homes have electrical panels rated at

100A or smaller, commonly found in smaller older homes, while 58% of homes have electrical panels of 200A or larger (Murphy et al. 2026). Panel capacity and space constraints remain common; an estimated 25% of homes with 100A panels and 20% of homes with 200A panels have no available space for additional circuits (Murphy et al. 2026, 18-19). The upfront costs of these improvements can be significant and are often further increased by the need to remediate barriers (Bastian and Cohn 2022).

This research characterizes the types and frequency of pre-electrification and pre-weatherization barriers across moderate-income and market-rate households in Massachusetts and identifies opportunities to improve barrier mitigation (Guidehouse 2026).

The Massachusetts Residential Turnkey Solutions (RTS) initiative offers incentives to both moderate-income and market-rate households for installing weatherization and electrification measures. Prior to installing weatherization or electrification measures, the customer receives a home energy assessment (HEA) conducted by a Lead Vendor (LV) or Home Performance Contractor (HPC). The program is administered by the Sponsors of Mass Save® (a collaborative of Massachusetts' electric and natural gas utilities and energy efficiency service providers including Berkshire Gas, Cape Light Compact, Eversource, Liberty, National Grid, and Unitil) and sponsor-approved contractors.

During the HEA, the LV or HPC identifies if there are any barriers that could prevent or delay installation of weatherization or electrification measures. If a barrier is identified, the LV or HPC informs the customer and can conduct a further inspection to determine next steps. Pre-weatherization and pre-electrification barrier mitigation is offered at no-cost for moderate-income customers, and the program covers up to $250 for market-rate customers. Customers may also use their own contractor for inspection.

Market-rate customers have the option to either address the issues themselves with their own contractor or use one recommended through the program. Market-rate customers pursuing electrification measures may also be eligible to finance remediation services through a HEAT Loan.[1] Moderate-income customers receiving enhanced incentives and turnkey remediation services must receive those services through the LV (including from their HPC under the management of the LV).

Table 1 presents the types of pre-electrification and pre-weatherization barriers that customers commonly encounter. They vary in severity and customers may have multiple barriers to address in their home. Relatively minor and inexpensive issues are considered soft barriers, while costly problems that may pose significant health and safety (H&S) risks are considered hard barriers. Soft barriers typically include limited attic or basement storage, inaccessible areas, recessed lighting, or minor home repairs. Hard barriers often include knob-and-tube (K&T) wiring, combustion safety, electrical hazards, mold, vermiculite, electrical panel upgrade, and structural issues. Furthermore, homes must be properly weatherized prior to electrification, thus any pre-weatherization barriers in a home seeking electrification also prevent electrification.

[1] The Sponsors of Mass Save® offer the HEAT Loan program, providing eligible participants with 0% financing for up to $25,000 toward qualifying energy-efficiency upgrades, including but not limited to pre-weatherization barriers, weatherization, and heat pump projects.

Table 1. Types of pre-weatherization and pre-electrification barriers

Pre-weatherization barriers	Pre-electrification barriers
• Asbestos • Combustion safety (e.g., unvented combustion applications or elevated carbon monoxide gas detected in heating system exhaust) • Electrical hazards • Knob and tube wiring • Mold • Moisture or water damage • Recessed lights • Structural issues (e.g., roof or foundation problems) • Vermiculite insulation • Other customer-related barriers (storage issues, inaccessible areas)	• Inaccessible or unsafe electrical infrastructure • Insufficient electrical panel capacity • Knob and tube wiring • Lack of ventilation • Limited space for new equipment (e.g., heat pumps, water heaters) • Structural limitations affecting electrification equipment installation • Unsafe or outdated electrical systems • Other customer-related barriers (storage issues, inaccessible areas)

Methodology

The following section outlines the methodological approaches used in this study. LVs provided program year 2023-2024 data, which the team cleaned and standardized for analysis. The processed data was then used as an input to run building simulation models to assess whether there is a higher energy savings potential in homes that experience pre-weatherization and pre-electrification barriers. The team interviewed the LVs and contractors to gain insights into the costs and processes involved in barrier mitigation and customers were surveyed and interviewed to understand drivers for mitigating barriers.

Data Analysis

The team analyzed HEA data, including customer details, home characteristics, and identified barriers, alongside measures that were both installed in the home, and measures recommended but not installed in the home. Each measure was classified as either weatherization or electrification (e.g. heat pumps and induction stoves as electrification measures; insulation and air sealing as weatherization measures). For each of the homes that participated in an HEA, the team tagged them as having a barrier identified or not. Then the team merged the installed measures and recommended measures data frames based on the cleaned project identifier.

After establishing the classifications, the team summarized the building characteristics of the homes based on multiple variables available in the data. The main crosstabs of interest were building age, building type, and region including designated equity communities (DECs)[2] and

[2] The team reviewed the Massachusetts 2025-2027 Energy Efficiency and Decarbonization Plan which identified 21 DECs based on renter share (>35%), renter population (>8,000), and low- or moderate-income population (>50%) (Massachusetts Program Administrators 2024).

environmental justice communities (EJCs)[3]. The team used these crosstabs as inputs to run the energy savings models for the building simulation.

The team reviewed the barrier descriptions across the four LVs and consolidated them into nine barrier types as identified in Table 2. The LV data primarily tracked pre-weatherization barriers and contained limited information on pre-electrification barriers. However, since a home must be properly weatherized prior to electrification, a pre-weatherization barrier may prevent electrification from moving forward as well if weatherization of the home is needed.

