

**Ōtākaro Avon River Corridor Regeneration Plan**

**Land Use Assessment Report –  
Residential**



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**REGENERATE  
CHRISTCHURCH**  
TE KŌWATAWATA



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## 1 Introduction

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### 1.1 Purpose of this report

This report has been prepared alongside a number of Land Use Assessment Reports to inform the shortlist of options and ultimately the preparation of the Ōtākaro Avon River Corridor Regeneration Plan (Plan).

The purpose of the Land Use Assessment Reports is to define the scope and establish the specific drivers, benefits and objectives for the land use/s that will best contribute to the overarching vision and objectives of the Plan.

### 1.2 Context

This report investigates at a high level the potential opportunities available within the Ōtākaro Avon River Corridor Regeneration Area<sup>1</sup> (Area) for residential development. It also discusses the possibility of a land swap option which, for the purposes of this report, is included in the wider reference to the Area.

This report has been informed by the ideas, suggestions and proposals received by Regenerate Christchurch that relate to residential housing in addition to facilitated discussions with key stakeholders and organisations. Strategic alignment with other available reports and assessments (where available) has also been undertaken.

This report sets out:

- A history of residential development located in the Area and the damage and impacts suffered as a result of the 2010 and 2011 earthquakes and an overview of the technical analysis performed on the land.
- An identification of problems and opportunities connected with any future residential development and an assessment of benefits and risks connected with the same. This is supported by an investment logic map (ILM), see Appendix 1.
- A demand analysis followed by a range of potential options or ideas to be considered with respect to residential housing.

While not a complete indicative business case, this report follows some steps from the Treasury's guidelines for "Better Business Cases for Capital Proposals: Indicative Business Case"<sup>2</sup>, including critical success factors, benefits, risks, constraints and dependencies.

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<sup>1</sup> As defined in the Outline for the Ōtākaro Avon River Corridor Regeneration Plan (Regenerate Christchurch, 2017).

<sup>2</sup> See: <http://www.treasury.govt.nz/statesector/investmentmanagement/plan/bbc/guidance>

Applying this approach provides a structure to test, refine and further develop the theme of residential housing, which in turn will inform the shortlist of land use combinations.

## 2 Land use description

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### 2.1 Overview

Developing the Plan presents an opportunity to assess whether future residential development could be considered for inclusion in the Area. Residential development could generate a number of outcomes beyond just a financial return and could be delivered in various ways. It is important to note that this report looks at the overall needs relating to residential development in Christchurch and whether there is an opportunity or need to include provision for residential development in the Area.

### 2.2 What is residential development?

“Residential development” refers to a land use in which housing (for the purpose of living accommodation) predominates, as opposed to industrial and commercial land use areas. Residential housing may be permanent or temporary and range in scale from low to high density depending on the respective District Plan zoning. Residential zoning may conditionally provide for community facilities, home occupations and complementary activities such as retirement villages, as well as other non-residential activities on a more restricted basis.

### 2.3 Background

#### 2.3.1 Why was the residential red zone created?

The Canterbury earthquakes and their aftershocks caused unprecedented and widespread damage to land and buildings in *greater Christchurch*<sup>3</sup>.

There was an urgent need, following the 4 September 2010, 22 February 2011 and 13 June 2011 earthquakes, for the Government to quickly assist people in the worst affected areas who were otherwise facing lengthy negotiations with their insurers and the prospect of living on damaged land with damaged infrastructure for long periods. Further, the Government was concerned that insurers may not renew existing policies. Action was needed to understand the land damage and ensure that insurance would continue to be available in *greater Christchurch*.

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<sup>3</sup> All terms in italics have the meaning given to those terms in the Greater Christchurch Regeneration Act 2016.

As geotechnical information was assessed by national and international experts and officials, it became clear that there were areas where the extent of the land damage meant that area-wide solutions would be required to address the damage.

The Government's zoning decisions were in response to the widespread damage and to help people in the worst affected areas. Without Government involvement, property owners were likely to face significant delays to repairing or rebuilding their homes.

On 23 June 2011, the Government agreed to an emergency social policy response to the widespread damage and to help people in the worst affected areas, consisting of:

- An area-wide process for assessing properties that resulted in properties being categorised green zone or residential red zone.
- Terms for a purchase offer to owners of insured residential properties in the residential red zone.

