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Upgrade or retire? Exploring factors in making decisions for privately owned homes in Tāmaki

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About This Report

Title

Upgrade or retire? Exploring factors in making decisions for privately owned homes in Tāmaki

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1.1 Background

This research aimed to improve understanding of options for upgrading or retiring poor building stock at the development or neighbourhood level. It addressed the BRANZ prospective request to: improve understanding of options around improving or retiring of poor building stock.

Beacon, working with Nga Iwi Kainga, had identified that many of the privately owned homes in Tāmaki were poorly maintained and provide a low level of performance (cold, damp and expensive to run) for their residents. While some of these private homes were considered to have clear upgrade potential, others were thought to be structurally unsound and have other technical challenges to efficient and effective upgrade i.e. may be candidates for retirement.

The Tāmaki Regeneration area is the largest brown-fields redevelopment to ever be undertaken in New Zealand. The state-led regeneration project focuses predominantly on the demolition of 1950s era state housing and intensive redevelopment of sites for social and privately owned homes. This will cater for approximately 6000 additional homes over the next 20-25 years. It does not have a clear plan for existing privately owned homes (47% of Tāmaki homes are privately owned). As a result, many of these households are being excluded from the regeneration benefits (building community). In addition, there was potential for the value of regeneration to be undermined if properties were left in their current poor condition.

1.2 What we did

The project sought to develop a structured comprehensive approach to decision making for Nga Iwi Kainga (representing community) and the regeneration project, based on three investigations:

1) A **household-level investigation** - this two part investigation involved a physical assessment of the home from both the perspective of performance and deferred maintenance (technical criteria); and an in-depth interview with at least one household member (social criteria)
2) A **community-level investigation** - this involved in-depth interviews with Tāmaki based organisations which are involved in either housing development or the provision of social infrastructure relating to housing (institutional criteria)
3) An **economic investigation** (economic criteria)

It was anticipated that the outputs from the three investigations would be used to develop a straightforward decision making framework that would provide the ability to look objectively at a dwelling and make a decision as to whether it was worth upgrading the house or if it should be 'retired'. However, each of the houses and households had a unique set of variables that required addressing making such a framework unwieldy and unworkable. The research instead developed an enquiry framework for asking questions which is detailed further in the key findings below.

1.3 Working in the Tāmaki Community

Despite already being involved in the community, the depth and complexity of the changes that the communities were undergoing were underestimated. Working with Nga Iwi Kainga and its community members, a process was developed to engage with the community; however, this was halted due to the other activities which were going on within neighbourhoods. At the time of project commencement, information flows between central government agencies and Tāmaki on-the-ground organisations were limited and on an as-needed basis. Therefore, despite this project being in direct contact with people engaged to support HNZC tenants being given notice, HNZC 90 day notices were being given in the study neighbourhoods without Nga Iwi Kainga being aware. This required a halting and rescoping of the recruitment process. In addition, given the magnitude of changes occurring in the area, it was difficult accessing households. Local households were wary in being involved in the project and engaging with people they didn't know. All homes assessed were introduced to the project through community networks or through introductions by community leaders. This led to a project in which the assessed homes closely met the case frame but were potentially more connected to the local community than the general population.

1.4 Key findings

1.4.1 Decision making variables are complex and highly individual

The project sought to develop a structured comprehensive approach (a decision making framework) to deciding whether a house should be upgraded or retired, based on technical (home quality and upgrade options), social (needs of homeowners/community), institutional (within the Tāmaki project) and economic (valuing different intervention options) criteria.

However, the complexity of the variables in the upgrade/retire decision made it impossible to develop such a simplified decision making framework. In particular, the following variables stood out:

- Despite considerable similarity in house typology and age, and common interventions across a number of houses, the approach taken (even for something as straightforward as insulating a ceiling) would vary between houses.
- Every household interviewed for this project had a unique set of living circumstances, a unique family set up, a unique history, unique financial positions and a unique emotional attachment to their dwelling and their community.
- Decisions relating to housing appear to be made more from a personal or family perspective than a house condition perspective
- Extended family needs and changing household size were often prioritised over plans to improve individual housing situations.
- Legal ownership of the homes is often not simple, and may impact on the decisions which can be made by a household.

The research has, instead, yielded an enquiry framework for asking questions and exploring options with homeowners, developers and the community at large. The questions have been oriented around five key areas:

- The person
- The house
- The land
- The community / neighbourhood
- External organisations (developer, central government, local council, housing stakeholders, TRC type partnerships)

1.4.2 None of the homes had a compelling case for retirement

Retirement was weighed against upgrades which focused on providing a reasonable standard of performance (warm, dry and healthy and with reasonable levels of energy and water use) and a reasonable level of rental income commensurate with the market for the Tāmaki area (neat, tidy and safe).

The majority of the houses were state house or mass house typology from the 1950s and 60s which is known to be relatively easy to retrofit. The costed upgrades averaged $23,251 over each of the sample houses with the most expensive individual house upgrade of $39,155.

The most likely house to consider for retirement had estimated costs for the upgrade of approximately $36,000. Given the house could be upgraded to a reasonable standard of performance and was providing relatively inexpensive (and debt free) accommodation for the family living in it, it was not a compelling case for retirement.

Two further factors weigh on the side of upgrade, rather than retirement, for these homes:

- Given the house typologies, the houses could be upgraded relatively simply and cheaply. Upgrade offers a relatively inexpensive way to accommodate families in existing communities while addressing health and cost concerns.
- Households had a strong connection and emotional attachment to their house and their land ("my place"), local neighbourhood, and home.

When the economic benefits of upgrades are assessed, the overall results indicate the benefits of upgrades that improve health conditions and reduce electricity use for heating are justified. The costs and benefits were not substantial enough to consider retiring the house and rebuilding. Overall the health and energy saving benefits from retrofitting insulation, extraction fans and more energy efficient heating outweigh the costs in the long term.

1.4.3 Redevelopment through retirement is complex for developers

Developers were ambivalent about retiring existing homes in favour of more intense development. Developers' involvement in privately owned homes primarily needs to make financial sense. However, it was rarely considered a simple decision and the suggestion was

that, while it made sense to aggregate some of the properties, it can be a marginal exercise that may not stack up economically.

1.4.4 Upgrades were dominated by deferred maintenance issues

Addressing deferred maintenance, especially painting and weathertightness of cladding and roofs, repair of gutters and windows and dealing with moisture issues, dominated the upgrades suggested in the houses studied.

The effect of deferring maintenance on house performance was clearly demonstrated in these houses, with significant rot, leaks, structural damage, internal mould and draughts all performance issues resulting from lack of maintenance.

A number of the issues caused by deferred maintenance had become costly to repair, particularly in comparison to the costs of the original maintenance. Painting stood out as a key maintenance intervention required to keep our stock of largely timber buildings in good repair, the significance of which is poorly understood, and which is often deferred given its relative expense. Consequently, many of the sample houses showed significantly deteriorated paintwork both inside and out, and this had been the cause of further need for intervention to deal with rot and repairs.

Evidence from the household and community interviews suggests that deferring of maintenance may in part be a financial issue (ability to set aside enough money for regular maintenance) as well as an advice and informational issue (understanding of the need and/or importance of regular maintenance. This is an area deserving of further research.

1.4.5 Upgrades are often non-technical and not expensive

Many of the interventions required in order to upgrade houses are not especially expensive. The estimate for external cladding repairs, for example, was relatively inexpensive ranging from $450 - $650. This is indicative of the relative ease of weatherboard repair and replacement (though this did not include an estimate for painting).

In addition, many of the upgrade interventions were non-technical in nature and do not require a high trained skill set. These include: house painting; house washing; ground vapour barrier; small roof repairs; installation of smoke alarms; installation of insulation; simple carpentry; draught stripping; leaking taps; thermal curtains; blocking off fireplaces; cylinder wrap and pipe lagging. They lend themselves to being done less expensively in many cases by a community enterprise or by an informed homeowner (for some interventions).

1.4.6 The combination of community regeneration and type of interventions highlights the potential for a community enterprise supporting home upgrade

The redevelopment of Tāmaki provides a unique opportunity to marry up community needs for economic development with a clearly demonstrated need for the upgrade of Tāmaki's existing housing stock.

The non-technical nature of the interventions frequently needed in these houses lend themselves well to a potential community enterprise such as a home advice and retrofit service. There is the further added benefit of being able to explore models where this is undertaken using local employed people and on a street by street basis thereby potentially leveraging additional community funding and achieving economies of scale. There may be the potential for a neighbourhood level intervention which brings together home performance advice (Eco Design Advisors or Home Performance Advisors), smoke alarms from the Fire Service, EECA insulation install, Ministry of Social Development funding for home healthy heating, and a trusted community retrofit service to support the upgrades. When an intervention requires specialist advice (e.g. structural work, electrical or plumbing), professionals can be contracted in and effectively managed on behalf of the homeowner.

1.4.7 Working in a community of change is complex and requires patience, communication and local connections

The depth and complexity of changes occurring in a regeneration community such as Tāmaki make it more difficult to access households. Local households were wary in being involved in the project and engaging with people they didn't know - households were concerned about being involved in the project and giving out personal information. In this project, access to households was only successfully gained through introductions by community and through community networks. The difficulty in recruiting is likely to present similar issues for other non-community based organisations which could be involved in upgrade interventions.

In addition, information flows between central government agencies and Tāmaki on-the-ground organisations were limited and on an as-needed basis. Consequently, there was potential for duplication and overlap of initiatives underway, and for intervention fatigue among the community. There was concern voiced that communication of changes within the Tāmaki community was limited to Housing New Zealand tenants and not going to private home owners or the wider community.

1.5 The implications for New Zealand

1.5.1 The Tāmaki community provided very specific conditions for researching retirement or upgrade. Cases for retirement in other communities may differ, and the enquiry framework may help to guide this.

The enquiry framework could provide useful guidance for approaching the question of whether to retire or upgrade homes within other regeneration projects and a smaller, individual house scale. Of particular note is that many households make decisions from a personal or family perspective rather than a house condition perspective; and in some cases legal ownership is not simple and sits across more than one nuclear family. Many decisions are likely to be multi-layered, including connections with the home, section, immediate neighbourhood, past generations and extended family. This is particularly likely in communities where the home has been owned through more than one generation.

The sample houses, and indeed, the Tāmaki community, had some characteristics which may not be representative across New Zealand.

- Given the difficulty recruiting families, those recruited had lived in Tāmaki longer than the general population
- Domination of the state house or mass house typology.
- All families had strong connection to their local area at multiple levels

This suggests that further testing of the enquiry framework within other communities may be useful to see if there are more compelling cases for retirement in other circumstances.

1.5.2 High rates of deferred maintenance and a lack of understanding of why maintenance is important are likely to be a New Zealand wide problem

Deferred maintenance is a significant problem. Across New Zealand, 85% of the existing housing stock will still exist in 2025 and, in a typical year, more buildings are renovated than are built. Many of these are in poor condition - the 2010 House Condition Survey found that:

- 41% of houses were in good condition and well maintained
- 59% in moderate or poor condition
- 25% of houses had defects that needed attention within 3 months.

The multifaceted reasons for this - financial, as well as advice and informational – are also likely to apply across New Zealand. Resene's research, for example, indicates that the importance of painting maintenance is poorly understood. There appears to be a relatively low level of knowledge of how to solve house maintenance problems, even smaller problems.

1.5.3 Deferred maintenance is contributing to New Zealand's poorly performing housing stock

Considerable research now shows cold, dampness and mould are major contributors to poor health outcomes. In this case study, a majority of home owners considered their homes to be cold but had limited heating (in two cases, no heating at all). The majority of households had

problems with mould, mildew and moisture on windows. Six households reported doctor or hospital visits because of health issues that they thought could have been prevented if the home was in better condition. The high levels of deferred maintenance in these houses were making very obvious impacts on living conditions; however, there was little awareness of the links between condition and performance.

1.5.4 Simple home upgrades are a potential community enterprise across New Zealand communities

These findings support earlier work by Beacon and others indicating that a multipronged approach to the upgrade of homes is required, which combines information, advice, support in how to approach upgrades/ manage contracts, and, for some people, financial assistance. This is likely to apply across all or most parts of New Zealand.

Many interventions required to upgrade houses do not require a high trained skill set and are not especially expensive. Some of these interventions lend themselves well to a potential community enterprise such as a home advice and retrofit service. Specialist advice, such as structural work, electrical or plumbing, could be contracted in and managed on behalf of the homeowner.

1.6 Recommendations

- Given affordable housing crisis, the relative low cost of upgrades to reasonable performance and the economic value of the resulting benefits means upgrading privately owned existing homes provides affordable accommodation
- Further testing of the enquiry framework in different communities is suggested. Although no house was a compelling case for retirement in the sample, there were characteristics of the Tāmaki community that may not be applicable in other settings.
- Deferring of maintenance, especially painting and weathertightness of cladding and roofs, repair of gutters and windows, and dealing with moisture issues, dominated the overall costs of upgrades suggested in the houses studied. Further research into the reasons for this is called for. Evidence from the household interviews suggests that this may, in part, be a financial issue (ability to set aside enough money for regular maintenance) as well as an advice and informational issue (understanding of the need and/or importance of regular maintenance).
- Explore addressing deferred maintenance through a community or social enterprise which provides a home advice and retrofit service. This could be an independent enterprise, formed between those with a stake in the future quality of the community, in this case, a partnership between community, TRC and developers. It could provide homeowners with objective advice, simple retrofits, coordination of professional services and access to funding or incentives. Community-based enterprise would have economic and social benefits, by employing local people, potentially leveraging additional community funding

and achieving economies of scale, and supporting achievement of better community outcomes.

- Find effective and simple ways to advise and inform households on:
  - The importance and need for preventative maintenance – especially the requirement for washing and painting cladding and windows, and keeping gutters clear.
  - The importance of building up dedicated savings to fund maintenance issues that will either pay back in the long run or help to avoid larger costs in the future.
  - How occupants can ventilate a home in a controlled manner to keep mould levels to a minimum.
  - The best and least expensive heating options and their correct usage to maintain efficiency and keep costs to a minimum.
  - The importance of moisture removal at source through adequate mechanical ventilation used at the right time, as well as modifying behaviours such as clothes drying in the home.
  - The importance of addressing moisture ingress as soon as it occurs in order to avoid ongoing or more expensive problems in the future.
  - The use of curtains to retain heat and the importance of letting solar energy into the home when and where it is useful.
- Explore options for secondary dwellings on Tāmaki sites to accommodate family expansion. One solution may be in moving surplus Housing New Zealand houses onto new sites within the Tāmaki area.
- Ensure communication across the broader community beyond those involved in specific initiatives. In Tāmaki's case, this includes those living in private homes in addition to Housing New Zealand tenants.
- Use every avenue possible to recruit participants in initiatives and be proactive chasing them up.
- Take the time to build trust and be guided by those who are connected into the community.
- Leverage individuals who have participated in a programme as valuable spokespeople to recommend the programme to others and help recruit further participants

2 Introduction

This research aims to improve understanding of the options for upgrading or retiring privately owned homes at the neighbourhood level. Based on home assessments, interviews with households, and interviews with key stakeholders, the research develops and tests a framework for improved decision-making about upgrading or retiring existing homes. In particular, it aims to create the basis for improved and more transparent decision making over whether homes should be renovated or retired.

There is a gap in present knowledge and practices around retiring existing housing stock. While previous research has been undertaken on the benefits of retrofit, limited work has been undertaken on the case to retire homes, particularly in a New Zealand context. In addition, most housing retrofit work has been undertaken from a housing technical perspective and does not include an overlay of homeowner and developer perspectives and the differing development environments.

This research project seeks to develop a structured comprehensive approach to decision making around retrofit or retiring housing. Working with a real-life example, the Tāmaki regeneration in Auckland, the research worked alongside Nga Iwi Kainga (formerly known as Nga Iwi Katoa and representing community) and the regeneration project.

Across New Zealand, 85% of the existing housing stock will still exist in 2025 and, in a typical year, more buildings are renovated than are built. The 2010 House Condition Survey (carried out every 5 years as part of a 20-year survey programme and jointly funded by BRANZ and MBIE) found that:

- 41% of houses were in good condition and well maintained
- 59% in moderate or poor condition
- 25% of houses had defects that needed attention within 3 months.

In addition many New Zealand homes are cold, particularly those in poor repair and where fuel poverty exists. Lower average household temperature is related to a higher than expected rate of winter hospitalisations among the very young and elderly. The World Health Organisation (1987) recommended a minimum indoor temperature of 18°C for healthy households based on a multi-country (including New Zealand) study of the link between housing conditions and health effects. They found that a minimum temperature below 16°C was particularly associated with an increased risk of sickness and premature mortality for children, elderly, the impaired/disabled and those with respiratory conditions such asthma. This increased level of risk led them to recommend a minimum indoor temperature of 20°C.

The upgrade/retire research was undertaken and tested in Tāmaki, which includes the suburbs of Glen Innes, Pt England and Panmure (Figure 1). Tāmaki is a priority area for growth in the Auckland Plan and has a long history of local and central government planning. Due to the enormous investment by central and local government as well as the impacts of current changes

and potential outcome for communities, Tāmaki represents a unique opportunity for stakeholders to explore and learn.

Tāmaki was predominantly developed in the 1950s as a number of working class suburbs (Pt England, Glen Innes and Panmure) with a strong and vibrant community. It covers, approximately, the Pt England, Glen Innes East and Glen Innes West and Tāmaki Census Area Units, all of which are deprivation index 10, based on the 2013 Census. However, the suburbs are undergoing rapid change, both in terms of the Tāmaki regeneration, but also in terms of gentrification.

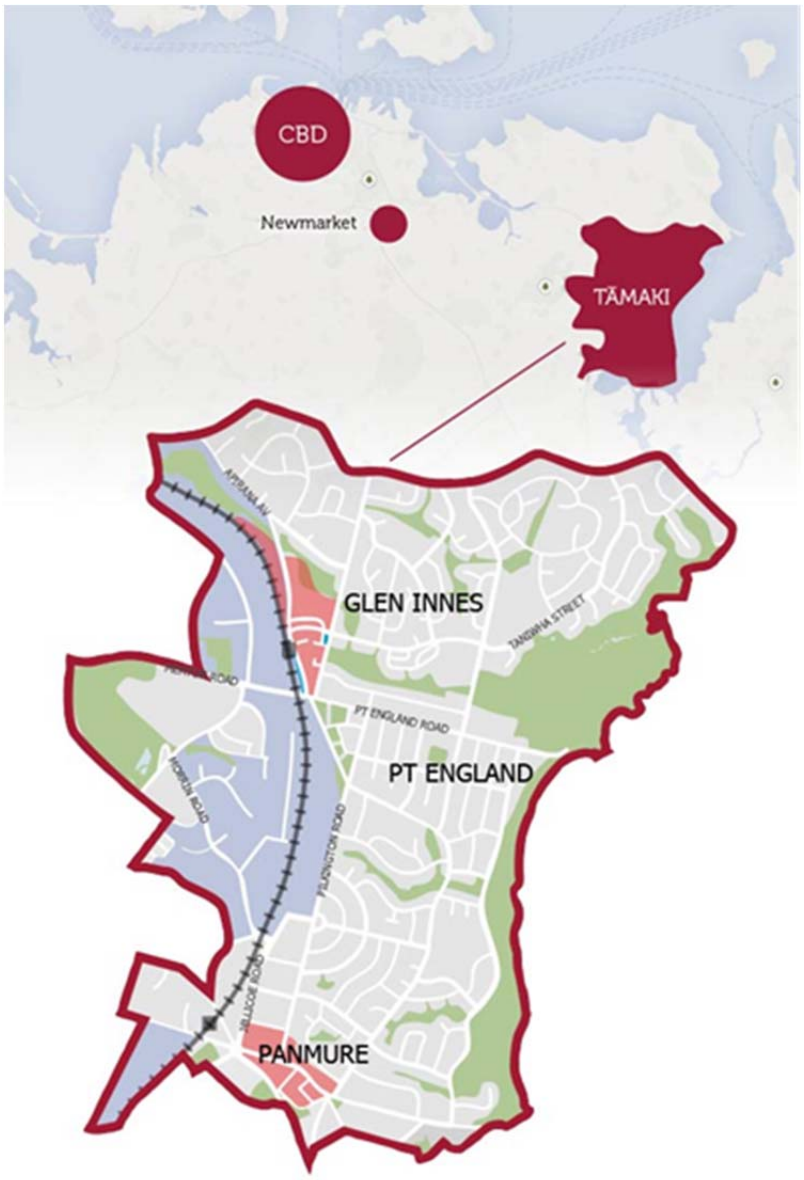


Figure 1: Tāmaki and the suburbs of Glen Innes, Pt England and Panmure

The Tāmaki Regeneration Project is the largest brownfields development undertaken in New Zealand and will provide approximately 6000 additional homes over 20-25 years, mainly replacing state-owned housing with a mix of social housing and privately owned housing. Part of the area is included in the Northern Tāmaki Special Housing Area in which 2000-2500 new homes will be built over the next 5-10 years. The regeneration seeks outcomes that improve quality of life and create new opportunities. It also aims to address housing affordability, availability and diversity issues.

Nearly half (47%) of Tāmaki homes are privately owned and are generally not part of the planned regeneration. Beacon, working with Nga Iwi Kainga, identified that many of the privately owned homes are poorly maintained and provide a low level of performance (cold, damp and expensive to run) for their residents. Currently, the Regeneration Project does not have a clear plan for these homes and, so, these households are excluded from many of the regeneration benefits and the value of regeneration is potentially undermined if properties are left in current poor condition.

While it was surmised that some of these private homes would have simple and cost-effective upgrade potential, others were considered to be more questionable. Issues such as structural integrity, housing typology, and other technical challenges to efficient and effective upgrade were voiced as reasons to make some houses candidates for retirement. Implementing upgrade or retirement options for these homes would bring benefits to home owners and occupants (improved physical and mental health, lower household running costs, fewer days off work or school), and to the community.

For these reasons, the purpose of this research is to improve understanding of options for upgrading or retiring poor building stock at the development or neighbourhood level. Due to the enormous investment by central and local government as well as the impact and potential outcome for communities, Tāmaki represents a unique opportunity for stakeholders to explore and learn. Nga Iwi Kainga, the developers, and Tāmaki Redevelopment Company (TRC) are keen to understand this issue so good decisions can be made to support the regeneration programme outcomes.

This report is structured around three investigations: a household-level investigation comprising a face-to-face interview with homeowners and a detailed assessment of their home, particularly from a performance and deferred maintenance perspective; a community-level investigation comprising structured interviews with key stakeholders in the regeneration process; and an economic investigation.

The results section is followed by a discussion on both the process and outcomes of the research. This is followed by conclusions on the effectiveness of the approach and its results as well as the usefulness and application of the resulting decision making framework.

3 Method

This research is designed as a multi-method participatory approach involving homeowners and tenants, community members, and local organisations (including Nga Iwi Kainga (formerly known as Nga Iwi Katoa), the Tāmaki Redevelopment Company and other local developers). The research was led by Beacon Pathway with input from Nga Iwi Kainga and Tāmaki Redevelopment Company (TRC), and economic analysis conducted by the New Zealand Institute of Economic Research (NZIER) .

The research develops a structured comprehensive approach to decision making for Nga Iwi Kainga (representing community) and the regeneration project, based on technical (home quality and upgrade options), social (needs of homeowners/community), institutional (within the Tāmaki project), and economic (valuing different intervention options) criteria. The findings have been drawn together to enable the organisations with a stake in Tāmaki outcomes to make good decisions based on the best information available across home, household and neighbourhood outcomes.

The research was undertaken through three investigations:

1) A **household-level investigation** - this two part investigation involved a physical assessment of the home from both the perspective of performance and deferred maintenance (technical criteria); and an in-depth interview with at least one household member (social criteria)
2) A **community-level investigation** - this involved in-depth interviews with Tāmaki based organisations which are involved in either housing development or the provision of social infrastructure relating to housing (institutional criteria)
3) An **economic investigation** (economic criteria)

The methodology relating to these investigations is provided below.

3.1 Household-level investigation

3.1.1 Description

The household-level investigation is based around a sample of 14 homes which include a mix of different housing typologies and tenures (owner-occupied and privately owned but rented homes) and a range of household types (single family, multiple generations, adults only). The case frame is further detailed in Section 3.1.2 Case frame.

Eleven of the homes were occupied and three were vacant but being considered for short-term tenancies (these were owned by a developer). Households were a mix of families (including those with children and teens), couples, multi-generational households, and people who weren't related to one another. A number of single person households were approached, including doorstep conversations about the project and home performance; however, all declined to be part of the project.

Homes owned by Housing New Zealand were not included in the research, given that these are mostly part of the planned upgrade of Tāmaki.

The sample includes homes from each of the three suburbs of Tāmaki - Glen Innes, Panmure and Pt England. The bulk of the interviews were undertaken in Glen Innes given the immediacy of the changes in the suburb. Parts of Glen Innes, such as the Fenchurch neighbourhood, are already being developed, with Housing New Zealand homes being either boarded up, demolished, or removed. Figure 2 shows the Fenchurch neighbourhood and the scale of regeneration. For those remaining homes in private ownership (dark grey on aerial photograph), their community has been removed from around them.

Figure 2: Fenchurch Neighbourhood Redevelopment Plan

3.1.2 Case frame

A case frame was developed based on experience from undertaking similar type research, discussions with key organisations, and perceived needs of the project. The purpose was to ensure that a broad but reasonably representative sample of the community was interviewed.

The following variables were considered important for the case frame:

- Housing typology
- Tenure - owner occupied or rented from a private landlord
- Household size
- Number of children under 16
- Whether the house included unrelated people
- Whether the house was multi-generational – housing three or more generations of family members or two adult generations

- Locality (suburb)

An analysis of how the households interviewed met the case frame is provided in Section 4.1.2 Discussion of case frame.

Two households who applied did not fit the case frame, being Housing New Zealand tenants; they were not included in the research. The sample included a range of the variables addressed above. Given the nature of how Tāmaki has developed over the past seventy years, there is a limited range of housing typologies, with most of the houses being state and mass housing built between the 1950s and 1970s. However, within this, there was variation in terms of inclusion of prefabricated housing (Austrian prefabs), state housing of the 1950s/60s, and the mass building from the 1960s/70s).

3.1.3 Recruitment of households

Many Tāmaki residents have already been involved in multiple research projects, and, therefore, the research aimed to minimise the interruption to those residents. Components of research were interlinked (e.g. technical and social), and researchers worked through existing community networks who understand how this research can lead to better outcomes for both the participants and the greater community. This also means that the process moved at the pace most appropriate for the local people involved.