Table 2. Barrier types and definitions

Barrier name	Definition
Asbestos	Asbestos identified in the home that may be disturbed by a weatherization or electrification measure.
Combustion safety	Includes a failed combustion safety check caused by unvented combustion appliance in living space and/or elevated levels of carbon monoxide (CO) gas in the exhaust of a heating system or water heating system.
Electrical hazard	A hazardous condition identified in the home that might cause electrical shock or hazard.
Knob and tube wiring	K&T wiring identified in the home.
Mold and moisture	Mold, mildew, or moisture found in the home.
Other – H&S	Other barriers identified that are related to H&S including lack of ventilation in the home (which may be related to dryer, attic, or bath fan ventilation), pest infestation, lead paint, and inoperable heating system.
Other – Non-H&S	Other barriers identified not related to H&S including recessed lighting, lack of storage, inaccessible areas, general repairs, landscaping restrictions, nailed wall panels, weak plaster, and Homasote ceilings.
Structural	Structural issues identified in the home.
Vermiculite	Vermiculite insulation identified in the home, which may contain asbestos.

For barrier mitigation costs, LVs provided 2024 to 2025 RTS initiative data and 2023 to 2024 HEAT Loan data related to barrier mitigation. The cost data was analyzed to understand the average cost of barriers as well as the cost range of the different barrier types.

[3] In Massachusetts, an EJC is defined as a neighborhood meeting one more criterion related to low income (≤65% of the statewide median), minority population (≥40%), limited English proficiency (≥25% of households), or combined income and minority thresholds, indicating potential exposure to disproportionate environmental burdens (Massachusetts Executive Office of Energy Environmental Affairs 2021).

Building Simulation

The team used the National Laboratory of the Rockies (NLR) ResStock tool to model the average weatherization savings for buildings of various vintages across the Commonwealth of Massachusetts.

To calculate the baseline, the team filtered the ResStock building model population for Massachusetts to build a custom sample of homes suitable for weatherization. Next, the team leveraged the data analysis to define the typical baseline performance of homes participating in the weatherization program, which resulted in filtering ResStock to be defined as homes with attic insulation less than R-30 and wall insulation less than R-13. Based on the filtering criteria, the custom sample trended toward higher counts of older homes than the typically defined population distribution of homes in Massachusetts, as seen in Table 3. The team limited the ResStock analysis to 101 samples to allow full customization of upgrade scenarios.

For this analysis, single-family (SF) detached home refers to a residential building that stands alone and is designed to house one family; SF attached home refers to a residential building with two to four separate units, where the units share one or more walls but are otherwise distinct; and multifamily homes refer to a residential building with five or more separate units.

Table 3. Building vintage distribution of ResStock model sample

Building type	<1940	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2010s	Total
SF detached	25	0	10	6	3	3	0	0	0	47
SF attached	45	0	0	0	0	1	0	0	0	46
Multifamily	5	0	0	0	3	0	0	0	0	8

To estimate post-retrofit energy consumption, the team developed measure performance criteria for each weatherization package (Table 4). These criteria were intended to reflect the actual performance of measures implemented through the program, particularly for air sealing measures where reductions in air changes per hour (ACH) can be difficult to estimate. Using these criteria, the team developed four weatherization measures to determine the weatherization package that yields the highest savings. The weatherization packages include air sealing and attic insulation, air sealing and foundation insulation, air sealing and wall insulation, and all the measures combined.

Table 4. Measure performance criteria

Measure	Performance criteria
Air sealing	21% ACH reduction for single-family detached homes 25% ACH reduction for single-family attached homes 17% ACH reduction for multifamily homes

Measure	Performance criteria
Attic insulation	R-45 for single-family detached homes R-49 for single-family attached homes
Foundation insulation	R-17 for all homes with foundation walls
Wall insulation	R-15 for all building types

Note: Foundation insulation is defined as wall insulation for unconditioned/unfinished basements and is only applied to select units with these characteristics. Attic insulation is defined as attic ceiling insulation and not roof insulation.

Once the baseline population and weatherization packages were defined, the team used the ResStock models to determine the building energy consumption for both the pre- and post-retrofit. First, the team ran the baseline ResStock models to calculate the pre-retrofit building energy consumption, followed by applying the weatherization packages to the baseline ResStock models to estimate the post-retrofit energy consumption. Using the ResStock results, the team calculated energy savings for the modeled buildings in terms of total MMBtu savings, including electric, natural gas, and delivered fuel savings.

Lead Vendor and Contractor Interviews

The team interviewed four LVs, two HPCs, and two independent installation contractors (IICs) in 2025. The LVs and HPCs perform the HEA and, for moderate-income customers, help facilitate the process of barrier mitigation. The two IICs selected for interview included an electrician who performs K&T sign-off, meaning their K&T wiring was inspected, found inactive, and did not require remediation, and a vermiculite and asbestos remediation contractor. The team conducted interviews to understand barrier identification process, mitigation cost, program feedback, and to identify additional obstacles contractors face during remediation.

Participant Survey and Interviews

The team used surveys and interviews to understand participants' decisions to remediate barriers, the costs of remediation, and determine the amount participants are willing and able to pay for barrier mitigation. An online survey was administered to market-rate and moderate-income participants who received a 2024 HEA through the Residential Coordinated Delivery (RCD) program[4] and had an identified barrier; to encourage participation, respondents received a $25 incentive upon completion. Survey respondents included eight moderate-income and 187 market-rate participants, spanning those who remediated barriers and completed weatherization and/or electrification upgrades and those who did not remediate barriers or pursue upgrades. In addition, the team conducted 17 in-depth participant interviews to explore experiences with barrier identification and remediation, motivations and constraints, financing approaches, and satisfaction with program support. Interviewees received a $100 incentive for their time.

[4] The RCD program was the predecessor program to the RTS Initiative.

Results

This section summarizes key findings on barrier characterization, potential energy savings for homes with barriers, and the frequency and drivers of barrier remediation.

Barrier Characterization

The team used LV data to summarize trends in recorded barrier types, building characteristics, and other available demographics.

Home type. Figure 1 shows that multifamily properties exhibit a higher incidence of recorded barriers compared with single-family homes. In Multifamily homes, the most prevalent recorded barriers included K&T wiring and asbestos. For SF attached and SF detached homes, there are similar trends in the frequency of recorded barriers with some variances in the specific barrier types. Note homes may have multiple barriers causing the total percentage to be greater than 100%.

