

SEISMIC MITIGATION – A CASE COMPARISON OF THREE COMMUNITIES IN NEW ZEALAND

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ABSTRACT

The Christchurch earthquake of 2011 resulted in a Royal Commission of Inquiry and a government led review of the legislation in New Zealand relating to the earthquake safety of buildings. This review culminated in the passing of the Building (Earthquake-prone Buildings) Amendment Act in 2016. This Act requires the mandatory upgrade or demolition of earthquake-prone buildings and has the potential to have significant impacts on not only individual owners but also on communities. In order to understand these community impacts a case study approach has been taken that looks at the three separate communities of Waimate, Timaru and Wellington. The experiences and responses of these communities to both the Christchurch earthquakes and the resultant legislative changes are examined in this paper using a mixture of document analysis and stakeholder interviews. Both negative and positive impacts are identified and analysed and their implications are discussed in this paper.

Keywords: earthquake mitigation, community impacts

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INTRODUCTION

The Christchurch earthquakes of 2011 resulted in a Royal Commission of Inquiry whose findings were critical of the performance of local authorities in terms of their implementation of seismic mitigation. As a result, the New Zealand Government reviewed the existing legislation and eventually passed the Building (Earthquake-prone Buildings) Amendment Act 2016. This Act requires the mandatory seismic mitigation of all buildings in New Zealand that are deemed to be “earthquake-prone” as per the definition in the legislation. Earthquake-prone buildings can be described as those buildings with a structural strength that is less than one third that of an equivalent building constructed to New Building Standard (NBS). Seismic mitigation under the Act can be achieved by either strengthening the building to a level greater than 33.33% of NBS or alternatively by demolishing the building or parts of the building deemed to be earthquake-prone.

This new legislation was a major change from the existing legislation which had required all local authorities in New Zealand to have a policy that set out how the local authority was going to manage the earthquake prone building problem in their jurisdiction. However, while the legislation required that a policy be prepared it was left up to the local authorities to decide what form that these policies would take. As a result, different communities responded to the problem in different ways depending on how they assessed the benefits and costs of seismic mitigation for their particular local area. This lack of uniform approach was criticised by Royal Commission and the NZ Government responded to this criticism by introducing new legislation that would force all local authorities to implement a seismic mitigation policy that was standard across the country.

As set out in the First Reading of the Bill this policy was described by the government as a “Nationally Consistent” approach which would shorten the time that would be taken to achieve seismic mitigation. The policy was also described as a one-size-fits-all approach and it was met with substantial opposition and criticism. Opponents of the Bill were concerned that the new proposed regime allowed for no recognition of regional differences and did not have the same flexibility provided for by the existing legislation which allowed for appropriate local solutions to seismic mitigation. They criticised the Bill for being both inequitable and

economically inefficient on account of it failing to recognise the different risk profiles of the various local authority areas or their different economic and demographic makeup.

In response to this opposition the Government ameliorated the one-size fits all approach to an approach that they described as a “risk based approach”. Under this approach the country is divided into three risk categories being “High”, “Medium” and “Low”. Once a building has been identified as earthquake-prone a building owner then has either 15, 25, or 35 years to achieve seismic mitigation with the shorter time frames applying in high risk zones and longer time frames applying in low risk zones. However, the standard time frames do not apply to those buildings defined as being “priority” buildings. Where these priority buildings are located in either a high risk or medium risk area then their allowable time frames are halved. There are three categories of buildings that may be designated as priority buildings. The first of these are particular building types specified in the Act. These are mostly buildings required for post disaster civil defence such as hospitals. The second category are those buildings located on identified strategic transport routes whose collapse in an earthquake may block those transport routes. The third category is those buildings located on busy thoroughfares where the collapse of the buildings in an earthquake would endanger pedestrians or other users of the street.

The need for seismic mitigation is also triggered by the owner carrying out a “change of use” of the buildings or by carrying out “substantial alterations”. Both of these circumstances are defined in the Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005 with substantial alterations defined as alterations whose value exceeds 25% of the value of the existing building.

One of the goals of the government is also to use market pressure to reinforce and accelerate the changes required by legislation. As part of this strategy a new publicly available National Register of earthquake-prone buildings has been established and owners of earthquake-prone buildings must display notices in a public area of their building to better inform the occupants of buildings that they are earthquake-prone. There has already been evidence of significant market response as the various real estate markets around the country have reacted to the what was dubbed the “Christchurch effect” (Brewdant, 2012). The market responses however are far from uniform. This is not surprising as the different markets show huge variation in rent levels, ownership characteristics, property type and land values. It is therefore dangerous to generalise about property market impacts and owners responses. For example, impacts on the Wellington CBD where the dominant property type is high rise office buildings owned or occupied by corporate and government tenants should not be extrapolated to provincial New Zealand.

The building owner caught by the new legislation has effectively two main options which are to either strengthen or demolish their buildings with the allowable time limits. Which of these options will be chosen by the owner will depend on their specific resources and their particular attitude, values and objectives as explained by Nahkies (2015) and Egbelakin et al (2011). While these decisions are made at an individual level their impacts when aggregated can be significant for communities.

Of major concern to communities is the proportion and type of earthquake prone buildings that are present in their towns and cities and particularly the number of earthquake-prone buildings that will be demolished as opposed to being strengthened. If large numbers of buildings are demolished then effectively it will be like “having an earthquake without the earthquake” as was stated by the Waitaki District Council chief executive Michael Ross. Clearly in the event of a ‘regulatory earthquake’ of the type feared by Ross there will not be any loss of life or injury as would occur in a severe physical earthquake. However, the financial impacts on owners and communities are likely to be more damaging than a physical earthquake as there will not be any insurance money to fund any rebuild. The impacts on land use, heritage and local economies and communities may be significant.