Guidance was taken from key organisations and locals who knew the community, particularly through Nga Iwi Kainga and Ruapotaka Marae and their networks, but also from the Tāmaki Redevelopment Company.

Nga Iwi Kainga, being a project partner, was involved in the scoping of the project and discussions around the recruitment of households, even prior to the research project's full commencement. The project was a standing agenda item and discussed at monthly meetings in 2014 and 2015. Through these meetings, a strong relationship was developed with the manager of the Ruapotaka Marae who provided guidance outside the meetings on contacting local people.

One of the early concepts was to undertake the work in the Fenchurch neighbourhood given that development was about to commence in the area, and a walk-around of the suburb with a local leader was undertaken in September 2014. However, prior to on-the-ground commencement in the community, concerns were raised from a number of perspectives about using the Fenchurch neighbourhood, predominantly that:

- The area was in turmoil with Housing New Zealand tenants in the process of receiving notice and there was already existing confusion with multiple parties working in the area (raised by Nga Iwi Katoa and Tāmaki Redevelopment Company)
- The project had potential personal benefits and therefore should focus on several neighbourhoods (raised by Nga Iwi Kainga).

This slowed the process and, in late October 2014, it was agreed to focus on three areas:

- Eastview Road in western Glen Innes
- Maybury precinct (including part of Elstree Ave, Maybury Street and Pt England Road) in Pt England; and
- Part of Alamein/Larsen/Benghazi and Dunkirk Roads in Panmure.

An additional area of Pilkington/Court/Oram Streets in Panmure was added at the request of a Nga Iwi Kainga meeting, and following a walk-around of the suburb.

Privately-owned homes in each of these areas were identified from tenure maps provided by Tāmaki Redevelopment Company. This information was verified on the ground by checking for visual indicators of private ownership (including types of planting and fencing type).

In November 2014, recruitment flyers were dropped in the letter boxes of 152 privately owned homes in the four areas. The flyers identified that the forms could be posted, dropped off at the marae, or someone could call and pick it up.

Two forms were returned to the marae, two were emailed back, and one was collected from the household. Of these, one household was ineligible due to being in a Housing New Zealand home and one pulled out due to ill-health. The three other homes were assessed and the households interviewed. At the time of the interview, it was discovered that all had connections to members of Nga Iwi Kainga, and the letterbox flyer had come on top of a prior discussion with members. A fourth home was also assessed at this time, being a distant neighbour of, and recommended by, the first household interviewed.

Following these interviews, multiple discussions were held with Nga Iwi Kainga members and emails sent seeking assistance in recruiting further homeowners, to no avail. A fifth home was recruited through the Glen Innes Family Centre in September 2015.

In September 2015, a community leader spent the afternoon with Beacon Pathway driving around identifying potential households and giving details on their composition and fit to the case frame. From this, 11 households were identified and visited up to three times (once during weekday and twice during weekend) in attempt to recruit. This approach yielded a further three households including the community leader. At the same time, flyers were delivered to another 20 surrounding houses which looked to be in private ownership.

In late November, another community leader agreed to have his home assessed and, following that process, to provide additional contacts. An additional four contacts were provided which yielded two more households.

The recruitment process was difficult and protracted. Tāmaki is a community in change and households were concerned about being involved in the project and giving out personal information. Several households requested detailed information about the project, prior to

agreeing involvement. All households were recruited through connections with Nga Iwi Kainga members

3.1.4 Defining level of home performance

The upgrade plans identify the whole-of-house interventions needed for the home to perform to a high standard. The proposed interventions were prioritised, listing the simplest and most cost effective first so that homeowners could begin on the journey of upgrading their homes. This was done both as a verbal overview at the end of the assessment, and in a written report provided to the household following the assessment. No costings were provided to the home owners; only a verbal discussion of the relative cost and effectiveness.

Defining a high standard for this project involved discussions with key project stakeholders and the builder engaged to assist with the home assessments and costings. The following factors were considered in defining the level of home performance:

- Beacon's HSS High Standard of Sustainability®
- Changes proposed in the Residential Tenancies Amendment Bill 2015
- Guidance provided in Homes Performance Advisor training programme
- Knowledge of housing typologies and where best gains would be achieved in terms of performance
- Likelihood of interventions being undertaken in the near future.

For example, as part of all assessment discussions and reports, wall insulation was discussed, including its benefits and the need to retrofit wall insulation as part of any renovation removing wall linings (either internal or external). However, given that this is a costly and disruptive intervention, it was not prioritised as an intervention unless a household was planning a major upgrade including removal of wall linings.

The following standard was defined for the project:

1) Any structural issues with the homes addressed e.g. foundation, leaks
2) Any deferred maintenance addressed where it has safety or health implications or the potential to impact on the structural integrity of the home e.g. painting of external cladding, remediation of unsafe wiring, fixing leaks and drainage
3) Upgrades to meet the standards included in the proposed amendments to the Residential Tenancies Act - underfloor and ceiling insulation, fire alarms
4) Upgrades to address moisture, ventilation and thermal envelope issues - installing thermal curtains, bathroom and kitchen extractor fans
5) Internal upgrades to ensure the house is at a good quality, rentable standard e.g. painting of walls if required
6) Performance upgrades - replacement of low efficiency lighting, inefficient hot water cylinders nearing the end of their life.

3.1.5 Why consider housing typology?

Housing typologies which identify different styles and characteristics of our housing stock have been developed to assist with finding retrofit solutions. Within each typology, the description of the systems and characteristics over the houses cover about 80% of cases.

The following typologies are considered to capture 80% of New Zealand's housing stock :

1) Early housing (pre-1890)
2) Villa (1880–1920)
3) Bungalow (1920–1930/40)
4) Art deco (1925–1935)
5) State house and mass housing (1930–1970)
6) 1960s multi unit housing
7) 1970s house (1970–1978 pre-insulation)
8) 1980s house (1978–1989)
9) Early 90s (1990–1996 pre-revamped Building Code)
10) Last decade (1996–2007 post-insulation upgrade)

House typologies are a good guide to where problems with the performance of a house are likely to arise (e.g. art deco houses commonly have roof failures) and what type of retrofit solutions are likely to work well for particular house types.

3.1.5.1 Typologies in the case frame areas

Table 1: House typology prevalence in New Zealand

Typology summary Numbers as at March 2006												
Number of dwelling units (000)												
	Bungalow	Art Deco	Mass housing	Multi units	Multi units	Mass housing	Housing	Multi units	Housing	Housing	Multi units	Total
Villas	1920 30	1925 40	40s 60s	Pre 1900	1900 70s	1970 78	1978 80s	1980 90s	1990 96	96s 00	2000s	
86	113	18	479	84	133	151	182	68	112	201	28	1606

Nearly all the houses assessed were state houses (either railway or Housing New Zealand) which fit in the Mass housing typology of the 1940s to 1960s. These are a prevalent housing type within New Zealand (Table 1). These houses are typically small (less than 100 m2) with a simple square plan. Many state houses are oriented to the north rather than facing the street. Roofs are usually hipped and typically have a reasonable pitch (30–40º). The majority are timber framed with either wooden cladding or brick, and the remaining cladding being stucco and fibrolite. These houses are unlikely to have insulation or building paper in the walls unless retrofitted.

Floors are typically suspended rimu and matai flooring of good quality and generally with reasonable ground clearance. Ceilings are of a standard 2.7 m stud height, often with some insulation present in the ceiling, although this is typically of poor quality (i.e. old Insulfluff).

Early state housing had smaller windows than the 1950s and most windows are wooden framed single glazing with good eaves. A wide variety of heating types exist from electric through to a large number of unflued gas heaters fixed to walls. An estimated 20% of these houses still use the open fires located in the living rooms. In terms of retrofit, state houses have "good bones", good orientation, and good levels of access to renovation areas

3.1.6 Conducting the home assessment and household interview

The physical assessment of the house (home assessment) and the interview of the household members (household interview) were conducted at the same time. The home assessment and household interview were set at a time to suit the interviewees; the bulk being undertaken in weekends and after hours. The home assessments were undertaken by a Beacon researcher with expertise in home performances and a local builder, while the household interview was undertaken by another Beacon researcher (three people attending the appointment). Generally one person undertook the interview followed by an assessment of the home conducted by a home performance expert and a local builder.

3.1.6.1 Training local people to conduct interviews

During early interviews, Beacon attempted to use local Tāmaki people to undertake the household interview. Four local residents were trained in 1.5 hour training session and guidance was provided on effective and ethical interviewing (Appendix One: Interviewer training material). Attempts were made to use the interviewers over the first four interviews; however, it was found that:

- Interviews were often set at short notice and no interviewers were available
- Interviewers knew or related to the families to be interviewed, and excused themselves
- Interviewers did not respond to messages (phone, text, email).

It should be noted that a majority of interviews were set in weekends so were often not at suitable times.

3.1.6.2 Interview set up and structure

Once households had either verbally or by email agreed to be involved in the home assessment and household interview, they were provided with a copy of the recruitment flyer (8.1 Recruitment flyer) and asked to fill in their details (if they had not already) for assessment against the case frame. If they fitted the case frame, they were emailed confirmation of an appointment time, an information sheet on the project, and a consent form (Appendix Two: Household recruitment). The day prior to the household interview and home assessment a reminder email or text was sent. On the day, the two people involved in the home assessment (Beacon researcher and builder) and the household interviewer (second Beacon researcher) arrived at the home together.

Where possible, two members of each household (aged over 16) met with the interviewer and home assessors for one to two hours. At least one of these people was the home owner or

tenancy holder. Participants were given a koha for their contribution ($50 Pak'nSave voucher per household). The process was led by the household interviewer, in the following format:

- Introduction to the project and team
- Talk through consent form and signing
- Householder interview (while the household interview was being undertaken, the home assessment team undertook an external assessment of the home)
- Internal assessment of home
- Discussion of key house points not already discussed during home assessment or needing further discussion/reinforcement
- Emailing of home assessment (also referred to as home performance upgrade plan or upgrade plan).

It should be noted that all households involved in the project were contacted by email, either using a personal or work email address.

3.1.6.3 Home Performance Upgrade Plan

A simple home performance upgrade plan (upgrade plan) was provided for all homes assessed (Please see separate Confidential Appendix: Home Performance Upgrade Plans). This included:

- An overview of the home and the high level areas to address
- The steps a household should take to improve the performance of their home
- Some notes from your assessor
- More explanation about why you should take the steps

A sample of households was contacted after their upgrade plan was delivered to check the understanding and usefulness of the information provided. All reported that the plan was useful. Three households provided several successful referrals, on receiving their upgrade plans.

3.1.7 Analysis

The data collected in both the home assessment and household interview were collected and are summarised in Section 4 Results. These were both used as inputs to the economic evaluation.

3.1.8 Costings

The upgrade plans provided to each household did not include costings for the upgrades; however, verbal discussions of relative costs were had at the time of the assessment. As part of the analysis for this report, costings for each of the upgrades was undertaken and details are provided in section 4.2 Household-level investigation - Home assessments. These costings were also inputs to the economic analysis. The costings were developed based on a combination of:

- Local knowledge from the builder involved in the home assessment and his trade contacts
- Assessment of component upgrade costs for other similar works, provided by a local Tāmaki developer

3.2 Community-level investigation

The community-level investigation identifies the key factors different stakeholders take into account when deciding whether or not they have a role to play in the fate of either individual privately owned homes inside the Tāmaki regeneration area, or privately owned Tāmaki homes in general.

Informed by the household-level findings, semi-structured interviews were undertaken with representatives of a number of community stakeholders. These explored their motivations and interest in contributing to the options available for upgrading privately owned homes if a home is identified as a candidate for retirement, and the relative palatability of these options. A copy of the interview questions is provided in Appendix Three: Community investigation.

The findings from this component informed the economic analysis and thoughts around a decision making framework by enabling a better understanding of the wider environment in which upgrade and retirement decisions should be raised and managed. A synthesis of the factors key stakeholders take into account when deciding how to engage with privately owned homes within the Tāmaki development is included in Section 4 Results.

3.3 Economic investigation

An economic investigation was undertaken by NZIER in two stages: a summary of key literature on health and housing; and using a cost benefit analysis (CBA) approach to guide the research and analysis. NZIER's ten-step CBA process is summarised in Table 2.

Table 2: NZIER's CBA methodology [1]

NZIER Ten-step CBA process	
1	Define the problem/opportunity
2	Decide whose benefits and costs count (standing)
3	Select options and specify the baseline (i.e. the 'without') scenario
4	Classify the kinds of benefits and costs and select the measurement indicators
5	Quantify the consequences (via the measurement indicators) over the life of the options
6	Value (attach dollar values to) the benefits and costs
7	Discount future benefits and costs to obtain present values
8	Calculate decision criteria
9	Analyse sensitivity of the results to assumptions
10	Make a recommendation and document the assessment

The economic assessment focused on the benefits and costs of housing upgrades related to health benefits and electricity savings. The benefits are considered from the perspective of

[1] ***Source: NZIER, primarily based on Boardman et al (2010)***

private households. A social cost benefit analysis methodology was used to assess whether the upgrades would be beneficial. The scope did not allow for the consideration of benefits of public health expenditure or environmental benefits from a reduction in electricity usage.

The cost benefit analysis assessed whether the incremental net-benefit of the proposed intervention compared to the status-quo baseline (national average). The cost benefit analysis used a 30 year time horizon and a 5% discount rate, with a sensitivity analysis considering the impact of higher discounts and a range of scenarios for the reduced number of days for work as a result of improved housing conditions.

The full report is available in Appendix Four: Economic report.

3.4 Synthesis and framework development

A key hypothesis was that a straightforward decision making framework could be developed that would provide the ability to look objectively at a dwelling and make a decision as to whether it was worth upgrading the house or if it should be 'retired.' The separate phases of the research were to be synthesised to produce a draft decision making framework. This synthesis was to be achieved through a meta-analysis undertaken by the inter-disciplinary team to identify patterns among the results from the three research investigations.

The synthesis of the results, exploration of a decision making framework and the resulting enquiry framework are included in Section 4 Results.

4 Results

Section four provides a summary of the results from the three investigations:

- Household-level
- Community-level
- Economic.

Information gathered from the household-level investigation and community-level investigation has been used to inform the economic assessment of the social value of the homes, and is a critical component in guiding the delivery of options if the home is identified as a possible candidate for retirement.

Key points to note were:

- Legal ownership of the homes is often not simple - of the owner-occupied homes interviewed, several were in multiple extended family ownership or were leasehold.
- Households had a strong connection to the section, local neighbourhood, and home
- Households were strongly connected to local neighbourhood. Of the four that considered they may move within the next few years, two were aiming for home ownership in their neighbourhood, one wanted to downsize their home, and one envisaged moving away for a few years for work but would retain their home.
- Decisions appear to be made more from a family personal perspective rather than a house condition perspective, and were multi-layered – including connections with the home, section, immediate neighbourhood, past generations and extended family.
- Given the difficulty recruiting families, those recruited had lived in Tāmaki longer than the general population, with three of the families living in homes that they had been born to and grown up in.
- There was a relatively low level of knowledge of how to solve problems e.g. households knew that they had mould, and that mould was a problem, but didn't know how to solve it
- There is a large level of deferred maintenance
- There was a strong degree of emotional attachment to their home for many households e.g. my place, history, stories
- Extended family needs often over-rode individual plans to improve their housing situation
- In three households, people were not living in the house: in two cases they were living in a portacom; and in one case a family member lived in the garage

4.1 Household-level investigation - Household interview

The household-level investigation included a household interview and home assessment, the results of which are assessed in the following sections.

4.1.1 About the families

Eleven families were interviewed, ranging in size from two family members to eleven family members. A number of the families reported frequently-changing household structures with adult children returning to live at home, particularly to study. At the time of the interview, five of the households were multigenerational, most frequently with adult children. One home was multi-generational with a tenanted flat of unrelated people in the basement.

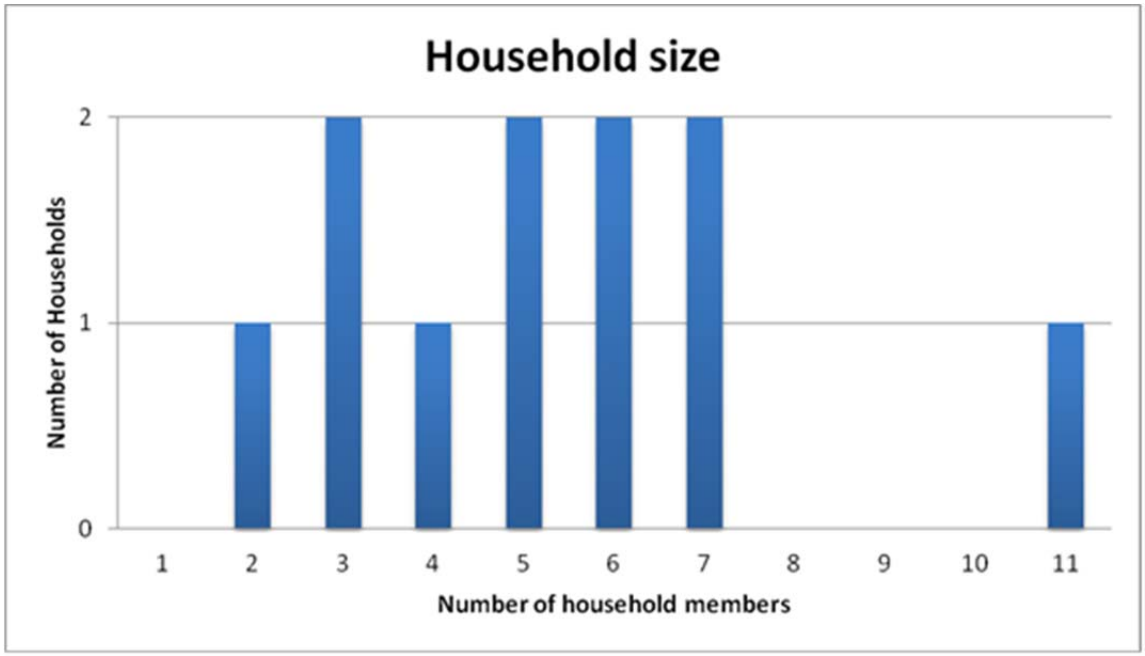


Figure 3: Household size for households interviewed

Five of the households reported having a Community Services Card while six did not. Income limits for receiving a Community Services Card depend on the circumstances of the household. Thresholds for the 2015/16 financial year are provided below.

Table 3: Thresholds for Community Services Card qualification 2015/16

	Yearly income (before tax)
Single – living with others	$26,042
Single – living alone	$27,637
Married, civil union or de facto couple – no children	$41,327
Family of 2	$48,797

Family of 3	$59,093
Family of 4	$67,282
Family of 5	$75,302
Family of 6	$84,265
For families of more than six, the limit goes up another $7,898 for each extra person.	

"We are that mid-threshold whānau struggling to cater for the demands of whānau."

4.1.2 Discussion of case frame

The homes met the case frame; however, the following should be noted:

- Given the difficulty recruiting families, those recruited had lived in Tāmaki longer than the general population, with three of the families living in homes that they had been born to and grown up in
- Thirteen of the 14 homes assessed were built in the 1950s or 1960s. This reflects the development patterns of Tāmaki
- Nine of the eleven households interviewed owned their own home, one of these having a leasehold property
- Six of the eleven households had between four and six family members;
- five households were multi-generational, predominantly with adult children who had returned to live there
- Nine of the households had children under the age of 16
- One household included unrelated people.

Table 4: Fit of houses to case frame

Locality	Decade Built	House	Tenure	House-hold Size (#)	Children under 16 (#)	Multi-gene-ration	Includes unrelated people
Glen Innes (Eastview)	1950s	State house Weatherboard, tile roof Extended to approx double original size	Owned	5	1	no	no
Glen Innes	1950s	State house Stucco, tile roof	Owned	2	0	yes	no
Panmure	1960s	State house Weatherboard, tile roof	Rented	6	4	no	no
Glen Innes	1950s	State house - (Railways). Weatherboard, tile roof	Owned	3	0	yes	no
Glen Innes	1960s	Mass housing. Weatherboard /brick base, iron roof. Leasehold Flat downstairs	Owned	5 + 2 in flat	1	yes	yes
Glen Innes	1950s	State house Weatherboard, tile roof	Owned	9-11	4-6	yes	no
Glen Innes (Wai O Taiki Bay)	1950s	State house Weatherboard, tile roof	Owned	3	2	no	no
Glen Innes (Fenchurch)	1950s	Prefabricated - Austrian Prefab Weatherboard,iron roof	Owned	6	4	no	no
Glen Innes (Wai O Taiki Bay)	1950s	State house Weatherboard, tile roof	Owned	6	4	yes	no
Pt England	1950s	Mass housing Weatherboard,iron roof	Owned	5	3	no	no
Pt England	2000s	Last decade 2 storey	Rented	4	2	no	no

4.1.3 Household interview

Eleven families were interviewed, two who rented the property they lived in, and nine who owned their own home. Legal ownership of the homes was, in several cases, across multiple generations, or between several adult children, with the resident family being part owner of the property. One of the owner-occupied properties was leasehold.

The families had strong connection to their local neighbourhood - often to a much more localised area than Tāmaki, such as to the immediate walking neighbourhood. Figure 4 shows that seven of the eleven households had no intention of moving from their home. Of the four households who had or possibly had intentions to move, three were considering moving to a more suitable property in the Tāmaki area, either to purchase their own home or to downsize to a smaller home, more suited to their needs. One of the homes owners had intentions to move away for work purposes but to retain ownership of the home for other members of their extended family.

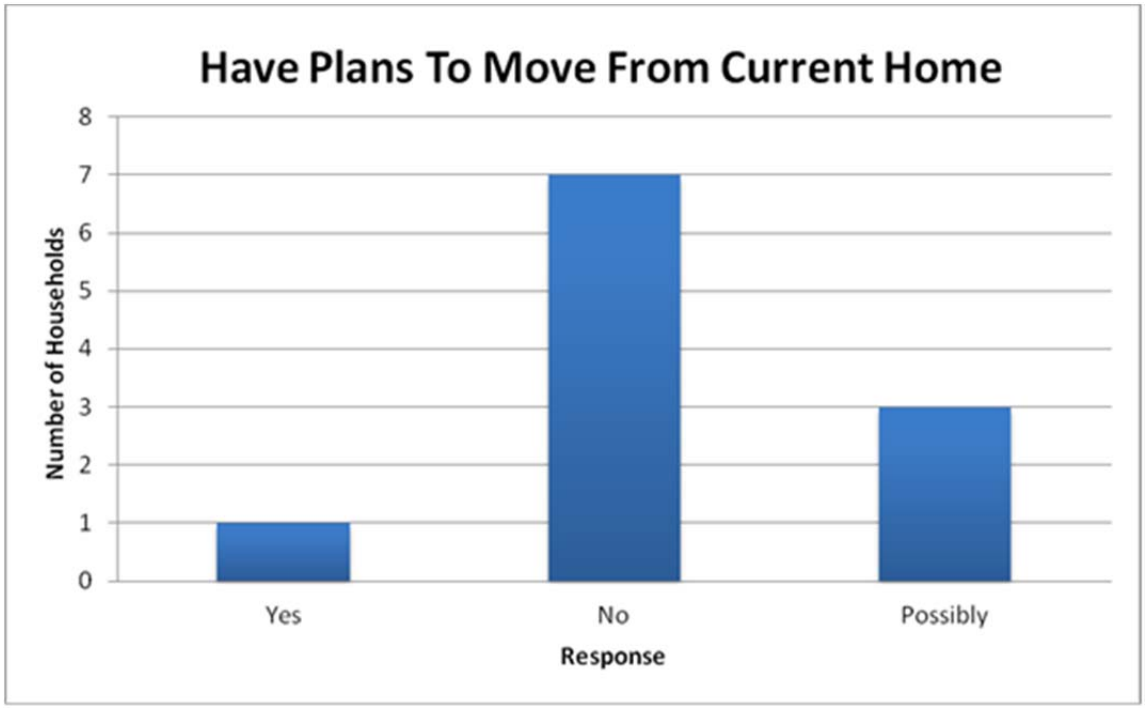


Figure 4: Household intentions to move from current house

All families had strong connection to their local area at multiple levels - the home, the section, the immediate neighbourhood, and, more broadly, to their suburb (Glen Innes, Panmure or Pt England).

Respondents were asked to provide details on what were the best things about living here (home and neighbourhood) and what was not so good about living here. The list of 'the best things about living here' was, in all cases, far longer than 'what was not so good about living here'.

Key areas of best things included:

Familiarity with the place

Grew up around here – familiar and feels like home
Grown up here, went to school here, know area well
Grew up here and know everybody
Know place, know people, people and place know us
Family is close by – brother, wife's parents
Mother-in-law lives across road but will move next year
Know areas as walk everywhere and people know them.
Area - husband grew up here so family are local- parent, grandparents, siblings

The people and community

Have lovely neighbours – very sober people who are at peace with each other
Very safe
Comfortable with community. Can walk down street and not get mugged.
Whole community. Been here all life. All looked after each other in past but people are now different.
Know everyone, knowing what's here
It's a happening place - a buzzy feel - lots of positive coming
Love Auckland, love GI

The heritage

Culturally rich in Maori and PI
People with passion. Kaupapa is around kids. People who pull together, people like <name>. Love it here
History of place gives it special meaning
Special character about being a working class neighbourhood
Spent a lot of time together as a neighbourhood

Accessibility

Close to train station and bus – use the train quite a lot
Close to everything as don't own a car. Can walk to everything.
Central to city, motorways, school is close by (about 2km), kids activities close by (dance, swimming, tennis courts)
Children's school, church close. Close to Panmure and GI convenient.