The zoning policy was not a formal Resource Management Act zoning or hazard mapping tool – its purpose was to identify where the Crown would offer to purchase damaged land and buildings. Land was zoned red where:

- There was significant and extensive area-wide land damage
- The success of engineering solutions may be uncertain in terms of design and possible commencement given the ongoing seismic activity
- Any repair would be disruptive and protracted for property owners

### **2.3.2 What does this mean today?**

The purpose of the red zoning policy was to identify where the Crown would offer to purchase damaged land and buildings to assist residents in the worst affected areas. As a result of this process, the Crown now owns a significant amount of land across *greater Christchurch*, with a large portion of this in the Area. The balance of land within the Area has multiple owners including the Christchurch City Council (Council) and a collective total of 30 private property owners.

In many cases, individual properties in the Area were red zoned due to the individual cost of land remediation being too high to complete case by case. However, now that the land has been cleared, undertaking large scale ground remediation may provide a feasible platform for residential development of certain scales. As such, further technical analysis has been undertaken.

### 2.3.3 Technical and commercial feasibility

To determine if traditional residential development is technically and commercially feasible within the Area, a technical study<sup>4</sup> of the Area supported by a valuation<sup>5</sup> has been completed.

The technical study has identified the scope of works necessary to provide a stable building platform that addresses the tidal and fluvial flood risk and geotechnical hazards to allow for residential development. To provide a stable building platform, considerable filling of the land to raise the level above the surrounding flood level (in accordance with the relevant District Plan rules) and protect against the effects of liquefaction will be required. Also required is the installation of stone columns and similar ground improvement works to restrain lateral movement towards free edges such as the river channel.

Suitable provisions have been made in the study for environmental protection, infrastructure, esplanade reserves and other elements which together meet the necessary design standards and “normal” planning instruments that would apply to this area if it was a typical “greenfield” development.

The technical analysis was costed and compared with the valuation of the land as a greenfield site suitable for immediate residential development. The results indicate that there are limited locations within the Area which have the potential to be technically and commercially feasible to remediate and used for traditional residential housing.

The findings are summarised as:

- With the “Expected remediation cost scenario”, only one sub-area of 2ha is financially viable for potential development.
- With the “Optimistic remediation cost scenario” (which relies on including land use that can generate surplus excavated material at no cost to the development, such as from stormwater treatment wetlands or a flatwater facility), ten areas are financially feasible for potential development. These give a total area of 217ha suitable for potential development with a possible return of \$15m. The total cost of remediation to achieve that return is estimated to be \$131m.
- If a 15% increase in land value is assumed along with the optimistic remediation cost scenario (free fill), then an additional 49ha becomes financially feasible for potential development. The total area under this scenario is 265ha with a potential surplus of \$35m. If all this area is remediated, then the fill required will be in the order 0.8–1.0M m<sup>3</sup> (this allows for a 30% overfilling to utilise more fill from any future wetlands or lake established within the Area if included).

<sup>4</sup> Regenerate Christchurch, 2017, Development Feasibility Assessment.

<sup>5</sup> Telfer Young Valuers, 2017, Ōtākaro Avon River Corridor.

- Sources of free fill have been calculated from potential options of the construction of stormwater treatment wetlands (1.0M m<sup>3</sup>) or the excavation of a flatwater facility (up to 2.2M m<sup>3</sup>). If both the wetland and flatwater facility or just the flatwater facility material is used for remediation there is a balance of material that could be placed on Bexley Reserve (former landfill) to facilitate other recreational activities with a depth of fill in the range of 1.6–3.1m.
- Advice from Telfer Young Valuers indicates that there is limited demand for commercial and industrial uses, with some demand for residential uses, noting that there is sufficient supply of land for Christchurch. As such, value uplift is unlikely to be seen in the near future except by improving the amenity of the balance land within the Area.

In addition to the above, there is also an opportunity to provide residential development through a land swap. The land swap proposed would see the land currently used for the Rawhiti and Avondale Golf Clubs swapped for land within the Area. Technical analysis shows that the land for both the Rawhiti and Avondale Golf Clubs is technically and commercially feasible for residential development.

