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Original research article

Uncertainties and anticipated disturbances as drivers of tenant relocation in Swedish housing renovation

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ABSTRACT

To meet the 2050 climate targets, the renovation rate of existing housing is expected to increase significantly. However, such large-scale renovation efforts have raised concerns about their social implications, particularly relating to disruption and the potential displacement of tenants. This paper aims to deepen the understanding of the social consequences of renovation by exploring whether and for what reasons renovation processes influence households' decision to relocate.

The study draws on 450 interviews with households in municipally owned housing who chose to relocate from 42 Swedish renovation projects affecting 6993 apartments, and was analysed using both qualitative and statistical methods.

The study contributes two main results. First, the qualitative analysis identifies disturbances and uncertainties as primary drivers of tenants' relocation. Second, the statistical analysis established relationships between tenants' relocation decisions and factors such as age, the rent per sqm before the renovation, and the extent of the renovation. The research revealed that tenant relocations frequently precede the start of renovation work rather than occurring during construction. The findings emphasise that mitigating renovation-related disruptions is crucial across both minor and comprehensive overhauls to prevent displacement and housing instability. Since most renovation-motivated relocations occur before work begins due to perceived insecurities, the timing and design of communication require particular care.

1. Introduction

Europe's ageing housing stock requires extensive repair and modernisation, aligning with European energy-efficiency policy. Renovating existing housing is central to the EU's climate strategy, as improving energy performance in buildings is considered essential for reducing emissions. Since the 1980s, the Energy Performance of Buildings Directive (EPBD) has been the EU's key regulatory instrument [1], emphasising the importance of major or “deep” renovation, which can reduce energy use by up to 60% compared to pre-renovation levels [2]. In 2020, the European Commission introduced further incentives to accelerate energy-efficient renovations, prioritising buildings with the highest energy use [3].

However, while the EU promotes renovation, it also stresses the need to avoid disproportionate rent increases that could displace vulnerable

households [4]. Previous studies highlight the relationship between major renovations and increased tenant relocation [5–9], largely driven by rent increases. Scholars argue that some property owners use renovation to enhance profitability, creating significant social challenges for affected individuals and society at large [6,10–12]. Socioeconomically disadvantaged households are particularly exposed, as they often live in areas with high energy use and urgent renovation needs [13]. Evidence also shows that low-income households tend to move from renovated areas to more disadvantaged neighbourhoods in search of affordable rents [10,14], potentially contributing to segregation [7] and “low-carbon gentrification” [11]. In Sweden, one study estimates that a 50% rent increase could force one-third of households to relocate, as their income would fall below the standard of decent living defined by Statistics Sweden (SCB) [15].

Although earlier research found that low-income households were

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more likely to relocate following major renovations [7], two recent analyses based on Swedish national data report no significant difference in relocation rates between low-income and middle-income households, suggesting that other factors may be at play [8,9].

Recent studies also indicate a shift in renovation strategies, with major renovations becoming less prevalent [8], as property owners increasingly opt for incremental, small-scale interventions distributed over time, largely due to financial constraints [16]. Despite the growing relevance of phased renovation, its implications for tenants remain insufficiently examined.

Against this background, the present study seeks to deepen our understanding of how renovation shapes tenants' behaviour by addressing two critical research gaps:

- (1) identifying the reasons that compel tenants to relocate during renovation processes, and
- (2) examining how the scope and characteristics of renovation projects shape relocation decisions.

By analysing these relationships, the study aims to support housing policymakers, property managers and tenants' organisations in developing socially sustainable renovation practices that limit unnecessary displacement.

A total of 450 interviews were conducted between 2018 and 2021 with tenants who relocated from municipally owned rental housing undergoing renovation in Gothenburg, Sweden's second-largest city. The study encompasses all renovation projects undertaken by the municipal housing companies during this period, including both minor and major projects, which affected 6939 apartments.

The paper is structured as follows: we first outline Swedish policy and housing renovation, then review previous research on relocation motivations, with a focus on renovation. Next, we describe our methods and materials. We then present the empirical results and discuss their implications. Finally, we conclude with recommendations for property owners and policymakers.

2. Policy and housing renovation in Sweden

Sweden's energy efficiency policy for building renovation is shaped by the EU climate targets, particularly the requirement for all buildings to achieve zero emissions by 2050. This objective necessitates a substantial increase in the national renovation rate. To align with the EU goal, the government plans to introduce a national renovation plan in 2025. Sweden has previously issued two policy frameworks for energy-efficient renovation in response to amendments of the EPBD [17]. The forthcoming policy is expected to adopt a life-cycle perspective, including the energy embodied in the production of materials and components [18].

Public housing accounts for approximately 16% of the total housing stock, rising to as high as 25% in municipalities like Gothenburg. One-third of the Swedish population lives in rental housing [19], a proportion that aligns with the average at the European level [20]. Following a political ambition from the 1940s to finance and support "good housing for all" [21,22], Sweden does not have a social housing system. Public, municipally owned housing is available to all income groups. Nonetheless, tenants in municipal housing tend to have lower incomes and more frequently a non-European background compared to tenants in the private rental sector [22]. Market rents do not apply in Sweden. Rents in both public and private rental housing are collectively negotiated with the Swedish Tenants Association and follow the Use Value Method, which bases rent levels on the standard of comparable dwellings [23]. Rent increases after renovation are permitted when demonstrable improvements in living standards occur. Since heating cost is typically included in the rent in Sweden, the financial benefits and energy-saving incentives from renovation essentially go to the landlord. In cases of comprehensive renovation, the landlords may, in principle, request

termination of rental agreements, although the Swedish Land Code (1970:994) [24] requires that the rights and interests of both parties be considered.

From a cost perspective, avoiding missed "windows of opportunity" is a crucial strategy for property managers [18]. These are occasions when renovation is already necessary due to technical or functional reasons. Capitalising on such moments does not imply that all projects should involve full-scale renovation; rather, stepwise renovation can provide significant advantages [25] as long as each measure is evaluated from a long-term cost-effectiveness perspective, ensuring that recently replaced or renovated elements do not require rework later if a more energy-efficient solution would have been more cost-effective from the start.