It has been noted by the economist Shamubeel Eaqub that many of the provincial towns in New Zealand have been struggling with a declining and ageing population and limited economic growth. He somewhat controversially described such towns as “zombie towns” and created considerable debate around the identity

and future of such towns in New Zealand. The problem has been recognised by Government in terms of commissioning research into the problem as part of one of the designated “National Science Challenges”. It has also been the political justification for the setting up of the \$3 billion “Provincial Growth Fund” by the current government as a tool to ‘reboot’ the provinces by giving government grants to applicants in order to boost economic development.

METHODOLOGY

The intention of this paper is to frame the problem of seismic mitigation as that of a land economics issue. As such the importance of location cannot be ignored and in order to test the importance of location three different towns and cities were chosen for in depth analysis in the form of three separate case studies. A case study has been defined by Yin as an empirical method that investigates a contemporary phenomenon (“the case”) in depth and within its real-world context (Yin, 2018). A case study approach has been used in order to help identify if there were any different challenges faced by different communities and different responses by these communities to the problem of simultaneously satisficing the goals of heritage conservation and seismic safety.

The choice of which three towns to study was based on a desire to have a range of population sizes while also choosing towns and cities which contain a significant number of earthquake-prone heritage buildings. The city of Wellington and the provincial towns of Waimate and Timaru were ultimately chosen for analysis although there were many potential ‘candidates’ in New Zealand that would have been suitable. Document analysis of submissions to the Royal Commission, Parliamentary Select Committees and media content identified a number of potentially good candidates for analysis including the three ultimately chosen.

Concerns about the impacts of the proposed legislation had encouraged a consortium of southern TLAs to jointly fund research and make a substantial submission to the MBIE Review and Select Committee hearings. This consortium included both Waimate and Timaru. Wellington was also prominently involved in giving evidence and making submissions. It was also considered a good choice due to the fact that of all the TLAs in New Zealand it has historically been the most pro-active in grappling with the problem of seismic mitigation.

Research on the three case studies began in 2012 and continues up to the present time. This long time period has been useful and necessary as the legislative, political and economic environment has changed significantly over this time period resulting in various impacts and responses from the communities being studied.

As an aid to the case studies interviews were also undertaken with a range of stakeholders in the three communities under study including real estate agents, valuers, engineers, architects, building owners, and relevant Council staff. This was done to complement information gained from document analysis and other data sources.

A summary of the case study findings for each of the three selected communities are presented below:

Waimate – A Case Study of a Small Provincial Town

Waimate is an example of a ‘typical’ small provincial town in regional New Zealand where property values, rents, and demand for new development are all low. Waimate is located in South Canterbury, in the South Island of New Zealand. The population in the Waimate urban area was assessed as 3285 at the 2013 census and 3,456 at the 2018 census. While this growth is minimal it is positive and reverses the trend of population decline that occurred between 2996 and 2013. Early settlement in Waimate occurred in the 1870’s and was based around the saw milling industry which utilised the nearby native forest and supplied the growing towns of Timaru and Oamaru. Over time the economy diversified into that of a typical provincial rural service town similar to many scattered throughout New Zealand.

The town suffered an economic downturn in the 1980's with the closure of the dairy factory and a number of sawmills. Recovery from this down turn has been slow and patchy with other economic setbacks occurring such as the closure of two furniture manufacturers and a vegetable processing plant early this century. Waimate also suffers somewhat from being located on Highway 77 which is a comparatively minor road that runs inland off State Highway 1. As such it is not on any of the major tourist trails and this has made it more difficult for the town to benefit from both domestic and overseas tourism. However, there has been some recovery over the last 10 years as the local dairy farming industry has increased in significance and two major dairy factories have been opened nearby.

Waimate enjoyed early prosperity but this was followed by a long period of limited economic growth. As a result, there has been limited development of new commercial buildings in Waimate over the last 50 years and Queen Street which is the main street of Waimate is still largely original in terms of its building stock and architectural appearance. This gives Queen Street a distinct Victorian and Edwardian ambience that is valued by most residents and tourists alike. A "Historic Walk" brochure published by the Waimate Information Centre describes 37 historical items or buildings, many of them located in Queen Street.

A legacy of the comparatively prosperous early history of Waimate is not just a collection of heritage buildings but also a significant number of substantial unreinforced masonry buildings that line Queen Street and adjoining streets. As required by the 2004 Building Act the Waimate District Council prepared "The Waimate Earthquake-prone, Dangerous and Insanitary Buildings Policy" which was formally adopted by the Council on 19th September 2006. The policy was reviewed in 2012 with the original policy left unchanged but with a proviso that it would be reviewed again after the findings of the Royal Commission became public along. This review was not undertaken as it was deemed prudent to wait until the new legislation signalled by the government in 2013 was finalised and introduced.

The Waimate Earthquake-prone Buildings policy was an example of what was known as a "passive" approach where seismic assessments and structural upgrades were only triggered by an application for a change of use. The Council could also assess a building if application was made for building alterations, extension of life or if a complaint was received.

A feature of the Waimate Policy was that once identified as an earthquake-prone building the upgrade time frame varied from 15 to 25 years depending on the existing strength of the building. Weaker buildings below 20% of New Building Standard (NBS) were given 15 years while those that were 25-32% of NBS had 25 years to carry out the strengthening work.

Due to the passive approach taken by the Council towards earthquake prone buildings and the limited economic growth occurring in the town there had been little activity in the form of either seismic strengthening or demolition and redevelopment. At the time of the Christchurch earthquakes only one shop had had some structural strengthening carried out.