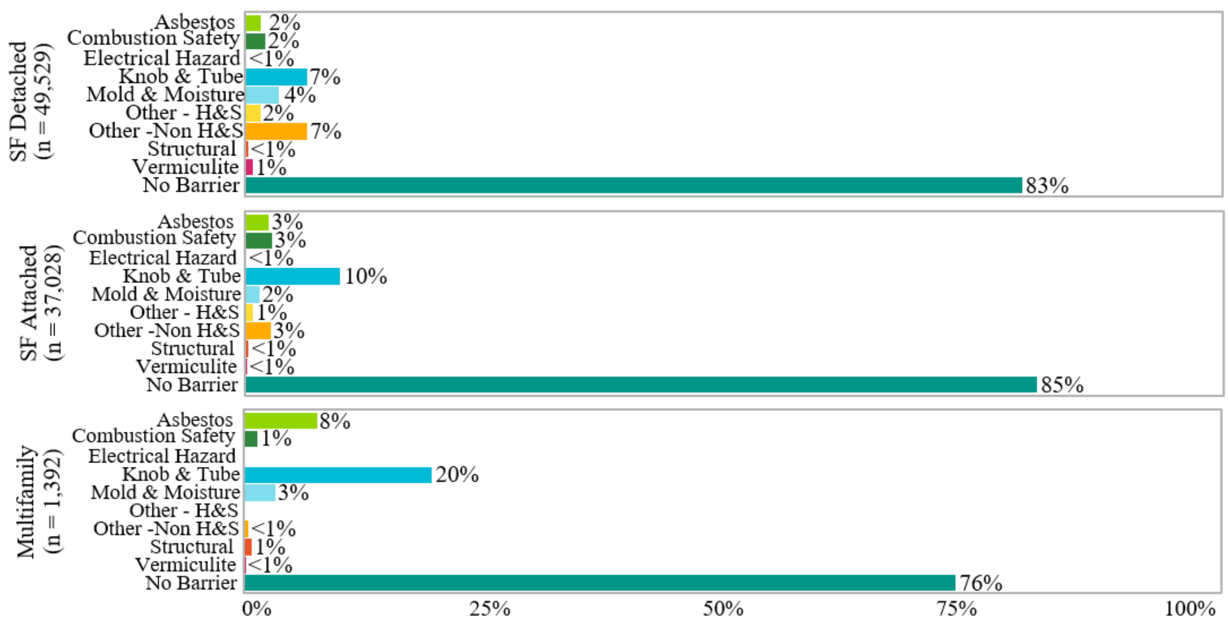

Figure 1. Distribution of recorded barrier types by home type.

Dwelling type. The team explored whether certain dwelling types have a higher frequency of recorded barriers. Figure 2 illustrates that double decker, triple decker, a-frame, and bungalows have the highest incidence of recorded barriers. Double decker and triple decker homes, in particular, frequently have multiple identified barriers. Notably, double decker and triple decker homes have a high prevalence of K&T wiring (39% and 38%, respectively) and asbestos (18% and 19%, respectively).

Contractors noted that bungalows, cape style, triple decker, and older Victorian and colonial dwelling types are where they typically see the most barriers. There are similar trends seen in Figure 2 based on these dwelling types.

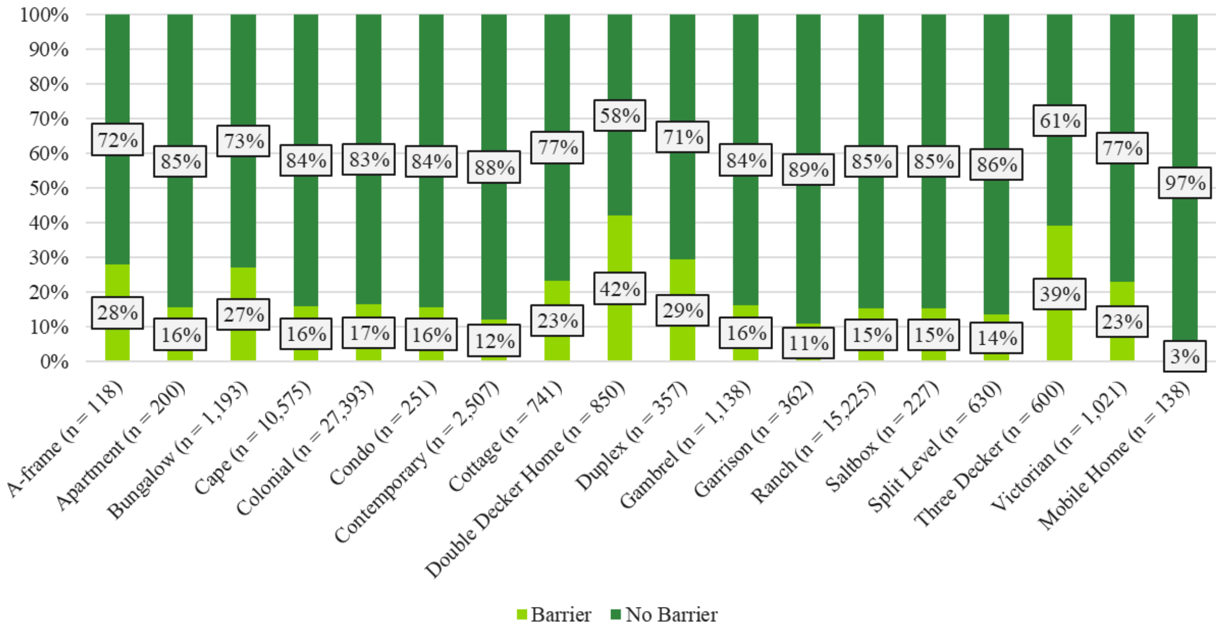

Figure 2. Distribution of recorded barriers by dwelling type.