In practice, renovation in Sweden is typically a needs-based process rather than driven by energy efficiency ambitions. Previous research has shown that energy efficiency rarely serves as the primary driver of renovation decisions [26]. Instead, renovations tend to address technical issues, functional upgrades, or improved comfort, with energy performance measures added opportunistically during these interventions. Renovations are commonly undertaken in a stepwise manner and distributed over time, allowing property owners to manage costs and minimise disruptions for tenants [16,25]. Recently, growing awareness of the climate impacts associated with material production, demolition waste, and the carbon footprint of new components has motivated property owners to prioritise repair over replacement [27]. This shift reflects a transition towards circular and low-carbon renovation strategies.

3. Why do people relocate?

According to Swedish statistics, individuals move around ten times over their lifetime, spending around seven years in each residence [19]. Compared with other European countries, Nordic residents have the highest mobility rate [28].

Residential mobility is a decision-making process shaped by individual preferences and contextual constraints. People move or choose to stay in response to changing life-course events, such as partnership formation or dissolution, childbirth, employment changes, or retirement [29,30]. These transitions alter housing needs and aspirations, but choices are always conditioned by the availability of housing options, financial resources, and institutional frameworks. Staying put, is therefore, not merely passive; it can reflect satisfaction, attachment, or limited alternatives [31]. Several factors strongly influence relocation patterns. More than half of all moves occur during youth (18–24) and the family formation (25–34). Mobility decreases substantially with age, especially after the age of 70 [19,29]. Household composition also matters: larger households and those with children under 18 are more likely to relocate [32]. Beyond demographics, personal history, social networks, and ties to the local area also shape relocation decisions in significant ways [29,33].

3.1.1. Relocation and residential satisfaction

Relocation decisions arise not only from dissatisfaction but also from expectations of better conditions elsewhere. This interplay of push (undesirable conditions) and pull (attractive alternatives) is well established in mobility research [34,35]. Residents are assumed to continually evaluate their housing situation [36], and a relocation decision is often triggered when dissatisfaction exceeds a personal threshold [37].

A range of factors contribute to this evaluation. First, changes in household circumstances, such as employment status, income levels, or relationship transitions. Second, dissatisfaction with the dwelling or neighbourhood, such as inadequate size or layout, poor quality, or

strained relations with the landlord, increases the likelihood of leaving [38]. Homeownership also lowers mobility; homeowners move less often than tenants, particularly those in private rentals [28,39]. Subjective factors are equally important. Perceived safety, neighbourhood cohesion, and social connections with friends, family, and neighbours strongly influence residential satisfaction and attachment to place [40,41]. Larger living space [41], longer residence duration and affordability [42,43] also contribute positively.

However, mobility decisions are constrained. Even when dissatisfaction is present, relocation does not always occur. Barriers such as financial limitations or scarce alternatives can prevent households from acting on their intentions [31,43]. The probability of moving increases when households can access and secure more satisfactory housing options [37,44]. Research consistently shows a gap between moving intentions and actual behaviour: many households plan to move without doing so, while others relocate unexpectedly or opportunistically [45]. This divergence, highlighted by Rérat [31], is central to understanding the dynamics of residential mobility.

3.1.2. Relocation driven by renovation

The current neoliberal approach to housing renovation has been widely criticised for leading to forced displacement and gentrification of neighbourhoods [46]. *Recent studies describe this dynamic through the concept of 'renovation', referring to situations where renovation works, often framed as necessary modernisation, result in substantial rent increases and the indirect eviction of existing tenants unable to afford the upgraded dwellings [47,48].* The concerns echo with earlier critiques which emerged in response to post-war urban clearance and reconstruction programmes during the 20th century [49–51]. Landlords are said to be profiting from the prospect of increasing rents, often to the detriment of existing tenants [11,52]. In some cases, renovation strategies appear to be deliberately aimed at transforming the population composition by displacing so-called 'unwanted' tenants [10,53,54]. The threat of forced displacement due to renovation has been linked to heightened emotional response among tenants, including anxiety and anger [54]. Financial strain, particularly related to increased rent levels, is often accompanied by a sense of being neglected or marginalised [54]. Furthermore, the uncertainties surrounding a renovation can lead to a "renovation stress" affecting tenants even before any physical work has started [55]. *Research on renovations also highlights the social and psychological dimensions of these processes, showing how they disrupt tenants' sense of home, fragment social networks, and reinforce existing housing inequalities [47,48].*

Earlier case studies on relocation in the context of renovation showed that both the most and least socioeconomically advantaged households are more likely to relocate, with the category of immigrant families often being overrepresented [50,51,56]. While the resourceful tenants tend to move to privately owned villas, households with fewer resources often relocate to other unrenovated or less desirable areas. Similar results have been found in a recent study, highlighting the vulnerability of less resourceful households facing renovation processes [57]. Temporal relocation, or evacuation, has been identified as a significant factor influencing tenants' decisions to permanently relocate in order to avoid enduring the inconvenience of moving twice [58]. Wiktorin [5] observed that when temporal evacuation was avoided, up to 80% of the tenants remained in the same apartment, suggesting that avoiding temporary evacuation can play a key role in encouraging tenant retention.

Although we acknowledge that residential mobility usually results from a combination of interrelated factors, our objective here is to examine the extent to which renovation itself acts as a triggering factor in the decision to move.

4. Method and material

The study employs a mixed-methods approach, combining

qualitative and quantitative analyses [59] based on interviews with tenants and data from renovation projects. This combination of data sources and analytical methods enables a more comprehensive understanding of the social dynamics of renovation. Additionally, the insights generated from each approach complement and validate one another, thereby strengthening the credibility and reliability of the results.

In total, 450 interviews were conducted with tenants who held a rental contract and chose to relocate from properties undergoing renovation. All properties are owned by three municipal-owned housing companies, the Gothenburg, which together manage approximately 76,000 apartments, accounting for 25% of the city's total housing and 50% of its rental stock. The interviews were primarily conducted by two of the authors, with periodic support from three research assistants.

The study includes all renovation projects ($n = 42$) undertaken by the three housing companies between June 2018 and March 2021, affecting 6939 apartments, or about 9% of their total stock. It covers the entire renovation process from the initial notification of the planned renovation until two years after completion. By examining the pre-renovation phase, the study captures tenants who moved before the renovation started, often due to anxiety, as noted in previous studies [10]. Extending the observation period to two years after the renovation enabled the inclusion of those who chose to relocate after the renovation. Project duration varied significantly, from eight months to over five years. Only three renovation projects were followed from initiation to completion.