The local facilities

Local facilities - so central so have access to everything in city - pools Tāmaki College recreational activities, new music facility
Library is excellent

The natural environment

Close to water

Water/rivers close
Now appreciate proximity of water as an adult

In response to 'what's not so good about living here', responses ranged from:

Nothing
Not really anything

Issues relating to living in a lower-socio economic area
Perceptions from outside community
That you have to struggle for everything – need to push and demand for everythin.
It's hard to be recognised [as a community]
All things that come with poverties. Double edged sword - people are deprived and don't have basic means of prosperity in their lives
Council doesn't look after parks as well as in the other communities - things broken longer, grass longer

Changes arising from the regeneration and general community changes
People are different now but not enough to more away
Slow decline of cultural integrities - family unit has constantly suffered
People with bonds have gone
Violence/drug use is growing. Character of 12-13 years olds - Catholic/Christian blanket has gone - drugs/anger
Only a few people are active
State movements, state brand etc
Redevelopment not so good - no incentive for current home owners
Might be good for community development overall

Lack of opportunities
Education - lack of solid education/employment opportunities

There were limited specific comments on antisocial behaviour
Had a couple of nighttime problems - eagle helicopter around
A little drinking in parks

4.1.4 4.2.4 The homes and their use

4.1.4.1 4.2.4.1 House condition

Ten of the eleven properties were built in the 1950s and 1960s with one being almost significantly extended by the current owner in the 1980s. Home owners were asked to rate their homes in terms of condition, with only two rating their home as being in good or very good condition (Figure 5). These condition ratings are similar to the information developed as part of

the home assessment. Section 4.2 Household-level investigation - Home assessments details the issues with the condition of the homes.

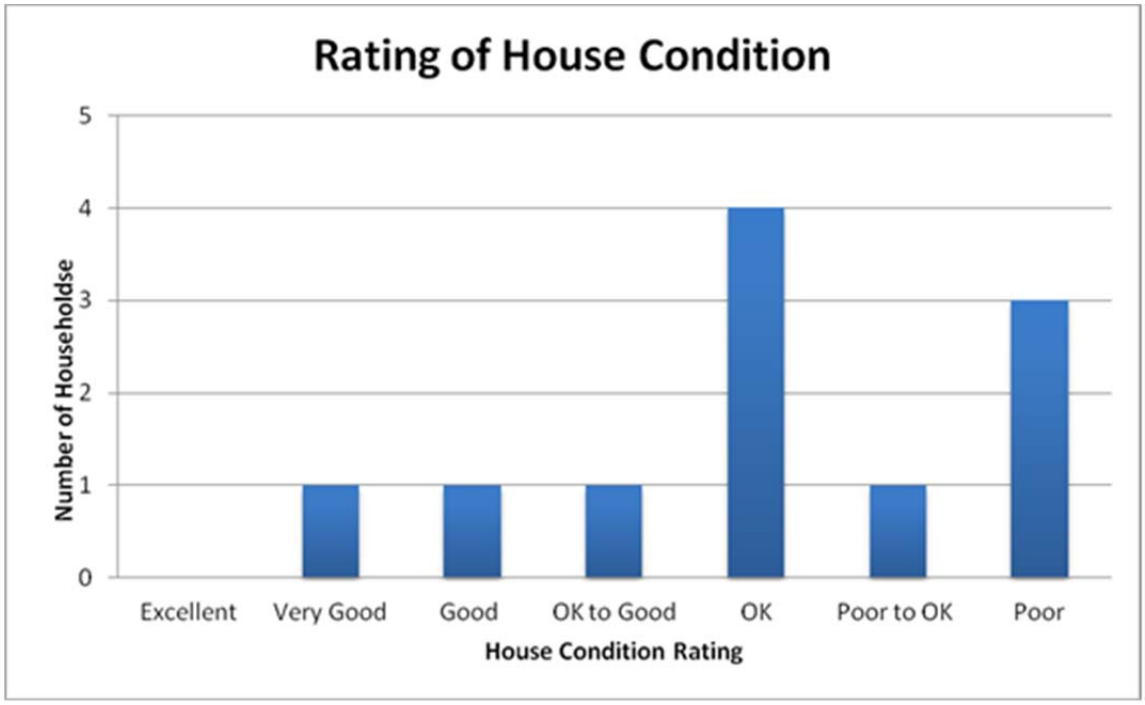


Figure 5: Rating of house condition

Those that gave lower condition rating for their homes tended to give two types of responses to why they rated the home that way:

1) A blanket statement of why everything was so bad and too hard
That's the reality of it
Headache to renovate – needs so much

2) Or more specific details on the issues
Corner of house is starting to subside, Concrete from copper still here, Possible leakage in bathroom
Crack on concrete side of house. Floor in bedrooms uneven. Wiring poor. Condition of roof, non-existing heating
Sometimes see mould. Black and red old wiring is brittle. No insulation so very cold in winter [in parts]

4.1.4.2 House use

In general, the house was used as designed. Cooking was predominantly done inside, with the use of BBQs during the summer common. Of particular note was one family who cooked on a

portable gas hob despite having a working stove, and one family in rental accommodation who had recently replaced the stove themselves.

Just cook inside
Cook on BBQ and inside
Generally do all cooking inside – use a gas burner and carry inside a smaller gas bottle
Kitchen used for cooking
Eat out on deck
Cook inside and use bbq outside
Electric stove
Don't have bbq at the moment.
In summer eat/sit outside
In winter eat inside
Stove broken – waiting for new one to be installed –had to by selves. Slow cooker. Wok etc

The lounge was generally used for communal daily activities; however, its use for sleeping when visitors arrived was noted by five households. One household was currently using a second lounge as a bedroom as additional family had come home to study, while two families were using portable bedrooms for adult children and extended family.

Lounge - watch tv, waiata practice
Lounge used as bedroom when have visitors
In lounge [sleeping] only if visitors
Back room sometimes lounge and sometimes bedroom depending on the size of the family
Sometimes lounge used for sleeping if people from overseas - haven't done in the last 3 months
Have sleepout for daughter - had 3 cabins as 3 kids came home then 2 left. One left but renting to sister who is coming to stay as sold house.
Lounge- tv room - only sleeping in lounge if visitors
Whanau hui in kitchen

4.1.4.3 Home heating

A majority of home owners considered their homes to be cold. Heating sources were limited, with two households having no form of heating, seven using electric portable heaters, one using a heat pump, and one using a fire as primary source of heating. Another two households identified the use of a fire as a secondary source of heating. A number of families had fireplaces which were no longer used. Some of these were blocked off to improve the thermal performance of the home; however, a number remained open, or were blocked off in a sub-optimal manner

Families tried to use alternative methods for keeping warm, predominantly use of blankets and warm clothes

Not heat - have an oil heater used for heating but try not to use too much else blankets
Lots of blankets. Lots of warm clothes
Gas heater - unflued (downstairs)
Oil filled heater in kids bedrooms

Or moving to perceived warmer parts of the house

Spend time down other dining/kitchen in winter as communal

Four of the households indicated that their homes overheated during the summer, while six indicated that they got a lot of sun in the winter.

4.1.4.4 Dampness and mould issues

Nine of the eleven households interviewed reported having problems with moisture on bedroom windows and the same proportion reporting having problems with mould or mildew in the home. Mould was most commonly reported to be a problem in bedrooms (8 respondents) and in the bathrooms (8 respondents). Several respondents reported having no mould as they cleaned it regularly. Five respondents reported drying clothes inside, which can be a contributor to dampness. Five households used a dehumidifier.

Research shows dampness and mould are major contributors to poor health outcomes. Six households reported doctor or hospital visits because of health issues that they thought could have been prevented if the home was in better condition.

All three had asthma before we got the insulation and heat pump

Figure 6: Mould noted in one of the houses

4.1.4.5 Other home maintenance

Some level of home maintenance had been undertaken in all homes; however, lack of technical knowledge had resulted in some 'disasters'. Two had reported taking out load bearing walls and needing to get outside help to remedy the problem.

Households were asked what repairs and maintenance they had undertaken on their home since owning it, with the most common responses being painting - internal (7) and painting - external (7). Repairing plumbing (5), insulating (4), and repairing hot water cylinder (4) were the next most common interventions.

Four households planned undertaking some work in the next 12 months, the most common activities being painting (3) and insulating (2).

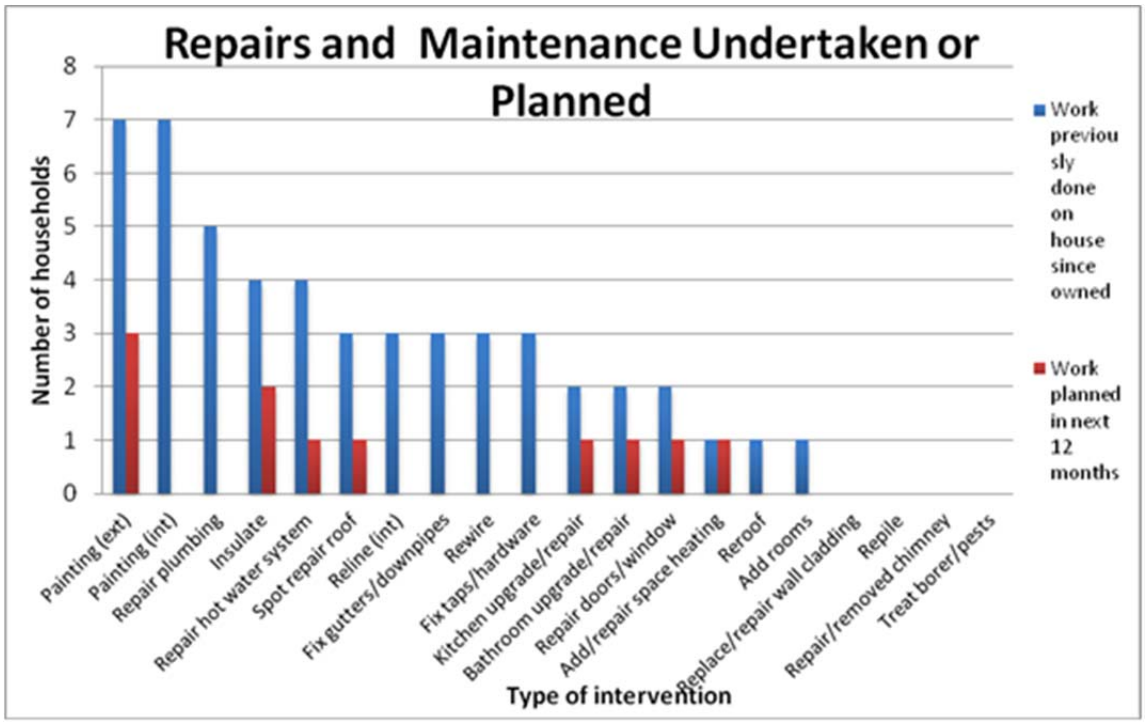


Figure 7: Repair or maintenance undertaken or planned

The respondents were asked what changes to their house would improve their quality of life. The most common responses were insulate (5), creating more space, including additional bedrooms (4), new/upgraded kitchen (4) and new/upgraded bathroom (4). Two respondents mentioned checking wiring and rewiring, and window upgrades including double glazing. Of particular note is that, while being cold was mentioned frequently by residents (including limiting the use of heating sources), only one household mentioned heating as a change that would improve their quality of life.

Insulation - so warmer in winter
Kids - oldest son needs a room
Good communal space so people can stay

The main barriers to upgrading their homes were financial (9), access to a tradesperson (5) and time to DIY (do it yourself) (5). Three respondents agreed that knowing where to start was a barrier to them upgrading their home.

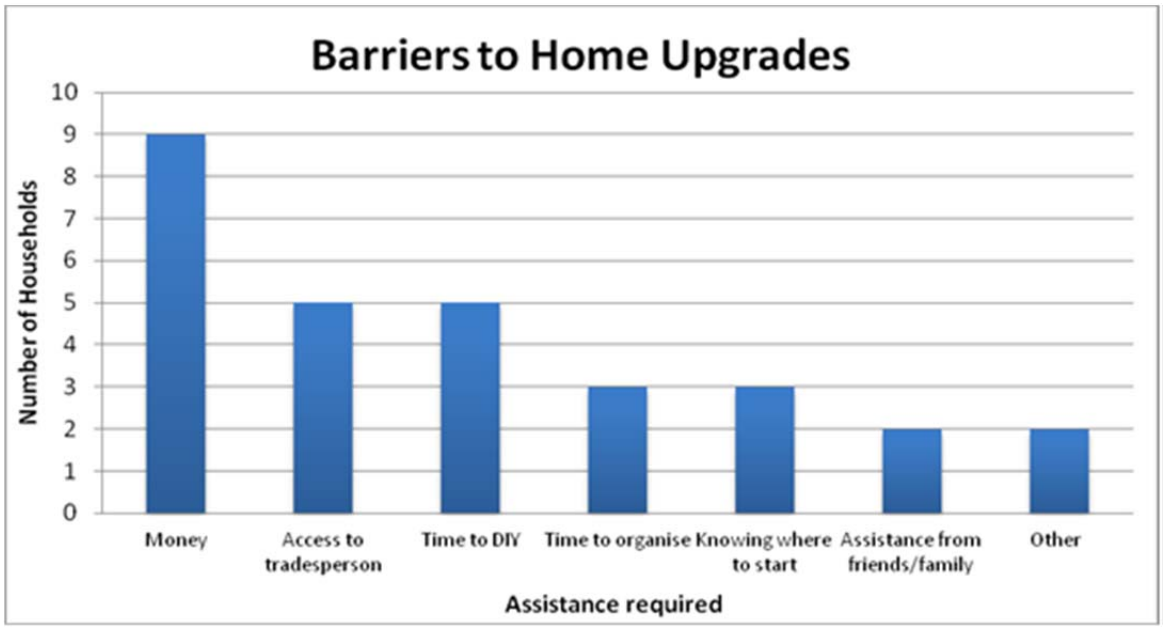


Figure 8: Barriers to home upgrades

Households were asked what their preference would be so their family could have a good life, if, in the worst case scenario, it was too expensive and difficult to bring their house up to a good standard. The responses showed a strong relationship with their section/ immediate neighbourhood with six households preferring to rebuild on their full site, two rebuilding on part of their site, and two households would do nothing. One household identified that they would prefer to move to another home in their neighbourhood, given their land was leasehold. Of particular note is that no-one chose to move outside their existing local neighbourhood (move to another community nearby/ move elsewhere in Auckland / move outside Auckland). Reasons for selecting their response varied from strong connections to the section and/or local neighbourhood, to wanting a new home.

> *Daughter and sons and moko's placenta is here. No intention of moving.*
> *[Want] to stay in community because love community and street. Looked at moving in this street a couple of years ago for a big back yard.*
> *Comfortable here and family is comfortable here.*
> *Love to have a new house.*
> *Would be easier to do 3-6 [move to another community nearby in Auckland / move to another community in another part of Auckland / mover out of Auckland] but less keen on them than 1 and 2.*
> *Move to another house in this community. This section is leasehold form St Johns holdings leasehold- could move to another community but don't want to.*

When asked about their ability to rebuild or undertake other options, three households indicated that they would be able to build a new home on their full-site or part of their full-site. A further two households indicated that they may be able to rebuild on their full or part site.

Nothing is impossible, just need to do a good business plan.

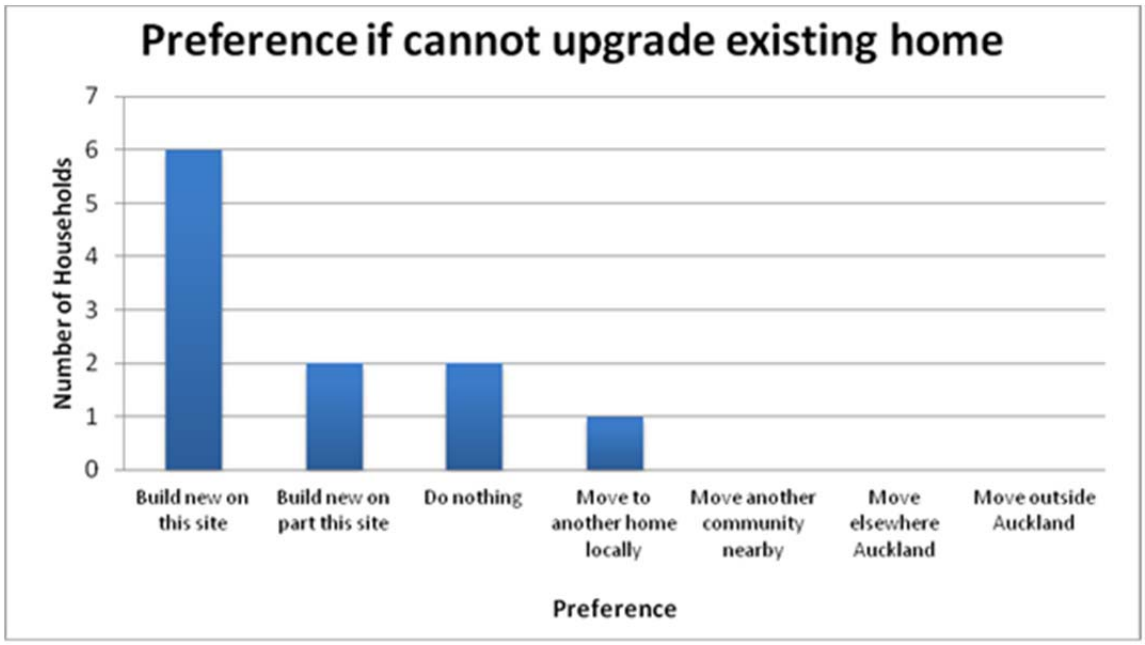


Figure 9: Preference if cannot upgrade existing home

4.2 Household-level investigation - Home assessments

The 14 case study houses were all assessed using a version of Beacon's 'Plan Builder' assessment process. This enabled a structured assessment of the home with a focus on areas for improvement that would result in the house achieving a reasonable standard of performance in terms of being warm, dry and healthy and with reasonable levels of energy and water use (avoiding excessive consumption).

The bulk of interventions suggested in the case study houses fell into the following broad categories:

- Structural improvements
- Weather tightness
  - Cladding
  - Roofing
  - Chimney
  - Windows and joinery
- Thermal envelope
  - Ceiling insulation

- Underfloor insulation
- Wall insulation (where practicable)
- Draught stripping
- Curtains
- Windows and double glazing
- Block open fireplace

- Heating
- Vapour barrier
- Energy interventions
  - Downlight replacement
  - CFL / LED retrofit
  - Hot water cylinder repair/replacement
  - Cylinder wrap and pipe lagging
- Ventilation
  - Mechanical kitchen ventilation
  - Mechanical bathroom ventilation
  - Clothes dryer extract ventilation
- Painting
  - External
  - Internal
- Repairs and maintenance
  - Internal repairs (wall linings, kitchen etc.)
  - Bathroom repairs
  - Gutters and stormwater
  - External surface drainage
  - Plumbing repairs
  - Electrical wiring and circuit boards
  - House wash exterior
  - House clean interior (mould)
- Smoke alarms
- Miscellaneous / Other – to capture unusual interventions required

4.2.1 House typologies assessed

As previously described, the bulk of the houses assessed were indicative of the period of development in the 1950s and 60s in the Glen Innes area. Most of these were state house or mass house typology with a couple of interesting outliers that were an Austrian prefabricated house design that are not uncommon to the area. Only one relatively modern house appeared in the case frame.

4.2.2 Upgrade interventions – common themes

All houses required some form of intervention to bring about improvements in performance, efficiency and health. Overall costs ranged from estimates of $7,135 for the relatively modern house (which required replacement of downlights and installation of a heat pump) through to the most expensive example which required an estimated $39,155 of works to enable the house to perform to a reasonable standard (though it should also be noted that this house also required a re-roof as the iron had deteriorated). The average estimate per house over the 14 houses was $23,251 with a median spend of $19,417 to bring the house up to a reasonable performance standard.

The largest single expense over the case study houses was that of external painting – a key maintenance item that is required to avoid further deterioration of the cladding and overall weathertightness of the houses (Figure 10).

The most common intervention suggested was the installation of a vapour control barrier underneath the house (suggested in all houses except the modern house which had a concrete slab). This was followed by the installation of curtains (13 of the 14 houses) and a heat pump which was required in 12 of the houses. Further detail of each intervention type is explored in the sections below.

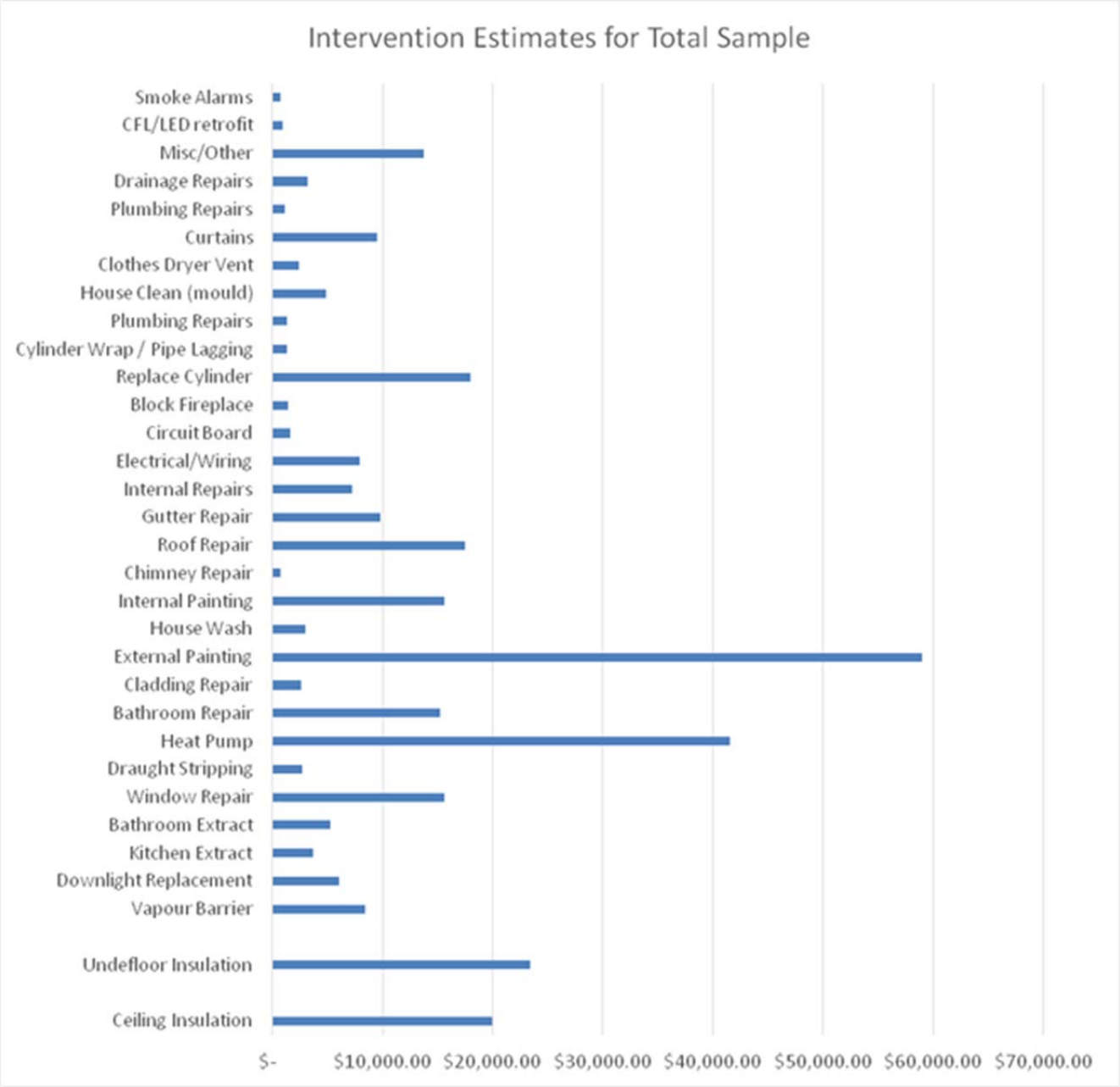


Figure 10: Intervention estimates for the total sample

4.2.2.1 Structural Improvements

The majority of the houses showed reasonable levels of structural integrity commensurate with the ages of the houses. Piles and foundations were generally in good condition, with one exception which required extensive work on the perimeter or ring foundation. Some owners had attempted DIY renovation with less than optimal outcomes. Where these were serious enough to require intervention by a licensed building practitioner, the assessment team noted the estimated costs of rectifying the situation (and informed the homeowner). DIY repairs were in evidence in the majority of the houses surveyed with mixed results.

Figure 11: Ring foundation damage requiring significant repairs

Figure 12: Damage to brickwork from DIY installation of a window

4.2.2.2 Weathertightness

The majority of houses had issues with general maintenance and, as a result, the weathertightness of the dwellings had been compromised in several areas as described below.

Cladding

Five of the sample houses showed significant rot and damage to external cladding. In the main. this was due to a lack of painting and maintenance. The estimate for repairs was relatively inexpensive ranging from $450 - $650. This is indicative of the relative ease of weatherboard repair and replacement (though this did not include an estimate for painting which is covered elsewhere). None of the cladding repairs were extensive enough to warrant full wall replacement (which could have opened up the opportunity for adding wall insulation).

Figure 13: Typical cladding damage that requires repair to make the dwelling weathertight

Roofing

Roofing was a key area that let a number of the houses down and, again, this was largely the result of poor preventative maintenance. A total of nine houses, out of the sample of fourteen, required repairs to the roof. In the main, these were small repairs to ridgelines or capping, although, in some instances, entire roof tiles were either missing or cracked and required replacement. All but one of the houses that required roof repairs had estimates in the range of between $300 and $900, with only a single house requiring a full re-roof (the owners were aware that this was overdue and were in the process of budgeting for this to be carried out).

Figure 14: A missing tile compromising the weathertightness of the roof but requiring a relatively simple repair

Chimney

Chimney repairs were required in only four of the sample houses with an average estimated cost of just $175 for relatively simple fixes. However, the impact of leaks around chimneys should not be underestimated, with several of the houses that did have leaks (chimney and roof capping

leaks) requiring remedial repairs to damp plasterboard in the ceiling (covered elsewhere in this report).

Windows and joinery

Windows and joinery were one of the worst affected areas as a result of poor overall maintenance and the age of the dwellings. Eleven houses in the sample group required repairs to their windows and, in some cases, these were extensive, expensive and, in the poorest maintained houses, almost all of the windows were affected.

Estimated repairs ranged from $150 for simple seal replacements in aluminium windows through to $3,200 for rectifying extensive rot in damaged frames caused by wood rot and a lack of maintenance (painting and sealants). This work could typically be carried out with a builder onsite who is effecting repairs elsewhere (e.g. internal modifications or structural repairs). These costs are for repair of the portions of the window where rot has meant that frames have to be replaced. They do not include the costs of painting which are dealt with below. The average cost of window repair across the sample group was $1,422 per affected house.