The government's initial proposal to introduce mandatory strengthening as part of the "one size fits all" approach would therefore have been a significant change impacting on the property market and land use in Waimate. Under this scenario owners would have had a maximum of 15 years to earthquake strengthen or demolish their buildings once they had been assessed. The assessments had a maximum time frame of 5 years to be completed thus giving a combined maximum time frame of 20 years to strengthen or demolish.

With the changes to the legislation based around seismic risk Waimate is now defined as a low risk area and building owners therefore have 35 years to strengthen their buildings once the Council has completed their assessments. This assessment process has not been started and may take up to another 15 years giving a potential time frame of 50 years. The Council had not previously attempted to carry out any identification process of earthquake-prone buildings under their own policy and have no immediate plans to carry out any seismic assessment of the building stock in Waimate. (Cooper, 2019).

Despite the long statutory timeframes, building owners may decide to voluntarily undertake seismic mitigation earlier than the required deadlines imposed by the legislation. Alternatively, the need for seismic mitigation may be triggered by the owner carrying out a “change of use” or “substantial alterations”.

Clearly, the extent to which building owners choose the option to demolish rather than retrofit will potentially be affected by the impact of heritage protection on their buildings. The current Waimate District Plan recognises the amenity and heritage value of the existing building stock and street scene. It seeks to maintain this by the use of heritage protection rules. There are also building design controls over new and existing non-heritage buildings which were introduced in response to some of the more recent developments which were unsympathetic to the streetscape.

Section 8 of the current District Plan deals specifically with heritage protection. Under this section heritage items are identified in the District Plan as either Category A, B or C. The demolition or removal of a Category A item is a Non-complying Activity. For Category B items any demolition, removal, alteration or addition is a Discretionary Activity. For Category C items demolition or removal is a permitted activity while alterations or additions are a controlled activity.

This means that effectively there is no legal impediment to an owner demolishing a category C building. There is a requirement to delay any demolition for 3 months to allow a chance for alternatives to be explored. Photographs must also be taken.

There are a total of 135 heritage items listed in the District Plan. Of these 23 (17%) are Category A, 22 (16%) are Category B and 90 (67%) are Category C. Within the Waimate CBD there are 46 listed buildings. One building is Category A (2%), two are Category B (4%) and the other 43 (94%) are Category C. Thus, the great majority of heritage buildings in the Waimate CBD can be demolished as of right and have little effective protection. Thus, the decisions of the owners in Waimate over whether to demolish or strengthen are expected to hinge around the economic impacts of the mandatory earthquake strengthening requirements unfettered by the current heritage protection rules.

The likely economic impacts of mandatory earthquake strengthening were explored by Nahkies who carried out financial modelling utilizing Rating Valuations and Land Use Data. His analysis indicated that due to the low rents and property values prevalent in Waimate that there was a significant economic impediment to earthquake strengthening and based on purely economic grounds the option of demolition was the more likely form of seismic mitigation (Nahkies, 2014).

This has proven to be the case as six heritage listed buildings on Queen Street have either been demolished or are scheduled for demolition. The catalyst for these demolitions is local entrepreneur and philanthropist Gary Rooney who contributed significantly to the building of the Waimate Event Centre which was completed in 2018. Rooney has recently purchased a number of Waimate properties with a view to demolition and redevelopment.

One of these properties was a large two-storey Category C heritage building at 84 Queen Street. This building was demolished and replaced with a new medical centre with ambulance bay and pharmacy. The medical centre is a single storey modern building designed to reflect the existing streetscape and has been praised by the mayor in the media as “looking fantastic”. Rooney has also purchased the Waimate Hotel which is a Category B Building which he plans to retain and convert to a restaurant. As part of his plans for this building he has also purchased two adjoining buildings which he is planning to demolish to create an outdoor dining area.

In August 2018 Rooney also received permission from the Council to demolish three Category C heritage buildings in the middle of the main street. These buildings adjoin each other and also adjoins the old Post Office Building which is a category B heritage building which is also owned by Rooney. The redevelopment plans for these sites post demolition are unknown but the Mayor has stated in the media that any future

development would be “in keeping with the main street’s streetscape” and the Council Regulatory Manager also stated that the Medical Centre “was a good indicator of what was likely to happen” in terms of design.

The planned demolitions appear to have attracted little criticism or opposition from the community or the Council. They have been widely reported in the local media (Williams, 2018) and have received considerable political support from the Waimate Mayor, Craig Rowley, who has described the demolition and redevelopment plans in the media as “a most wonderful opportunity for Waimate” and “I think a lot of this is just Mr Rooney giving back to Waimate again. It’s absolutely fantastic. This actually tied in very, very nicely with our theme of rejuvenation of the main street.” Strong support from the demolition also came from Councillor Tom O’Connor who was reported in the media as praising the demolition and saying the town should not be turned into a museum. (Littlewood, 2018).

However, there has been some positive heritage outcomes in Waimate in relation to the iconic Waimate heritage building known as Quinn’s Arcade. This building had been purchased in 2007 by a community group called Pro-ject Waimate who had the intention of saving and restoring the building. They struggled with the task of finding a viable use and funding what was reportedly a \$3.6m project. Attempts to have the Council commit to using the building as a new library and learning hub failed in 2017 and the building was facing an uncertain future. However, Rooney purchased the property in December 2018 which was sold by Pro-ject Waimate on the condition that it was retained and restored. No plans have been announced as to what use will be made of the building which was built in 1907 as a shopping arcade before being converted to a theatre and billiard parlour in 1920. It has an A classification in the District Plan and is a Category II on the Heritage New Zealand Register.