4.1. Data collection through interviews

In total, 908 tenants terminated their rental contracts during the data collection period, of whom 450 were successfully interviewed. For 499 tenants, the reason for relocation was identified either through information provided by the property owner or through contact with the household or a relative. Contact details were forwarded to the research team, which then arranged for an interview with the primary rent contract holder. All sensitive information was handled according to the GDPR routines, and informed consent was obtained from all participants. No incentives or monetary compensation were provided.

Initially, interviews were conducted face-to-face in participant's home or public spaces, but shifted to telephone during Covid-19. Interviews ranged from a few minutes (telephone) to around an hour (in person). With consent, 52% ($n = 235$) were recorded. The interview guide covered three themes: the relocation process and its connection to renovation, household perspectives on the renovation, and basic demographics. Each interview began with an open-ended question: "We understand that you have decided to move. Can you tell us more about that?"

The shift to phone interviews increased accessibility and boosted completion rates. As Mann and Stewart note [60], telephone interviews can increase access to participants but may reduce participants' control over their immediate environment, potentially affecting their comfort and openness [61].

4.2. Analysis

Interviews were transcribed and imported into NVivo (release 1.6.2) for coding. The qualitative data were inductively clustered into a dataset, followed by a subsequent comparison to the literature review (see Section 2). Converting qualitative data into codes for statistical analysis is standard in mixed-methods research [62]. The coded data were transferred into a spreadsheet, combined with the interviewees' demographic data and data from the 42 renovation projects. Quantitative analysis in NVivo was abandoned due to the software's limitations in handling the extensive and diverse dataset.

A deductive statistical analysis was performed to utilise the large dataset. Since the dependent variable (whether a household relocated due to the renovation or not) is dichotomous, a theory-based logistic regression was preferred [63,64]. The logistic regression model was

evaluated using diagnostic tests, including the log-likelihood test [65], the Wald test for the degree of explanation [66], goodness-of-fit assessment [67], and evaluation of multicollinearity and the influence of potential outliers [68]. The logistic analysis results are presented as marginal effects at the mean (MEM), which are interpreted as the effects of an independent variable while holding the other variables at their average [69].

4.3. The case of 42 renovation projects

Data from the 42 renovations, provided by the housing companies, include the year of construction, property size, number of apartments, renovation measures, renovation duration, initial rents, and subsequent rent increases.

The renovations were mainly driven by maintenance needs and energy use. Before renovation the buildings' Energy Performance Certificate (EPC) were generally E-F, with an energy use of around 140–145 kWh/m² per year (including Domestic Hot Water (DHW) and property electricity, excluding household electricity). Actual use ranged from 90 kWh/m² to 321 kWh/m². After renovation, the most comprehensive renovations achieved a 50% reduction, reaching 74 kWh/m² per year.

Energy efficiency is a formal priority of the studied municipal companies, and is routinely considered in renovation planning, with an emphasis on cost-efficient solutions. At the same time, a local policy states that no tenant should be forced to relocate due to renovation-driven rent increases [70]. In response, the companies have developed a shared guideline for cautious, “varsam”, renovation. Extensive renovation, implementing both internal and external measures simultaneously, is generally avoided as it is costly and often requires temporary evacuation. Instead, renovations are usually phased: internal and external measures are implemented over time, in either sequence. Extensive renovation is undertaken when the building conditions require. To limit rent increases, a minimum standard upgrade is applied, while tenants may opt for a higher standard, such as a new kitchen, refurbished bathroom or glazed balcony.

The sample includes eight extensive renovations; the remaining involve either external or internal measures as part of a phased renovation. To analyse how household relocation relates to renovation characteristics, a typology with three renovation classes was developed, based on the scope of measures and the expected level of tenant disruption, for example, including whether temporary evacuation was required (Table 1). All, except for two projects, were built after World War II (Fig. 1).

Class 1 renovations involve external measures, such as window replacements and façade insulation, that offer medium to high energy-saving potential with modest rent increases. Tenant disturbance is minimal, usually limited to 1–2 days for window sealing, though scaffolding may remain longer.

Class 2 renovations, the most common in the sample, focus on internal measures: plumbing replacement (often requiring full bathroom reconstruction), installation of mechanical ventilation; updated electric

installations; and, in some cases, renovation of common facilities such as laundry rooms and outdoor areas. As DHW and heating have been included in Swedish rents, individual DHW metering was not standard. Following the strengthened Energy Efficiency Directive (2018/844/EU) [1], DHW metering is now required and is typically installed during Class 2 renovation, while heating remains included in the rent.

Class 2 renovations usually avoid full tenant evacuation, although temporary relocation may be offered to elderly or night shift workers. Still, the disruption remains high as parts of the apartment may be unusable for up to three months. Energy savings primarily stem from reduced hot water consumption and heat-recovery ventilation. Rent increases are moderate and largely depend on the standard of the newly installed bathroom.

Class 3 renovations involve extensive upgrades, which require tenants to evacuate for a period of requiring tenant evacuation for up to 12 months. Contracts are retained, and temporary accommodation is provided. These renovations offer high energy-saving potential, but are also associated with a substantial rent increase. For households returning after evacuation, rent increases are typically introduced gradually. Measures include climate-envelope improvements, balanced ventilation with heat recovery, and DHW metering.

5. Results

The results section outlines descriptive findings from the interviews and presents the relationships revealed through the logistic analysis.

5.1. Description of the dataset

Table 2 summarises the relationship between the number of renovations, affected apartments, and relocating households across renovation classes. During the study period, 908 households relocated; 450 of them were interviewed about their reasons for moving. Among these, 141 reported that the renovation motivated their relocation, while the remaining 309 moved for reasons unrelated to the renovation, even though their relocation occurred during the renovation period.

The sample of interviewees generally mirrors the national and local population average in terms of age, employment activity, and dwelling size. However, some notable differences emerge. The unemployment rate among respondents was 3.8%, which is significantly lower than the Gothenburg average of 7.2%. Additionally, 50% of the interviewees reported having a post-secondary education compared to the average of 25% in the general population of Gothenburg [71]. A well-established survey bias may explain the higher education level among respondents in this study: individuals with more education are generally more likely to participate in research studies [72].