#### **2.3.4 Adaptation and resilience**

The earthquakes and corresponding land damage within the Area also provide an opportunity to investigate whether adaptable residential housing solutions are available that do not require full scale land remediation works and may be either temporary or permanent.

The Canterbury earthquakes have taught us some very useful lessons around residential building resilience. Some house types and foundations were considerably more resilient than others to the effects of ground deformation caused by liquefaction. Buildings on land vulnerable to liquefaction should be light weight (single level, timber frame and weatherboard with iron roofs) and regular shaped (square or rectangular). The evidence base is demonstrated by the damage ratios of the various building and foundation types, as set out in Rogers et al (2015)<sup>6</sup>. Building lighter and simpler, on suspended timber floors above flood levels, could secure the future of residential areas affected by sea level rise. These building types are also easier (less costly and faster) to repair. More information on building (including foundation types) in such areas is set out in the MBIE Guidance document 2015<sup>7</sup>.

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<sup>6</sup> Rogers et al. 6I EGE Conference, November 2014.

<sup>7</sup> "Repairing and rebuilding houses affected by the Canterbury earthquakes", MBIE 2015.

The imperative for disaster risk reduction and community resilience continues to become significantly greater. To do this, however, we need to shift the focus from risk to resilience, where natural hazards and other risks are considered in planning for the future and the local authorities and local communities of *greater Christchurch* are well prepared and able to function, recover and adapt post events, whatever these happen to be. This means focussing more on the consequences, and less on the likelihood, of disasters occurring.

The Valentine’s Day earthquake of 14 February 2016 produced levels of shaking in some eastern suburbs at around Building Code Serviceability Limit State (SLS) levels of shaking (about 25-year return period levels of shaking). This tested the resilience of both recently constructed buildings on new foundations, and new buildings constructed on ground with ground improvement works.

Accordingly, it is now known what the liquefaction hazard actually looks like, and hence damage scenarios can now be developed to inform risk management approaches. *Greater Christchurch* is now better placed to identify which land presents the greatest risk of financial losses, and this risk may be able to be reduced to a considerable degree through appropriate risk management.

Building back better does not necessarily mean stronger or more expensive. For resilience, it may mean building back very differently (eg lightweight, off-grid). Individual houses and residential housing complexes need to be cheaper and faster to build, and easier to repair after being subjected to damaging events. Houses also need to be designed in recognition of, rather than in ignorance of, the medium to high frequency threats that can cause them significant damage.

Adaptable residential development solutions have the potential to be feasible in the Area with lower costs than traditional residential housing involved in land remediation and associated infrastructure. However, new approaches to residential housing will need to be created to make this happen.

## 2.4 Examples

There are various examples of types of adaptable building structures. For example, the ZEDpod low carbon homes as shown by the images overleaf. The image on the left depicts a standalone ZEDpod on display at the EcoBuild 2016 London show. The image on the right depicts a single row ZEDpod terrace.



Credit: ZEDfactory, UK



Credit: ZEDfactory, UK

## 2.5 Uncertainties and assumptions

This report has been prepared with the following uncertainties and assumptions.

Uncertainty	Assumption
Capital and valuation accuracy	The capital construction cost and residual land valuations are accurate and robust.
Acceptability of use	The re-use of the land for residential purposes is acceptable to stakeholders in light of the red zone decisions and processes.
Accessibility	Lifemark offers design standards on the accessibility and future adaptability of residential housing. It is expected that these needs will be addressed in any residential housing development.
Sustainability	Greenstar offers design standards on sustainable building. It is expected that buildings will be of an exemplar status in any residential housing development.
Timing	For land identified for any potential residential development that is not required immediately, interim uses of the land can be found.
Implementation of Plan	It is assumed that implementation of the Plan is enabled, including funding, land ownership, governance, management and delivery responsibilities

## 3 Strategic assessment

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### 3.1 Purpose

This section outlines the case for change, by addressing:

- Strategic context
- Problem definition
- Investment objectives, existing arrangements and business needs
- Potential investment scope
- Benefits, risks, constraints and dependencies

This section has been informed by the community ideas, suggestions and proposals received by Regenerate Christchurch and the need for a range of quality homes in east Christchurch that are affordable.