Figure 15: A window requiring significant repair following a lack of maintenance (primarily painting and avoiding rot)

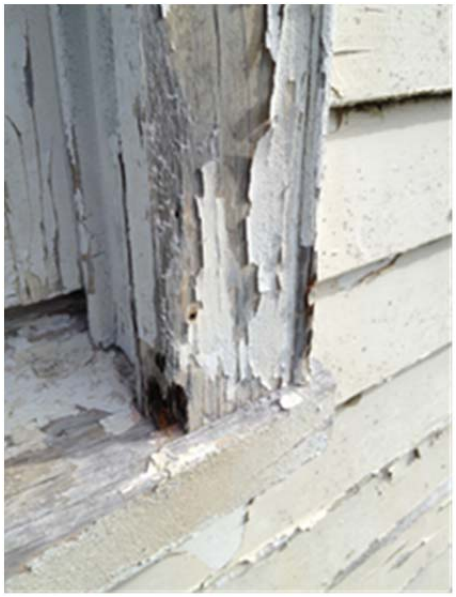


Figure 16: The beginnings of rot setting in as a result of the breakdown in the paint

Figure 17: An aluminium window with perished rubber seals allowing moisture ingress - note the mould

4.2.2.3 Thermal envelope

With the exception of one house, the sample houses had been constructed prior to Building Code levels of insulation being specified. As expected, this resulted in most of the houses showing deficiencies in the thermal envelope, with only one out of the 14 houses showing evidence of any wall insulation. Some houses had benefited from EECA's Warm Up NZ programme and had adequate levels of both floor and ceiling insulation.

Ceiling insulation

A total of nine of the sample 14 houses required additional ceiling insulation to bring the house up to standards required under EECA's Warm Up NZ programme. Costs were estimated at between $1,650 and $2,500 with an average per household of $2,222. In some cases, a full install would be required but, in others, simply a top up to minimal but existing insulation was called for. In many cases, there was evidence of damp and deterioration in existing insulation indicating the need for roof repairs prior to install. In some cases, downlights were an issue as

well as cellulose insulation sitting too close to downlights. Homeowners were made aware of safety issues at the time of the assessment.

Figure 18: Deterioration in early retrofitted insulation showing damp and extensive areas of gaps and minimal coverage

Figure 19: An EECA subsidised Warm Up NZ installation - note good coverage and rating label attached to insulation

Underfloor insulation

Ten of the 14 houses required installation of underfloor insulation costing between $1,500 and $2,400 per dwelling (based on dwelling size, coverage and access issues). In some instances, as per ceiling insulation, the houses had received an insulation retrofit under the EECA Warm Up NZ programme. In most cases, access to the subfloor was possible and the predominant housing typology (state/mass housing from 1950s and 60s) with raised floors, piles and bearers lent itself well to this intervention.

Figure 20: A simple underfloor insulation job waiting to happen. Good access with the potential to achieve a good result.

Figure 21: An underfloor that has benefited from EECA's Warm Up NZ installation of bulk underfloor insulation - note the labelling and information provided

Wall insulation (where practicable)

Only one of the houses was built at a time when wall insulation was a mandatory requirement (the relatively new house constructed in the 2000s). Some dwellings had been subjected to a major renovation with an extension built onto the house in recent enough years to have been retrofitted with insulation; but the majority of walls were assumed to be uninsulated. The two main opportunities to retrofit wall insulation occur when external linings or internal claddings are being replaced. As mentioned previously, external cladding damage was not considered widespread enough to warrant insulation install from removal of the claddings – which only leaves retrofit when replacing internal wall linings. In some instances where significant interior modelling had been suggested, there could be an opportunity to remove wall linings and add building paper and insulation, but these opportunities were not common. Taking Auckland's relatively warm climate into account, it has been assumed that provision of ceiling and

underfloor insulation along with an adequate heating device and other interventions (ventilation and behavioural) should be sufficient to bring these homes up to a reasonable standard as far as overall occupant health and warmth is concerned.

Draught stripping

Twelve of the sample houses required draught stripping in order to reduce levels of uncontrolled ventilation in winter. In most cases, it was assumed that a $250 pack of window and door stripping would be sufficient to improve the air tightness of the house. This is not a technical job and could be done by the homeowner or alternatively a trained community business (see later in this report).

Figure 22: This door needs extensive repairs prior to draught stripping

Curtains

All but one dwelling in the sample required the installation of better curtains on some or all of the windows in the house. The average price across the range of curtain install was $730 but this is reflective of the assumption of a basic level of curtain provision. Obviously, curtains vary widely in both price and quality as well as install procedure. For the purposes of this study, the researchers have assumed a basic thermal lined curtain could be purchased and put up by the homeowner.

Windows and double glazing

Windows form an important part of the thermal envelope, both as a source of heat loss but also in allowing solar energy to come into the home to provide daylight and warmth. In some cases where windows needed full replacement, the suggestion was made to retrofit double glazing. However, the cost/benefit of undertaking this in the Auckland market may be marginal . This factor, coupled with the relatively low level of finance available from homeowners to effect retrofits, meant that a suggested double glazing retrofit of windows was not a priority intervention. Window repair is covered elsewhere in this report.

Block open fireplace

Ten of the 14 sample houses had open fireplaces which ranged from being open and used for heating through to being partially and inadequately blocked off. Some householders greatly valued their open fire in terms of the relatively cheap heating it provided (when free wood was

available) as well as the aesthetics of the open fire making the place 'feel cosy'. In all cases where a fire was open, Beacon recommended installing a more efficient heating device and fully blocking the chimney so as to avoid draughts and heat escape. Blocking off the fireplace was estimated across the sample at $150 per house. This is a relatively non-technical and inexpensive fix which could be undertaken by the homeowner or a community retrofit provider.

4.2.2.4 Heating

Many of the homeowners reported being cold in their houses and this was reflected by the fact that all but two of the houses required some form of additional heating. In all cases a retrofit heat pump was suggested as being the most cost effective solution to allow heating of the main living areas and, to some extent, the whole house (often effective in smaller footprint homes). This was costed at an average of $3,500 for each dwelling although, in reality, there will be deviations from this due to the final size of heat pump chosen to address the needs of the space and the level of complexity required in joining the internal and external units. This expense shows up clearly in Figure 10: Intervention estimates for the total sample; for the sample houses, it would come to approximately $41,500. Homeowner reports resulting from the assessments indicated the need to address insulation and thermal envelope upgrades first but stressed that heating was an essential element to maintaining healthy indoor temperatures.

In one house, a heat pump was not used due to the perceived running costs and a lack of knowledge of the controls. This points to the need for additional information being required for homeowners beyond the installation of products and/or upgrades in services. Advice on the relative running costs of heat pumps was provided to the homeowner along with a downloaded PDF of instructions from the manufacturer's website.

4.2.2.5 Vapour barrier

All of the houses in the sample required the installation of a vapour barrier except for the modern house constructed in the early 2000s with an in-situ poured concrete slab. There were signs of damp under most of the sample houses, either from plumbing leaks or inadequate site drainage. The installation of a vapour barrier was estimated at $650 with most houses providing easy access to the underfloor area. In practice, the vapour barrier could be installed as part of the underfloor insulation install required in all but four of the houses. Once again, this job does not need technical training and could be undertaken either by the homeowner or by a community retrofit organisation.

Figure 23: The underside of a floor indicating significant damp rising into the structure of the house from the sub-floor area

4.2.2.6 Energy interventions

A range of simple energy interventions were highlighted to homeowners as part of the assessment plans; these were intended to reduce bills and increase the overall performance of the house.

Downlight replacement

Five of the sample of 14 houses had enough issues with their downlights to warrant replacement. This was especially true in houses with retrofitted downlights from the 1980s with large cans and standard tungsten bulbs that are not only inefficient but allow significant heat to escape through the chimney effect and through the loss of insulation. Notably, the house with the most downlighting issues was the modern house constructed in early 2000. Not only did this have excessive numbers (over 25 downlights in the ceiling) but many of these were showing concerning signs of overheating. The owner reported the constant need to replace bulbs and a burned sooty effect could be seen around many of the downlight fittings.

The estimated costs of replacing downlights ranged from one or two lights ($300) up to replacement of 25 lights (estimated at $2,500 or approx., $100 per fitting).

Figure 24: Older style 'recessed can' fitting requiring replacement CFL / LED retrofit

As part of the advice provided to homeowners following the assessment, an indication was given as to the need to replace standard incandescent bulbs with CFL or LED equivalent. Anecdotal conversations with owners indicated that they knew this was a good idea but that the upfront costs of the bulbs was a sticking point. All but one house would have benefited from a retrofit of bulbs – with an average spend per house required of $73. Information was provided to homeowners of the cost benefit of bulb replacement.

Figure 25: In addition to standard tungsten bulb replacement, several houses would benefit from replacing bathroom heat lamps which can use in excess of 500 watts (note also the blocked fan extract reducing the effectiveness of moisture removal)

Hot water cylinder repair/replacement

Three of the houses had cylinders that were in need of replacement within the next 6 months. In these situations, a replacement with either solar or hot water heat pumps were suggested in order to achieve a more efficient result. A standard supply and install cost of $6,000 was estimated for this purpose. In reality, the cylinders (which were on their last legs) may stop working at any

time, leaving the homeowner making a decision to replace urgently. In all likelihood, this will lead to replacement by a standard (though new) hot water cylinder which may be less expensive in terms of capital outlay but will not deliver significant hot water savings for the owners.

Figure 26: Some cylinders were very old and required replacement in the near future - note also the lack of cylinder wrap and pipe lagging

Cylinder wrap and pipe lagging

Ten of the sample houses required cylinder wraps and/or pipe lagging to increase the efficiency of their systems. This is a relatively simple DIY job and was costed at between $120 and $250. This non-technical job could also be very easily carried out by a community retrofit organisation.

4.2.2.7 Ventilation

The lack of adequate ventilation to remove sources of moisture was evident in all of the houses except the modern house constructed in the early 2000s. In some situations, mechanical extract ventilation did exist but had been poorly installed or was failing to deal with moisture adequately. This affected the performance of the houses across the sample and is a likely contributor to the houses being mouldy and harder to heat in winter time. This, in turn, is likely to contribute to the overall health (or rather sickness) of the occupants.

Mechanical kitchen ventilation

The average costs of installing mechanical kitchen extract was estimated at $336 across the sample with all but three houses recording the need for expenditure in this area. In one house, an estimated $200 would be required to make good a DIY installation, and, in another, $100 was suggested to repair and clean an existing faulty system.

Figure 27: This kitchen extract installation needs repair to improve weathertightness

Mechanical bathroom ventilation

The average cost of installing mechanical bathroom extract was estimated at $407 across the sample with all but one house requiring either new ventilation in the bathroom or repairs/upgrade to existing systems. As can be expected in a sample of this nature, there were instances of existing mechanical extract going straight into the ceiling cavity as well as poorly functioning combined fan/heat lamp units (Figure 25).

Figure 28: The lack of any extract in this bathroom is causing widespread mould issues

Figure 29: A less than adequate bathroom extract leading to mould and deterioration of the painted surfaces on the ceiling and wall

Clothes dryer extract ventilation

Eight of the sample houses used a dryer inside the house without provision of adequate ventilation. Anecdotally, several of the occupants expressed surprise that this should cause an issue with moisture in the home. A simple, through-the-wall ventilation kit for the dryer was recommended in most instances (with an associated cost of $300) and, in some cases, repositioning the dryer to the outside garage or outside services room was possible.

4.2.2.8 Painting

Painting is a key maintenance intervention required to keep our stock of largely timber buildings in good repair. Unfortunately it is also a relatively expensive recurring cost and, according to sources in the industry (such as Resene), it is not a well understood component of home maintenance. Many of the sample houses showed significantly deteriorated paintwork both inside and out, and this had been the cause of further need for intervention to deal with rot and repairs (e.g. see Windows and joinery section above)

External Painting

By far the biggest overall cost of interventions suggested for the total sample lay in external paint costs which came in at nearly $60,000 for the sample. These ranged from $2,500 for touch up maintenance painting through to more expensive $11,500 for a whole house cladding only paint job (a relatively conservative estimate based on the prevalent typology of single storey dwellings not requiring scaffolding). The average painting cost estimate across the sample, where this intervention was suggested, was $8,428 with half the houses (seven) requiring some form of external painting. It should also be noted that, although care and attention to detail is required for house painting, it is also not a technically skilled job and easily undertaken much more cheaply by homeowners or potentially through a community enterprise.

Having said that, none of the houses were tested for the presence of lead in the paint and, given the age of the houses, it is not unreasonable to assume that some of the paint will need special treatment. This could alter the technical approach required to undertake the painting and, hence, costs.

Figure 30: Significant deterioration in external paintwork with the potential for further rot to set in. In some instances this may be the original paint job (i.e. no additional painting has been undertaken since the 1960s)

Internal Painting

All but two of the houses required some internal painting from a maintenance and health perspective (mainly treating mould). This was estimated at approximately $1,000 for each of the nine houses requiring some minor work through to a more extensive repair and internal re-paint to bring the house up to a reasonable rental standard which was estimated to cost $3,500. In practice, the houses may require significant additional painting internally from an aesthetic point of view, but that was considered outside the scope of this project.

Figure 31: Internal painting in this bathroom is required to bring it up to a rental standard

Figure 32: Significant deterioration of internal paintwork leading to the start of breakdown in the plasterboard

4.2.2.9 Repairs and maintenance

Each of the houses in the sample showed some level of repairs and maintenance that was required. These ranged widely from concerning health and safety issues such as old wiring and exposed circuits through to much needed repairs of sealants in bathroom areas. These are explored and illustrated in more detail in the following sections.

Internal repairs (wall linings, kitchen etc.)

Seven of the sample houses indicated a need for internal repairs to linings (plasterboard) and in areas such as the kitchen (floor surfaces, cupboards etc.). In the main, these were judged on what would be considered a reasonable standard of rental, indicating a need, for example, to repair plasterboard where door handles had made a hole in the wall or to fix lino coming up in a kitchen creating a trip hazard. The costs of repairs ranged from $250 for relatively simple plasterboard repair through to $2,000 for one house where a number of the ceilings had to be replaced due to a roof leak causing damp pinex to bow in the ceiling and leading to significant mould. The average price of internal repairs was an estimated $1,035 for each of the houses that required it.

Figure 33: Lino on a kitchen floor which needs replacing

Figure 34: Damp pinex ceiling caused by a roof leak

Figure 35: Bow in the ceiling caused by the damp pinex

Figure 36: A repair required in the plasterboard in this bathroom

Bathroom repairs

Eleven of the sample houses required bathroom repairs ranging from replacement of sealants around the baths to make waterproof through to complete bathroom renovation caused by a plumbing leak and the damage to the underfloor substructure (estimated to cost $6,000 for a relatively basic repair/replacement of floor, shower, toilet and hand basin). An average cost of $1,381 was estimated for the eleven houses that needed some form of repair totalling $15,200 across the sample.

The presence of water in the bathroom area highlighted the need for vigilant maintenance. In many cases, showers over baths were leading to less than optimal outcomes where silicone sealants had deteriorated and moisture was starting to penetrate the building structure. This was leading to excess moisture in the bathrooms and then the home more generally, which, in turn, was encouraging the growth of mould throughout the house.

Figure 37: The seal has been removed from this bath and the silicone has deteriorated causing additional and unnecessary moisture issues in the home

Figure 38: A leak from a toilet cistern that was causing significant damage to the floor and subfloor in this house

Gutters and stormwater

Ten of the 14 sample houses required guttering repairs and/or maintenance. These ranged from simple clearing and cleaning of gutters ($100 - $350) through to a full gutter replacement on two houses (estimated at $3,000). Guttering (or lack thereof) is a key maintenance issue that addresses the large amount of stormwater falling on houses in the Auckland area. Effective guttering is required to remove stormwater from the dwelling and channel it away from the overall site so as to maintain dry conditions. In several houses, guttering needed relatively minor repair but was beginning to cause major issues. For example, a simply blocked gutter on one house was causing ingress of rainwater into the cavity of the dwelling down one side of the house. In another house, the absence of suitable guttering on one side of the house was the cause of excess ponding of water under the dwelling, leading to damp and unhealthy conditions. On average, the costs of guttering was $980 for each of the ten houses that required it.

Figure 39: This blocked gutter was causing water to rot the bargeboard (underneath gutter) and allowing water to enter the wall cavity

External surface drainage

Four of the sample houses indicated a need for external surface drainage interventions. In the main these were due to sloping sites that had not had adequate drainage installed in the past. Relatively simple ring drains were suggested that could divert the path of moisture away from the dwelling. On average, surface drainage costs were estimated at $800 for each of the houses that required it.

Figure 40: Significant levels of ponding under a house caused partly by poor onsite drainage and partly by the need for suitable guttering

Plumbing (internal)

Six houses indicated a need for internal plumbing repairs in the house. These ranged from repair of a simple leak from a cistern (estimated at $150) through to more extensive plumbing repairs involving replacement of pipework underneath a bathroom. Once again, the addition of moisture means that maintenance and repair of plumbing work as soon as required can save greater repairs in the long run.

Figure 41: Small leak from plumbing works that, over time, is adding significant moisture to the underside of the house

Electrical wiring and circuit boards

As part of the assessment process, the wiring and circuit boards in the house were visually checked with an assessment made as to the needs of repair from a safety point of view. There were several instances of quite dangerous wiring set ups and recommendations were provided to call in the services of a specialist

electrical contractor as soon as possible to rectify serious issues. Nine of the sample houses showed issues with the electrical system that would require intervention. These ranged from simple 'make safe' of wiring through to the potential for a full re-wire of a house where the electrical conduit was thought the be the old style perishable cable (with accompanying fire risk). In addition, eight of the houses had old style circuit boards and breakers and it was suggested that these should be upgraded to modern boxes with suitable resettable fuses (estimated at an additional $200 on top of the charge for the electrician in the house checking the wiring and making repairs). The average cost of electrical repair (not including the new circuit boards) was estimated at $880 with a partial rewire of an old part of the dwelling estimated at $2,500 for one of the houses.

Figure 42: This light fitting is dangling precariously from the ceiling and is potentially unsafe

Figure 43: A circuit board requiring replacement

Figure 44: Wiring in this house is a combination of old style perishable wiring that may be a safety risk and new wiring

House wash exterior

Exterior house washing is a key maintenance item that can keep paintwork and sealants from deteriorating and/or failing early over their lifetime. Seven houses were recommended to have an exterior house wash with an average cost of $428. Where extensive external painting had been suggested, this was not deemed a priority intervention as this would be either unnecessary or dealt with as part of the painting work.

House clean interior (mould)

An internal house clean to address mould was recommended in all but two of the sample houses. The average estimated cost of this was set at just over $400 with some houses requiring as much as $600 to clean internally. This is considered an important step in improving the health and wellbeing of the occupants.

Figure 45: An internal house clean to remove mould was suggested in almost all of the sample houses

4.2.2.10 Smoke alarms

Additional smoke alarms were considered necessary in all but two of the houses, with an estimated cost of $60 per house (to install an average of three 10 year life smoke alarms as per recommendations from the NZ Fire Service). There was evidence of smoke alarms having been installed in several houses but then removed (with the backing plate still attached to the ceiling). Once again, this could be a useful service carried out by a community retrofit organisation and linked to the NZ Fire Service (perhaps with the installation of free alarms)

4.2.2.11 Miscellaneous / Other

Despite the range of categories identified above, there was a total of $13,700 worth of recommendations spread over the total sample, indicating a spend of $1,522 for those houses that did require an intervention in this catch-all category. This covered items such as the replacement of a working stove in one property that was using an unsafe gas set up, through to re-connection of water and electrical services to an abandoned property. Also included was maintenance of a DVS system which had not had the filters regularly cleaned and was depositing black markings at the outlet points.

Figure 46: Discoloration around the outlets of a DVS system indicating a need for maintenance

4.2.2.12 Upgrade priorities and aesthetic considerations

The interventions covered in the house assessments in this section deal primarily with the health, safety, and comfort of the occupants. The idea is to provide homeowners with a list of prioritised recommendations that primarily address the following:

1) Keeping the heat in the home (insulating, draught stopping, thermal envelope)
2) Keeping healthy indoors (reducing damp)
3) Best ways to heat (effective and efficient heaters)
4) Using less water (cut water bills and water heating bills)
5) Saving on water heating (efficient water heating)
6) Lighting and appliances (reduce power bills, increase safety)

It was outside the scope of this project to make an assessment of the value of aesthetic interventions such as landscaping, house decoration, carpets and floor treatments etc. However, undoubtedly there is a value attached to these items which is evident when people prepare their houses for sale (including repairing any fencing, addressing landscaping, painting etc.).
Some of these interventions would undoubtedly add value to the property, and, as such, would help to add value to neighbouring houses. It is these type of 'prettying' interventions that developers may be more willing to help fund.

4.2.2.13 Behavioural issues

The upgrade plans provided to homeowners covered a range of behavioural issues that are not fully covered in this report or the research frame (which is primarily concerned with the economic benefits of more physical and technical upgrade interventions). However, in applying the results and conclusions from this research in the broader context of upgrading existing housing, it is clear that a wider set of behaviourally related issues are important to explore. These include (but are not limited to) the following:

- The need to inform and advise homeowners of the importance and need for preventative maintenance – especially the requirement for washing and painting cladding and windows, and keeping gutters clear.
- How occupants can ventilate a home in a controlled manner to keep mould levels to a minimum.
- The best and least expensive heating options and their correct usage to maintain efficiency and keep costs to a minimum.
- The importance of moisture removal at source through adequate mechanical ventilation used at the right time, as well as modifying behaviours such as clothes drying in the home.
- The importance of addressing moisture ingress as soon as it occurs in order to avoid ongoing or more expensive problems in the future.
- The use of curtains to retain heat and the importance of letting solar energy into the home when and where it is useful.
- The importance of building up dedicated savings to fund maintenance issues that will either pay back in the long run or help to avoid larger costs in the future.

4.2.3 Conclusions drawn from the upgrade assessments

The rich data set provided by the house assessments has led to a broad set of conclusions in relation to the both the sample set of houses and upgrade vs retirement options in Tāmaki (and wider New Zealand). These are explored here and also inform the conclusions of the main report.

4.2.3.1 The impact of deferred maintenance

Deferred maintenance, especially painting and weathertightness of cladding and roofs, repair of gutters and windows, and dealing with moisture issues, had a dominating effect on the overall costs of upgrades suggested in the houses studied. For instance, in some cases, the failure to keep up with a regular painting regimen had led to suggestions of a full replacement of windows at significant cost. Similarly, the lack of

a gutter on one side of a house was causing systemic mould problems in a house leading to unhealthy conditions and potential deterioration of the building fabric. Evidence from the household interviews suggests that this may, in part, be a financial issue (ability to set aside enough money for regular maintenance) as well as an advice and informational issue (understanding of the need and/or importance of regular maintenance). This is an area deserving of further research.

4.2.3.2 Upgrade interventions – at a reasonable cost

Estimates of upgrades were costed using data from a range of sources including previous Beacon and BRANZ research alongside more recent construction cost data and advice from an experienced building contractor linked to sub trades. Although it could be argued that the suggested interventions did not fully 'renovate' the houses (as might be done to achieve the best sales price), the suggested plans would result in significant changes to the levels of home performance as far as running costs, warmth, health and comfort are concerned. This was achieved with interventions that averaged $23,251 over each of the sample houses with the most expensive intervention upgrade plan running to a total individual house cost of $39,155. This would result in an upgraded house that could be expected to achieve a reasonable level of rental income commensurate with the market for the current Glen Innes area (prior to redevelopment).

The house with the most compelling case for retirement indicated structural issues with the ring foundation as well as significant cladding and window issues complicated by deferred maintenance. Despite this, the full costed plan for the upgrade of this house came in at just over $36,000; hardly a case for retirement of a dwelling that was providing relatively inexpensive accommodation for the family living in it.

4.2.3.3 A potential economic opportunity for the community

As is evidenced from the results of the household assessments, many of the interventions required in order to upgrade houses are non-technical in nature, do not require a high trained skill set, and are not especially expensive. These include items such as painting, house washing, installation of smoke alarms and insulation, simple carpentry and roof repair etc. The researchers suggest that many of the interventions lend themselves well to a potential community enterprise such as a home advice and retrofit service. Where specialist advice is required (e.g. electrical or plumbing), these services can be bought in and effectively managed on behalf of the homeowner. The redevelopment of Tāmaki provides a unique opportunity to marry up community needs for economic development with a clearly demonstrated need for the upgrade of Tāmaki's existing housing stock. There is the further added benefit of being able to explore models where this is undertaken using local employed people and on a street by street basis, thereby potentially leveraging additional community funding and achieving economies of scale.

4.3 Community-level investigation

Interviews were undertaken across a broad sector of the Tāmaki community which engages with housing needs. Copies of the two questionnaires are provided in Appendix Three: Community investigation. Slightly different questionnaires were used between the developer and community based organisations.

As context for the interviews, those interviewed were told about the project and its findings.
Key points were:

- Eleven households were interviewed and 14 houses assessed
- All households had very strong connections to Tāmaki
- The primary connection was to the place and land, but households had strong connections to their houses and in a number of cases the homes had been lived in across generations.
- The houses were in various levels of condition, but generally were structurally sound
- The financial positions of those interviewed were varied – some felt they had the financial ability to plan for everything they needed to do with their property including subdivision/building, others clearly indicated no financial ability to undertake any repairs or maintenance.

The interviewees were then asked a number of structured questions around:

- The organisations and their roles and aspirations in Tāmaki
- Housing issues facing the community and engagement with organisations
- The Tāmaki community from your organisations perspective
- Privately owned housing - condition and upgrades
- Most important upgrades
- When to consider demolishing a home
- Involvement in property transactions and upgrades
- Triggers for involvement with privately owned homes.
- Intervention points and community receptivity

4.3.1 The organisations and their roles and aspirations in Tāmaki

All people interviewed had a passion for Tāmaki, or the suburbs and neighbourhoods within Tāmaki they were working in. While the organisations interviewed all played completely different roles and had different drivers in the community and in the Tāmaki housing market, all had common underlying desires including seeing Tāmaki and its people prosper.

For example, Tāmaki Redevelopment Company has the following outcomes

> *Lifestyle and culture - Tāmaki people are engaged, healthy and safe and their cultural identity and diversity is celebrated*
>
> *Talent and creativity - Tāmaki residents have good sustainable employment and education opportunities*
>
> *Places and neighbourhoods - connected, safe, attractive and well-used spaces with quality, healthy homes.*

The developer talked about both being involved in the community and bottom line and risk. They cared about the community but, as a business, needed to make a profit to stay viable.