5.2. Layered rationales for relocating

The interviews revealed a pattern of relocation decisions, shaped by a complex interplay of personal, housing, and renovation-related

Table 1
Measures in Class 1–3 renovation: subsequent disturbance for tenants, typical rent increases and energy savings.

Class	Renovation	Typical measures	Tenants' options	Evacuation	Disturbances	Rent increase	Energy savings
1	Climate envelope	Renovation/replacement of façade, windows, roof, and/or balcony, occasionally common areas	Glazed balconies	Tenants are requested to remain in their apartment	1–2 days, scaffolding can remain 12 months	Low: 1–20%	Window replacement ~10–15%; facade renovation ~40%
2	Plumbing/bathroom	Plumbing replacement, bathroom renovation, occasionally electricity and/or ventilation	New kitchen/kitchen renovation	Tenants generally remain, and are occasionally evacuated	6 to 12 weeks	Medium: ~12–30%	Low flow taps ~ < 1%; Individual DHW metering ~2%; vent. ~1,5%
3	Extensive renovation	Climate envelope, plumbing/bathroom, ventilation, and interior renovation	New kitchen/kitchen renovation	Temporary evacuation	Up to 12 months	High: 20–50%	Up to 40–50%

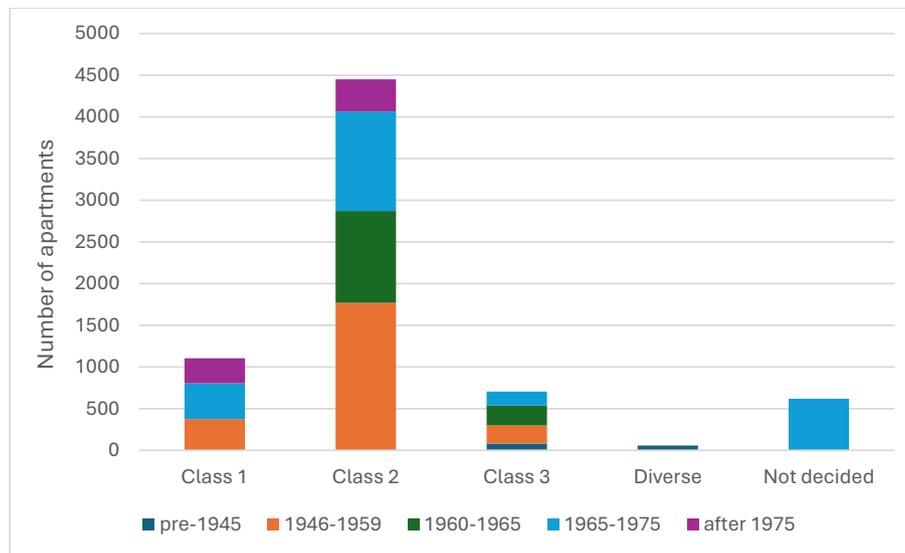


Fig. 1. Classes of renovation and number of affected apartments distributed by period of construction.

Table 2
Description of the dataset.

Class	Renovation projects	Affected apartments	Relocating households	Households for which the reason for relocation is known (n = 499)		Subsample (n = 141) of the 450 households who indicated renovation as motive for relocation
				Interviewed	Not interviewed	
1	10 (24%)*	1105 (16%)*	186 (20%)*	83 (18%)*	4 (8%)*	8 (6%)*
2	21 (50%)	4452 (64%)	550 (60%)	282 (63%)	30 (60%)	93 (66%)
3	8 (19%)	705 (10%)	124 (14%)	62 (14%)	11 (22%)	34 (24%)
Diverse	2 (5%)	58 (1%)	15 (2%)	9 (2%)	–	2 (1%)
Not decided	1 (2%)	619 (9%)	33 (4%)	14 (3%)	5 (10%)	4 (3%)
Total	42	6939	908	450	49**	141

* The percentage of the total in each column

** Of these, 8 were deceased, 17 moved to a home for the elderly, 9 had not lived in the apartment and considered themselves not in a position to answer questions, 15 declared that there had been a mistake and they were not relocating, and 24 lived on short-term “renovation contracts”

factors. Among the 450 participants, thirty-one motivations were identified, grouped into six themes (Table 3). While some households cited a single motive, such as a job opportunity in a new location, most described multiple, intertwined reasons for moving. For example, one household (P270) explained:

I wanted to reduce my costs, but more importantly, my daughter and my grandchildren lived in the property where I moved, and the apartment attracted me. I was a bit tired of [the current area].

Descriptive statistics confirm that the most common motivations were related to changing housing needs or everyday circumstances. A

Table 3
Motivations for relocation among the 450 interviewed households. More than one motivation can be counted for each respondent.

Households who relocated... independently of the renovation (n=309) motivated by the renovation (n=141)	Everyday related (n=166)						Dwelling related (n=226)			Tenure (n=77)		Other (n=67)			Urban area related (n=67)			Renovation related (n=141)												
	Move in together	Closer to work/school	Move to the countryside	Growing family	Closer to friends	Shrinking family	Upsize	Upgrade standard/quality	Disturbing neighbours	Downsize	Upgrade accessibility	Got an offer	Bought a condominium	Bought a villa	Was sub-letting	Not primary home	Moved to elderly home	Move to another area (Pull)	Move from area (Push)	Feeling of unsafety	Held renovation contract	Avoid disturbances	Uncertainties/lack info	Speeded up decision	Avoid evacuation	Can't afford the rent	Disappointed with results	Disappointed with standard	Rent not worth it	Pets disturbed
	52	28	27	17	17	5	91	28	23	13	9	9	34	27	24	9	2	17	16	1	-	-	-	-	-	-	-	-	-	-
	4	1	7	5	5	5	21	8	7	15	5	2	8	8	-	-	-	7	6	2	24	56	43	30	22	19	19	17	17	6

frequent reason was the need for a larger dwelling often associated with life events such as forming a couple or expecting children.

Other everyday-related motives included a desire to live closer to work, schools, or relatives or to pursue a more rural lifestyle. Dwelling-related reasons involved seeking improved standards, avoiding disturbing neighbours, or downsizing as children left home. Another distinct set of motives is associated with the aspiration to own rather than rent one's dwelling. The attractiveness and perceived safety of the neighbourhoods also played a significant role in the decision. Some households referred to "push factors" for leaving, such as prolonged construction works or simply fatigue with their current area. Others referred instead to "pull factors", expressing a desire to live in a more desirable or better-located neighbourhood.