Timaru – A Case Study of a Large Provincial Town

Timaru is an example of a large provincial town typical of many such towns around New Zealand. The population of the city was 26262 at the 2013 census and 27501 at the 2018 census showing minimal growth. Despite this minimal growth the town cannot be classified as a zombie town as it has a number of vibrant and successful industries and is an important service centre for a generally prosperous agricultural hinterland. Being located on State Highway 1 it has the advantage of being well located regarding the tourist trail to the bottom of the South Island including Oamaru, Dunedin and Stewart Island.

The CBD in Timaru is traditionally based around the area of Commercial 1 zoned land in the town. This zoning promotes retail and office use with an emphasis on maintaining an ‘active’ street frontage with no gaps. At the core the Commercial 1 land is the main street of Timaru known as Stafford Street. Despite the good health of the local economy parts of the CBD are struggling economically and trends like e-commerce are limiting demand for traditional retail space. Locational changes within the city brought about by the creation of a by-pass and establishment of big box retailing has also seen the flight of commercial activity to areas outside the traditional main street precinct. The leakage of retail activity to areas outside the city remain a threat to the vitality of the traditional CBD area which is already showing signs of decline. In particular the southern end of the CBD is suffering from high vacancies and deteriorating buildings.

Timaru District Council is currently reviewing their district plan and running parallel to the district plan review has been a “District Town Centres Study.” This study was commissioned partly in response to concerns about the future economic viability and health of the existing town centres. A report was prepared by the Council which identified the issues and options regarding each of the four town centres within the Timaru District Council area. The report was made public in February 2017 and has been used initially as a supporting document for a targeted consultation programme currently underway with the Timaru CBD stakeholders

Opportunities identified in the Town Centre Report include getting residential uses into the town centres although the current policy relating to car parking is seen as an impediment to residential conversions. Problems with urban decline were identified with parts of the Timaru CBD and in particular the southern end

of Stafford Street. Considering is being given to rezoning parts of the CBD in order to reduce and to consolidate the Commercial 1 (retail) area. The report also identified earthquake-prone buildings as being a challenge along with the age and condition of the building stock in general. Like Waimate, Timaru also has a CBD that has seen limited redevelopment over the years and has a large proportion of URM buildings in the CBD that are highly likely to be identified as earthquake-prone.

Timaru adopted their Earthquake-prone Buildings Policy as required under the 2004 Building Act in October 2006. The policy adopted was a 'passive' policy as it was considered that such a policy was an acceptable approach to "reduce risk over time but in a way that is acceptable to its ratepayers in terms of the key well-beings; economic, social, environmental and cultural".

Being a passive approach there was no attempt made by the Council to conduct an assessment of the building stock to identify potential earthquake-prone buildings. However, an assessment was required when the following occurred:

- Alterations to the buildings where the cost of the building work is greater than 25% of the "Value of Improvements" appearing on the District Valuation Roll. This threshold was increased to 30% for heritage buildings and notably expenditure on specified systems and disability upgrades was excluded from the calculation.
- Change of use of the building
- Complaints about the building

Once identified as earthquake-prone the owner then had 15 years to undertake strengthening work. Council would engage in discussions with the owner to arrive at a formal proposal for seismic mitigation. If such discussions were not fruitful then a formal notice would be served on the owner under section 124 of the Building Act. The Council kept a register of all earth-quake-prone buildings and made a note on LIMs.

This policy was due for review in 2011 but like many TLAs this review was postponed in anticipation of changes to the legislation post the Christchurch earthquakes.

Currently work is being done by the Council to identify the numbers and types of earthquake-prone buildings as part of a "Stronger Timaru" programme which was announced in February 2018. The Council has stated that they have no "no idea how many structures were likely to be earth-quake-prone" but that it is a 20 year programme. As well as many buildings located in the CBD there is also likely to be a significant number of large brick houses that have been converted into multi-unit dwellings that will be caught by the legislation.

As part of the Stronger Timaru Programme a new rates remission policy targeting earthquake-prone buildings has been developed. This policy will see owners of earthquake-prone buildings receiving up to a 25% reduction in their general rate for a maximum of 2 years. The proposal is to assist people who cannot occupy their building during strengthening work and does not apply to people who are still able to generate income from their building during that time. More generous incentive programmes are unlikely as the Council is focussing on funding the strengthening or replacement of their own buildings first. These include the Temuka Library, Caroline Bay Soundshell, and Timaru Museum.

Timaru is located in a medium risk area and as such the time frames for carrying out seismic assessments and subsequent mitigation work are 5 years and 25 years respectively. However, for many of the buildings in Timaru the time frames will be half that as they have been identified as "priority buildings". As required by the legislation a "Special Consultation Process was undertaken by the Timaru District Council in order to set those streets or parts of streets that were strategic routes and/or busy thoroughfares. The outcome of this consultation was to effectively designate the majority of earthquake-prone buildings in the CBD as "priority buildings".

Many of these priority buildings are also heritage buildings which raises substantial fears that large numbers of heritage buildings will be demolished and destroy the "character" of the town centre. In order to prevent a

loss of heritage buildings the old earthquake-prone building policy had taken a 'lenient' approach to heritage buildings. In terms of earthquake strengthening, there was no set time limit for heritage buildings and it was left up to the owner and the Council to negotiate time frames after consultation.

There is a list of heritage buildings in the 2005 Operative District Plan with heritage buildings given either an A or B classification depending on their assessed heritage value. Under the current Timaru District Plan there are a total of 12 Category A and 117 Category B listed heritage items. The rules relating to heritage are contained in Part D Section 6.12 of the 2005 Operative District Plan. The rules provide that for Category A items demolition is a non-complying activity while for Category B demolition is a discretionary activity.