> *Giving back to the community*
> *We're passionate about making a positive difference in Glen Innes. For us, that's not just about creating great homes. It's also about giving back to the community and its people. We're proud to support some great organisations that are helping to make Glen Innes a better place to live.*
> *We're primarily driven by bottom line*
> *We lose money on houses, make money on land*
> *Risk - if we increase borrowing, say by $2m, we increase sales risk*

Both Nga Iwi Kainga leadership group members, interviewed separately, talked of how the organisation was going through a transitional phase; partly due to intra-organisational restructuring and partly because of the significant changes in need and opportunity within the Tāmaki community. The organisation was looking at options to stay relevant and believed that there were benefits in hanging in long-term.

However, the kaupapa of the organisation has not changed, believing that stable healthy homes (including affordable, appropriate and sustainable housing) provide the basis for a better and more prosperous life for whānau and for communities. Their vision (te raurangi) is

> *Tāmaki is the community of choice for people who live here now and in the future.*

Key issues raised by the organisation about working in Tāmaki were:

- It feels like a parallel to Christchurch impact in many ways [referring to the level of redevelopment and resettlement] - the scale of the impact on the community is immense.
- There was a perception that the environment had changed and that having a large organisation such as TRC was disruptive, making it hard for community organisations as everything is driven out of TRC.
- The collaborative nature of their aspirations are not being fulfilled. Concern was raised that TRC influenced the way of working. Collaboration had disappeared and everything was now being done by RFP rather than partnership.
  For TRC, read EQC. It's not that TRC are nasty, they are just well resourced . No-one else gets resourced unless TRC have put out a RFP.
- The changing nature of the national housing sector was raised - the potential to become a housing provider was resulting in organisations working alone and marginally competitively, rather than together for the betterment of the communities that they worked in.

4.3.2 Housing issues facing the community and engagement with organisations

A myriad of housing issues were raised including:

- Affordability of home ownership - and that the affordable homes being built were out of reach of a vast proportion of the Tāmaki community currently renting

"We talk to a lot of people with expectations of getting houses for prices they can afford. Perception is 'what's in it for me'. If you've historically lived in GI then it is more likely that you will be in the affordable rental end than the investor end."

- A lack of housing to meet local demand
  "When we have an open day... tenants come to see what's happening – as either they are looking to get out of GI ... or looking to get a home at a more entry level price that they think might be affordable. So we see considerable disappointment from people about how the value of land is and then the costs of construction (more expensive than people imagine by a large factor)."

- The variety of conditions that the local houses are in - some have been very well maintained while others have had very little maintenance since they were built
- A lack of knowledge on where to start and what interventions to prioritise.

An example of community-based organisations working together to develop solutions was given with the development of short-term accommodation for families using empty ex-Housing New Zealand Corporation (HNZC) houses.

Several organisations identified the need for short-term accommodation for families and 'the waste of having empty ex-Housing New Zealand Corporation (HNZC) houses sitting vacant and being vandalised' , when there were families in need. The Glen Innes Family Centre, Ruapotaka Marae, Nga Iwi Kainga and Beacon Pathway worked with a developer (Creating Communities) to gain access to some of these houses, retrofit them to a reasonable standard, and provide rental accommodation to local families in a scheme where they are able to clear debt and start saving towards home ownership. Access to the house was the most difficult part, taking approximately 9 months for HNZC to release one house for use. The family has now been living in the home for the past six months, with improving financial position. This community partnership in action arose out of the Beacon Pathway involvement in Nga Iwi Kainga, including through discussions of the BRANZ funded project.

Several other development related issues were raised including:

Noise and dust! Have range of upset neighbours complaining about impact of development – construction issues rather than housing issues.

4.3.3 The Tāmaki community from your organisation's perspective

In response to these questions, there were a number of views expressed ranging from the positive *'that people are showing less anxiety'* to the negative *that 'there is a perception that the community is not engaged, or is being done-over'*.

"People are being dealt to and rolling over"

"Only talk to [community leader in neighbourhood currently undergoing regeneration] - he finds out everything second hand.'

There was a perception that the movers and shakers are moving with TRC. They were not sure what certain segments of the community were doing e.g. Pacific Community

4.3.4 Privately owned housing - condition and upgrades

All people interviewed considered that there was a wide variance in both the condition of existing privately owned homes and the financial ability of homeowners to undertake any upgrade. This supports the findings of the household interviews and in-home assessments, discussed elsewhere in this report. The wide variance in the local population's financial ability to upgrade their homes was perceived to be linked to the fact that many people own their own home but have no income to invest in maintenance. There was an assumption that owner occupied homes were better looked after in terms of wear and tear (than state homes).

> *"Some are in need of maintenance - to moving towards Panmure, some are nice state houses with subdivision potential"*

Other key issues raised were:

- A mistrust of workers/tradespeople
- Not knowing what to do
- Lots of disengagement and overseas owners
- Elements of personal choice - education a priority
- Privacy issues – and people not wanting to open up their homes

4.3.5 Most important upgrades

The question 'what do you think are the most important upgrades that could be done in privately owned homes?' received a range of answers that were influenced by the stakeholders' understanding of requirements for upgrade and the outcomes desired.

> *"Don't know - get the fundamentals right e.g. addressing water-tightness issues, insulating before introducing heat, address broken windows"*
>
> *"The most important issue will be to get an assessment done and walk alongside people as their homes are upgraded. People need assistance in knowing what quality work looks like"*
>
> *"Most cost effective would be [installing] HRV and heat pump and couple of thousand dollars credit on power. Insulation would be good – and cost efficient in roof and floor. Many require upkeep and maintenance – exterior painting and to protect the exterior of the building."*
>
> *"Need to get an inspection and prioritise upgrades. People will make decisions if they can see value from them."*

An interesting perspective was provided by a respondent involved in development at Tāmaki. They spent a considerable sum refurbishing a house making it look attractive and 'modernised'. This included putting in a new kitchen, new bathroom, internal painting, sanding floors, new gutters, underfloor and ceiling insulation etc. This work involved a total cost in excess of $131,000, indicating the difference

between the recommended housing upgrades to drive performance and deal with basic maintenance of the sample houses (an average of $ 23,251) and the money that would be required to take a 'modernised' house to market. The developer also suggested that more could have been spent to maximise return including opening the front of the house, installing decks for indoor outdoor flow, landscaping, parking, garage – and concentrating on maximising value (e.g. *"a new garage might cost $50,000 but recoup an extra $100,000 on the sale of the house"*) .

4.3.6 When to consider demolishing a home

Interviewees provided little insight into the question 'under what circumstances to you think a homes should be demolished?'– perhaps indicating the difficulty of making this decision without a concrete example that provides detailed variables about the circumstances of the home (indicating the complexity of the evaluation framework when considering demolition – see section 4.6 Exploring decision making factors).

> *"If house needs relocation and refurb then marginal (mainly judged from economic point of view) – depends on extent of refurbishment required."*

4.3.7 Involvement in property transactions and upgrades

Developers were asked a number of questions around buying privately owned homes, moving them on site and providing improvements to homes neighbouring their development. This question yielded a variety of responses. One developer suggested that it *"Makes sense to aggregate some of the properties – but can be marginal economically. Should work but when you actually look at it often it doesn't stack up. Not being able to aggregate isn't always a disadvantage - sometimes having a sole owner in amongst terraces breaks up the urban form and looks good."*

> *"At one point <name> suggested a land swap and adding $30,000 to do up house next door – but owner would rather take a new house in new development. Now deciding what sort of option he would have on new house. If developer seen to need house the price goes up."*

One developer, when asked about the impact of the condition of adjacent properties on sale prices in his development, identified that the type of neighbour (person) was more important than the condition of the house. However he also identified that they may offer to do some superficial improvements such as mowing the lawn.

> *"It's about the nature of the neighbour, not so much the state of the house."*

4.3.8 Triggers for involvement with privately owned homes.

Development stakeholders were asked:

- What triggers your decision to purchase a privately owned home and relocate, upgrade, or demolish?
- Does the condition of a house have any impact on your decision to retire it?

This question provided insight into the complexity of the development environment in Tāmaki. Each situation involving dealings with privately owned homes was driven by a unique set of circumstances and

involved a unique set up with different personalities playing roles. In short there was no set process for decision making about dealing with private homes if they were bordering or somehow linked to a development site – it was undertaken on a case by case basis (except perhaps when dealing with a large parcel landowner such as HNZC).

> *" Ultimately it's not a new house – so at most you can get 70% on the way to new house… so would be tough – more likely to give it to someone locally. The person most able to put in management time is person who wants to do it up – so if they take it off [our] hands then it's worth pursuing that."*
>
> *"[refurbishing existing housing] is a good housing outcome – so achieving that without having to spend a lot can work well. We are keen to achieve the housing outcome. We would watch closely to see if it [retrofit/upgrade/relocation] would stack up – but if you discount the lesser quality dwelling and then the sweat equity inputs it is cheaper than building a new house. A relocated house is significantly cheaper [than building new] at perhaps 200k [costs of relocation and upgrade] – developer might get a better margin out of it – lower costs but worth nearly as much as other houses in street."*
>
> *"Can spend 18 months negotiating this sort of thing [upgrade, land swap, purchase versus build them new house on subdivided section] with no expectation that you would get a meaningful outcome. TRC think they will fill in missing teeth – but it is challenging and can be problematic."*
>
> *"Complications with all sorts of variables – marriage splits and ownership and this drives the development outcomes and how and why people sell. Though sad in some respects will help to solve the quality problems as they will move out and then house and land will be sold and demolished and 4 new ones built."*

One developer identified that a conversation between the developer and a private home owner was sometimes instigated by the home owner and sometimes by the developer. However it was the developers preference that the homeowner instigated the conversation as this was perceived to raise price expectations less.

> *"Bit of both – they approach in many cases but it is always better if the landowner/homeowner comes to them and wants to proactively develop their options."*
>
> *"Better if the homeowner comes to them - If developer approaches homeowner then there is a price expectation that developer wants it – and therefore can request higher price / more developer input etc. [about 'showing your cards']. Some efficiencies in doing deals with people – but has to stack up – first and foremost you* have to get more out of the property than you would get out of the property by itself."

4.3.9 Intervention points and community receptivity

People interviewed were asked:

- If there were to be some intervention point to upgrade privately owned homes, when do you think that should be? And how?
- How receptive do you think the community would be to this?
- What do you think would be the best way to start a conversation with homeowners about this?

Answers to this question ranged from an analysis of the local Tāmaki situation through to a more national level intervention point. One interviewee suggested that the best intervention point is at the time of the neighbourhood regeneration commencing. The perception was that the community would react quite positively to this as it is inclusive of the whole community.

Another interviewee suggested that offering inspections was a key intervention point and that there is potential to offer advice to owners about the impact of regeneration. Another potential option suggested was to provide local trades training under supervision.

> *"Intervention point is when TRC gets everyone together - rental through to private ownership - deal with the whole community at once".*
>
> *"People then need assistance with facilitation e.g. providing a list of contractors and advice around managing quotes and inspections etc." "*
>
> *"The best point in time [to intervene] is anytime – but probably winter when everyone feeling cold and thinking of upgrading."*
>
> *"Need to measure somehow – then carrot or stick to improve measurement – so WOF for houses sort of thing. Hesitate to advocate that nationally as housing needs to be more affordable [and expectation was that this could increase costs]."*
>
> *"Even by doing nothing [for houses in GI] there is quite a lot of change occurring – this leads to people wanting better environment and better financially educated etc. – so change coming anyway in the area. Will effect houses reasonably generically – people selling houses at market of $1.2 mil are going to upgrade anyway – this will drive and transform the area."*

There was concern voiced that private home owners don't know what is going on – i.e. additional communication was needed beyond the information being supplied to HNZC tenants and out into the wider community of the change that is occurring in Tāmaki.

One of the key interventions suggested was to get local people to intervene, and a model such as the Roots Collective . A lack of time was also raised as a concern.

> *"It's hard, and people are busy"*

4.3.10 Conclusion

The findings in this section reinforced what was found in the home owner interviews, particularly that the landscape is complex and it is the detail that is important. Beyond price, there were no other repeatable variables which influenced whether or not a developer was interested in a site, for example, sometimes it was seen as beneficial to purchase a site between their developments and join them together. In other cases it was seen as good urban design, to break up developments with different housing types. The developer also identified that the nature of the neighbour was far more important than the state of their home, in terms of impact on the sale price of adjacent new homes. Once again, this reinforces the importance of people rather than house condition in decision making.

4.4 Economic investigation

A summary of the NZIER economic investigation is provided below. The full report is provided as Appendix Four: Economic report.

4.4.1 4.5.1 Health and housing literature

Achieving a healthy indoor environment requires balancing interrelated factors temperature, the moisture levels in the home (relative humidity) and ventilation (Figure 50). Improvement in one factor can lead in improvements in another factor.

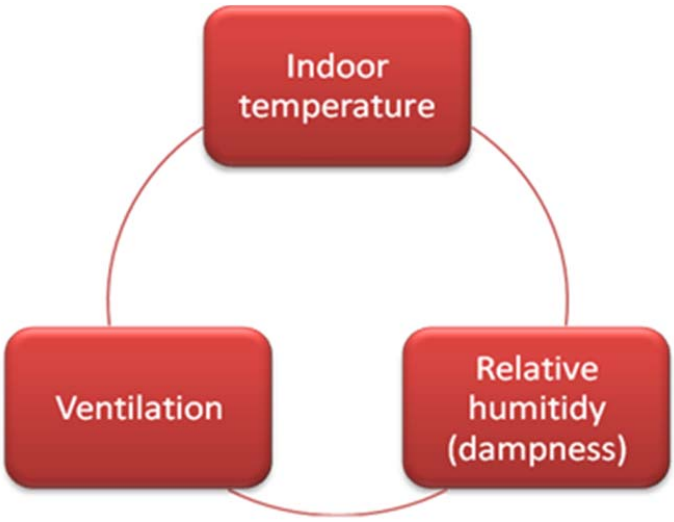


Figure 47: The inter-related factors for healthy housing

4.4.1.1 Indoor temperature

There is a lot of New Zealand and international evidence the cold indoor temperature are related increased incidence of sickness, particularly during the winter months when the thermal envelope matters more for maintaining a warm indoor temperature relative to outside. New Zealand research includes:

- Davie et al. (2007) found that New Zealand was at the upper end of the spectrum of the incidence of winter hospitalisations when compared to European countries, some which had much colder winters.
- Butler et al (2003) interviewed 1,376 Pacific Island households. About half (53%) reported problems linked to living a cold house, and the study found a statistically significant association between living in a cold house and maternal depression and childhood asthma.
- Barnard (2009) found that lower average household temperature were positively related to a higher than expected rate of winter hospitalisations among the very young, elderly generally, but also higher than average for Maori and Pacific people. Barnard also identified a link between dwelling types and increased incidence of hospitalisations.

Overseas research includes:

- Healy (2003) identified colder indoor temperatures, associated with housing quality as factor in increased incidence of winter hospitalisation in southern Europe compared to North Europe which colder winters outdoors.
- The Marmot Review 2011 found the following:
  - Countries with more energy efficient housing have lower Excess Winter Deaths (EWDs).
  - There is a relationship between EWDs, low thermal efficiency of housing and low indoor temperature.
  - Children living in cold homes are more than twice as likely to suffer from a variety of respiratory problems as children living in warm homes
  - Fuel poverty can shape the outcomes in the most deprived households.

4.4.1.2 Dampness and ventilation

Keall et al (2012) found that increased evidence of housing conditions supporting dampness and mould was associated with increased odds of respiratory symptoms. They recommend that a standardised household assessment framework be developed to inform decisions about improving housing quality.

4.4.1.3 The evidence the insulation delivers economic benefits in New Zealand

Howden-Chapman et al (2007) retrofitted 1350 households with insulation in seven low income communities in Zealand. Participants experienced several inter-related benefits after the insulation was retrofitted including a 20% decrease in heating energy consumption, an average 0.5°C increase in bedroom temperature and 2.3% decrease in bedroom dampness. This implies the environment was healthier and cost the household less to heat. This benefit could be important for low income households. Howden-Chapman et al also identified a range of improved health and social outcomes from retrofitting the insulation in addition to the direct improvement of indoor conditions in these households such as:

- 50% decrease in the risk of poor health
- 43% decrease in the wheezing
- 51% decrease in children taking a day off school
- 38% reduction in reports of adults taking a day off work
- visits to general practitioners were less often reported by occupants of insulated homes.

Howden-Chapman et al also did a basic cost-benefit analysis of insulation retrofit. They estimated and benefit cost ratio of 2 over a 30 year period. This indicates the benefits are twice as large as the cost and the investment is net beneficial for the household.

Barnard et al (2011) estimated the overall value the benefits of retrofitting ceiling and under floor insulation to be $563 per household for those over 65 years old. The benefits from life year saved ($440 per household per year) were the largest proportion of the benefits. Benefits including a decrease in the following:

- hospitalisations
- pharmaceutical costs
- asthma costs

- heating expenditure
- life years lost

4.4.1.4 Energy cost savings

Improving insulation, ventilation, and heating system can lead to energy cost savings for households. Grimes et al (2011) evaluated the changes in metered energy use from the Warm-up New Zealand programme and found the metered energy savings for houses with retrofitted ceiling and under floor insulation were small but statistically significant. The energy cost savings were 1% annually when compared against total energy use, however this is equivalent a cost saving of about 6% of electricity used specifically for heating.

A recent (2015) comparison of home heating cost published by Consumer shows the significant variation in home heating running costs using a range of heating systems. Heat pumps are much more energy efficient and cost effective than other electric options. The midpoint cost for a heat pump is around 8 cents per KwH. Plug-in electric heaters have a much wider cost range and the midpoint cost is approximately 26 cents per kWH. This implies the installing a heat in the retrofit houses could reduce heating expenditure at the midpoint by 69%. That represents an estimated annual cost saving benefit of $231 annually based average weekly expenditure on electricity and the proportion of electricity used for heating estimated by Grimes et al (2011).

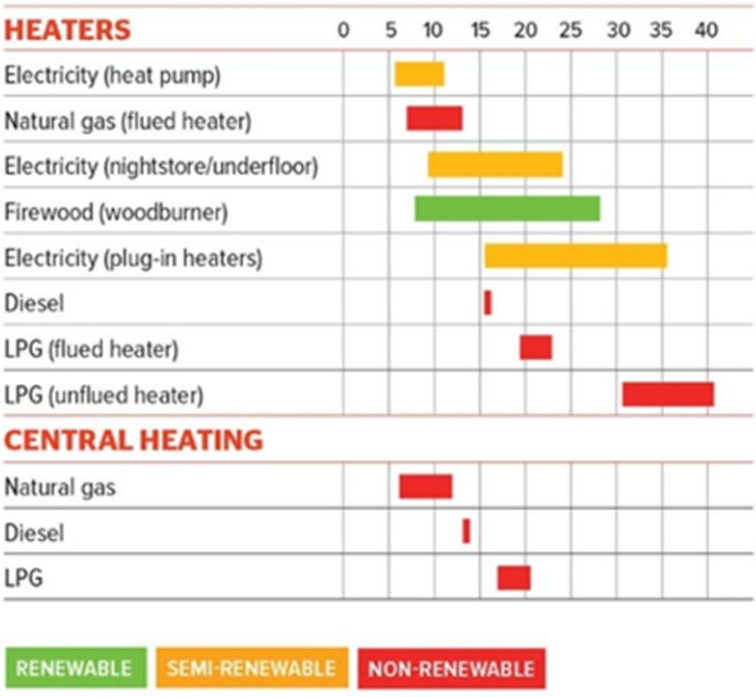


Figure 48: Home heating cost comparison (c/kW incl. GST)

4.4.2 Indicative costs and benefits

The cost and benefits were limited to those associated with health benefits or electricity costs savings benefits. These were looked at from the perspective of the whole sample/community. This is intended to provide a sense of the scale of the costs and benefits at the two different levels. The estimates should be treated as indicative but conservative estimates given data limitations including a small sample of households.

4.4.2.1 Costs

The analysis considered a subset of retrofit activities compared to the total activities suggested in the household upgrade plan. These represent 39% of the total repair and retrofit activities and are shown in Table 5.

Table 5: Cost of upgrades

Cost item	Average Household	Community
Ceiling insulation	$2,222	$20,000
Under floor insulation	$4,338	$43,375
Heat pump[2]	$3,500	$41,500
Replacement heat pump in year 15	$3,500	$41,500
Extract fans in the kitchen and bathroom	$744	9,500
Curtains	$731	$9,000
Clothes dryer vent	$300	$2,400

The total costs of these upgrades are not at a level that justifies the consideration of retiring and rebuilding the houses.

Some of the costs excluded from the analysis are detailed below. These elements will have benefits but they are difficult to quantify within the scope.

- internal and external painting
- repairs to glazing, roofs and foundations
- clean and removal of mould
- repairs to guttering and drainage
- cladding repairs
- wiring

4.4.2.2 Benefits

A range of potential health and energy savings benefits the households in the sample were identified based on the preceding existing literature.

[2] ***It is assumed that the heat pump will require replacing every 15 years.***

Reduced days of work

For adults the value of an avoided day off due to illness related to housing conditions was estimated based on the average daily take home pay for these households. This approach was used by Holt (2010) to estimate the national cost of illness. For children we assumed the cost on illness was 50% higher than adults, reflecting disruption to parental work days. The cost of illness of those over 65 years was assumed to be $563 annually (Barnard et al 2011.)

According to the Wellness in the Workplace Report (2015) the average number of days off work annually is 4.7. NZIER assumed that the combination of housing upgrades would reduce the average number of sick by 2 per year for adults and children. This is a slightly more conservation assumption than the 50% reduction implied by (Howden-Chapman et al 2007). NZIER also estimated the scenario for 1.5 and 2.5 days off work per to provide some sense of how the net present values varies with the reduction in days off work.

Energy savings from heating upgrades, insulation and ventilation upgrades

Based on Grimes et al (2011) assumed electricity savings from insulation of 1% of annual total electricity expenditure, an annual cost saving of $21 per household was identified. It was assumed that the benefits for ventilation upgrades such as installing extraction fans where the same as the benefits from insulation. The cost saving due upgrading to a heat pump were $231 per household annually compared to plug-in electric heaters.

4.4.3 Results

An analysis of incremental costs and benefits of specific housing upgrades assessed showed that in all scenarios the net present values (NPVs) of the benefits were positive over a 30 year time horizon (Table 6). However, it takes some time for the benefits to be realised.

Figure 49 shows how the net present values develop over the course of the 30 year period. Under the 1.5 fewer sick days scenario the net benefits in cover the cost in year 13. In the 2 day and 2.5 scenario the benefit exceed the costs in years 7 and 9 respectively.

Table 6: Overall results

Scenario	NPV (30 years)	Benefit-cost ratio
1.5 fewer days off annually per person	$73,250	1.6
2 fewer days off annually per person	$124,210	2.0
2.5 fewer days off annually per person	$175,170	2.4

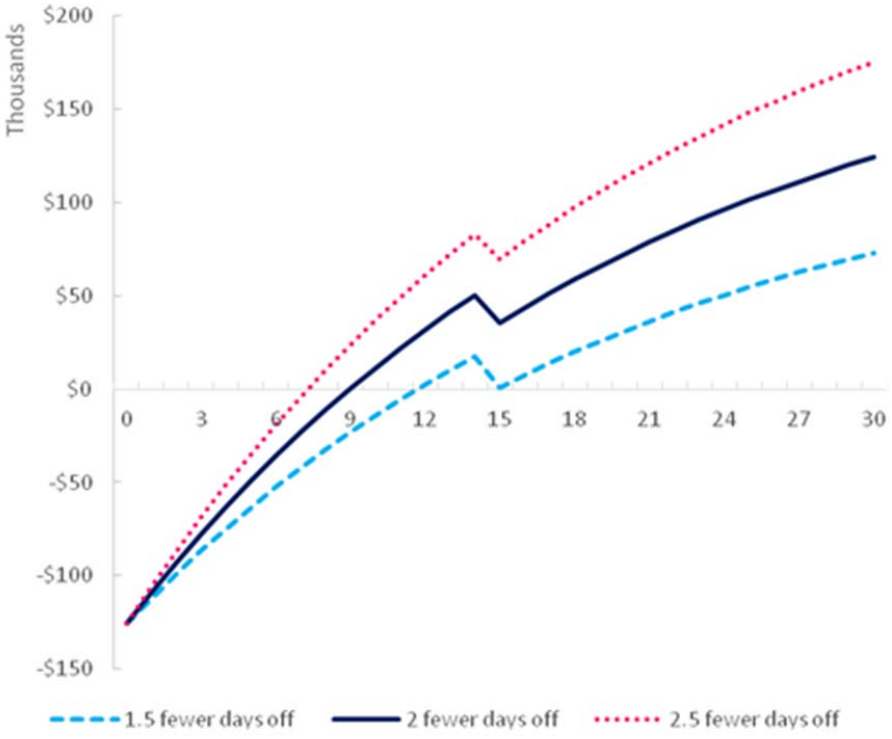


Figure 49: How the NPVs of the upgrade develop over time

The horizontal axis is the number of years

Increasing the discount rate from 5% to 7.5% (a 50% increase) still results in a positive net present value for all three scenarios. This is a clear indication that the results are not driven by the discount rate. The effect of increasing the discounts is a lower NPV and later breakeven point in all three scenarios.

The overall results indicate the benefits of upgrades that improve health conditions and reduce electricity use for heating are justified. The costs and benefits were not substantial enough to consider retiring the house and rebuilding. Overall the health and energy saving benefits from retrofitting insulation, extraction fans and more energy efficient heating outweigh the costs in the long term.

4.5 Exploring decision making factors

At the outset of this research, a key hypothesis was that a straightforward decision making framework could be developed that would provide the ability to look objectively at a dwelling and make a decision as to whether it was worth upgrading the house or if it should be 'retired'. Undoubtedly, a new house, built competently to the current Building Code, will outperform an existing house in relation to most indicators of home performance, such as health and comfort, warmth and resource use. From there, a relatively crude cost/benefit could be worked through, with some additional layers of increasing the value of the land and property offset against the potential costs of house removal and re-build.

This type of analysis makes for a reasonable economic assessment but fundamentally misses the key social and, arguably, 'emotional' components of 'home' and neighbourhood (community) that this research has demonstrated. Every one of the sample houses had a unique set of physical issues that required addressing. These issues were varied enough that a unique plan had to be developed for each house, and, whilst some of the interventions were common to a number of houses, the approach taken, even for something as straightforward as insulating a ceiling, would vary between houses.