5.3. Renovation-related relocations

A total of 141 households reported that their relocation was fully or partially driven by the renovation. Of these, 24 held short-term renovation contracts, which were offered to home seekers during the renovation planning phase, meaning their moves were predetermined by the terms of the contract. This leaves 117 households whose relocation was genuinely influenced by the renovation. The main themes emerging from these cases are presented in the following subsections.

The most cited renovation-related motive was disturbances ($n = 56$), followed by uncertainty ($n = 43$). Rent increases, a major concern in earlier research on renovation-driven relocation, were mentioned by 36 households.

Nineteen households who moved *after* the renovation cited disappointment with the renovation outcomes as their primary reason for leaving. Interestingly, another 17 households expressed dissatisfaction that too few measures had been implemented, some referring to shortcomings in interior upgrades, others to insufficient improvements in thermal comfort.

For 30 tenants who had already been considering a move, the renovation acted as a catalyst, prompting a final decision. As one interviewee (P106) explained, an offer of a new apartment became more appealing when weighed against the prospect of living through the renovation. Another participant (P151) described that the renovation had accelerated their decision. For others, it served as a decisive trigger, as expressed by one tenant:

I was looking for another apartment before the notification about the renovation, and then it became even more critical for me. I do not think that my apartment needs renovation, and it will be more expensive. It is a combination.
[P218]

A logistic regression analysis, based on 181 out of the 450 interviews

(thus including both households that moved because of the renovation and those who moved for other reasons) for which had information in all categories necessary for the analysis (excluding the 24 short-term renovation contracts), identified three key predictors of renovation-motivated relocation: the age of the contract holder, the extent of the renovation, and the rent increase per square meter (Table 4).

The likelihood of relocation due to renovation was significantly higher among older tenants and those exposed to more extensive renovations. Among tenants who cited renovation as their main reason for moving, a larger share has been affected by Class 3 renovations than by Class 1.

Regarding rent increases, a statistically significant effect emerged only when considering the rent increase per square meter. The higher the rent increase per square meter, the more likely relocation was attributed to the renovation, either fully or partly. Several alternative rent-related variables were tested: the absolute rent increase in SEK (Swedish crowns), the percentage rent increase, and the pre-renovation rent level. However, none of these variables improved the model fit (adjusted R^2) or reached statistical significance. Although the marginal effect at means is small, it remains sensitive to the underlying variable values, reflecting that the effect corresponds to an increase of only one Swedish crown.

5.3.1. Disturbances as motivators for relocation

Disturbances caused by renovation were the most frequently cited reasons for relocating. In Class 3 projects, the desire to avoid temporary evacuation played a major role. In contrast, in Classes 1 and 2 renovations, where tenants generally remain, relocation was often attributed to noise, concerns for the safety of personal belongings, and the apartment being partially uninhabitable. Even among interviewees who did not mention the issue as a cause for relocation, many reported experiencing similar nuisances associated with the renovation process.

Twenty-two households opted for permanent relocation instead of temporary evacuation and moving twice. Even a short-term move was seen as logistically overwhelming. One participant described the strain of preparing:

So, what clothes to bring and how much? How many towels? How many changes of bed linen?
[P127]

Older households were more frequently offered a temporary evacuation, including during Class 2 renovations, and many chose a permanent replacement apartment rather than moving twice. For these households, the renovation became an opportunity to reassess their living situation, with landlords often providing valuable assistance in finding an alternative apartment better suited to their needs. Several of them used the renovation to move to more accessible homes, for

Table 4
Logistic regression model – marginal effects of key explanatory variables.

Conditional marginal effects at means for $n = 181$ observations, on whether tenants relocate because of renovation.						
	dy/dx	std.err	z	P-value	95% conf. Interval	
Rent increase per sq. meter	0.0009	0.0003	3.0013	0.0027	0.0003	0.0014
Housing company [HC] (Dummy)						
HC 1 "Landlord 1" (Reference)						
HC 2 "Landlord 2"	0.0252	0.1125	0.2242	0.8226	-0.1953	0.2457
HC 3 "Landlord 3"	0.1121	0.0907	1.2367	0.2162	-0.0656	0.2899
Income of the household	-0.0106	0.0073	-1.4555	0.1455	-0.0249	0.0037
Age of contract holder	0.0688	0.0223	3.0890	0.0020*	0.0252	0.1125
Gender of contract holder	0.0493	0.0619	0.7959	0.4261	-0.0721	0.1706
Renovation class	0.1859	0.0755	2.4620	0.0138*	0.0379	0.3338
Evacuation	-0.1558	0.1651	-0.9439	0.3452	-0.4794	0.1677
Sq meters in old aptm	0.0026	0.0021	1.2746	0.2025	-0.0014	0.0067
Household size	0.0235	0.0339	0.6944	0.4875	-0.0429	0.0899

McFadden's adjusted R^2 : 0.193

The marginal effects, displayed in the column named "dy/dx", represent the probability effects when all other variables are kept at their mean (MEM)

* $p \leq 0.05$.

example, P414, who previously lived in a building without an elevator, or to downsize from a larger family home.

Disturbances caused by Class 1 and 2 renovations are particularly challenging for individuals who work night shifts as well as for those who spend much of their time at home, such as retirees, families with small children, and people on sick leave. Many of these households described feeling effectively evicted from their homes during the day-time. As one participant, P046 says that “*When they enter into the apartment, you are not allowed to stay*”. Similarly, P408, who was home with a child during a class 2 renovation, explained: “*We were practically homeless...*”. Households living in smaller apartments were especially affected, as there was nowhere to retreat, as described by P071, experiencing a Class 1 renovation:

Now we only know that sometime next week at 7 o'clock, they will come and take out the windows. If they come ... We might be asleep or be in the shower.

[P071]

During a Class 2 internal renovation, the prospect of sharing temporary sanitary facilities in the courtyard motivated some tenants, in particular older individuals and families with young children, to relocate. Although portable toilets were offered, this arrangement was not appealing to everyone.