DECs and EJCs. Figure 3 shows the presence of barriers in DECs and EJCs. Both DECs and EJCs have a higher prevalence of barriers compared with non-DECs and non-EJCs, with 20% of DEC homes and 21% of EJC homes having recorded barriers compared with 15% in non-DECs and non-EJCs. As DEC and EJC designations are not mutually exclusive, some degree of overlap is anticipated. DECs with a high prevalence of barriers included Fall River, Fitchburg, and New Bedford. Fifty-three percent of homes in Fall River had recorded barriers, 44% in Fitchburg, and 31% in New Bedford.

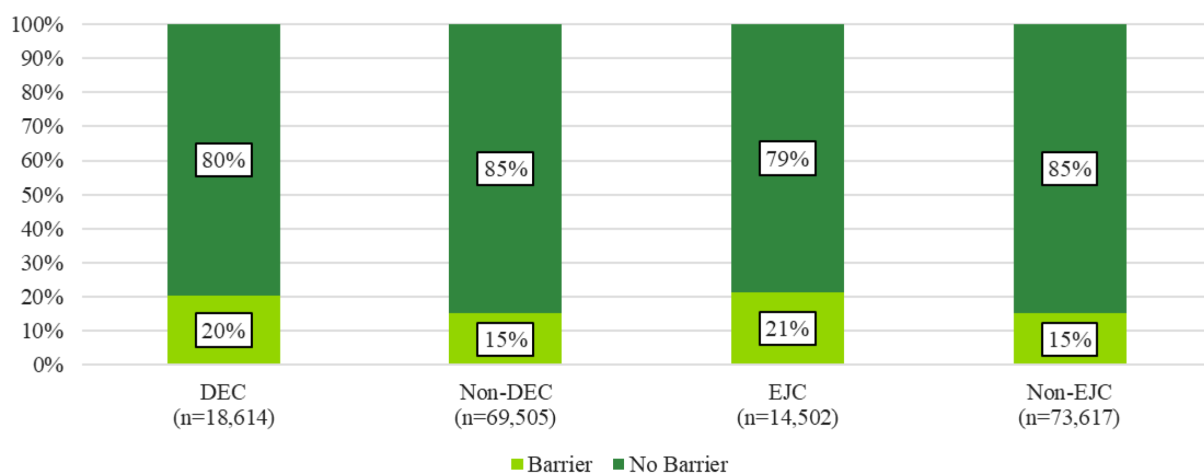

Figure 3. Distribution of recorded barriers by DEC and EJC.

Building vintage. As anticipated, the team found that older homes have a higher proportion of recorded barriers, as Table 5 shows. Homes built in the 1940s and earlier have the highest number of recorded barriers with the most prevalent being K&T wiring, asbestos, and vermiculite. Homes built between the 1940s and 1960s also have a high prevalence of barriers such as electrical hazards, structural, and combustion safety. Homes built between the 1970s and 1990s tend to experience recorded barriers of mold and moisture, other non-H&S, and structural. Newer homes built between the 2000s and 2020s experience barriers such as structural, other H&S, mold and moisture, and combustion safety. Overall, pre-1940s homes have the highest prevalence of recorded barriers.

Table 5. Weatherization barrier distribution by building vintage and home type for installed weatherization measures

Vintage	SF detached		SF attached		Multifamily	
	Sites with barriers (n=4,391)	Sites without barriers (n=16,266)	Sites with barriers (n=1,835)	Sites without barriers (n=7,336)	Sites with barriers (n=24)	Sites without barriers (n=113)
Pre 1940s	39.1%	24.4%	74.9%	45.3%	83.3%	45.1%
1940s	6.8%	6.0%	3.5%	4.5%	0.0%	2.7%
1950s	13.6%	15.7%	3.9%	11.1%	0.0%	2.7%
1960s	10.4%	12.0%	5.7%	9.6%	4.2%	6.2%
1970s	10.1%	9.5%	3.1%	5.4%	4.2%	6.2%
1980s	7.8%	10.0%	4.1%	7.9%	8.3%	25.7%
1990s	6.0%	8.6%	2.2%	6.6%	0.0%	2.7%
2000s	4.6%	6.2%	1.8%	5.4%	0.0%	7.1%
2010s	0.5%	1.3%	0.3%	1.0%	0.0%	1.8%
2020s	1.1%	6.3%	0.4%	3.1%	0.0%	0.0%
Total	100%	100%	100%	100%	100%	100%

Note: Values show percentage distribution by building vintage.

Potential Energy Savings

Figure 4 shows the percentage of energy savings per site for the weatherization measure packages for SF detached homes.[5] On average, the team found that older homes are less insulated and have a higher energy intensity. As a result, measure savings trend higher with older home vintages. Similarly, weatherization barriers are more common in older vintages. The combination of an older site with weatherization barriers yields higher average savings potential.

[5] The 1940s does not have any homes presented due to the ResStock baseline model distribution as identified in Table 3.