As a regulatory incentive otherwise non-complying activities for a zone are considered as discretionary activities. Non regulatory incentives for heritage buildings are the waiving of resource consent fees where the consent is for something considered sympathetic to the retention of the building. In addition, there is a small "Heritage Incentive Fund" which makes grants that are typically no more than \$5,000 dollars.

As part of the District Plan Review a Discussion Document on "Heritage Issues" was released on the 5th November 2016. Community feedback to this document was generally positive in terms of heritage protection and conservation but concerns were raised about the financial impacts on owners.

Since then there has been a well publicised resource consent hearing case involving a local heritage landmark known as the Hydro Grand Hotel. Permission was granted for the demolition of this category B building by the Hearing Commissioner on the 21 April 2017. This decision was not without controversy particularly when the Town Centres Report had identified heritage buildings and the ambience they provided as a potential strength of the town centre that needed to be better utilized. The site of the heritage listed Hydro Grand Hotel was even singled out as a key strategic site in the report. Based on the decision to allow demolition of the Hydro Grand it would appear that many of the earthquake-prone heritage buildings in Timaru will be in danger of demolition particularly if better utilization is not made of the vacant space that is characteristic of many of these buildings.

Wellington – A Case Study of a Large Metropolitan City

Wellington is the capital city of New Zealand and had a population of 190,065 in 2013 within the Wellington City Council TLA area. It differs significantly from Waimate and Timaru as it is significantly larger and has a more robust and diversified economy that supports a large and growing CBD. Demand in the CBD has created opportunities for both new developments and the retrofitting of existing properties.

Wellington out of all the Territorial Authorities in New Zealand has probably been the most pro-active in terms of promoting seismic mitigation over the last 50 years. Unlike both Waimate and Timaru, Wellington has long pursued an 'active' policy of encouraging seismic mitigation under the old legislation rather than a passive approach. This is not surprising given that Wellington has experienced a number of significant earthquakes in the past and is known as having a high seismic risk that makes the city vulnerable to suffering a severe earthquake with potentially catastrophic results. Unsurprisingly, the city is defined as "High Risk" area under the new legislation.

In response to the 1968 Amendment to the Municipal Corporation Act that gave power to territorial local authorities to take action on buildings that were an earthquake risk the Wellington City Council began a survey of buildings in the CBD in 1971. The survey identified 3 classes of buildings of different risk.

Class A – buildings of mainly unreinforced masonry construction generally built between 1895 and 1914. These were estimated to be less than 50% of the 1968 Code;

Class B - buildings mainly constructed of reinforced concrete and constructed between 1910 and 1935. These were estimated to be between to be between 50% and 66.66% of the 1968 Code; and

Class C- buildings mainly constructed of reinforced concrete and built after 1935 and estimated to be more than 66.66% of the 1968 Code.

Of the 1875 buildings assessed 758 or approximately 40% were considered an earthquake risk based on the standards of the day. In 1973 the owners of earthquake risk buildings were notified that they had 10 years to strengthen or demolish their buildings. In 1979 a number of owners were warned that a formal notice to strengthen or demolish would be served in 1983 giving a maximum of 5 further years to comply.

In 1984 formal notices were served on 120 buildings that were considered to be the greatest risk in the CBD due to their location on the main retail streets with high foot traffic. They were given another 5 to 10 years to comply. By 1984 it was found that that only 32 of the earthquake risk buildings in the CBD had been strengthened while by comparison 248 had been demolished. Demolition was a popular choice at least in part due to the office development boom that was taking place in the 1980's up until the share market crash in October 1987 which led to a collapse in the demand for new buildings.

In 1996 the Council did an audit of their records of earthquake risk buildings. In compliance with the 1991 Building Act these buildings were now defined as "earthquake-prone buildings". As a result of the audit it was found that there were still 160 earthquake-prone buildings in the CBD. Of these 69 or 43% were considered heritage buildings. Time limits had also expired on 48 buildings which had been served notices.

As a result of this audit, the Council became concerned about the need to mitigate for buildings known by the Council to be earthquake-prone and in particular to follow through with the process of mitigation where notices to strengthen or demolish had already been issued to owners. As a result, an Earthquake Strengthening Strategy was developed in 1997/98 that included a Building Safety Policy which commenced in 1998. Funding of \$1,500,000 was budgeted for the implementation of this policy which paid for an incentive program for heritage buildings along with a further identification process made necessary by the changes introduced by the 1991 Building Act. A review of all buildings was conducted and Council building records were searched to find any evidence of building strengthening work. Based on this process an initial list of approximately 700 suspected earthquake-prone buildings was reduced down to 400. An inspection was then made of the 400 which were then further reduced down to about 270 of which approximately 100 were listed heritage buildings, and a further 50 were deemed to have streetscape value.

Heritage had started to become more of a priority for the Council from the early 1990's partly in response to the large scale demolition that had occurred in the 1980's as a result of development demand and earthquake risk. It was recognised that a large number of the earthquake risk buildings that had been identified and served compliance notices also had heritage value. An Earthquake Risk Working Party was established in 1991 to try and resolve the conflict between safety and heritage. The Working Party recommended that the Council provide financial assistance to owners of heritage buildings as a way to encourage strengthening rather than demolition. This recommendation found favour with the Council and an Earthquake Risk Building Fund was established in 1992 along with a Heritage Building Fund. This fund provided a grant towards strengthening in return for a legal agreement with the owner to ensure the protection of the building where the size of the grant was greater than \$5,000. Financial assistance of \$48,300 was offered to heritage buildings plus \$10,000 - \$12,000 to properties with streetscape value. The money was offered on a competitive first in first served basis and was largely allocated. Funding was then extended to allow the strengthening strategy to be completed.