### 3.2 Strategic context

The Greater Christchurch Regeneration Act 2016 establishes Regenerate Christchurch’s purpose as to “support a vibrant, thriving Christchurch that has economic, social, and lifestyle opportunities for residents, businesses, visitors, investors and developers”. The overarching vision and objectives for the Area are:

#### **Our Shared Ōtākaro Avon River Vision**

The river is part of us and we are part of the river.

It is a living part of our city.

#### **A place of history and culture**

where people gather, play, and celebrate together.

#### **A place of learning and discovery**

where traditional knowledge, science and technology meet.

#### **A place for ideas and innovation**

where we create new ways of living and connecting.

**OUR VISION IS FOR THE RIVER TO CONNECT US TOGETHER –**

**with each other, with nature and with new possibilities.**

## Our Shared Ōtākaro Avon River Objectives

### For Christchurch

- Support safe, strong and healthy communities that are well-connected with each other and with the wider city.
- Provide opportunities for enhanced community participation, recreation and leisure.
- Create a restored native habitat with good quality water so there is an abundant source of mahinga kai, birdlife and native species.
- Create opportunities for sustainable economic activity and connections that enhance our wellbeing and prosperity now and into the future.

### For New Zealand

- Develop the Ōtākaro Avon River Corridor Regeneration Area as a destination that attracts a wide range of domestic and international visitors.
- Establish a world-leading living laboratory, where we learn, experiment and research; testing and creating new ideas and ways of living.
- Demonstrate how to adapt to the challenges and opportunities presented by natural hazards, climate change and a river's floodplain.

The ultimate purpose of the Plan is to enable long-term uses of land within the Area that will contribute to, and support, the regeneration of east Christchurch and *greater Christchurch*. The vision and objectives have been developed in order to achieve this.

### 3.3 The case for change

It is recognised that any discussion around residential development in the Area needs to be mindful of previous, existing and neighbouring residents.

The Area predominantly consists of approximately 602ha of open space land located in central and east Christchurch, and wholly within the Christchurch district. It is bordered by urban suburbs and encapsulates that part of the Ōtākaro Avon River that runs from close to Barbadoes Street in the central city out to the Estuary of the Heathcote and Avon Rivers/Ihutai.

There is currently no agreed long-term use for the Area and in its current state there are concerns about the future use of the land, safety of local residents and users, the effectiveness of current flood and stormwater infrastructure and uncertainty around transport and roading networks.

Before the 2010 and 2011 earthquakes, the Area accommodated nearly 5,500 residential properties that were all part of strong local communities. As a result of the quakes, a number of these communities suffered the loss of neighbours and local community facilities.

For some residents of east Christchurch, residential housing affordability is a significant issue, with 39 per cent of low income households spending more than 30 per cent of their household income on rent compared with 35 per cent of low-income households across the city.<sup>8</sup> In Wainoni and Rawhiti this is almost half of all households.

Residential development within the Area has the potential to offer a range of quality residential housing options that are affordable. This would provide an opportunity to re-connect communities and bring more residents back into east Christchurch, as well as improving the relationship and interface between local residents and the Area. Further, residential development has the potential to provide a financial return in certain instances.

The case for change has been mapped in an investment logic map, see Appendix 1. That process is described in the following sections.

### **3.3.1 Investment drivers (problems/opportunities)**

The first step in establishing a case for change is to identify drivers for investment. These drivers encompass the problems that need to be addressed, their causes and the related opportunity if they are addressed.

The following table provides an overview of the investment drivers which will help guide any decisions around including residential development in the Area.

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<sup>8</sup> Census 2013, Statistics New Zealand.

Land use driver	Causes of problem
<p>1. Addressing sea level rise and hazards means a very high cost of typical residential development<sup>9</sup> with limited opportunity for financial return. New Zealand lacks an approach to residential housing development for adaptable and resilient housing.</p>	<ul style="list-style-type: none"> <li>• The lack of residential housing options and different approaches to housing mean that many large family homes in Christchurch sit empty while there is a shortage of smaller homes.</li> <li>• The current approach to rental tenancy in New Zealand creates a distortion between home ownership and home rental.</li> <li>• Current approaches to residential development do not focus on the creation of communities, rather they focus on achieving the best financial return.</li> <li>• There is the issue around building in a flood zone and also the potential impact on existing houses of building new houses.</li> </ul>
<p>2. Parts of Christchurch lack the required range of quality and affordable residential housing options designed to meet the needs of local residents, contributing to poor social outcomes within communities.</p>	
<p>3. Market driven residential developments do not focus on delivering a range of residential housing options, resulting in market failure and supply imbalances.</p>	
<p>4. The lack of a residential population within the large area of land contributes to low levels of activation, leading to high likelihood (or perceived likelihood) of safety and security issues.</p>	
<p>5. The red zoning of houses contributed to the loss of a number of established communities and changed the way local residents interact with each other and the river.</p>	

<sup>9</sup> “Typical” refers to normal subdivision-style development with single unit dwellings on freehold allotments.