In a similar way, every household interviewed for this project had a unique set of living circumstances, a unique family set up, a unique history, unique financial positions, and a unique emotional attachment to their dwelling and their community. Once this rich layering of social, cultural, financial and emotional filters has been applied, the numbers of variables involved in developing a decision making framework for 'retire vs upgrade' would quickly make such a framework unwieldy and unworkable.

Perhaps the best that can be hoped is that the research has yielded a framework for asking questions and exploring options with homeowners, developers, and the community at large. A starting point for the conversation that may assist all the stakeholders in the community to decide what is best for a single family, in a single house, that is part of a neighbourhood and a community.

So what then are the factors that should be included in this framework? And how should they be split out and categorised? Undoubtedly, further work is required to develop this approach and to test it with a range of suitable communities. A starting point is provided below:

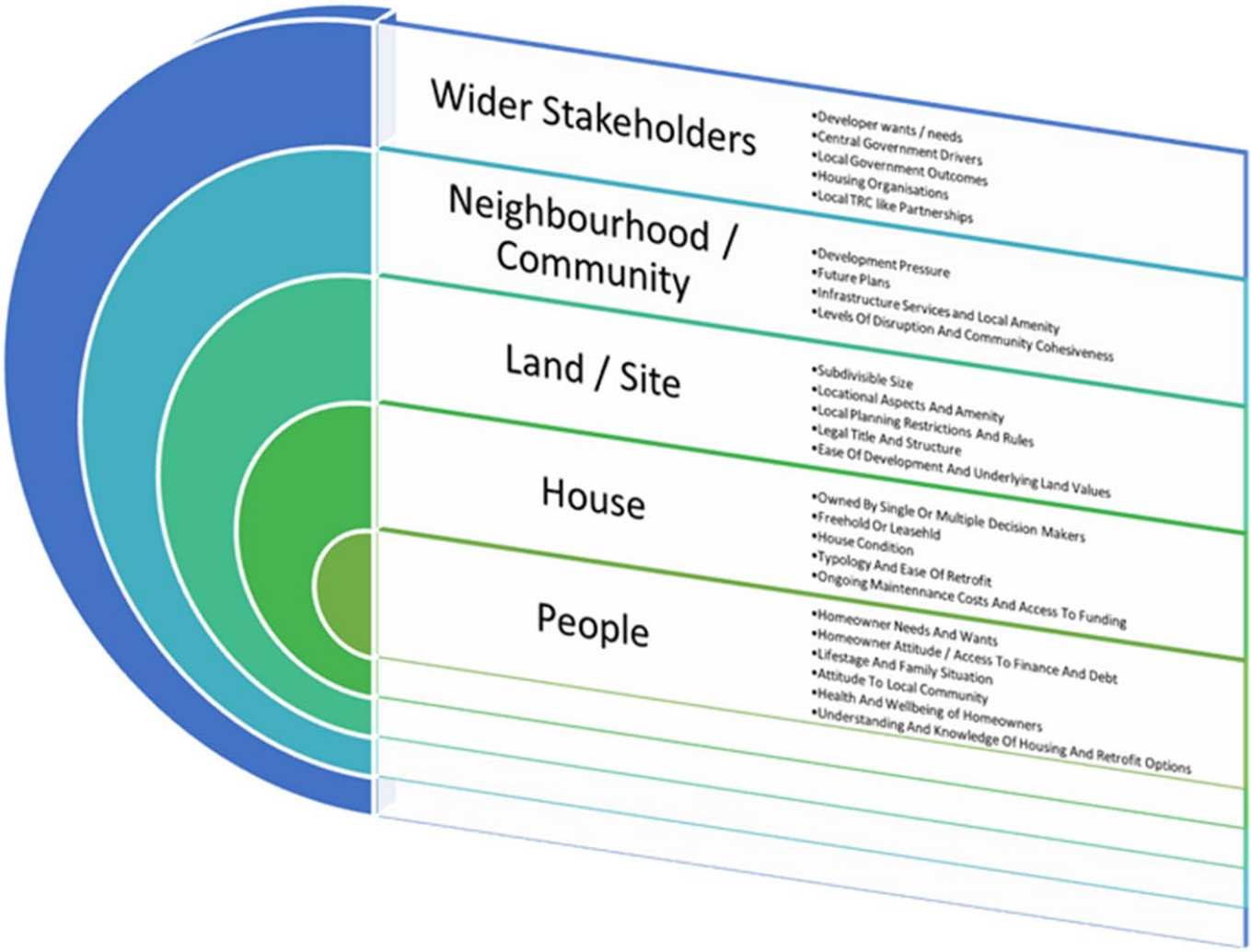


Figure 50: Enquiry framework showing people at the heart of the framework

Person (Householder and Family Wants/Needs)

- Does the homeowner want a new home or would they prefer to upgrade their existing?
- What is the homeowner's attitude to finance and debt (including emotional response)?
- Is access to capital or borrowing difficult or easy? What is the ability to fund upgrade or new build?
- What is the homeowner's desire to stay, and is this influenced by friends, family, history in the house?
- What life-stage is the homeowner at? e.g. starting a family, heading toward retirement
- What is the overall health of the occupants in the home, and is the home having an impact either negatively or positively?
- What is the homeowner's attitude to their local community? e.g. do they feel included, are they a leader, are they wanting to move?

- What is the family situation? e.g. is extended family living with them, are they contemplating separation, are they on their own?
- What is their ability and/or knowledge of housing? e.g. are they a competent DIYer, can they project manage upgrades themselves, do they know what makes a home healthy?
- What is their assessment and appetite for risk? e.g. would they contemplate developing their section themselves, are they risk averse?
- What are their financial skills like? e.g. do they regularly budget, are they savers or spenders, could they put aside money for maintenance and repairs?
- What are the household needs for accommodation? Does the house fit those needs – e.g. layout, size, numbers of rooms etc.? Are these needs likely to change?
- How much time does the homeowner have and what is their attitude to the hassle of upgrade or re-development?
- What is the homeowner's understanding of planned regeneration changes – both threats and opportunities?

House

- Is the dwelling owned by a single decision maker or, alternatively, is it family owned with multiple decision makers needing a say?
- Is the house/land freehold, cross lease or leasehold?
- House condition – is it in good condition and well maintained or has it been left to deteriorate, and to what point?
- What are the on-going maintenance costs going to be for the dwelling and will these act as a drain on resources?
- What is the typology of the house and does that lend itself well to upgrade? e.g. many of the sample houses were state houses with good bones and relatively easily retrofitted.
- Who else may be involved in the house and where are the trigger points for this? e.g. health funding for insulation to assist with chronic asthma, financial assistance with installation of heat pumps or payment of electricity bills
- Is co-funding for upgrade or new build available? e.g. IRRS, ACC, EECA?

Land

- What are the householder's aspirations? Do they want to maintain a full-site?
- Is the land/site big enough for an extra dwelling or subdivision? Is there the ability to subdivide as of right?
- Is the location good or bad in terms of local services - e.g. transport links, shops, employment – and does this add or detract from its value?
- Does the site have good amenity which can add value e.g. views, bordering a reserve, waterfront etc.?
- Does the land have a suitable legal structure in place? e.g. titles, cross lease structures etc.
- How easy would development of the site be? e.g. site infrastructure and other services, stormwater, access etc.
- Is the site adjoining other available sites that can be aggregated for development?
- What are the local planning restrictions and rules pertaining to the site?

Community / Neighbourhood (including regeneration and/or community plans)

- Is there development pressure in the area? e.g has it been zoned a Special Housing Area?
- What are the future plans for area including zoning, roading, compulsory acquisition etc.?

External organisations

Developer:

- Is the developer motivated to become involved?
- Is the price or value of the land high enough to encourage development, or to encourage upgrade of existing houses?
- Are there motivations other than profit that could be explored with the developer? e.g. community benefit, brand recognition, land swap etc.?
- What upgrades might a developer be interested in funding in privately owned stock in order to improve margin on developer owned stock – e.g. paint job on old house in middle of terrace development?
- How receptive/proactive is the community to engaging with retire and rebuild or upgrade decisions?

Central government

- What community outcomes are being driven?
- What are the overall benefits for the nation in terms of employment, health, energy and water saving?

Local council

- What will the impact be on local services from additional development?
- How will the upgrade or retirement of existing stock affect local price affordability?
- Does upgrade lead to gentrification and a breakdown in community?

Housing stakeholders

- What are the needs of the local community for affordable housing and how are these best met?
- Is there an opportunity to use houses in transition (upgraded and can be used as emergency housing)?
- What are the trusted networks in the community to discuss the process of transition?
- At what point should the upgrade occur and who should benefit (or should that be shared)?

TRC type partnerships

- What are the regeneration plans for the neighbourhood and what outcomes are being sought – e.g. employment, economic regeneration, transformational social outcomes?
- How to involve developers without giving away the margin and increasing the overall affordability of the housing?

5 Conclusions and recommendations

5.1 Key findings

5.1.1 Decision making variables are complex and highly individual

The project sought to develop a structured comprehensive approach to deciding (a decision making framework) whether a house should be upgraded or retired, based on technical (home quality and upgrade options), social (needs of homeowners/community), institutional (within the Tāmaki project) and economic (valuing different intervention options) criteria.

However, the complexity of the variables in the upgrade/retire decision made it impossible to develop such a simplified decision making framework. These ranged from variations in what upgrades would entail, to social and individual household needs, to legal situations. In particular, the following variables stood out:

- Despite considerable similarity in house typology and age, and common interventions across a number of houses, the approach taken (even for something as straightforward as insulating a ceiling) would vary between houses.
- Every household interviewed for this project had a unique set of living circumstances, a unique family set up, a unique history, unique financial positions and a unique emotional attachment to their dwelling and their community.
- Decisions relating to housing appear to be made more from a personal or family perspective than a house condition perspective, and were multi-layered, including connections with the home, section, immediate neighbourhood, past generations and extended family.
- Extended family needs were often prioritised over plans to improve individual housing situations. A particular challenge for family was catering for changing household size (adult children home, other extended family, teenagers growing up)
- Legal ownership of the homes is often not simple, and may impact on the decisions which can be made by a household. Of the owner-occupied homes interviewed, several were in multiple extended family ownership, and one was leasehold. In some cases, this could combine more complex extended family decisions, along with less financial freedom for the resident household.

Once this rich layering of social, cultural, financial and emotional filters has been applied, these variables quickly make a decision making framework for retire versus upgrade unwieldy and unworkable.

The research has, instead, yielded an enquiry framework for asking questions and exploring options with homeowners, developers and the community at large. This is a starting point for the conversation that may assist all the stakeholders in the community to decide what is best for a single family, in a single house that is part of a neighbourhood and a community. The questions have been oriented around five key areas:

- The person
- The house
- The land

- The community / neighbourhood
- External organisations (developer, central government, local council, housing stakeholders, TRC type partnerships)

5.1.2 None of the homes had a compelling case for retirement

The upgrades prioritised for these houses focused on providing a reasonable standard of performance in terms of being warm, dry and healthy and with reasonable levels of energy and water use (avoiding excessive consumption and reducing running costs). The interventions also aimed improve the property to a level which would achieve a reasonable level of rental income commensurate with the market for the Tāmaki area (prior to redevelopment) i.e. neat, tidy and safe. .

The majority of the houses were from the period when Glen Innes was developed in the 1950s and 60s in the Glen Innes area. These were state house or mass house typology which is known to be relatively easy to retrofit, having "good bones", good orientation, and good levels of access to renovation areas.

The costed upgrades averaged $23,251 over each of the sample houses with the most expensive individual house upgrade of $39,155. The most likely house to consider for retirement had structural issues with the ring foundation as well as significant cladding and window issues complicated by deferred maintenance. Despite this, the estimated costs for the upgrade of this house were approximately $36,000. Given the house could be upgraded to a reasonable standard of performance and was providing relatively inexpensive (and debt free) accommodation for the family living in it, it was not a compelling case for retirement.

Two further factors weigh on the side of upgrade, rather than retirement, for these homes:

- Given the house typologies, the houses could be upgraded relatively simply and cheaply. Upgrade offers a relatively inexpensive way to accommodate families in existing communities while addressing health and cost concerns."
- Households had a strong connection and emotional attachment to their house and their land ("my place"), local neighbourhood, and home. Even those that would consider moving, only thought about moving within the same locality.

When the economic benefits of upgrades are assessed, the overall results indicate the benefits of upgrades that improve health conditions and reduce electricity use for heating are justified. The costs and benefits were not substantial enough to consider retiring the house and rebuilding. Overall the health and energy saving benefits from retrofitting insulation, extraction fans and more energy efficient heating outweigh the costs in the long term.

5.1.3 Redevelopment through retirement is complex for developers

Developers were ambivalent about retiring existing homes in favour of more intense development. Developers' involvement in privately owned homes needs to make financial sense. However, it was rarely considered a simple decision and the suggestion was that, while it made sense to aggregate some of the properties, it can often be a marginal exercise that may not stack up economically. In some cases the developer saw benefit in retaining privately owned homes to break up developments of terrace housing.

The developers noted that it can be time consuming dealing with private landowners, with no expectation that it would lead to a purchase outcome. Each situation involving dealings with privately owned homes was driven by a unique set of circumstances and involved a unique set up with different personalities playing roles. Developers experienced greater success (and lower price expectations) when the homeowner instigated the conversation.

In terms of a decision making framework, developers noted the complexity of the development environment in Tāmaki. Beyond price, there were no other repeatable variables which influenced whether or not a developer was interested in a site.

5.1.4 Upgrades were dominated by deferred maintenance issues

Addressing deferred maintenance, especially painting and weathertightness of cladding and roofs, repair of gutters and windows and dealing with moisture issues, dominated the upgrades suggested in the houses studied.

The effect of deferring maintenance on house performance was clearly demonstrated in these houses. Typical problems were:

- Lack of painting and maintenance of external cladding (significant rot and damage causing leaks and draughts)
- Poor roof maintenance (cracked ridgelines or capping, missing or cracked roof tiles leading to roof leaks causing heat loss, mould and damaged ceiling panels)
- Lack of painting and sealant replacement on window (extensive rot, damaged frames causing leaks and draughts)
- Lack of effective guttering (ingress of rainwater into the cavity of the dwelling, ponding of water under the house, leading to systemic internal mould and structural damage)
- Not making internal plumbing repairs (dripping taps, leaking plumbing adds moisture to house causing mould and structural damage)
- Failing to replace wet area sealants (moisture leaking into structure leading to mould and structural damage)
- Failing to address mould through internal painting or cleaning (continued health hazard)

A number of the issues caused by deferred maintenance had become costly to repair, particularly in comparison to the costs of the original maintenance. For example, failure to keep up with a regular painting regimen had led to suggestions of a full replacement of windows at significant cost ($3,200). In

another case, a complete bathroom renovation was necessary caused by a plumbing leak and the damage to the underfloor substructure (estimated to cost $6,000 for a relatively basic repair/replacement of floor, shower, toilet and hand basin). Painting stood out as a key maintenance intervention required to keep the stock of largely timber buildings in good repair, the significance of which is poorly understood, and which is often deferred given its relative expense. Consequently, many of the sample houses showed significantly deteriorated paintwork both inside and out, and this had been the cause of further need for intervention to deal with rot and repairs.

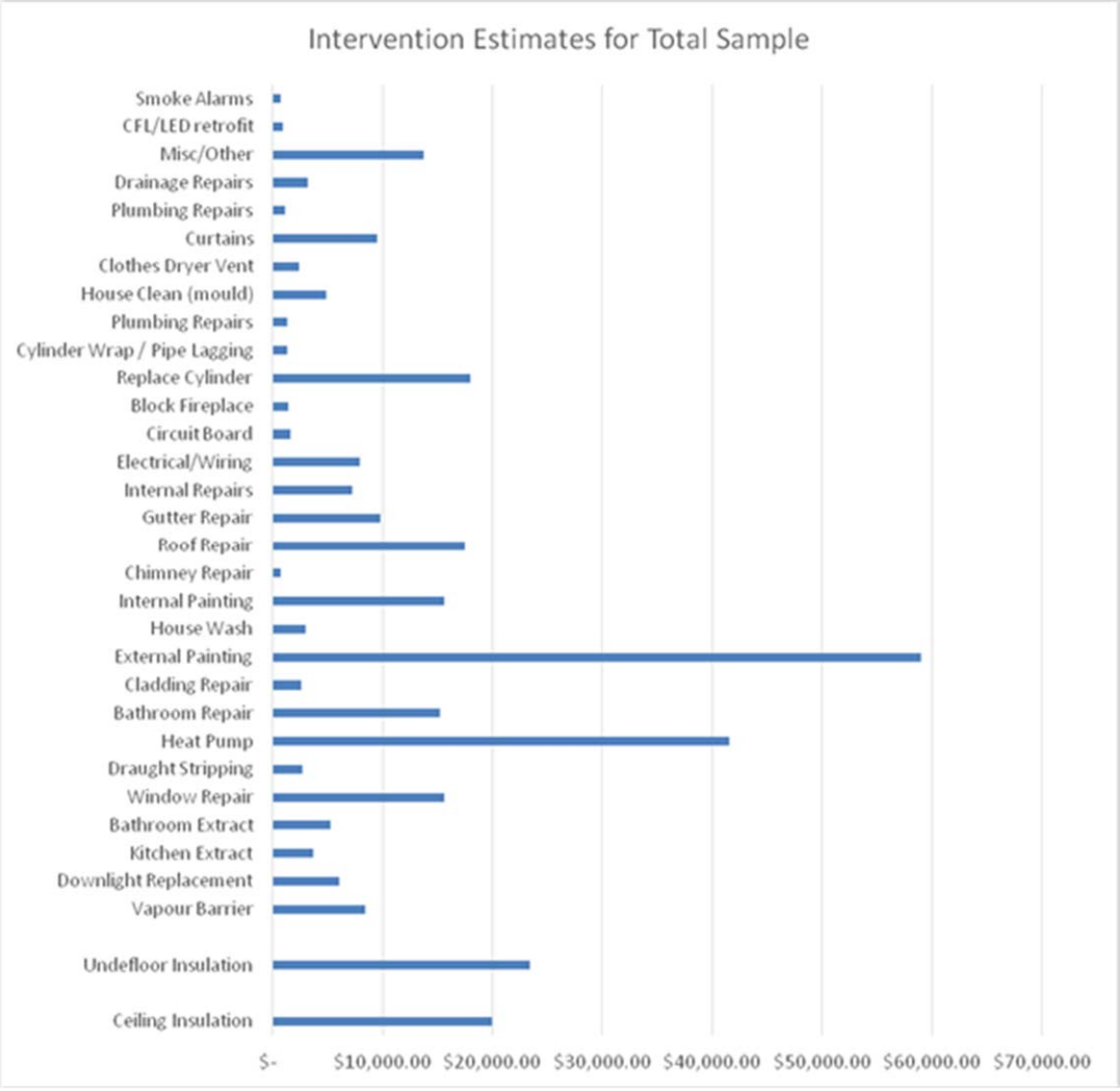
Evidence from the household and community interviews suggests that deferring of maintenance may in part be a financial issue (ability to set aside enough money for regular maintenance) as well as an advice and informational issue (understanding of the need and/or importance of regular maintenance.

- Financial constraints were identified by 9 of the 11 households as being a barrier to upgrading their home.
- Households reported a relatively low level of knowledge of how to solve house maintenance problems. For example, several households knew that they had mould, and that mould was a problem, but didn't know how to solve it.
- Community organisations identified a lack of knowledge on where to start and what interventions to prioritise.

This is an area deserving of further research.

5.1.5 Upgrades are often non-technical and not expensive

Many of the interventions required in order to upgrade houses are not especially expensive. The estimate for external cladding repairs, for example, was relatively inexpensive ranging from $450 - $650. This is indicative of the relative ease of weatherboard repair and replacement (though this did not include an estimate for painting). Internal house cleans to address mould were estimated at just over $400 but is considered an important step in improving the health and wellbeing of the occupants. Blocking off fireplaces is an inexpensive fix estimated across the sample at $150 per house. All but one house would have benefited from a retrofit of bulbs – with an average spend per house required of $73.



In addition, many of the upgrade interventions were non-technical in nature and do not require a high trained skill set. These include: house painting; house washing; ground vapour barrier; small roof repairs; installation of smoke alarms; installation of insulation; simple carpentry; draught stripping; leaking taps; thermal curtains; blocking off fireplaces; cylinder wrap and pipe lagging. They lend themselves to being done less expensively in many cases by a community enterprise or by an informed homeowner (for some interventions).

5.1.6 The combination of community regeneration and type of interventions highlights the potential for a community enterprise supporting home upgrade

The redevelopment of Tāmaki provides a unique opportunity to marry up community needs for economic development with a clearly demonstrated need for the upgrade of Tāmaki's existing housing stock.

The non-technical nature of the interventions frequently needed in these houses lend themselves well to a potential community enterprise such as a home advice and retrofit service. There is the further added

benefit of being able to explore models where this is undertaken using local employed people and on a street by street basis thereby potentially leveraging additional community funding and achieving economies of scale. There may be the potential for a neighbourhood level intervention which brings together home performance advice (Eco Design Advisors or Home Performance Advisors), smoke alarms from the Fire Service, EECA insulation install, Ministry of Social Development funding for home healthy heating, and a trusted community retrofit service to support the upgrades. When an intervention requires specialist advice (e.g. structural work, electrical or plumbing), professionals can be contracted in and effectively managed on behalf of the homeowner. Using the results of this research, Beacon Pathway and other stakeholders such as Tāmaki Redevelopment Company, Nga Iwi Kainga and Creating Communities are exploring ways of undertaking this important work.

Other potential intervention points for home upgrades were suggested in interviews including:

- Discussions with a neighbourhood (both social housing and privately owned homes) at the point of commencing neighbourhood regeneration.
- Offering inspections
- Lists of local contractors
- Provision of advice relating to the management of quotes and inspections.

5.2 The implications for New Zealand

5.2.1 The Tāmaki community provided very specific conditions for researching retirement or upgrade. Cases for retirement in other communities may differ, and the enquiry framework may help to guide this.

The enquiry framework could provide useful guidance for approaching the question of whether to retire or upgrade homes within other regeneration projects and at a smaller, individual house scale. Of particular note is that many households make decisions from a personal or family perspective rather than a house condition perspective; and in some cases legal ownership is not simple and sits across more than one nuclear family. Many decisions are likely to be multi-layered, including connections with the home, section, immediate neighbourhood, past generations and extended family. This is particularly likely in communities where the home has been owned through more than one generation.

The sample houses, and indeed, the Tāmaki community, had some characteristics which may not be representative across New Zealand.

- Given the difficulty recruiting families, those recruited had lived in Tāmaki longer than the general population, with three of the families living in homes that they had been born to and grown up in
- Thirteen of the 14 homes assessed were built in the 1950s or 1960s. This reflects the development patterns of Tāmaki state house or mass house typology .
- All families had strong connection to their local area at multiple levels - the home, the section, the immediate neighbourhood, and, more broadly, to their suburb (Glen Innes, Panmure or Pt England).

This suggests that further testing of the enquiry framework within other communities may be useful to see if there are more compelling cases for retirement in other circumstances.

5.2.2 High rates of deferred maintenance and a lack of understanding of why maintenance is important are likely to be a New Zealand wide problem

Deferred maintenance is a significant problem, as shown from this research and other national level research such as the 2010 House Condition Survey. Across New Zealand, 85% of the existing housing stock will still exist in 2025 and, in a typical year, more buildings are renovated than are built. Many of these are in poor condition - the 2010 House Condition Survey (jointly funded by BRANZ and MBIE) found that:

- 41% of houses were in good condition and well maintained
- 59% in moderate or poor condition
- 25% of houses had defects that needed attention within 3 months.

The multifaceted reasons for this - financial, as well as advice and informational – are also likely to apply across New Zealand. Resene's research, for example, indicates that the importance of painting maintenance is poorly understood. There appears to be a relatively low level of knowledge of how to solve house maintenance problems, even smaller problems.

5.2.3 Deferred maintenance is contributing to New Zealand's poorly performing housing stock

Considerable research now shows cold, dampness and mould are major contributors to poor health outcomes. In this case study, a majority of home owners considered their homes to be cold but had limited heating (in two cases, no heating at all). The majority of households had problems with mould, mildew and moisture on windows. Six households reported doctor or hospital visits because of health issues that they thought could have been prevented if the home was in better condition. The high levels of deferred maintenance in these houses were making very obvious impacts on living conditions; however, there was little awareness of the links between condition and performance.

5.2.4 Simple home upgrades are a potential community enterprise across New Zealand communities

These findings support earlier work by Beacon and others indicating that a multipronged approach to the upgrade of homes is required, which combines information, advice, support in how to approach upgrades/ manage contracts, and, for some people, financial assistance. This is likely to apply across all or most parts of New Zealand.

Many interventions required to upgrade houses do not require a high trained skill set and are not especially expensive. Some of these interventions lend themselves well to a potential community enterprise such as a home advice and retrofit service. Specialist advice, such as structural work, electrical or plumbing, could be contracted in and managed on behalf of the homeowner.

5.3 Working in a community of change is complex and requires patience, communication and local connections

The depth and complexity of changes occurring in a regeneration community such as Tāmaki make it more difficult to access households. Local households were wary in being involved in the project and engaging with people they didn't know - households were concerned about being involved in the project and giving out personal information. In addition, information flows between central government agencies and Tāmaki on-the-ground organisations were limited and on an as-needed basis. Consequently, there was potential for duplication and overlap of initiatives underway, and for intervention fatigue among the community.

In this project, access to households was only successfully gained through introductions by community and through community networks. The difficulty in recruiting is likely to present similar issues for other non-community based organisations which could be involved in upgrade interventions.

There was concern voiced that communication of changes within the Tāmaki community was limited to Housing New Zealand tenants and not going to private home owners or the wider community.

5.4 Recommendations

Retire or upgrade

- Given affordable housing crisis, the relative low cost of upgrades to reasonable performance and the economic value of the resulting benefits means upgrading privately owned existing homes provides affordable accommodation
- Further testing of the enquiry framework in different communities is suggested. Although no house was a compelling case for retirement in the sample, there were characteristics of the Tāmaki community that may not be applicable in other settings.