The importance of heritage was also recognised in the Wellington District Plan which became operative in 2000 and has a number of rules to protect heritage buildings and objects. For example to demolish a heritage building is a Discretionary Activity (Restricted). However, unlike Waimate or Timaru there is only one category of heritage items with the same rules applying to all items identified in the Heritage List that is contained in the District Plan.

There are a number of high profile heritage buildings where the need for strengthening is a serious challenge. These include iconic buildings such as St Gerard's Monastery where the cost has been estimated at \$10 million.

Attempts have been by some owners to demolish their earthquake-prone buildings rather than strengthen them. For example, two heritage buildings that were part of the old Erskine College were demolished after the owner made an appeal to the Environment Court. However, an appeal by the owner of the Harcourts Building to demolish the heritage building was not successful and the building has now been successfully strengthened and converted into a hotel. These two high profile cases illustrate the additional pressures of reconciling the costs of earthquake strengthening with heritage preservation which can lead to heritage planning rules being challenged in the Environment Court if Resource Consents are not granted. However, there have also been a number of successful retrofit projects and adaptive re-use examples. These include the Former Public Trust Building, and Defence House. The Council itself has to meet the significant financial demands of earthquake strengthening its own heritage buildings including the Wellington Town Hall at an estimated cost of \$112.4 million.

Inner city residential living has been encouraged in the Wellington CBD as a way of using obsolete office buildings and as a way of ensuring inner city revitalisation. The Wellington City Council took a pioneering role in establishing inner city housing by developing the Old Harbour Board Offices into the Queens Wharf Apartment buildings in 1993. This development was undertaken by the council organisation tasked with developing the waterfront known as Wellington Waterfront Limited. Private developers followed this example by converting a number of obsolete CBD buildings into apartments or hotels such as the Dominion Building, the old Hannahs Factory Building, City Life Apartments and the Wellington Workingmen's Club. Education is also a significant occupier of CBD space and has created a need for specialist student accommodation that has also been accommodated in converted office buildings. Many of these early apartment conversions of old buildings are now caught by the new legislation even though they were strengthened to the levels required at the time under the 1991 Building Act but now do not comply with the new legislation.

Since the Christchurch earthquakes and also the Kaikoura earthquakes there has also been considerable market pressure on the owners of earthquake-prone buildings in Wellington. Post Christchurch earthquakes there was a significant flight of tenants from buildings with poor seismic ratings to newer stronger buildings and redrafting of leases to incorporate lessons from Christchurch.

The impacts of the Christchurch earthquakes were reinforced by a 6.5 magnitude Seddon earthquake centred in the middle of Cook Strait which struck Wellington late in the afternoon of 21 July 2013. This caused some minor damage in Wellington but more serious for Wellington was the Kaikoura earthquake that occurred on 14th November 2016. Research by Colliers calculated an office vacancy rate of 10.5% pre the Kaikoura earthquakes along with expectations that with new stock in the pipeline vacancy rates could rise to 15%. However, the Kaikoura earthquakes affected a large number of Wellington office buildings including Statistics House, Defence House, BNZ Harbour Quays, Deloitte House and Rivera House. The total office stock was estimated to have been reduced by 97,125sm reducing the post-quake vacancy rate of 7.8% and creating a frenetic leasing market which quickly became a game of "musical chairs".

Concerns with the performance of Wellington buildings during the earthquakes and Statistics House in particular resulted in an independent Government review of the performance of Statistic House. As a result of this enquiry Wellington City Council then requested "targeted building assessments" for approximately 80 buildings of a specific type which were expected to potentially need 'repairs' based on their likely response to the November earthquake. What is notable is that these buildings are mostly reinforced concrete buildings built since the 1980's and thus not expected to be earthquake-prone. However, they were selected partly because they are sited on soft soil or ground features that might amplify ground shaking. Although not required to do so some tenants choose to vacate their buildings.

In addition a further 108 unreinforced masonry buildings in the Wellington CBD were identified as a public risk and give a year to secure their parapets and facades. This was initiated by the Government under the Hurunui/Kaikoura Earthquakes Recovery (Unreinforced masonry Buildings) Order 2017 in response to advice from engineers about increased seismic risk following the Kaikoura earthquakes. Due to the short timeline

given to the affected owners the Government and Wellington City Council agreed to provide grants to partially meet the costs.

Given the high prominence of seismic issues in Wellington it is not surprising that there have been significant market adjustments. Research from Motu which looked at the impacts of earthquake building legislation on the commercial building market in Wellington found that the price of the buildings nearly halved when they were publicly identified an earthquake-prone building by the issuing of a public notice.