### 3.3.2 Residential development investment objectives

The residential development investment objectives help determine Christchurch’s needs with respect to residential housing options and solutions. They inform the assessment of how residential land use could contribute to achieving the overarching objectives and land use assessment criteria for the Area.

The residential investment objectives are to:

- Increase the range of quality residential housing options in east Christchurch, with a focus on affordable residential housing options.
- Deliver innovative and leading residential housing solutions which address natural hazard risks and can deliver a return over time.
- Deliver residential housing solutions designed to improve activation surveillance and guardianship over the Ōtākaro Avon River.
- Deliver housing solutions in ways that enhance and build communities.

### 3.3.3 Benefits

To be able to measure the success of the land use, these benefits have been established:

- An increase in the range of quality residential housing options that are affordable.
- Sustainable, resilient and thriving communities with a sense of belonging.
- A financial return through innovative residential housing development that can be invested in other projects in the Area.
- Creation of adaptable and resilient residential housing “best practice” approaches for New Zealand.
- Creation of adaptable and resilient residential housing “best practice” approaches for New Zealand.

### 3.3.4 Contribution to overarching vision and objectives

Residential land use is considered to contribute to the overarching vision by connecting people and creating places where people gather together.

Residential land use could contribute to the overarching objectives in these ways.

Overarching objectives	Link to residential land use benefits
<b>For Christchurch</b>	
Support safe, strong and healthy communities that are well-connected with each other and with the wider city.	An increase in the range of quality residential housing options that are affordable.  Sustainable, resilient and thriving communities with a sense of belonging.
Provide opportunities for enhanced community participation, recreation and leisure.	No material contribution.
Create a restored native habitat with good quality water so there is an abundant source of mahinga kai, birdlife and native species.	No material contribution.
Create opportunities for sustainable economic activity and connections that enhance our wellbeing and prosperity now and into the future.	A financial return through innovative residential housing development that can be invested in other projects in the Area.
<b>For New Zealand</b>	
Develop the Ōtākaro Avon River Corridor Regeneration Area as a destination that attracts a wide range of domestic and international visitors.	No material contribution.
Establish a world-leading living laboratory, where we learn, experiment and research; testing and creating new ideas and ways of living.	Creation of adaptable and resilient residential housing “best practice” approaches for New Zealand.
Demonstrate how to adapt to the challenges and opportunities presented by natural hazards, climate change and a river’s floodplain.	Creation of adaptable and resilient residential housing “best practice” approaches for New Zealand.

### 3.3.5 Scope assessment

An initial scope has been developed, to guide potential options for residential development. This takes a portfolio perspective, providing a minimum, intermediate and maximum scope, assuming that some level of residential development has been included in the land use options for the Area. The scope is aimed at helping assess each option or opportunity from a residential development perspective:

- Minimum scope: residential development will be included only in locations where the interface or connections between existing communities and the Area are required.
- Intermediate scope: residential development will include the minimum scope plus the most appropriate parts of the Area to undertake land remediation based on technical and commercial feasibility. Parts of the Area will also be considered for adaptable residential housing solutions. The exchange of land outside the Area will also be considered.
- Maximum scope: residential development will be undertaken in all parts of the Area considered to be technically and commercially feasible.

### 3.3.6 Risks

It is also important to identify and record any potential risks around including residential development in the Area, and their mitigations.