Deferred maintenance

- Deferring of maintenance, especially painting and weathertightness of cladding and roofs, repair of gutters and windows, and dealing with moisture issues, dominated the overall costs of upgrades suggested in the houses studied. Further research into the reasons for this is called for. Evidence from the household interviews suggests that this may, in part, be a financial issue (ability to set aside enough money for regular maintenance) as well as an advice and informational issue (understanding of the need and/or importance of regular maintenance).
- Explore addressing deferred maintenance through a community or social enterprise which provides a home advice and retrofit service. This could be an independent enterprise, formed between those with a stake in the future quality of the community, in this case, a partnership between community, TRC and developers. It could provide homeowners with objective advice, simple retrofits, coordination of professional services and access to funding or incentives. Community-based enterprise would have economic and social benefits, by employing local people, potentially leveraging additional community funding and achieving economies of scale, and supporting achievement of better community outcomes.

Find effective and simple ways to advise and inform households on:

- The importance and need for preventative maintenance – especially the requirement for washing and painting cladding and windows, and keeping gutters clear.
- The importance of building up dedicated savings to fund maintenance issues that will either pay back in the long run or help to avoid larger costs in the future.
- How occupants can ventilate a home in a controlled manner to keep mould levels to a minimum.
- The best and least expensive heating options and their correct usage to maintain efficiency and keep costs to a minimum.
- The importance of moisture removal at source through adequate mechanical ventilation used at the right time, as well as modifying behaviours such as clothes drying in the home.
- The importance of addressing moisture ingress as soon as it occurs in order to avoid ongoing or more expensive problems in the future.
- The use of curtains to retain heat and the importance of letting solar energy into the home when and where it is useful.

Catering for family growth

- Explore options for secondary dwellings on Tāmaki sites to accommodate family expansion. One solution may be in moving surplus Housing New Zealand houses onto new sites within the Tāmaki area.

Working in a community in change

- Ensure communication across the broader community beyond those involved in specific initiatives. In Tāmaki's case, this includes those living in private homes in addition to Housing New Zealand tenants.
- Use every avenue possible to recruit participants in initiatives and be proactive chasing them up.
- Take the time to build trust and be guided by those who are connected into the community.
- Leverage individuals who have participated in a programme as valuable spokespeople to recommend the programme to others and help recruit further participants.

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7 Appendix One: Interviewer training material

7.1 Interviewer training outline

Ruapotaka Marae, 17 November 2014

10:30 Welcome, intros, whakawhanaungatanga:
Name, background, connection to Tāmaki, who has done some interviewing before…

10:40 Intro project

- Purpose of research is to improve understandings of options for upgrading privately owned homes in Tamaki.
- Research being undertaken by Beacon Pathway and funded by BRANZ.
- Nearly half of Tāmaki homes are privately owned and most are not part of the planned regeneration. Many of these homes could be upgraded to make them warmer, drier and healthier to live in and cheaper to run.
- This research focuses on understanding what this potential is from the perspective of home owners, community members and relevant local organisations, including Nga Iwi Katoa, the Tāmaki Redevelopment Company and other local developers.
- The intention is to use this research to inform action BUT there is no guarantee that any improvements will happen for those participating.
- What they will get out of it is an independent assessment about the state of their home, some advice about how to improve their home and a Pak ‘n Save voucher for their time ($50)
- Households will be invited to participate through a letterbox drop and word of mouth.
- Process for choosing 15 houses is based on a case frame. We aim to get a mix but not every factor will be included.

	Maybury	Benghazi/Alamein/Larson	Eastview/Faringdon/Murfield
House typology			
Owner occupied			
Privately rented			
Household size			
Household type*			

- Involves a house assessment and an interview. I will do one interview with each of you and you will do the rest in pairs. We will try to allocate the interviews fairly so everyone gets to do several but this will depend on both your availability and that of the householders.
- Any thoughts or questions?

1:.00 Interview process

- Purpose of today is to help you feel confident about being an interviewer in this project
- Using a structured interview process so we can have some consistency no matter who is doing the interviewing. OK? Any questions?
- Group discussion
- Using interview guide, start with information sheet: read through and answer questions/make changes…
- Same with consent form…
- Go through interview sheet as a group – red parts are instructions to you (interviewer). Make any changes

11:20 Practice

- Have turns at interviewing one another in pairs: 1 person interview questions 1-14, nest 15-28.

12:00 Feedback

- Any thoughts, challenges etc. make any changes

12:15

- Agreement re getting finalised documents to <name>
- Payment – letter of agreement

12:30 finish

7.2 Effective and ethical interviewing

Thanks for offering to be an interviewer in this project. We really appreciate your involvement and your local knowledge. We want to ensure you enjoy the experience as well as gather data for us in respectful and safe ways. This document includes a summary of the project plus some techniques for interviewing and keeping safe.
If you have any queries or concerns, contact <name> <phone> or <name> <phone>

Project purpose

- The research will improve understandings of options for upgrading privately owned homes in Tamaki.
- Research being undertaken by Beacon Pathway and funded by BRANZ.
- Nearly half of Tamaki homes are privately owned and most are not part of the planned regeneration. Many of these homes could be upgraded to make them warmer, drier and healthier to live in and cheaper to run.
- This research focuses on understanding what this potential is from the perspective of home owners, community members and relevant local organisations, including Nga Iwi Katoa, the Tamaki Regeneration Company and other local developers.
- The intention is to use this research to inform action BUT there is no guarantee that any improvements will happen for those participating.
- What they will get out of it is an independent assessment about the state of their home, some advice about how to improve their home, contribution of information which may help shape how their community can be helped/help themselves and a PaknSave voucher for their time ($50).
- Households will be invited to participate through a letterbox drop and word of mouth.
- Process for choosing 15 houses is based on a case frame. We aim to get a mix but not every factor will be included.

	Maybury	Benghazi/Alamein/Larson	Eastview/Faringdon/Murfield
House typology			
Owner occupied			
Privately rented			
Household size			
Household type*			

- Involves a house assessment and an interview.

Interview process

- Households will be offered a range of times to be interviewed. Where possible this will be joined up with the house assessment so there will be at least 2 household members present, 2 interviewers and 2 house assessors.
- This may not always be possible, however, and some interviews may happen at a separate time from the house assessment. If this is the case, the voucher will be given to the household member after whichever happens last out of the house assessment and interview.

- <name> will match you up with households that best fit the times you are available. Either <name> or <name> will contact you to book these in with you and make sure you know who your interview partner will be and where you will meet.
- You can refuse to interview someone for any reason and do not have to tell us why.
- Please do not tell other people WHO you are interviewing. This is confidential.
- Please also do not tell anyone other than someone in the interview team anything about what people say to you in the interview. This is also confidential.
- You will be given <name> contact details in case you need to change anything, or have a question. You will also be given the contact details for the person and home you will visit.
- <name> will partner with you for your first interview. You will be the note-taker for the first half of the interview and then be the interviewer.
- After that you will work in pairs with one another. Work out between you who will write notes and who will ask questions. You may like to swap halfway, or have one person do all the interviewing while the other is the note-taker.
- We will make every effort to share the interviews fairly – there will be 11 more interviews to do after the first 4 with <name>That means there will be around 7 opportunities for each of you to work, if you are available when the householders are available.

Effective Interviewing

- Make sure you each have a paper copy of the interview guide and a pen that is working (take 2!)
- Dress appropriately and interview in a comfortable place
- Be prepared and not rushed - never begin an interview cold – introduce yourselves, check that it is still ok to interview the householder at this time, ask about their day, comment on the place you are in etc
- Remember your purpose – and remind them too: you are here to interview you as part of a research project to improve understandings of options for upgrading privately owned homes in Tamaki.
- Give them the information sheet and read this with them to make sure they understand it. Ask if they have any questions.
- Give them the consent form and make sure they sign the consent form BEFORE you start the interview.
- Be yourself, present a natural front and be respectful, cordial and appreciative
- Demonstrate active listening - check that you understand what they say by paraphrasing and/or clarifying points
- Check in with your note-taker that they have recorded everything required as you go, especially after lengthy replies! Interrupt politely if you are the note-taker and haven't quite got everything written down.
- Treat all interview data with respect and make sure no unauthorised person sees it, or that it gets lost, before it is handed back to Beacon.
- Any vehicle use is your responsibility. The vehicle must be warranted and registered and the driver must have a current driver's license.

Key skills and qualities

- You don't need to read the questions but make sure that what you ask is broadly the same as on the interview sheet. Ask the questions in the same order as on the sheet too.
- Try to keep the interview on track, otherwise it will take a l o n g time! Use a relaxed manner and respect the interviewees thoughts, feelings and experiences (non-judgemental) but gently guide them back to the subject by saying things like" So, in relation to your home, we'd like to ask you about…" or " So tell me more about…" or "Let's move onto …"
- Be quietly enthusiastic to learn about what the interviewees have to say - warm and genuinely interested
- If they decide not to continue at any time, that is fine. Ask them if we can use the information gathered so far and, if not, write 'withdrawn and the time' on each page and assure them that it will be handed in (so you get paid for the time you have spent there) but not included in the data.

Keeping safe

- Only interview in pairs.
- Tell someone at home where you are going and how long you expect to be. Do not include names of the interviewees in the note (this is confidential), just their address.
- Carry a cell phone with credit at all times.
- Do not drink alcohol or use drugs before or during an interview.
- You can refuse to interview anyone who is drunk, drug-affected or aggressive or if anyone else in the house makes you feel unsafe.
- Ask for any unfriendly or threatening dog to be tied up or put in another room.
- Do not bring any unnecessary money, credit cards or other valuables with you if possible.
- If you use your vehicle make sure it is locked and valuables are taken with you.
- Make sure you have enough petrol in your vehicle to get home.
- Make sure you know the way out of the home in case of emergency.

If you can't make it to an interview that you have agreed to, call <name> <phone>and if the interview needs to be cancelled, call the householder.

8 Appendix Two: Household recruitment

8.1 Recruitment flyer

Research project: Options to upgrade private homes in Tamaki

Greetings!

We are undertaking a research project to understand the potential to upgrade privately owned homes in Tamaki alongside the regeneration project. This work is supported by Nga Iwi Katoa.

We'll be combining an assessment of the state of each house, interviews with homeowners to find out their perspective, and a look at the economics of upgrading the house. Only 15 households can be involved in the research and we are looking for households like yours to participate.

If you are interested, please contact us using the short form attached.

We will be selecting a mix of houses including different styles of housing as well as owner-occupied and privately owned but rented homes. We are also interested in including different kinds of households: for example, families (including those with children and teens), couples, singles, older people and people who aren't related to one another.

Ideally, two members of your household (aged over 16) will need to be available to meet with our team for two hours. At least one of these people needs to be the owner or tenancy holder. If only one person is available, it will take a bit longer. We will come to your place at a time that works for you.

One person from your home will contribute to the house assessment and one will talk with our interviewer about maintenance and improvements and how your house is used. Neither of your household members will be identified in any of our reports. At the completion of the two hour session you will receive a koha for your time ($50 Pak'nSave voucher).

Please either:

- **Drop** your expression of interest into Ruapotaka Marae,
- **Email** the details to Glenda Lock glendal@beaconpathway.co.nz,

or

- **Phone/txt** us and we will organise to pick up the forms – Glenda ph 021 082 13976 or 522 5170

If you have any thoughts, concerns or queries, please phone or email Glenda.

Research funded by BRANZ

Main household contact (must be over 16 year):

Name_____

Address_____

Phone_____ Email_____

Do you own or rent your home? Own / Rent

How many people live in your house?

_____children (16 and under) _____adults

Does your household include people not related to you? Yes / No

---

Please either:

- **Drop** your expression of interest into Ruapotaka Marae,
- **Email** the details to Glenda Lock glendal@beaconpathway.co.nz,

or

- **Phone/txt** us and we will organise to pick up the forms – Glenda ph 021 082 13976 or 522 5170.

If you have any thoughts, concerns or queries, please phone or email Glenda.

8.2 Information sheet

Information sheet

Options for upgrade of private homes in Tamaki

This research aims to improve our understanding of options for upgrading privately owned homes in Tamaki.

Nearly half of Tamaki homes are privately owned and most are not part of the planned regeneration. Many of these homes could be upgraded to make them warmer, drier and healthier to live in, and cheaper to run.

We are talking to homeowners, community members, and local organisations (including Nga Iwi Katoa, the Tamaki Regeneration Company and other local developers) to understand the potential to upgrade these homes.

We'll be combining an assessment of the state of each house, interviewing each homeowner to find out their perspective, and a look at the economics of upgrading the house.

This research aims to develop information to help Tamaki organisations and homeowners make decisions on improving their homes as part of the overall regeneration project.

If you would like more information or have any concerns or comments about the project, please contact:

Glenda Lock
Phone: 09 522 5170
Email: glendal@beaconpathway.co.nz

Research funded by BRANZ

8.3 Consent form

Consent form

Options for upgrade of private homes in Tamaki

Thank you for considering being a part of this research project. You have been invited to participate because you live in a privately owned home in the Tamaki area and your household meets our research criteria which includes talking with people who live in different types of houses and households.

All information you contribute will become part of the overall research and your information will be kept confidential to the research team. Any direct quotes used in public documents will be anonymous to reduce the likelihood of identifying you.

You may withdraw from the research at any time by emailing or phoning Glenda Lock, 09 522 5170 or glendal@beaconpathway.co.nz. Every effort will be made to withdraw any information you have contributed.

Please indicate your willingness to contribute to the research by checking the relevant boxes below:

- ☐ I have read and understood the Information Sheet and have had an opportunity to have my questions answered.
- ☐ I understand that any information I contribute will be confidential to the research team.
- ☐ Information I contribute will become part of the overall research and any direct quotes from me will be anonymous.
- ☐ I understand that I may withdraw from this research at any time and every effort will be made to also withdraw any information I have provided to that date.
- ☐ I am happy to participate in this interview and house assessment.

My name _____

My phone number _____

My email address _____

My signature _____

Date_____

Researcher name _____

Research funded by BRANZ

Creating homes and neighbourhoods that work well into the future and don't cost the Earth

8.4 Household interview guide

8.1 Household interview guide

Introduction: Thanks for agreeing to participate in this research. First of all I need to make sure you understand what the research is about [Give info sheet and talk through].
Do you have any questions on that? [Answer best as possible and refer to emails on info sheet if they want more details]
If that is all ok I need your signature on this consent form and we can get started [Sign consent form]. Thanks!

1. So, tell me how long you have owned this house…

Length of time	Please tick	Length of Time	Please Tick
1-5 months		6-11 months	
12-23 months		Between 2 and 5 years	
Between 5 and 10 years		More than 10 years	

2. And have you lived here all that time?

☐ Yes

☐ No

[If yes, say "so xx years?" and if no, ask "how long have you actually lived here?"]

Enter number of years	

3. Do you have any current plans to move away? Probe for reasons

4. What are the best things about living here? [Allow wide responses e.g. neighbourhood as well as home, but bring back to home/house. Probe for social/cultural, economic, environmental factors as much as house quality, particular facilities in house, local amenities…]

5. And what's not so great about living here? [As above]

6. Tell me more about your house, what condition do you think it's in? [Probe using descriptors and please tick]

   ☐ Excellent [everything in good repair, well maintained, working well – nothing needs doing immediately]

   ☐ Very good [in good condition all round – one or two items needing attention coming up – e.g. need painting in a year or so to keep maintained]

- ☐ Good [sound condition but some minor areas need attention and maintenance e.g. painting needed now, gutters need clearing out, house wash required]
- ☐ OK [areas of maintenance needed and potentially some structural issues e.g. dripping gutters, mould on exterior or minor mould on interior, painting overdue]
- ☐ Poor [some serious maintenance issues and potentially structural issues e.g. extensive mould inside, rotten floorboards, cladding in disrepair, leaky gutters/roof, house on a lean]

7. Can you please tell me a bit about why you chose this description? [Add notes here]

8. Now, tell me a bit about how you use your house…. [Probe: For example, do you heat your home? How? Do you cook at home? Cook outside? Or use non-bedrooms as bedrooms? Other things like this… Add notes here]

9. Do you know when the house was built (or approximately) [Add year] _____

10. In summer, do your living areas overheat?

- ☐ Yes
- ☐ No

11. How much sun comes in through windows in to the house in winter?

- ☐ A lot, most of the day
- ☐ Some, all day
- ☐ Very little
- ☐ Unsure/don't know

12. How do you heat your house?

Primary heating type	Secondary heating (if any)	Other heating type (if any)
☐ No heating ☐ Electric portable heaters ☐ Electric fixed heaters ☐ Heat pump ☐ Heat pump (Energystar) ☐ Night storage ☐ Unflued gas heater ☐ Open fire ☐ Flued gas heater ☐ Enclosed wood burner (modern post 2000) ☐ Enclosed wood burner (older pre 2000) ☐ Pellet fire ☐ Enclosed coal burner ☐ Radiator central heating ☐ Other central heating (specify)_____ ☐ Other (specify)_____	☐ No heating ☐ Electric portable heaters ☐ Electric fixed heaters ☐ Heat pump ☐ Heat pump (Energystar) ☐ Night storage ☐ Unflued gas heater ☐ Open fire ☐ Flued gas heater ☐ Enclosed wood burner (modern post 2000) ☐ Enclosed wood burner (older pre 2000) ☐ Pellet fire ☐ Enclosed coal burner ☐ Radiator central heating ☐ Other central heating (specify)_____ ☐ Other (specify)_____	☐ No heating ☐ Electric portable heaters ☐ Electric fixed heaters ☐ Heat pump ☐ Heat pump (Energystar) ☐ Night storage ☐ Unflued gas heater ☐ Open fire ☐ Flued gas heater ☐ Enclosed wood burner (modern post 2000) ☐ Enclosed wood burner (older pre 2000) ☐ Pellet fire ☐ Enclosed coal burner ☐ Radiator central heating ☐ Other central heating (specify)_____ ☐ Other (specify)_____

13. On winter mornings is there moisture on bedroom windows?

☐ Yes
☐ No

14. Is there any mould or mildew inside the house?

☐ Yes
☐ No

If **YES**, which locations?

☐ Bedrooms
☐ Bathrooms

- ☐ Kitchen
- ☐ Living room
- ☐ Laundry
- ☐ Wardrobes
- ☐ Other _____(please specify)

15. Do you ever dry clothes inside?

- ☐ Yes
- ☐ No

16. Do you use a dehumidifier?

- ☐ Yes
- ☐ No

17. Do you compost or have a worm farm?

- ☐ Compost
- ☐ Worm farm
- ☐ None

18. Is there a dedicated space inside the house for separating and temporarily storing recyclable waste?

- ☐ Yes
- ☐ No

19. Do you have space outdoors to store recyclables before they are collected by Council?

- ☐ Yes
- ☐ No

20. Has anyone in the house had to go to the doctor or to hospital because of health issues that you think could have been prevented if your house was in better condition?

- ☐ Yes
- ☐ No

If yes, what are these issues?

And what changes in your house would make a difference to them?

21. Have you done any work on the house since you have owned it? [Probe against checklist]

Maintenance / Improvements:

- ☐ Painting (external)
- ☐ Painting (internal)
- ☐ Replace / repair wall cladding
- ☐ Re-lined (internal)
- ☐ Added insulation (Roof? Floor? Wall?) [Circle which]
- ☐ Re-roofing
- ☐ Repaired doors/windows
- ☐ Spot repair of leaky roof
- ☐ Fixed gutters / downpipes
- ☐ Repaired plumbing
- ☐ Re-wiring (full or half)
- ☐ Re-piling
- ☐ Fix / replace taps/hardware
- ☐ Repair hot water system
- ☐ Added or repair to space heating system
- ☐ Added rooms / m^2 [How much?]
- ☐ Repaired / removed chimney
- ☐ Treated for borer / pests
- ☐ Kitchen upgrade / repair
- ☐ Bathroom upgrade / repair
- ☐ Other [Note]:

22. Do you plan to do any work in the next 12 months? [probe against checklist]

Maintenance / Improvements:

- ☐ Painting (external)
- ☐ Painting (internal)
- ☐ Replace / repair wall cladding
- ☐ Re-lined (internal)
- ☐ Added Insulation (roof?, Floor? Wall?)(circle which)
- ☐ Re-roofing
- ☐ Repaired doors/windows
- ☐ Spot repair of leaky roof
- ☐ Fixed gutters / downpipes
- ☐ Repaired plumbing
- ☐ Re-wiring (full or half)
- ☐ Re-piling
- ☐ Fix / replace taps/hardware
- ☐ Repair hot water system
- ☐ Added or repair to space heating system
- ☐ Added rooms / m^2 (how much?)
- ☐ Repaired / removed chimney
- ☐ Treated for borer / pests
- ☐ Kitchen upgrade / repair
- ☐ Bathroom upgrade / repair
- ☐ Other (note):

23. What changes to your house would improve your quality of life here? [Inside and out… allow wide responses as before. Probe for social/cultural, economic, environmental as much as house quality, house facilities etc.]

24. What would most help you to achieve these improvements?

Independent advice and information on …..

- ☐ Money / funding
- ☐ Assistance from friends / family
- ☐ Access to a builder/tradesperson
- ☐ Knowing where to start
- ☐ Time to DIY
- ☐ Time to organise/manage tradespeople
- ☐ Other [Note response] _____

25. Thinking of a worst case scenario… if it was just too expensive and difficult to bring your house up to a good standard so that you and your family can have a good life here, what would your preference be?

- ☐ To build a new home on this full site
- ☐ To build a new home on part of this site
- ☐ Move to another community nearby in Auckland
- ☐ Move to another community in another part of Auckland
- ☐ Move out of Auckland
- ☐ Do nothing

26. If this was the case, what is your ability to do any of these?

	Can do	**May be able to do**	**Cannot do**
To build a new home on this full site			
To build a new home on part of this site			
Move to another community nearby in Auckland			
Move to another community in another part of Auckland			
Move out of Auckland			
Do nothing			

[Probe for why and, if moving is the preferred option, then where to?]
Why?

Where?

And finally a bit about you and your household

27. Your gender

- ☐ Male
- ☐ Female

28. Your age [Tick one]

- ☐ 16-19
- ☐ 20-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60-69
- ☐ 70+

29. Who lives here with you? [Tick as many as apply]

Age	**Number in household**	**Relationship(s) to you**
0-4		
5-9		
10-19		
20-29		
30-39		
40-49		
50-59		
60-69		
70+		

30. Is anyone in the house a community services card holder?

- ☐ Yes
- ☐ No

31. Does anyone in the house have respiratory health problem(s)?

- ☐ Yes
- ☐ No

32. Do you own or rent this house?

- ☐ Own
- ☐ Rent

33. Can you please tell us how many people are working or studying in your household?

	Number of people		**Number of people**
Working part time		Studying part time	
Working full time		Studying full time	
Working and studying		More than one job	

34. Can you please tell us what your household income was last year before tax? [Please tick one answer]

- ☐ No income
- ☐ Less than $10, 000
- ☐ $10, 001-$20, 000
- ☐ $20, 001 - $30, 000
- ☐ $30, 001- $40, 000
- ☐ $40, 001 - $50, 000
- ☐ $50, 001 - $60, 000
- ☐ $60, 001 - $70, 000
- ☐ $70, 001 - $80, 000
- ☐ $80 001 - $90, 000
- ☐ $90, 001 - $100, 000
- ☐ $100, 001 - $150, 000
- ☐ $150, 001 - $200, 000
- ☐ More than $200, 000
- ☐ Prefer not to say
- ☐ Don't know

35. Thanks so much for your time… do you have any other comments or thoughts you would like to add?

What happens now is that your information is linked up to that from 15 other local households and we also talk with the Tāmaki Redevelopment Company, local developers and others about what can happen next. We'll invite you to a dinner sometime in the late summer to tell you what we find out too.

Check contact details

We really appreciate you taking time to talk to us in your home today. Thanks again! [Give voucher]

9 Appendix Three: Community investigation

9.1 Consent form

Consent form

Options for upgrade of private homes in Tamaki

Thank you for considering being a part of this research project. Your organisation has been invited to participate because it is involved in housing in Tamaki area, either directly or through other services it provides.

All information you contribute will become part of the overall research and your information will be kept confidential to the research team. Any direct quotes used in public documents will be anonymous to reduce the likelihood of identifying you.

You may withdraw from the research at any time by emailing or phoning Glenda Lock, 09 361 5170 or glendal@beaconpathway.co.nz. Every effort will be made to withdraw any information you have contributed.

Please indicate your willingness to contribute to the research by checking the relevant boxes below:

- ☐ I have had an opportunity to have my questions answered.
- ☐ I understand that any information I contribute will be confidential to the research team.
- ☐ Information I contribute will become part of the overall research and any direct quotes from me will be anonymous.
- ☐ I understand that I may withdraw from this research at any time and every effort will be made to also withdraw any information I have provided to that date.

Name _____

Organisation _____

Phone _____

Email _____

Signature_____Date_____

Researcher name _____

Research funded by BRANZ

Creating homes and neighbourhoods
that work well into the future
and don't cost the Earth

9.2 Interview guide for developer-based organisations

Introduction: Thanks for agreeing to participate in this research. First of all I need to make sure you understand what the research is about and talk to you about what we have found so far. [Give info sheet and talk through].

- Interviewed 12 households and assessed 15 houses
- All households had very strong connections to Tāmaki
- Primary connection was to the place and land, but households had strong connections to their houses and in a number of cases the homes had been lived in across generations.
- Houses were in various levels of condition, but generally were structurally sound
- The financial positions of those interviewed were varied – some felt they had the financial ability to plan whatever they needed to do with their property including subdivision/building, others clearly indicated no financial ability to undertake any repairs or maintenance.

Do you have any questions on that? [Answer best as possible and refer to emails on info sheet if they want more details]

I would like to record this interview, so that I can check back to anything I have missed in my notes. Is that OK? If not, not problem.

Now I need your signature on this consent form and we can get started [Sign consent form]. Thanks!

Your Organisation

1. So, tell me about [your organisation] and their role in housing in Tāmaki?
   - How long have you been working in this area?
   - What do you do?
   - Is it different working in Tāmaki compared to other places? How?
   - [Your organisation's] roles/responsibilities/ability to influence in housing?

2. What housing issues does the local community engage mostly with your organisation about?

3. What are your organisation's aspirations when working in housing in Tāmaki?

Tamaki Community

4. Can you tell me about the Tāmaki community from your organisation's perspective?
   - What do people think about the existing housing?

5. What do people tend to say they like and dislike about living in Tamaki?

6. How are people engaging with the current changes?

Tāmaki Houses

7. Thinking about the housing which is in private ownerships (both owner occupies and private rental), can you describe what sort of condition it is in? Acknowledging the variability, are there some common issues?
   - Do you think there are difference between those owner occupied and those privately rented?