Some households also expressed concern for their personal safety and their security of their belongings when workers were granted access to their apartments. In addition, many worry that their pets might experience discomfort or stress during the renovation process, or accidentally escape when workers enter the home.

5.3.2. Uncertainties and lack of information

Uncertainty and lack of information were major stress factors, especially for tenants trying to plan significant life events such as extended travel or childbirth. Repeated delays, unclear timelines without confirmed start dates, and insufficient communication about expected disturbances heightened their frustration and anxiety. As one participant (P129) put it, the information or rather lack of it was “*really bad*”, with several delays and unclarity. Another participant (P140) chose to relocate after losing patience with a renovation that had been postponed for two and a half years. Similarly, one tenant explained that he moved rather than continue waiting among ongoing uncertainty:

...And there have been so many twists and turns with this. It's been going on for several years now. ... I mean, I don't even dare book a trip three or four months ahead, because I never know — will I have to move out then, or what? It's like that all the time. Honestly, I'm a bit tired of it.

[P017]

Such uncertainty was a recurring theme among tenants. One household was planning to start a family and could not imagine managing childbirth preparations alongside the renovation process:

So we actually planned a bit around that — we started trying to have a child last year, thinking that the baby wouldn't arrive until after we had moved back [after temporary relocation]. But then they changed the date, and now the renovation won't be finished until sometime next year.

[P052]

The lack of communication and the way information was conveyed were frequently cited as contributing factors in decisions to relocate. Landlords and tenants did not always share the understanding of what constitutes sufficient information.

Many people think that [the landlord] has handled this very poorly, with inadequate information — something the landlord themselves disagree with. They believe that meetings have been held and that people have had the opportunity to ask questions. However, even

during well-prepared meetings, they haven't been able to provide enough information to satisfy people.

[P013]

For households that had a personal contact with a representative from the landlord, it made them feel heard and noticed. In a personal meeting, the households could express their worries and questions.

5.3.3. The influence of rent increases

Thirty-six tenants cited rent increases as a decisive or contributing factor in their decision to relocate. Two distinct subgroups emerged. The first, 19 tenants, often single parents, retirees, or unemployed individuals, were simply unable to afford the post-renovation rent. Several described feeling displaced. P063, a single parent, explained: “*I had no choice.*” She was offered a smaller, cheaper apartment within the landlord's stock in the neighbourhood. However, for her, this represented a lower standard and poorer quality of life. P063 expressed disappointment with the public landlord. “*They're supposed to promote integration,*” she argued, referring to the need for mixed housing with varied standards and rent levels. In her view, raising rents in public rental housing through renovation risks increasing dependence on social benefits. P063 will miss the silence and the trees by her old home, as well as being able to let her child play outside without worrying about traffic. The new apartment offered to her is located closer to a busy road.

P064, an unemployed tenant whose son had recently moved out, also had to relocate: “*I can't afford to move back.*” She loved her apartment and the neighbourhood, and she would miss the birdlife, the courtyard, the calm, and the good neighbours. She acknowledged that the buildings needed renovation but questioned the extent of the upgrade.

But why does it have to mean such an upgrade in standards? I like my cabinet doors that have been here since the house was built, and I don't need anything flashy.

[P064]

P064 believed many residents would leave because of the renovation, and feared that the atmosphere might not be the same afterwards. If her rent hadn't increased so much, she probably would have stayed, although she might have considered downsizing.

Among the 19 households that cited rent increase as a motive for relocating, nine decided to downsize to smaller apartments to reduce the financial burden. In some cases, downsizing also coincided with children having left the home. As P279, a retired tenant living with his wife, expressed:

P279: I've lived for 30 years on [street number], **and then we got kicked out.** We ended up in a temporary apartment. They're doing a full renovation of the apartments — replacing kitchens, plumbing, bathrooms, and they're also adding two floors on top. So they'll have to run new pipes down through the apartments below as well. So now we're living like damn [homeless].

Investigator (I) So you got a temporary apartment, but you've terminated that one, too?

P279: Yes, I've terminated it. We've got a 2-bedroom apartment down on [new street].

I: How did you get that one?

P279: Through [landlord], their internal relocation queue.

I: **Why did you choose not to move back after the renovation?**

P279: Because my wife and I live in a 3-bedroom, and it doesn't really make sense, right? And the rent is going up. There are two reasons we're not moving back: we got a 2-bedroom instead, lower rent. I said, **Why should my wife and I live in a 3-bedroom when a 2-bedroom is enough?**

A second sub-group of 17 households did not object to the cost itself,

but rather to the perceived value. They felt the rent increase was unjustified, given the outcomes of the renovation.

When comparing the size and rent levels of the new dwelling and the one they relocated from, an interesting pattern emerged between these two sub-groups who cited rent as a reason for relocation (Table 5). The first sub-group of 19 tenants who couldn't afford the new rent stayed with municipal landlords and moved to smaller and less expensive apartments, while the sub-group of 17 tenants who found the new rent "not worth it" moved on to larger and more expensive homes (Table 5).

5.3.4. The timing of the relocation

A clear pattern also emerged between the timing of relocation and its underlying motivation (Table 6). Among the 117 tenants who relocated due to renovation, 64% (n = 75) moved before work had begun, while 12% (n = 14) moved during the renovation and 24% (n = 28) relocated after the renovation was finished. These early movers typically cited a desire to avoid anticipated disturbances and uncertainties. In contrast, those who moved afterwards (n = 28) often expressed dissatisfaction with the renovation outcomes, including layout changes, the use of low-quality materials, or inadequate thermal discomfort. As one participant reported after the renovation:

The apartment is cold in winter and hot in summer.
[P068]

Others, particularly older households, struggled with new low-flow taps installed to reduce DHW consumption, as they were difficult to operate for those with reduced hand strength.

6. Discussion

In this study of buildings undergoing renovation, one-fourth of the relocations were fully or partially motivated by the renovation itself. However, most relocations, 309 of the cases, occurred independently of the renovation, reflecting that moving home is a typical part of people's life trajectories [28,35,39,41]. Relocation is often driven by a layered rationale, including everyday needs, dissatisfaction with the current dwelling, or a desire for a different way of living, such as homeownership or living in the countryside. Most households in the study described such layered motives, with the desire for a larger dwelling being the most common. The findings also confirm that a renovation can disrupt the timing of individual trajectories, potentially prompting relocation [57]. As previous research shows, people continuously reassess their residential situations [36], and renovations can serve as a tipping point [37] ultimately leading to the decision to resettle.