Risk	Mitigation process	Residual risk rating
Development cost is greater than forecast.	Do robust technical feasibility analysis and allow for contingent risks in estimates.	High
Revenue is lower than forecast due to falling prices or lack of demand.	Do robust market analysis and allow for contingent risks in analysis.	High
Natural hazard risks are greater than forecast or occur earlier than expected.	Ensure conservative approach taken to scale and timeframe.	Low
Attempts at providing affordable residential housing creates negative perceptions of residential housing quality or socio-economic status for development.	Employ high quality urban design standards and focus on principles-based housing, ie sustainability. Use ownership and funding mechanism to create affordability rather than allowing a low-quality living environment. Ensure a mix of residential housing typologies and tenure options in any one residential area.	Moderate
High quality and desirability of the Area (due to the implementation of	Consider carefully the impacts on property value. Support forecast with economic modelling.	High

regeneration strategies) lifts prices of property outside, adversely affecting affordability for existing residents in east Christchurch.		
Residential housing in the Area undermines other strategic objectives in Christchurch, including New Brighton and the central city.	Carefully consider the location of residential housing within the Area. Subject to quantum, this is perceived to be a low risk. Give consideration to residential housing typology, competition, timing and other matters if this land use progresses, to ensure the balance is appropriate.	Low

### 3.3.7 Constraints and interdependencies

The following constraints have been identified for residential development.

Constraints	Description
Land	The geotechnical and flood plain footprint of the land will affect what can be developed or built in the area.
Regulatory standards	To gain a consent and code of compliance, any residential building must meet the building code.

The following interdependencies have been identified for residential development.

Interdependency	Description
Relevant plans and planned works	Any residential housing development needs to align with the relevant standards and regulatory framework including the Canterbury Regional Policy Statement, National Policy Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011. It is also important to note that any proposal within the central city part of the Area is subject to the provisions of the Christchurch Central Recovery Plan which is zoned for residential purposes.
Transport infrastructure	The success of any residential development plans will also be largely dependent on the work plan, timing and delivery of transport infrastructure in surrounding areas to the Area.
Market conditions	The general residential housing market and construction costs (see below).
Other regeneration and urban master plans	Any land use needs to consider other projects undertaken by Regenerate Christchurch, Development Christchurch Ltd and Christchurch City Council in nearby areas, including New Brighton and the central city.
The Plan	The Plan which sets out proposed land uses is being prepared under the Greater Christchurch Regeneration Act. The Minister makes the final decision on whether or not to approve the draft Plan. In making this decision, the Minister must have regard to/consider matters set out in section 38 of the Act. This includes considering the fiscal and financial implications of the draft Plan and whether the draft Plan is in the public interest.
The Crown's investment in land	The Crown has made a significant investment in this land and is the critical decision maker in determining the future use of the Ōtākaro Avon River Corridor. The overall return on investment (financial and non-financial) is a critical issue for the decision makers.

## 4 Residential development attributes and options

### 4.1 Purpose

The purpose of the economic case is to:

- establish the critical success factors for residential development
- understand the demand for residential development in east Christchurch
- develop a set of example options to inform the development of a longlist of land use options

### 4.2 Critical success factors

Critical success factors are considered to be the attributes essential for ensuring any residential housing land use types align with the overall vision and objectives for the Area. The key point is that critical success factors are crucial, not desirable. Further, it is important to differentiate between critical success factors and design principles.

The following factors are considered essential in delivering any residential development in the Area if areas for residential development are included in the longlist of land use options.

Critical success factor	Description
Commercial viability/financially sustainable	<ul style="list-style-type: none"> <li>• Ability to access funding from the private sector or through existing public sector residential housing initiatives and policies, or through a joint venture.</li> </ul>
Effective, efficient and resilient infrastructure	<ul style="list-style-type: none"> <li>• Focus on lifecycle cost of infrastructure, potential short-term cost versus long-term gain and efficiencies.</li> <li>• Residential housing serviced with sufficient roading, water, wastewater, electricity, etc.</li> </ul>
Resilience to natural hazards	<ul style="list-style-type: none"> <li>• Addresses the threat of natural hazards, including the increased hazard risk presented due to climate change over an extended time horizon.</li> </ul>
A range of residential housing	<ul style="list-style-type: none"> <li>• Provides product that is affordable and attractive across a range of market segments.</li> </ul>
Safety and security	<ul style="list-style-type: none"> <li>• Creates safe, active and lively neighbourhoods.</li> </ul>
Aligns with regeneration of the Area	<ul style="list-style-type: none"> <li>• Any residential development option will need to align with wider regeneration principles for the Area and surrounding communities.</li> </ul>

## 4.3 Demand analysis

This section provides a high level overview of the potential demand for residential development in east Christchurch to provide context for any future residential development opportunities. Note that any residential development opportunity may not be delivered for a number of years, and any discussion around demand needs to take this into account.