8. From your perspective, what do you think are the most important upgrades that could be done to privately owned homes?

9. Under what circumstances do you think a home should be demolished?

10. Have you been involved in any of the following:
    - buying privately owned homes?
    - moving them on the site?
    - providing improvements to properties neighbouring your developments? If so, what?

And how was this funded?
What was the outcome?

11. What triggers your decision to purchase a privately owned home and relocate, upgrade, or demolish? Does the condition of a house have any impact on your decision to retire it?

12. Who would typically instigate the conversation between developer and home owner?

13. If there were to be some intervention point to upgrade privately owned homes, when do you think that should be? And how?

14. How receptive do you think the community would be to this?

15. What do you think would be the best way to start a conversation with homeowners about this?

16. Who else should we be talking to?

17. Will you make use of the results from this work and how?

Thanks so much for your time… do you have any other comments or thoughts you would like to add?

9.3 Interview guide for community-based organisations

Introduction: Thanks for agreeing to participate in this research. First of all I need to make sure you understand what the research is about and talk to you about what we have found so far. [Give info sheet and talk through].

- Interviewed 12 households and assessed 15 houses
- All households had very strong connections to Tāmaki
- Primary connection was to the place and land, but households had strong connections to their houses and in a number of cases the homes had been lived in across generations.
- Houses were in various levels of condition, but generally were structurally sound
- The financial positions of those interviewed were varied – some felt they had the financial ability to plan whatever they needed to do with their property including subdivision/building, others clearly indicated no financial ability to undertake any repairs or maintenance.

Do you have any questions on that? [Answer best as possible and refer to emails on info sheet if they want more details]

I would like to record this interview, so that I can check back to anything I have missed in my notes. Is that OK? If not, not problem.

Now I need your signature on this consent form and we can get started [Sign consent form]. Thanks!

Your Organisation

1. So, tell me about [your organization] and their role in housing in Tāmaki.
   - How long have you been working in this area?
   - What do you do?
   - [Your organisation's] roles/responsibilities/ability to influence in housing?

2. What housing issues does the local community engage mostly with your organisation about?

3. What are your organisation's aspirations when working in housing in Tamaki?

Tāmaki Community

4. Can you tell me about the Tāmaki community from your organisation's perspective? What do people think about the existing housing?

5. What do people tend to say they like and dislike about living in Tāmaki?

6. How are people engaging with the current changes?

Tāmaki Houses

7. Thinking about the housing which is in private ownerships (both owner occupies and private rental), can you describe what sort of condition it is in? Acknowledging the variability, are there some common issues?

- Do you think there are difference between those owner occupied and those privately rented?

8. What do you think are the most important upgrades that could be done to privately owned homes?

9. If there were to be some intervention point to upgrade privately owned homes, when do you think that should be? And how?

10. How receptive do you think the community would be to this?

11. What do you think would be the best way to start a conversation with people?

12. Who else should we be talking to?

13. Will you make use of the results from this work and how?

Thanks so much for your time… do you have any other comments or thoughts you would like to add?

10 Appendix Four: Economic report

Healthy housing: Retire or upgrade?

NZIER report to Beacon Pathway
March 2016

About NZIER

NZIER is a specialist consulting firm that uses applied economic research and analysis to provide a wide range of strategic advice to clients in the public and private sectors, throughout New Zealand and Australia, and further afield.

NZIER is also known for its long-established Quarterly Survey of Business Opinion and Quarterly Predictions.

Our aim is to be the premier centre of applied economic research in New Zealand. We pride ourselves on our reputation for independence and delivering quality analysis in the right form, and at the right time, for our clients. We ensure quality through teamwork on individual projects, critical review at internal seminars, and by peer review at various stages through a project by a senior staff member otherwise not involved in the project.

Each year NZIER devotes resources to undertake and make freely available economic research and thinking aimed at promoting a better understanding of New Zealand's important economic challenges.

NZIER was established in 1958.

Authorship

This report was prepared at NZIER by Michael Bealing.
It was quality approved by Peter Clough.
The assistance of Glenda Lock and Verney Ryan from Beacon Pathway is gratefully acknowledged.

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Tel +64 4 472 1880 | econ@nzier.org.nz

10.1 Key Points

- This research is one component of a larger investigation looking at options for improving housing within the Tamaki regeneration area.
- Our research focused on the costs and benefits of retrofitting insulation, ventilation (extraction fans) and heat-pumps to improve indoor conditions and lower household expenditure on heating.
- The World Health Organisation (WHO) recommends a minimum indoor temperature of 18 degrees Celsius for healthy households based on a multi-country study (one of which was New Zealand).
- The WHO found that a minimum temperature below 16 degrees Celsius was particularly associated with an increased risk of sickness and premature mortality for children, elderly, the impaired/disabled and those with respiratory conditions such as asthma.
- Cold and damp houses have been linked to an increased incidence of illness in New Zealand.
- Our research focused on two questions:
  - Would retiring the house and rebuilding be more cost effective than retrofitting and upgrading?
  - Do the benefits of upgrades justify the costs?
- We found that the costs and benefits were not substantial enough to consider retiring the house and rebuilding.

However, the health and energy saving benefits from retrofitting insulation, extraction fans and more energy efficient heating outweighed the costs in the long term.

10.2 Scope and methodology

This research is one component of a larger investigation looking at options for improving housing within the Tamaki regeneration area. The aim of the wider project is to improve our understanding of the options for upgrading or retiring privately-owned homes at the neighbourhood level. This report contributes to the wider research, led by Beacon Pathway (henceforth Beacon), by assessing the case for upgrading houses using a cost-benefit analysis framework. The output of this report will be combined with other information to shape the development of a multi-pronged neighbourhood assessment.

The two main research questions considered in this analysis were:

1) Would retiring the house and rebuilding be more cost effective than retrofitting and upgrading?
2) Do the benefits of upgrades justify the costs?

Beacon and NZIER originally intended that the cost-benefit analysis would be detailed and consider a wide range of factors including: health benefits, energy-use, mental health, amenity benefits, environmental benefits and neighbourhood benefits.

However due to the major changes occurring in Tamaki, and community concerns about researching in an already stressed community Beacon had difficulty in recruiting Tamaki home owners and private tenants to be part of the process. The neighbourhoods originally identified for involvement were changed. To fill the required number of assessments several community leaders offered their homes for assessment and from this recruited other local people fitting the case frame. This setback resulted in narrower scope and shorter timeframe available and the economic assessment being more limited than originally anticipated.

10.2.1 Methodology

The economic assessment in this report is focused on the benefits and costs of housing upgrades resulting in health benefits and electricity cost savings. The benefits are considered from the perspective of private households. Specifically we estimate the net benefits from retrofitting insulation (ceiling and under floor), ventilation, and more energy efficient heating. We assessed the benefits in terms of a reduction in days of work due to sickness and electricity cost savings.
NZIER used a cost-benefit analysis (CBA) approach to guide our research and analysis. We used NZIER's ten-step CBA methodology, a proven method for assessing whether the costs outweigh the benefits of interventions. It can be tailored to a wide range of different circumstances and we have applied it over 50 times since 2010. Our ten-step process is summarised in Table 7.

Table 7: NZIER's CBA methodology[3]

Ten-step CBA process
1. Define the problem/opportunity
2. Decide whose benefits and costs count (standing)
3. Select options and specify the baseline (i.e. the 'without') scenario
4. Classify the kinds of benefits and costs and select the measurement indicators
5. Quantify the consequences (via the measurement indicators) over the life of the options
6. Value (attach dollar values to) the benefits and costs
7. Discount future benefits and costs to obtain present values
8. Calculate decision criteria
9. Analyse sensitivity of the results to assumptions
10. Make a recommendation and document the assessment

A social cost benefit analysis methodology was used to assess whether the upgrades would be beneficial. The scope did not allow for the consideration of benefits of public health expenditure or environmental benefits from a reduction in electricity usage.

[3] ***Source: NZIER, primarily based on Boardman et al (2010)***

Our cost-benefit analysis assessed the incremental net-benefit of the proposed intervention compared to the status-quo baseline. In this report we used the national average as our baseline for the number of days off work.
Originally, we hoped that specific household conditions could be used as the baseline. However, the complication experienced by Beacon meant the baselines for specific households could not be established. The use of national averages for baselines could lead to an under estimate of the incremental benefits if the actual baseline is lower than the national average.

In the cost-benefit analysis we used a 30 year time horizon and a 5% discount rate . Our sensitivity analysis considered the impact of higher discounts and a range of scenarios for the reduced number of days off work as a result of improved housing conditions. Our sample in this report consisted of 14 households that was made up of 32 adults and 27 children. Because the sample is small we have not attempted to extrapolate these results over wider population.

10.3 Health and housing

Achieving a healthy indoor environment is all about balancing temperature, the moisture levels in the home (relative humidity) and ventilation. These factors are inter-related as shown in Figure 51. An improvement in one factor can lead to improvements in another factor. For example, damper air is harder to heat than drier air so improving ventilation which leads to drier air can lead to a warmer environment without increasing spending on heating. Thus there are potentially co-benefits generated through a single intervention.

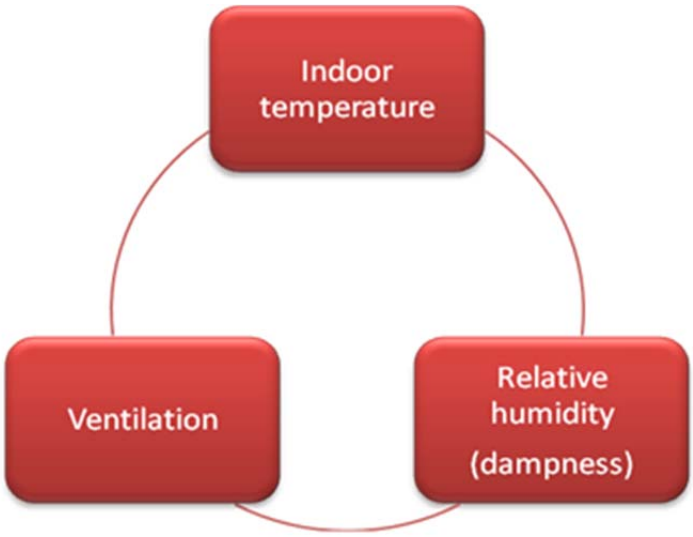

Figure 51:The interrelated factors for healthy housing[4]

[4] ***Source: Beacon 2012***

10.3.1 Indoor temperature

There is a lot of international evidence that shows cold indoor temperature are related to an increased incidence of sickness, particularly during the winter months when the thermal envelope matters more for maintaining a warm indoor temperature relative to outside. Healy (2003) identified colder indoor temperatures, associated with housing quality, as a factor contributing to an increased incidence of winter hospitalisation in southern Europe compared to northern Europe, which has colder winters outdoors. The Marmot Review Team (2011) found the following:

- countries that have more energy efficient housing have lower Excess Winter Deaths (EWDs)
- there is a relationship between EWDs, low thermal efficiency of housing and low indoor temperature
- children living in cold homes are more than twice as likely to suffer from a variety of respiratory problems than children living in warm homes.

In 1987 the World Health Organisation recommended a minimum indoor temperature of 18 degrees Celsius for healthy households based on a multi-country (that included New Zealand) study of the link between housing conditions and health effects. They found that a minimum temperature below 16 degrees Celsius was particularly associated with an increased risk of sickness and premature mortality for children, elderly, the impaired/disabled and those with respiratory conditions such asthma. This increased level of risk led them to recommend a minimum indoor temperature of 18 degrees Celsius and a minimum temperature 2 to 3 degrees higher for the very young, elderly and those with respiratory conditions.

Cold houses have been linked to an increased incidence of illness in New Zealand. Davie et al (2007) found that New Zealand was at the upper end of the spectrum for the incidence of winter hospitalisations when compared to European countries – some of which have much colder winters than New Zealand.

Butler et al (2003) interviewed 1,376 Pacific Island households. About half (53%) reported problems linked to living in a cold house. The study found a statistically significant association between living in a cold house and maternal depression and childhood asthma.

Telfar-Barnard (2009) found that lower average household temperatures were positively related to a higher than expected rate of winter hospitalisations among the very young, elderly generally, but also higher than average for Māori and Pasifika people. Telfar-Barnard also investigated the link between dwelling and increased incidence of hospitalisations. Telfar-Barnard also found that living in old villas and bungalows were linked to an increased incidence of hospitalisations during winter.

10.3.2 Dampness and ventilation

Keall et al (2012) investigated the link between damp houses in New Zealand and the risk of respiratory illness among adults and children. They found evidence that linked housing conditions where dampness and mould were present with increased odds of those housing inhabitants experiencing respiratory illness symptoms. They recommended that a standardised household assessment framework be developed to inform decisions about improving housing quality.

10.3.3 The evidence: insulation delivers economic benefits in New Zealand

Howden-Chapman et al (2007) surveyed 1,350 households in seven low income communities in Zealand that lived in houses that were retrofitted with insulation. They found the participants experienced several interrelated benefits after the insulation was retrofitted. These included a 20% decrease in heating energy consumption, an average 0.5 degree Celsius increase in bedroom temperature and 2.3% decrease in bedroom dampness. This implies the environment was healthier and cost the household less to heat. Which means the cost-savings for heat retention can be reallocated to other needs. This benefit could be important for low income households.

While fuel poverty is not the focus of this report it is an internationally recognised factor that can shape the outcomes in the most deprived households, especially if the decision is to heat or eat. For more discussion and a broad review of housing and fuel poverty see the Marmot Review Team's 2011 report "The Health Impacts of Cold Homes and Fuel Poverty".

Howden-Chapman et al also identified a range of improved health and social outcomes from retrofitting insulation in addition to the direct improvement of indoor conditions in these households. These included:

- a 50% decrease in the risk of poor health
- a 43% decrease in the wheezing
- a 51% decrease in children taking a day off school
- a 38% reduction in reports of adults taking a day off work
- visits to general practitioners were less often reported by occupants of insulated homes.

Howden-Chapman et al's work included a basic cost-benefit analysis of the insulation retrofit. They estimated a benefit-cost ratio of 2 over a 30 year period. This indicates the benefits are twice as large as the cost and the investment is net beneficial for the household.

Telfar-Barnard et al (2011) estimated the overall value of the benefit of retrofitting ceiling and under floor insulation to be $563 per household for those over 65 years old. The benefits included a decrease in the following:

- hospitalisations
- pharmacy costs
- asthma costs
- heating expenditure
- life years lost.

The benefits from a life year saved were the largest proportion of the benefits. They were estimated to be $440 per household per year.

10.3.4 Energy cost savings

Improving insulation, ventilation, and heating systems can lead to energy cost savings for households. Grimes et al (2011) evaluated the changes in metered energy use from the Warm-up New Zealand programme. They found the metered energy savings for houses with retrofitted ceiling and under floor insulation were quite small but statistically significant. The energy cost savings were 1% annually when compared against total energy use, however this is equivalent to a cost saving of about 6% of electricity used specifically for heating.

A recent comparison of home heating cost published by Consumer (Figure 52) shows there is a significant variation in home heating running costs across a range of heating systems. Heat pumps are much more energy efficient and cost effective than other electric options. The midpoint cost for a heat pump is around 8 cents per kWh. Plug-in electric heaters have a much wider cost range and the midpoint cost is approximately 26 cents per kWh. This implies that installing a heat pump in retrofitted houses could reduce heating expenditure at the midpoint by 69%. That represents an estimated annual cost saving benefit of $231 annually based on average weekly expenditure on electricity overall and the proportion of electricity used for specifically heating estimated by Grimes et al (2011).

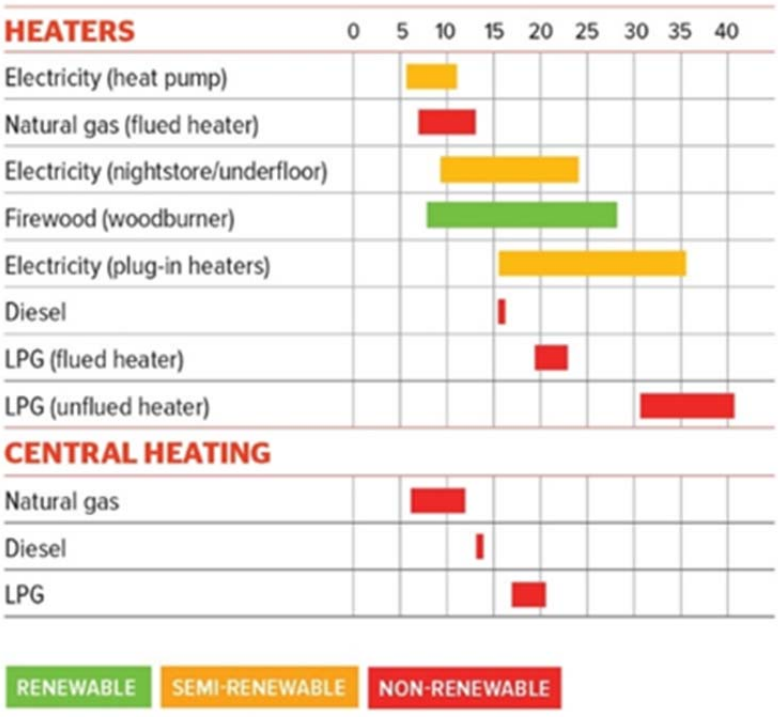

Figure 52: Home heating cost comparison[5]

[5] *Source: Consumer*

Based on the literature we have established that housing conditions in New Zealand and overseas are contributing factor in health and wellbeing. The literature also demonstrates that improvements to insulation, ventilation and heating solutions can led to improved health and energy efficiency outcomes. In the next section we estimate the net benefits of retrofitting upgrades for the sample of household assessed by Beacon.

10.4 Indicative costs and benefits

The limitations of the data available and our small sample of households means the estimates of benefits should be treated as indicative but conservative estimates. For example, evidence from the literature indicates benefits for people with asthma. There may be some individuals who suffer with asthma within our sample, but the number of cases is unknown.

The cost and benefits were limited to those associated with health benefits or electricity cost savings benefits. We look at the costs and benefits from the perspective of the whole sample/community. This is intended to provide a sense of the scale of the costs and benefits at the two different levels.

10.4.1 Costs

Our analysis considered a subset of retrofit activities compared to the total activities suggested by the Beacon household assessments. Our analysis represents 39% of the total repair and retrofit activities suggested by Beacon. Some of the costs excluded from our analysis were the following:

- internal and external painting
- repairs to glazing, roofs and foundations
- cleaning and removal of mould
- repairs to guttering and drainage
- cladding repairs
- replacing wiring.

These elements will have benefits but they are difficult to quantify within the scope of our analysis.

The costs that we considered are shown in Table 8. We have assumed that a heat pump will need replacing in year 15.

Table 8: Costs of upgrades [6]

Cost of item	Community costs
Ceiling insulation	$20,000
Under floor insulation	$43,375
Heat pump	$41,500
Replacement heat pump in year 15	$41,500
Extract fans in the kitchen and bathroom	9,500
Curtains	$9,000
Clothes dryer vent	$2,400

The total costs of these upgrades implies that it is highly unlikely that rebuilding would deliver greater net benefits than upgrading.

10.4.2 Benefits

We have identified a range of potential health and energy saving benefits based on the preceding literature survey. This provides an approach to apply the identified potential benefits for households in the sample.

Reduced days of work

For adults, the value of an avoided day off due to illness related to housing conditions was estimated based on the average daily take home pay for these households. This approach was used by Holt (2010) to estimate the national cost of illness. For children we assumed the cost of illness was 50% higher than adults. This is intended to reflect that cost of days when children are sick can be higher due to the disruption to parental work days. The cost of illness of those over 65 years was assumed to be $563 annually (Telfar-Barnard et al 2011).

According to the Wellness in the Workplace Report (Southern Cross and Business New Zealand, 2015) the average number of days off work annually is 4.7. We assumed that the combination of housing upgrades would reduce the average number of sick days by 2 per year for adults and children. This a slightly more conservation assumption than the 50% reduction implied by Howden-Chapman et al (2007). We also estimated the scenario for 1.5 and 2.5 days off work per person to provide some sense of how the net present values vary with the reduction in days off work.

Energy savings from heating upgrades, insulation and ventilation upgrades

Based on Grimes et al (2011) we assumed the electricity savings from insulation were 1% of annual total electricity expenditure. We estimated this to be an annual cost saving of $21 per household. We assumed that the benefits for ventilation upgrades such as installing extraction

[6] *Source: NZIER based on Beacon's household assessments*

fans were the same as the benefits from insulation. We found that cost saving from upgrading to a heat pump was $231 per household annually compared to plug-in electric heaters.

10.4.3 10.3.3 Results

Our analysis of incremental costs and benefits of specific housing upgrades showed that in all scenarios the net present values (NPVs) of the benefits were positive over a 30 year time horizon (see Table 9). However it takes some time for the benefits to be realised. Figure 53 shows how the cumulative net benefits in present value terms develop over the course of the 30 year period. The break-even years are identified by the lines crossing the axis. Under the 1.5 fewer sick days scenario the net benefits cover the cost in year 13. In the 2 day and 2.5 day scenarios the benefits exceed the costs in years 7 and 9, respectively.

Table 9: Overall results[7]

Scenario	NPV (30 years)	Benefit-cost ratio
1.5 fewer days off annually per person	$73,250	1.6
2 fewer days off annually per person	$124,210	2.0
2.5 fewer days off annually per person	$175,170	2.4

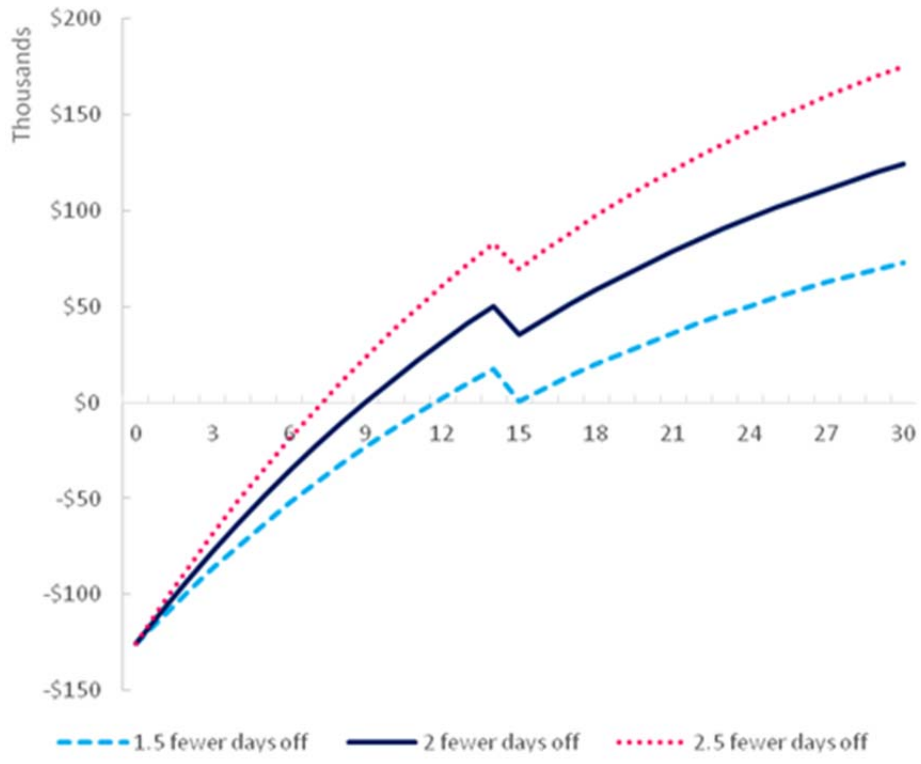

Figure 53: How the NPVs of the upgrade develop over time[8]

The horizontal axis is the number of years. The vertical axis is benefits net of costs.

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[7] *Source: NZIER*

[8] *Source: NZIER*

Increasing the discount rate from 5% to 7.5% (a 50% increase) still results in a positive net present value for all three scenarios. This is a clear indication that the results are not driven by the discount rate. The effect of increasing the discounts is a lower NPV and results later breakeven point in all three scenarios.

The overall results indicate that the benefits of upgrades that improve health conditions and reduce electricity use for heating are justified. The costs and benefits were not substantial enough to consider retiring the house and rebuilding. Overall the health and energy saving benefits from retrofitting insulation, extraction fans and more energy efficient heating outweigh the costs in the long term.

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11 Appendix Five: Descriptions of contributing organisations

Beacon Pathway: Beacon Pathway is an Incorporated Society committed to transforming New Zealand's homes and neighbourhoods through research and demonstration projects that show how to make neighbourhoods and homes more resource efficient, healthier to live in, adaptable, resilient and affordable.

www.beaconpathway.co.nz

Nga Iwi Kainga (formerly known as Nga Iwi Katoa) – is a collective of Tāmaki organisations and individuals working together to ensure that the existing residents and communities are properly represented in the proposed Tāmaki redevelopments. Formed in 2010, the organisation changed names from Nga Iwi Katoa in 2015. The network includes a broad range of representation, history, culture, knowledge, skills and experience, and believes that stable healthy homes (including affordable, appropriate and sustainable housing) provide the basis for a better and more prosperous life for whānau and for communities. Their vision (te raurangi) is

Tamaki is the community of choice for people who live here now and in the future.

Tāmaki Redevelopment Company – was set up in 2012 and is jointly owned by the New Zealand Government and Auckland Council. Tāmaki Redevelopment Company (TRC) Statement of Intent, 2013 identifies four regeneration objectives captured in the Tāmaki Heads of Agreement that was signed by the Crown and Council on 24 July 2012:

1) Social: Supporting Tāmaki residents and families to get the skills, knowledge and employment opportunities to progress in their lives;
2) Economic: Strengthening the local economy and unlocking the potential of the Tāmaki area to enable a prosperous community and deliver better value for money to the Crown (with a focus on increasing the return on investment and realising the potential value from state and council- owned housing);
3) Spatial: Creating safe and connected neighbourhoods that support the social and economic development of Tāmaki and its community; and
4) Housing resources: Optimising the use of land and existing housing stock to effectively support and deliver social and economic results, including progressing private housing development and better public housing options for Tāmaki.

TRC works in partnership with local residents and businesses, mana whenua, local and central government agencies, the Maungakiekie Tāmaki and Orakei Local Boards, local service providers, the community and the private sector to provide a platform for

successful regeneration of Tāmaki. From 1 April 2016, Housing New Zealand assets and tenancies in the Tāmaki regeneration area will be transferred to TRC.

www.tāmakiregeneration.co.nz/

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