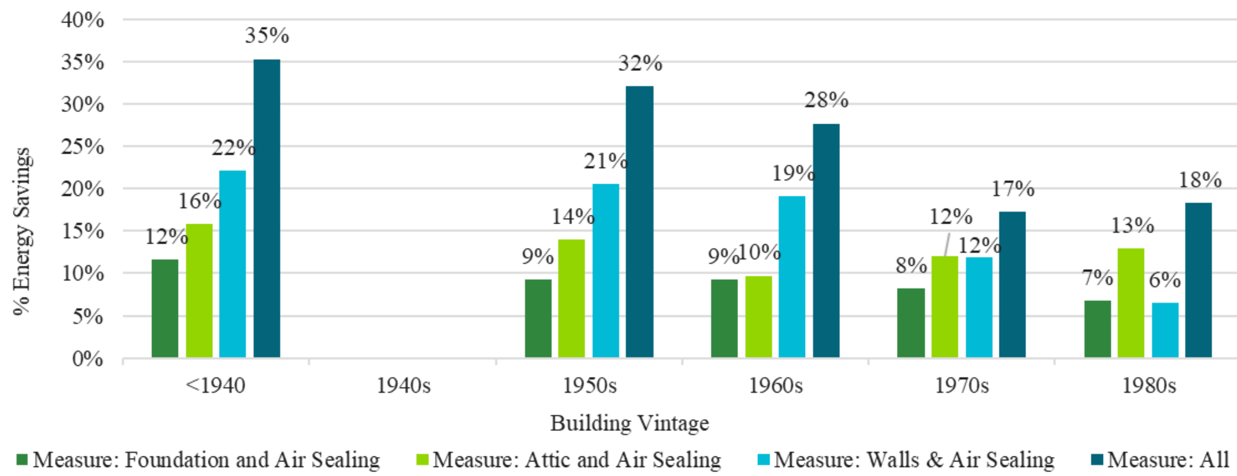

Figure 4. Average energy savings by measure package and home vintage for single-family detached homes.

The team also calculated energy savings for a reference home scenario. The team used LV data to summarize the distribution of homes by vintage that received any weatherization measure, as Table 5 shows. Savings weighted using this distribution are referred to as the reference home scenario, which is meant to serve as a proxy for the savings used in the Massachusetts Technical Reference Manual (TRM) and Benefit Cost Ratio (BCR) model. Figure 5 shows the absolute savings between the reference home and homes with barriers. The team also included specific scenarios for older homes, pre-1940s to 1960s, to highlight the impact of building vintage. The modeled reference home savings may be higher than what is seen in the Massachusetts TRM and BCR model as the savings are inclusive of the total site MMBtu savings. Additionally, the modeled measure performance may be higher than what is seen in the program (e.g., attic insulation reflects a fully insulated attic rather than the insulation of an attic hatch).

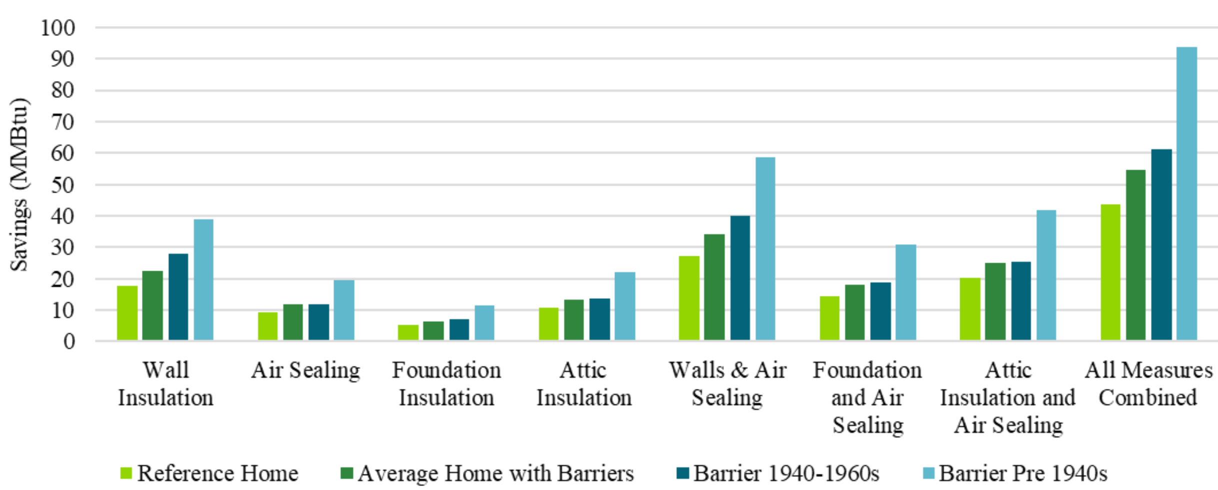

Figure 5. Reference home savings compared with homes with barriers.

Barrier Mitigation Frequency and Drivers

The team used the results from the contractor interviews, participant survey, and participant interviews to understand barrier mitigation frequency and drivers for both participants who remediate and who do not remediate barriers.

Contractor timeline and cost estimates. LVs and HPCs noted K&T wiring and vermiculite as the most time-intensive and cost-intensive barriers, expressing that these barriers typically take up to 6 months for remediation and are very expensive. Vermiculite requires multiple testing stages to ensure state building code compliance. For K&T wiring, the work can become very invasive if rewiring is required. Additionally, LVs and HPCs noted that combustion safety can be costly and time-consuming, especially if a heating system replacement is needed. From the IIC perspective, once they are contracted, the barrier remediation takes approximately one to two days for vermiculite removal and one to two days per circuit breaker for K&T wiring.

Contractors noted that the barrier type and severity often drive barrier remediation. Multiple barriers and high costs often cause participants to not move forward with remediation and therefore not move forward with weatherization or electrification measures. For hard barriers, the LVs and HPCs estimated the barrier remediation frequency to be less than 20% of homes. However, for soft barriers, the majority of customers remediate them. For instance, K&T wiring may not be active and therefore, not require remediation. The IIC notes that in Middlesex County, 60%-70% of K&T wiring is inactive and requires only sign-off rather than remediation.

For barrier mitigation costs, structural barriers represent the highest average cost at $19,606, followed by vermiculite at $10,023, and K&T wiring at $9,421, excluding K&T sign-off costs, as Figure 6 shows. The barrier mitigation cost data also highlights the significant variability in mitigation costs, driven by differences in severity. For instance, mold remediation has an average cost of $6,200, yet some projects exceed $20,000, a trend that is similarly observed across other barrier types.