There has also been market pressures on owners that effectively trump the regulatory requirements. Many owners of commercial buildings in Wellington have been strengthening their buildings not due to statutory requirements but due to the need to meet the requirements of the market. This has largely been driven by concerns over the health and safety concerns of tenants in the corporate and government sectors. Evidence of this trend was identified by research which analysed building consent data relating to earthquake strengthening projects in Wellington between 2006 and 2012. (Thomas et al, 2013). This research showed that 35% of the buildings that were strengthened were already above 34% of NBS and not deemed to be earthquake-prone. Only a small proportion of the buildings were strengthened to 34% NBS with the most common level achieved being 100% and next most common being 67% NBS. The average was 72% NBS. The research showed that the number of consents increased dramatically in 2011 and 2012 presumably as a result of the Christchurch earthquakes. An analysis was undertaken of the types of building being strengthened and an interesting finding was that very few were unreinforced masonry. A good example of this can be seen in the well publicised seismic retrofit of the Majestic Centre. The Majestic Centre was built in 1991 and at 28 floors is the tallest office building in Wellington. It was reported to have cost in excess of \$100 million at the time of construction but was purchased by Kiwi Income Property Trust (KIPT) for \$48.55 million. This heavy discount on cost was due to the lingering impacts of the property market crash that followed the 1987 Share market crash and the very high vacancies at the time of purchase. In fact it was not until June 2002 that the building became fully tenanted. However, by 2011 it had a reported value of more than \$100 million and a rating value of \$104.5 million. However, after the Christchurch earthquakes engineering assessments were carried out which identified that the building was only 35-45% of NBS. While a surprisingly poor standard for such a comparatively modern building this assessment meant that the building was not earthquake-prone in terms of the legislation. However, in order to protect its position as an 'A' Grade office building and retain tenants KIPT decided to strengthen it to 70% of NBS. This decision was made in 2012 and the strengthening project was expected to cost approximately \$35 million and to take between 18 months to 2 years.

As a result of the seismic issues with the building the 2012 Annual Report wrote down the value of the property to \$67 million. In 2013 the scope of the strengthening was increased in order to achieve 100% of NBS with the expected cost now estimated at \$54 million. By 2014 the budget was reported to have blown out to \$83.5 million with completion now expected in early 2016. It was eventually completed and sold in November 2017 for \$123.2 million.

Based on the above figures that were reported in the media the seismic strengthening was far from economically feasible and would indicate that the owners spent \$83.5 million on strengthening but only succeeded in adding approximately \$23 million dollars and thus would have lost about \$60 million. For many owners such a loss would be financially crippling however KIPT has a property portfolio of over \$3 billion so was able to absorb the loss.

The strong Wellington focus on seismic issues is also illustrated by new developments that have been done to higher than necessary structural standards such as the recently completed 14 storey CBD office building constructed to 180% of NBS.

The CBD is also home to a significant residential population that is housed in multi-storey apartment buildings that are subject to the requirements of the Act if deemed to be earthquake-prone. It was reported on Radio New Zealand (RNZ, 2017) that of the 699 earthquake-prone buildings identified at that time in Wellington that 195 were residential and of those 70 had body corporates. Strong lobbying from the Inner-City Wellington

and Body Corporate Chairs organisations has resulted in the recent announcement by the government of funding to provide loans to apartment owners in earthquake-prone buildings located in high risk areas.

SUMMARY

The potential impacts of the regulation on the property market will be highly variable with some localities and property types being particularly affected. It will also vary depending on the property market cycles and general economy over the time period allowed for implementing seismic mitigation. Provincial towns like Waimate and Timaru have economies that are very different to a city like Wellington. As an example there is now considerable concern that the expected downturn in the dairy industry will have a significant negative knock on effect on the economies of many small towns like Waimate and Timaru which will exacerbate the challenges faced by such towns.

Clearly the issues facing Waimate are very different to those facing Wellington. This is starkly illustrated when one considers that the aggregate rateable value of the buildings in the Waimate CBD was just over \$6 million in total while the value of the Majestic Building in Wellington alone is over \$120 million. Although the legislation recognises the different levels of seismic risk that is present in different parts of the country, it ignores the highly variable economic and social environments that is the context for seismic mitigation decision making. There are clearly different challenges and opportunities facing regional New Zealand and the major cities.

The wealth destruction due to the 'blighted' values of earthquake-prone buildings impacts on those 'sitting' owners who purchased buildings prior to the market response to seismic issues. This can create hardship for individual owners and this has been well publicised in the case of apartment owners in Wellington. The significant destruction of wealth will also have a significant negative impact on some communities as well as individuals. These impacts are site and location specific with the impacts of the legislation falling more heavily on some parts of the country or segments of the community than others. Many New Zealand towns already struggling for economic sustainability are going to come under even more stress as their towns become blighted by poorly maintained earthquake-prone buildings. There is the potential for the building rehabilitation of earthquake-prone heritage buildings to be a catalyst for heritage led urban renewal. However, based on the recent examples of demolition in Timaru and Waimate this is unlikely without significant intervention by central government in the form of stronger heritage protection and incentives for heritage building rehabilitation.

For those towns where there is sufficient real estate demand to make new development feasible it is likely that 'predatory' developers will target distressed and stigmatised properties for purchase with the intention of demolition and rebuilding rather than retrofitting. Unless heritage protection is strong then heritage buildings may be the targets for such developers. This new development may be of a type and location that is detrimental to existing town centres and may lead to a significant loss of heritage buildings. An example of this is the new development in Invercargill that is a joint venture between the Richardson Group and the city council.

Where seismic mitigation takes the form of demolition rather than strengthening then the occupants of the building are unlikely to benefit as they will be forced to relocate. This may prove disruptive and expensive, particularly if forced on them at a time that is not convenient. This is also an issue for some seismic strengthening projects. An indirect cost on communities is the disruption to traffic and pedestrians caused by the building work that can potentially harm businesses that are located in buildings close to earthquake-prone buildings.

Of concern for communities is the potential loss of affordable commercial space that is an important part of the economic 'ecosystem' of many towns. Relocation of displaced owners and tenants may not be a practical option if there are no alternative buildings to relocate into which may occur if the local economy make new building financially feasible. In towns with low economic activity and growth it may be uneconomic to replace

demolished buildings with new replacement buildings as rent levels may be too low to provide an economic return on the new build. This may result in large numbers of vacant sites that will adversely affect town centres. There may also be a degree of statutory blight whereby owners of earthquake prone buildings will no longer invest in the maintenance of their buildings on the assumption that they will eventually demolish them anyway. There has also been concerns that the owners of earthquake-prone buildings will avoid doing necessary alterations on their buildings for fear that the alterations will trigger the need for earthquake strengthening to be completed at the same time. Successful lobbying by a number of mayors has been successful in having the definition of what constitutes “Substantial Alterations” amended such that a minimum of \$150,000 threshold applies. Thus owners are now able to carry out alterations up to \$600,000 before they are considered to be “Substantial” thus triggering seismic upgrades.