The study provides two main contributions to the understanding of the social effects of housing renovation and, notably, how renovation influences tenants' decisions to relocate. First, it identifies disturbances and insecurities as primary motives for relocation. Second, it establishes the correlations between relocation and the age of the household, the pre-renovation rent per sqm, and the extent of the renovation.

Table 5
Size and rent levels of new housing compared to the original among subgroups of the sample.

	Characteristics of new compared to previous			New tenure (n = respondents)			
	Rooms (n)	Living space (m ²)	Monthly rent (€)	Rental	Condo	Private villa	Info missing
Households that relocated for other reasons than the renovation (n = 309)	+0,5 (n = 232)	+15,8 (n = 232)	+163,7 (n = 133)	178	46	43	42
Households that relocated due to renovation (excluded the 24 short-term contracts) (n = 117)	-0,2 (n = 109)	+7,9 (n = 109)	+7,94 (n = 75)	88	12	9	8
Sub-group of those relocating due to the renovation and "cannot afford" the new rent (n = 19)	-0,7 (n = 19)	-14,2 (n = 19)	-116,3 (n = 16)	19	-	-	-
Sub-group of those relocating due to the renovation and find the rent "not worth it" (n = 17)	-0,3 (n = 17)	+11,6 (n = 17)	+18,5 (n = 8)	11	3	3	-
The remaining (n = 81) (117 -19 -17)	+0,4 (n = 73)	+12,9 (n = 73)	+156,2 (n = 51)	62	9	6	4

Table 6
Timing of relocation in relation to renovation class among renovation-motivated movers. (The 24 short-term contracts are excluded.)

Renovation class	Relocated before renovation		Relocated during renovation		Relocated after renovation	
	n	(%)	n	(%)	n	(%)
1	4	(57%)*	-	-	3	(43%)
2	52	(68%)	8	(10%)	17	(22%)
3	17	(57%)	6	(20%)	7	(23%)
Diverse	1	(50%)	-	-	1	(50%)
No decided	1	-	-	-	-	-
Total no households**	75	(64%)	14	(12%)	28	(24%)

* Percentage of the total number of relocating households in each category of renovation class.

** Total number 117, the 24 households with rental contracts are not included here.

6.1. Disturbances as an explanatory factor

The interviews demonstrated how anticipated disturbances from renovation, uncertainties about the renovation process and its consequences for daily life, and the desire to avoid temporary evacuation can motivate relocation. Earlier studies have primarily raised concern about rent increases leading to displacements, as well as the precarious situation of low-income households [6,7,10,11]. However, two recent studies based on national renovation data in Sweden show no significant difference in relocation patterns between low-income and middle-income groups, suggesting that other factors may be influencing households [8,9]. The findings for this study, emphasising the role of disturbances and uncertainties as key drivers of renovation-related relocation, could explain the former. Such disturbances and uncertainties experienced by residents are often overlooked factors in the debate on the social effects of renovation. Similar observations of "renovation stress" exacerbated by insufficient information about a planned renovation have also been highlighted converting in a recent study [55].

The logistic regression indicates that rent becomes significant when considering the pre-renovation rent per square meter. This suggests that rent increases matter when the initial rent level is already high relative to the apartment's size. As pre-renovation rents rise, for example, due to high inflation, this may cause tenants to be more likely to relocate during future renovations. Several interviewees expressed frustration that rents increase annually regardless of any improvements being made. Higher rent levels may therefore challenge the feasibility of achieving the required renovation rate for the implementation of the EPBD, potentially complicating efforts to meet energy objectives while also adhering to the directive's social ambitions.

Although rent increases are not the most common motive for relocation, their impact on low-income households must be considered. Several households described being forced to relocate due to anticipated high rents. The analysis also reveals that households relocating due to

rental increases tend to move to smaller and less expensive apartments. For some, downsizing from an unnecessarily large home was not perceived as dramatic, as several saw it as a logical step given that their household size had decreased. However, for a few households, as illustrated in the results, the new home represented a deterioration from the former. Some households could not afford the new rent and were required to accept a lower standard, while others moved because the value for money was worse after the renovation. It is worth noting that one in four of the 450 interviewed tenants expressed objections to what they perceived as unnecessary or “luxury” renovations.

This study focused on households that chose to permanently relocate, but it is possible that some of those who remained were among the most adversely affected, for example, regarding rent increases. Some households may have stayed because they were unaware of their options, or were unable to manage a relocation due to age, disabilities or other constraints. As previous studies have shown, individuals who struggle to find housing that meets their needs are more likely to remain in their current location [37,73]. This suggests a potential lock-in effect resulting from renovation, particularly among less resourceful households and those dependent on social benefits, an issue which calls for further investigation. In contrast, most of the interviewed tenants, especially those who moved independently of the renovation, appeared to have the competence and resources needed to secure a new home. The vulnerable situation of less resourceful households when attempting to find a suitable accommodation after a renovation has been highlighted in earlier research [57,58].

6.2. The influence of the renovation

Previous studies have established a link between tenant relocation and extensive renovation [5–9]. The logistic analysis confirmed that the likelihood of relocation increases in connection with an extensive renovation. A key factor is temporary evacuation or relocation, which is often necessitated by Class 3 extensive renovations, but is also used to some extent in Class 2 renovations, for older tenants, night shift workers, or families. A temporary evacuation can motivate households to relocate permanently, thereby avoiding the need to move twice, a pattern also identified in earlier research [5,58]. In this study, the landlords manage large housing stocks and were able to offer an alternative apartment. This also created opportunities for households to find an apartment that better matched their needs. Drawing on Crull et al. [37], the prospect of improving one's housing satisfaction increases the probability of relocation.

The logistic regression also confirmed a strong relationship between age and renovation-related relocation, a pattern likewise visible in the descriptive data. Although older people typically move less often and have longer residence durations, generally reducing mobility [19,29], our findings show that in the context of renovation, older households are more likely to relocate permanently. They more often chose a replacement apartment rather than undergo a temporary evacuation. Relocation can be challenging for individuals, as several examples in our study illustrate. However, from a societal perspective, renovation may also create opportunities for older households to transition to more suitable living arrangements. Several older interviewees took the opportunity, with the landlord's support, to either downsize to mitigate rent increases or to move to an apartment with better accessibility, thereby supporting ageing in place.