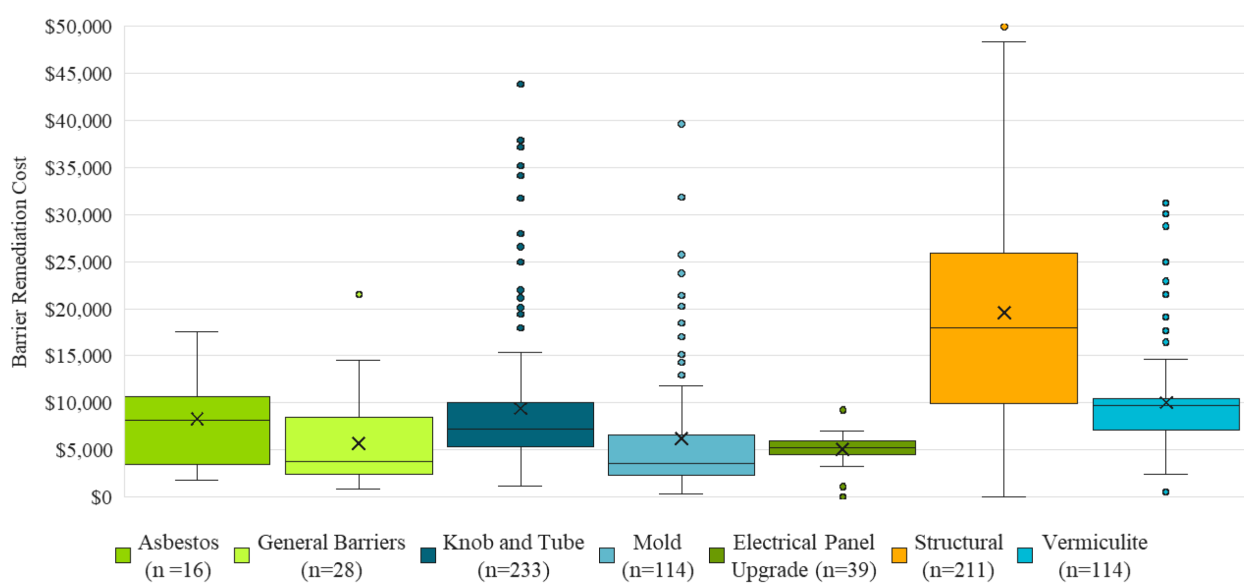

Figure 6. RTS Initiative 2024-2025 LV cost data and 2023-2024 HEAT Loan barrier mitigation data.

Participant timeline and costs. The participant survey explored the timeline of barrier remediation and the cost of barriers both remediated and not remediated. For the timeline of pre-weatherization barriers, 96 of 115 participant survey respondents that experienced barriers and received weatherization upgrades remediated barriers in less than 2 months. Of those survey respondents, 12 indicated receiving K&T sign-off. Similarly, 23 of 33 survey respondents who experienced pre-electrification barriers and received electrification upgrades remediated barriers in less than one month. Of those survey respondents, three received K&T sign-off.

Participant survey respondents reported a wide range of costs for weatherization barriers with most barriers being remediated at a cost of less than $5,000 (80 of 132 survey respondents). For barriers not being remediated, the cost of remediation for weatherization barriers tended to be higher with 10 of 36 survey respondents stating the weatherization barrier cost estimate was over $10,000.

In comparison, for electrification barrier remediation costs, 18 of 39 survey respondents reported the barrier remediation cost less than $5,000 and nine survey respondents reported it cost over $10,000 for barrier remediation. For participants who did not remediate electrification barriers, seven of 16 survey respondents reported it cost more than $10,000, two reported it was between $1,000 and $3,000, and six did not know the cost of remediation. Survey results indicated that customers are more likely to mitigate barriers that cost less and subsequently proceed with electrification upgrades. For electrification barriers, higher remediation costs often relate to K&T wiring, unsafe or outdated electrical systems, and insufficient electrical panel capacity. From the participant survey and interviews, the team did not see any significant trends in certain barrier types being mitigated versus not mitigated, but rather the cost of the barrier being the driving factor.

Motivations for remediation. Survey respondents ranked motivations for remediation in order of influence on their decision to remediate the barrier. Sixty-one percent of survey respondents identified “qualifying for weatherization incentives” as their leading motivator for remediating weatherization barriers. Many respondents also cited “addressing H&S concerns", “reducing energy bills” or “improving energy efficiency” as significant drivers. Similarly, 38% of survey respondents indicated that “qualifying for electrification incentives” was the primary motivator for remediating electrification barriers, with H&S considerations again ranking as a key reason for action. Figures 7 and 8 show how survey respondents ranked the influence of different factors on their decision to remediate weatherization and electrification barriers.