### 4.3.1 General residential housing demand

To understand the general residential housing market in Christchurch and what this would mean for any residential development in the Area, Telfer Young was engaged to provide a high-level overview. The paragraphs below incorporate the advice provided by Telfer Young Valuers on demand for housing in the River Corridor (Feb 2017).

“It is considered that the volume of section sales has now returned to the longer term average across the greater Christchurch region. Value levels have remained relatively static in recent years and demand for sections is not likely to increase from longer average levels unless Christchurch sees an increase in population. Christchurch has capacity for some 15 years of ‘normal’ section demand with already zoned land.

However, many parts of the Area are well located with regard to amenities and schooling and are close to the city centre relative to other new greenfield areas. As such, it is envisaged that there will be demand for small components of land within the red zone over time. There will also be a greater demand for properties as other regeneration projects are delivered in the Area. Timing is an important consideration for the Area as it is almost certain that the regeneration will take a significant period of time and any residential development may not occur for a number of years if included in the Plan.”

### 4.3.2 Demand for residential housing across a range of housing typologies and price points

Access to quality residential housing that is affordable is not just an issue for Christchurch but for New Zealand as a whole. The Monitoring Greater Christchurch Regeneration – June 2017 report<sup>10</sup> prepared by the Department of the Prime Minister and Cabinet, shows that Christchurch has made a number of positive steps towards resolving the residential housing issues that occurred as a result of the 2010 and 2011 earthquakes. However, the Housing Affordability Measure Buy indicator shows that for 77.8 per cent of renting households in Canterbury, buying was unaffordable as at the June 2015 quarter.

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<sup>10</sup> See: <https://www.dPMC.govt.nz/sites/default/files/2017-07/monitoring-greater-christchurch-regeneration-june-2017-report.pdf>

This is supported by the report prepared by Community Housing Aotearoa: Christchurch Social and Affordable Housing<sup>11</sup> – which identifies that although there have been a number of pragmatic and innovative responses to the residential housing rebuild that are being made to redress housing imbalances, these do not apply to everyone. The report identifies that most of the rebuild has focused on the mid to high-end of the residential housing market for those with the ability to invest \$500,000 or more for a new home.

Further, the Community Housing Aotearoa report identifies that a large portion of low cost residential housing was previously lost in the earthquakes and the main replacement is what is being provided by the community housing sector, Housing New Zealand Corporation and Christchurch City Council, rather than by the private sector.

The location and size of the Area presents an opportunity to investigate how a new or innovative way of delivering residential development can be delivered for Christchurch and New Zealand, creating a housing product that does not currently exist in Christchurch and meets the needs of local residents.

#### 4.4 Potential options

To inform the development of a longlist of land use options, the potential residential development options have been explained in line with the work undertaken in this report. The potential options for residential development are intended to provide context for the development of a longlist of land use options only and should not be interpreted as a decision that residential development that will be included in the Area.

Further work on the actual delivery method, costs, feasibility and potential environmental, community, transport and other impacts will also need to be investigated for each option once further clarity on the land use options for the Area is established.

##### 4.4.1 Traditional residential development

###### Small scale residential development

This option involves small scale low density or cluster development in particular locations where the opportunity arises either from the existing physical characteristics of the land or its relationship with the surrounding residential neighbourhoods outside the Area or created by a compatible future use of the Area that enhances the value of the property.

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<sup>11</sup> See: <http://communityhousing.org.nz/>

Small scale development can be done in locations where large-scale land remediation is not required and found to be feasible in the Development Feasibility Study. This may be any of:

- Low density development along the fringe of the Area that leverages off existing services and roads and employs individual ground improvement or foundation systems to mitigate the effects of earthquake-induced liquefaction.
- Cluster development that also employs individual ground improvement or foundation systems to mitigate the effects of earthquake induced liquefaction.
- Development that leverages off groundworks associated with an adjacent land use.

Note that this type of small scale development, where small scale foundation or remediation works are used to mitigate geotechnical risks are not specifically addressed in the Development Feasibility Study.