Even if replacement buildings are available, these alternatives may be at higher rent levels that effectively price some owner occupiers and lessees out of the market. There may also be the situation where new development leads to ‘churn’ and the relocation of tenants into new buildings creates vacancies in the older buildings that they shifted out of.

The problems prevalent in provincial towns has also been recognised by alterations to the Heritage EQUIP Incentive Scheme. This incentive scheme is the flagship programme to help the owners of heritage buildings to strengthen rather than demolish their buildings. The Scheme has been running for 3 years but it was found that very few owners in provincial centres were applying for the grants. This was partly attributed to the large up front costs that had to be met by the owner at the initial stages of the project and as a result many owners were delaying any potential strengthening work. Now the owners of buildings located in the provinces are able to apply for “Professional Advice Grants” up to a maximum of 50% of the costs or \$50,000. Regional owners can also get funding up to 67% of the upgrade seismic work cost and to levels above 34% NBS. This compares with non regional applicants who are only eligible for 50% of the seismic upgrade costs and then only to fund up to 34% NBS.

In towns such as Waimate and Timaru there is low development demand and the problem of urban decay in the town centres may lead to demolition by neglect. However, the opposite can be said of Wellington which has strong demand in various real estate markets which creates opportunities for adaptive reuse of obsolete buildings. However, it also creates high land values which can create an economic incentive to demolish buildings particularly where the site is perceived to be underutilized.

In Wellington you have a comparatively affluent population of commercial tenants and high rents. In addition seismic issues in Wellington continue to be prominent in the minds of the public, the property market and the politicians. Wellington City is probably the most advanced TLA area in terms of embarking on seismic mitigation and the result of this can be clearly seen in local market impacts where the seismic issues have been highly publicised and the market has been comparatively well informed compared with other areas of the country.

However, despite being a well resourced and pro active advocate of seismic mitigation the Wellington City Council has still struggled to implement mandatory seismic retrofitting. The bulk of their seismic mitigation has been achieved by market forces and has often been achieved by demolition and not retrofitting. The successful implementation of the Unreinforced Masonry Buildings Programme in Wellington potentially provides a valuable proto-type for how seismic mitigation can be effectively and speedily implemented. A debrief report (Falcon Consulting, 2019) to the Wellington City Council identified the need for a ‘one stop shop’ approach where owners had effectively a case manager to advocate for them within council and access to technical and project management assistance. Also identified as key was the provision of financial assistance in various forms to owners.

CONCLUSIONS

While the risk based approach satisfied some of the critics, it still remains potentially problematic as it is still a comparatively blunt “three sizes fits all” approach. Although recognition is given to location by the new legislation in terms of recognising different seismic risks there is no recognition given to the different economic and social environments. Real estate investment and development decisions are made within the context of the local real estate markets that they are part of. This will impact significantly on the viable options available to the owners of earthquake-prone buildings.

Location clearly does matter and the goal of the legislation to achieve a “nationally consistent approach” to managing earthquake-prone buildings will significantly impact on some communities. This is not reflected sufficiently in the legislation as policy makers have chosen to effectively ignore this local context by removing decision making around earthquake-prone buildings from local communities. Far from being a weakness in the existing legislation, the ability for local communities to ‘tailor’ their seismic mitigation approaches to their particular circumstances appears to have been a strength

This should not come as any surprise as the variable impacts and challenges of implementing mandatory seismic mitigation were highlighted in many submissions to both the Royal Commission, MBIE and the Parliamentary Select Committee. For example, the Dunedin City Council outlined to the Royal Commission the challenges they have in terms of a lack of economic growth and high proportions of URM buildings, low levels of building investment, and poor maintenance of buildings. The current approach falls well short of addressing the very different needs and challenges facing different communities in different parts of the country.

The number of demolitions likely to be triggered by the new legislation is unknown but likely to be significant. There has been no research to quantify likely levels of demolition or political debate as to what level would be acceptable in terms of ‘balance’ being sought by the government. The only explicit attempt made to forecast the likely level of demolition resulting from the legislation is the 10% "judgement based" estimate contained in the Martin Jenkins Cost Benefit Analysis (Martin Jenkins, 2012). No other attempts appear to have been made by government agencies to estimate alternative likely 'attrition' rates resulting from the legislation. Assuming that the 10% demolition estimate is correct and is politically and socially acceptable it is still far from clear as to how the 10% would be distributed around the country. It is likely to fall unevenly on different communities and different building types. It is not clear for example as to what proportion of the demolished buildings are liable to be heritage buildings or what will be the flow on effects in terms of community impacts.

There are a number of sustainability benefits that accrue to the recycling of existing buildings rather than the demolition and rebuilding option. These benefits as espoused by McDonagh and Nahkies (McDonagh and Nahkies,2010) are both environmental such as a reduction of construction waste, conservation of embodied energy, lower environmental impacts as measured by life cycle costing, and a reductions in vehicle miles travelled and also economic. Economic studies have shown rehabilitation work uses less materials and more labour than new construction which creates more employment and a greater multiplier effect in local communities. Rehabilitation should thus be encouraged as a valuable and attractive form of regional economic development.

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