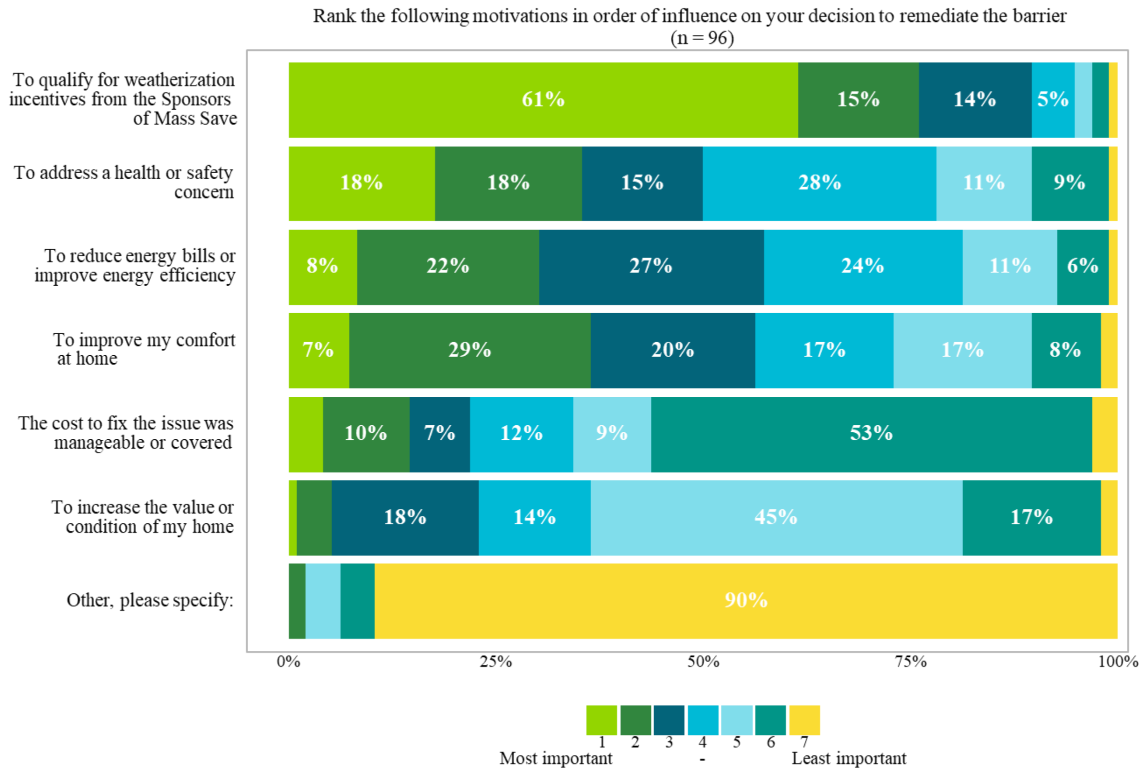

Figure 7. Motivators for remediating weatherization barriers.

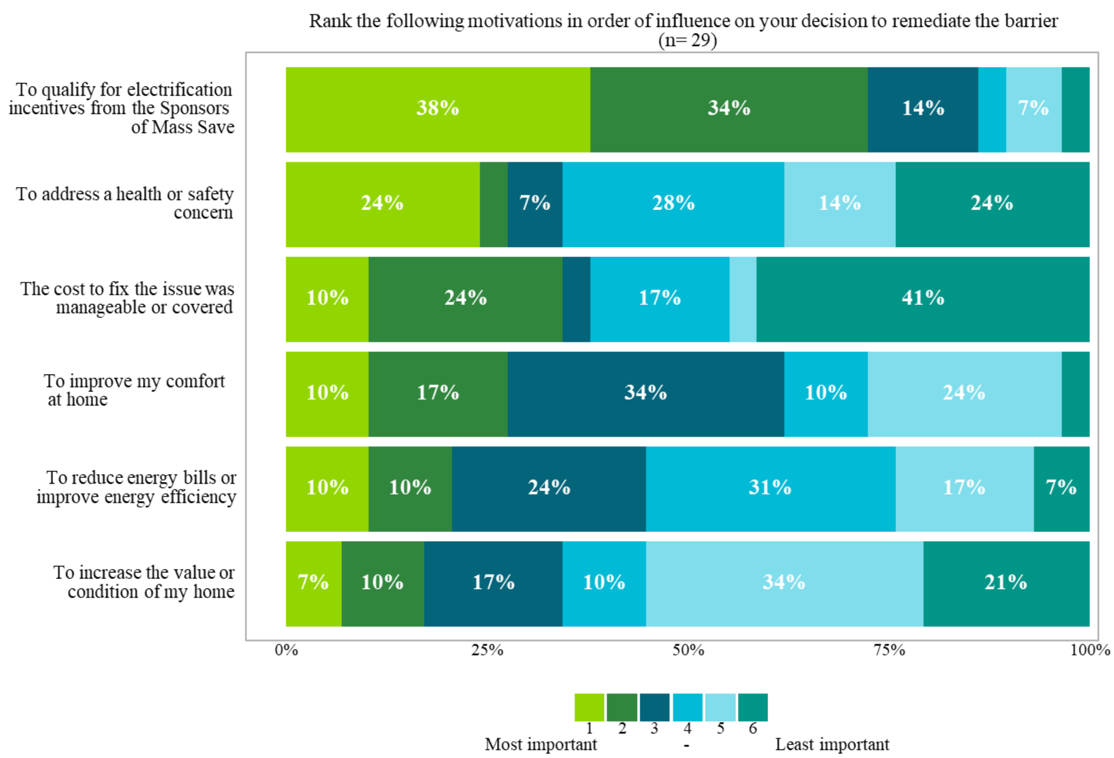

Figure 8. Motivators for remediating electrification barriers.

Based on participant interviews, safety and comfort emerged as the primary motivators for remediation, especially after discovering hazards in their homes. One participant explained, "The biggest reasons were safety and energy efficiency from the financial side, as well as being comfortable in the space. Once we identified both K&T and vermiculite, safety was the highest priority."

Financial incentives also played a crucial role, making upgrades more feasible. One participant stated, "We were aware of them (financial incentives) and the Mass Save program's incentives helped us justify the home purchase."

For electrification upgrades, improved climate control and comfort was found important, with participants eager to resolve heating and cooling needs: "We wanted to get mini splits to heat and cool our home and fixing the hot water heater issue and panel capacity was the best option to get that done."

Reasons for not remediating barriers. Survey respondents and interviewees were asked to rank reasons for not remediating the barrier in their home. In both the participant survey and participant interviews, the most frequently cited reason for not proceeding with remediation was cost, as Figure 9 shows. Ten out of 23 participants stated that the cost was extremely influential in their decision to not remediate weatherization barriers, and seven out of 13 participants for electrification barriers. Many participants found the quoted prices prohibitively expensive, especially those who did not qualify for enhanced incentives. One participant stated, "The price they quoted cost too much. Cost was the main and only reason." Another added, "On paper I don't qualify for enhanced incentives but still need to save up to be able to afford these." Even those motivated to act expressed the need to delay due to financial constraints: "I would like to do this more than anything, but I am saving up while looking into quotes."