### **Large scale development**

Traditional residential development would involve the remediation of land within the Area that is technically and commercially feasible to create a building platform. The building platform would then be able to be used for the construction of a mix of residential housing options and the construction of roads and infrastructure to service each individual allotment or townhouse.

The development feasibility study shows that traditional residential development is commercially feasible in certain areas. However, due to the land remediation required, the financial returns are not significant. There is also sufficient residential zoned land for traditional residential development in Christchurch over the next 15 years. These factors place a greater emphasis on achieving other outcomes beyond just a financial return.

### **Land swap development**

There is also the option to deliver traditional residential housing through a land swap. The land swap proposed would see the land currently used for the Rawhiti and Avondale Golf Clubs (with a capacity for approximately 900–1000 houses) swapped for a combined new course to be developed in the Area. The benefits associated with such a land swap would be the financial return from residential development, creating a greater population and potentially more employment opportunities to support the local economy.

## **4.4.2 Adaptable residential development**

### **Interim**

Temporary adaptable residential development options would involve the construction of structures and supporting infrastructure which could be easily assembled/disassembled and/or relocated, ie relocatable homes, tiny houses, modular structures, etc. The residential development would be an interim land use until other uses were identified or flood risk or

other hazards made the location undesirable or unsuitable. To be considered, any interim residential development would need to be resilient to the effects of liquefaction and lateral spread (generally light framed structures on a repairable foundation and supported by appropriate infrastructure).

Interim adaptable residential development options could contribute to the short and medium demand for a range of residential housing options that are affordable while longer-term options are further investigated. It would also serve as a basis for exploring more permanently adaptable solutions. Importantly, temporary adaptable residential development will not require the large-scale land remediation required for traditional development, which reduces the investment and commitment associated with any future residential development in the Area.

### **Permanent**

Permanent adaptable residential development options build on the above considerations for temporary adaptable residential development and look for solutions that could be permanent. Options which could be considered further include the construction of houses on stilts or floating foundations so that floodwater does not enter the habitable floor areas; or light weight structures that can be easily adjusted following disruption by an earthquake. Similar to temporary adaptable residential development, permanent structures will not require the large-scale land remediation required for traditional development, which reduces the investment and commitment associated with residential development in the Area. However permanent structures may require more investment in infrastructure and services.

Note that adaptable residential development approaches do not necessarily address the effects of hazards on the surrounding land, infrastructure and the prevention of escape routes, however, they do represent an adaptation to the hazards.

## **4.5 Key land use attributes**

This report has aimed at addressing whether residential development should be included in the Area and, if so, the potential residential development options available to be investigated further. As such, a number of land use attributes relating to residential development have been developed. The key land use attributes differ from the investment objectives and critical success factors as they focus on residential housing in the Area as a land use, rather than assessing a specific opportunity.

The key land use attributes that will inform the development of the longlist of land use options are:

- Overall, further work around the possibility for residential development in the Area should be investigated, but it is crucial that any residential development needs to align with the wider regeneration of the Area and surrounding communities.
- In localised areas, there are likely to be opportunities for small scale residential housing or clustered development to create a better interface and connection between surrounding communities and the Area.
- It is recommended that the opportunity for medium term adaptive housing, possibly as a demonstration of affordable housing, sustainable/alternative housing and/or to activate and reconnect the Area, be investigated further.
- The strongest financial benefits come from the land swap option, which also offers regeneration benefits for the surrounding communities, and is recommended as an area to investigate further.

In addition to the above, it is recognised that there is a range of delivery, ownership and funding models that can be considered for residential development. These include housing co-operatives, co-housing, housing trust, shared equity schemes and social housing initiatives. Further work should be done on what models generate the most optimal outcomes for local residents if land uses for residential development are included as part of the Plan.

## 5 Conclusion

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This investigation has revealed that there are potential opportunities available within the Area for both traditional and adaptable style residential housing. In conclusion, **it is recommended that the ability to allow for residential development within the Area is included in the longlist of land use options for further consideration.**

## Appendix 1: Investment logic map

The investment logic map process provides a framework for identifying the problems which need to be resolved, the potential benefits from addressing the problems and the development of investment objectives with respect to a potential project or land use.