Tenants living in smaller apartments, often those with limited financial resources, are particularly exposed during a Class 1 or 2 renovation, as they have little or no space to withdraw when the renovation workers enter the dwelling. This also affects individuals who spend a significant portion of their day at home, such as the unemployed, those on parental or sick leave, or the elderly. The growing preference among housing owners for stepwise renovations carried out over time, rather than all-at-once renovations [16,25], may intensify these challenges. This shift is partly a consequence of life-cycle

approaches to housing renovation that account for the embodied carbon impact of replacement materials [18] but it also indicates the need for measures to minimise disturbances for residents if permanent relocations are to be avoided. Additionally, the increasing construction of smaller apartments and studios being built in Swedish urban [19] indicates that exposure to such renovation-related disruptions may become more common in the future.

6.3. Uncertainties and lack of information

Another key finding highlights the relationship between the timing of renovation and relocation decisions. Relocations driven by renovation are more likely to occur before renovations begin. Tenants frequently reported insufficient information regarding the renovation's start date, duration, planned work, anticipated disturbances, and expected rent increases. Drawing on broader empirical data, this study supports earlier research showing that the lack of information generates insecurity and anxiety among tenants facing renovations [10,54,55]. The timing of a renovation can also disrupt household life courses [57], and uncertainties related to scheduling and expected disturbances may prompt relocation among households preparing for significant life events, such as starting a family or undertaking an extended journey.

The timing and nature of the communication to the tenants are consequently of importance. The Swedish Tenants' Association, which serves as a negotiation partner for Swedish property owners, recommends that tenants be informed early about planned renovations. The challenge lies in identifying the appropriate moment: communication must occur early enough for tenants to be invited to influence the renovation, yet late enough for key details to have been settled. Ensuring adequate information is further complicated by the fact that renovation processes are often subject to change. As the interviews illustrate, delays such as those arising during contractor procurement are common. The mode of communication is also important. Written notices sent out by the landlord or posted in the building entrance are insufficient on their own. Tenants consistently expressed that they value information delivered through personal contact with a landlord representative.

Finally, the study raised questions about the long-term sustainability of housing renovation, an issue which needs further attention to address climate change [74]. Among 187 tenants who relocated after the renovation, nineteen reported that negative outcomes of the renovation motivated their move. They referred to the apartment's diminished functionality, including a poorly designed kitchen, low-quality materials and craftsmanship, and even reduced indoor comfort. If renovation is intended to enhance residents' quality of life, as articulated in European policy, those aspects require closer examination. Low-quality solutions may also compromise environmental sustainability, as premature wear and deterioration can necessitate additional renovations and replacements, thereby counteracting efforts to achieve greater resource efficiency.

6.4. Limitation of the results

The study encompasses the totality of the renovation projects undertaken by the municipally owned housing companies in the second-largest city in Sweden between 2018 and 2021, affecting 6993 apartments, and includes a high number of interviews with 450 tenants. Nevertheless, several potential limitations should be acknowledged. Although interviewees lived in areas with varying socio-economic profiles, response rates did not differ between more and less resourceful neighbourhoods. The households self-reported higher levels of education and employment than the average resident in Gothenburg. The study also focuses exclusively on public housing in Gothenburg. While previous research suggested a degree of convergence in renovation strategies between private and public landlords across Sweden [16], the findings cannot be assumed to be generalisable to all contexts and landlord types. Furthermore, renovation practices, context, and policy

evolve over time [25], necessitating new and updated research. For instance, the study was conducted before the current economic crisis, and households may now be more sensitive to rising housing costs.

7. Conclusions

The study contributes to the understanding of the social effects of housing renovation, aiming to bridge the current dichotomy between energy efficiency, renovation, and the provision of affordable and secure housing for tenants. European policy highlights multiple dimensions of housing renovation, including energy performance, social safeguard and affordability [75]. Earlier research has drawn attention to challenges posed by rent increases following extensive renovation and the vulnerable situation this creates for weaker households. This study broadens that perspective by demonstrating that disturbances and uncertainties are significant drivers of permanent relocation along rent increases. These factors have received insufficient emphasis in the debate on socially sustainable renovation.

Energy policy cannot be held directly responsible for the disturbances and inconveniences experienced by tenants. Renovations limited to external measures, such as upgrading the building envelope, tend to cause relatively little nuisance. However, the housing stock is in substantial need of internal upgrades, such as plumbing, ventilation, and the replacement of electrical installations. In practice, landlords often combine external and internal measures, either simultaneously or in stages, which inevitably raises questions about how to address the nuisance and the potential relocation of tenants. Previous studies have shown that spreading out measures over time can offer advantages both by making projects more manageable for owners and by contributing positively to climate mitigation efforts [76].

The property owners in this study have been relatively successful in protecting tenants from renovation, largely due to the limited scope of renovations and the moderate rent increases that followed. However, phased renovations, where measures and rents are introduced step by step, may eventually reach a threshold at which relocation becomes the only viable option.

To protect tenants' well-being and support long-term community stability, property owners should also revise renovation processes to minimise disturbances. This applies also to minor renovations and maintenance work, especially when essential functions, such as bathrooms and kitchens, are affected. Temporary evacuation, which is common during extensive renovations, frequently leads to permanent relocation and should be carefully evaluated and avoided whenever possible. Uncertainty can also be reduced through clearer communication, with a focus on the timing of information and a preference for direct, personal contact.

National policy should recognise the growing tendencies among landlords to favour step-wise, phased renovation [16,25], a practice likely to increase as climate concerns and preferences for repair intensify [18,27]. It is essential to consider the disruption that even minor work can cause for residents, particularly for vulnerable groups, such as older tenants, families with young children, individuals spending most of their day at home, and those residing in smaller apartments.

CRedit authorship contribution statement

Paula Femenias: Writing – review & editing, Writing – original draft, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Kaj Granath:** Writing – review & editing, Formal analysis. **Martine Buser:** Writing – review & editing, Validation. **Jens Widmark:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation.

Declaration of competing interest

The authors declare that the study was carried out without influence from property owners who provided access to the data. Furthermore, the authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

The data that has been used is confidential.

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