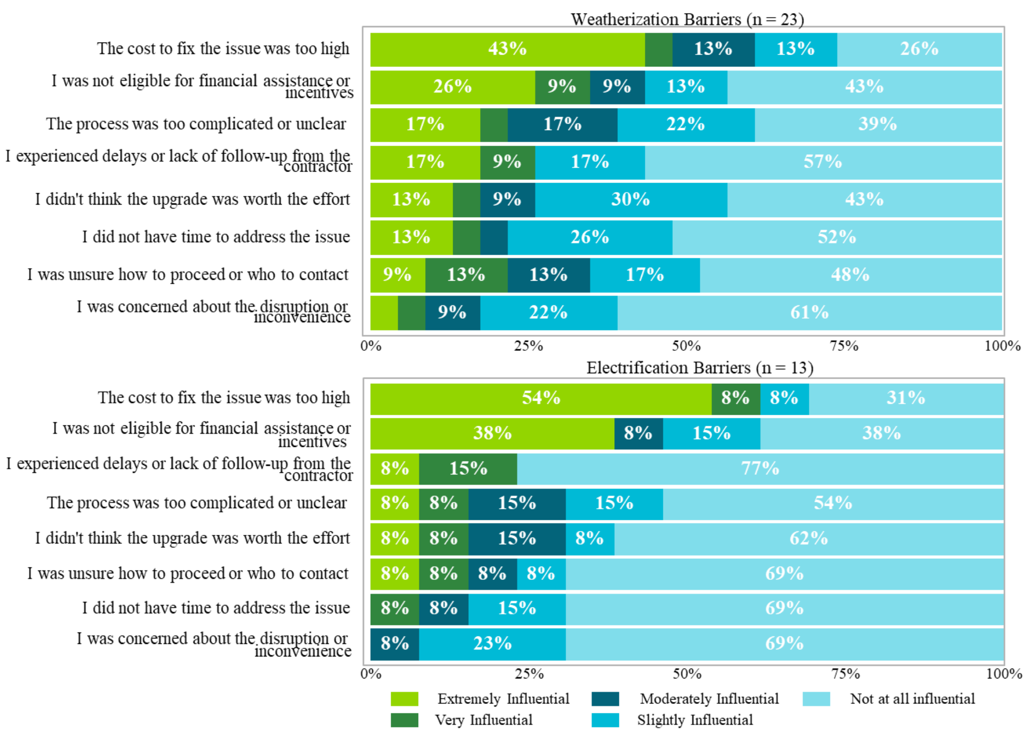

Figure 9. Motivators for not remediating barriers.

Interview participants also indicated storage and space limitations within the home as significant barriers. Participants described physical constraints that made upgrades impractical or more costly. For example, one noted, “Mainly it was a storage issue in the attic but also a cost issue." Another shared, “The biggest issue was the furnace did not pass the combustion safety test and there is limited space as well for the furnace,” highlighting how technical assessments sometimes revealed challenges that could not easily be resolved.

Willing and able to pay. The participant survey asked both those who remediated and those who did not remediate barriers about the maximum amount they are willing and able to pay for barrier mitigation. On average, participant survey respondents who had remediated barriers reported they are willing and able to pay about $1,280 for weatherization barrier remediation and $3,200 for electrification barrier remediation. When excluding those who indicated they are willing and able to pay $0, the averages rise to $2,600 and $5,600, respectively, for weatherization and electrification barrier remediation.

For participants who did not remediate barriers, on average, survey respondents reported they were willing and able to pay approximately $1,900 for weatherization barrier remediation and $1,600 for electrification barrier remediation. When excluding those who indicated they are willing and able to pay $0, the averages increase to $2,600 and $2,500, respectively. Comparing the amount respondents’ who did not remediate barriers are willing and able to pay with their estimated remediation costs, the team found that for weatherization barriers, 49% of participants are not willing and able to pay the estimated cost, 33% are willing and able to pay the estimated cost, and 18% did not know the cost but are willing and able to pay between $1,000 and $5,000. For electrification barriers, 71% of participants are willing and able to pay the estimated cost, 6% are not willing and able to pay the estimated cost, and 24% did not know the cost but are willing and able to pay between $1,000 and $5,000.

Conclusions

Overall, pre-weatherization and pre-electrification barriers continue to be found in homes throughout Massachusetts. Homes built in the 1940s and earlier exhibit both the highest prevalence of barriers such as K&T wiring, asbestos, and vermiculite and the highest modeled weatherization savings potential. Consequently, the homes with the greatest opportunity for energy savings may often be the homes most likely to stall or exit the program due to high remediation costs and logistical complexity. Similarly, the Mass Save Sponsors should continue to target DECs for barrier remediation and could consider targeting triple-decker and two-family homes as these communities and dwelling types show a higher prevalence of barriers.

While safety, comfort, and access to incentives motivate many participants to consider barrier remediation, survey and interview results indicate that decisions are driven primarily by cost, with willing-and-able-to-pay amounts falling well below the average costs of hard barriers. On average, barrier remediation costs approximately $13,600, with structural issues having the highest average cost of $19,600, followed by vermiculite at $10,000, and K&T wiring at $9,421, while the average willing-and-able-to-pay amount is approximately $2,000.

To better understand which barriers most frequently prevent the installation of specific measures, the team recommends that the Mass Save Sponsors standardize barrier tracking by clearly identifying high priority barriers and consistently documenting their presence, location within the home (e.g., attic, basement), size of the barrier (e.g., entire attic, one attic wall), and the specific measures they impact. Improved documentation would enable the Mass Save Sponsors to more effectively identify barriers that are not being mitigated, assess where they occur within homes, and determine whether certain barriers or conditions warrant prioritization during the HEA or targeted increases in barrier mitigation incentives.

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AI-assisted Tools Disclosure

AI-assisted tools used: Microsoft Copilot
Used for: grammar review.
Extent: light editing.
Human review: The authors reviewed and verified all content, calculations, and citations.