SECOND GENERATION DISTRICT PLAN

Variation 2 – Additional Housing Capacity

Section 32 Report

Supporting Documents

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2GP / NPS-UDC & Appeals Support

3 Waters Strategic Direction Position Paper

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Executive Summary

DCC through its Second-Generation Plan (2GP) aims to promote growth in the city by providing good quality and cost-effective infrastructure while ensuring the sustainable management of natural and physical resources, to meet the needs and provide for the wellbeing of current and future generations.

2GP also promotes the protection and enhancement of biodiversity and natural character of the land and coastal and riparian margins, in addition to the creation of high-quality amenity within urban environments.

Some of the zone changes made under the 2GP will result in an increased pressure on the existing 3 Waters infrastructure network and either new infrastructure or upgrades to the existing infrastructure will be required.

Whilst the 2GP was being developed by DCC, central government released the National Policy Statement on Urban Development Capacity (NPS-UDC). The NPS-UDC identifies the projected growth for Dunedin, which is subsequently classified as a medium growth urban area. Dunedin is therefore required to ensure it has provision to meet the demand for residential development capacity over the short (3 years), medium (10 years) and long (30 years) term.

This position paper serves to test, challenge and confirm DCC's strategic approach to 3 Waters infrastructure in relation to the 2GP and NPS-UDC objectives, as well as provide supporting evidence for appeals that challenge DCC's current strategic approach to 3 Waters infrastructure. It is noted that the NPS-UDC has been superseded by the now adopted National Policy Statement – Urban Development (NPS-UD), which came into effect on 30 September 2020. The background work informing this position paper serves to inform DCC's position in respect of the NPS-UD. We note further that the NPS-UD is meant to work alongside with the other NPS documents in particular in regards to the versatile soils (or productive soils) and the freshwater and biodiversity policy statements.

Whilst this position paper covers part of the 3 Waters infrastructure in the context of 2GP, it is important to note that infrastructure planning should be carried out holistically to account for wider infrastructure growth initiatives (e.g. transport and others) as well as the parts of the 3 Waters network not included as part of this work (treatment plants, operational changes, renewals, existing capacity constraints etc). Additionally, growth initiatives should ensure the provision of infrastructure that is efficient, and which helps achieve a compact urban form that will benefit the city as a whole.

Where adequate stormwater, wastewater and water supply infrastructure is not available or is inadequate to facilitate development, the proposed 2GP Objectives and Policies support a self-serviced approach providing it does not impact on 3 Waters infrastructure and adverse effects are insignificant.

For clarity, the term "self-service" refers to on-site servicing of individual properties; however communal self-service through privately owned decentralised servicing schemes is also considered.

Additionally, multi-servicing options are also considered, where service is achieved through a combination of privately owned devices and public infrastructure.

Areas which can be publicly serviced in the short term should be prioritised for development, with an infrastructure development focus on provisioning public servicing to future development sites. This

approach minimises the need for self-servicing and assists the DCC in meeting their roles and responsibilities as a Territorial Local Authority.

Likewise, by prioritising development of public network serviceable sites, the DCC is able to avoid the issues that can be associated with privately self-serviced sites, including potentially onerous requirements such as meeting of drinking water standards, security of water supply and avoiding contaminated wastewater flows from affecting the environment.

Where self-servicing is allowed, it should be done only for those sites that cannot be serviced through the public network in the foreseeable future and which have passed site feasibility tests such that minimum design standards are met.

Stormwater Infrastructure

With regard to stormwater management, the adoption of a Low Impact Design (LID) philosophy (also known as Water Sensitive Design (WSD)) would help facilitate urban growth within both serviced and un-serviced areas, while achieving sustainable, cost-effective, resilient, robust and good quality stormwater infrastructure that meets DCC's stormwater management objectives.

LID adopts a design approach that is sensitive to the natural characteristics of the land, landform and hydrology and which seeks the creation of naturalised urban environments, thereby also meeting DCC's objectives for the protection of biodiversity and natural features, and the creation of high amenity values and high-quality urban environments.

LID is well suited to support on-site self-serviced or multiple self-serviced (decentralised) stormwater schemes.

The use of on-site stormwater attenuation devices is also considered as an option for the mitigation of stormwater flows in areas where the capacity of existing public infrastructure is constrained (i.e. multi-servicing) or where there are flood vulnerable areas downstream.

Wastewater Infrastructure

The ability to provide good quality wastewater infrastructure and an adequate level of service as per DCC's objectives relies on the management of wastewater flows and loads to ensure that the capacity of infrastructure is not compromised, and the availability of suitable land to facilitate self-service situations where no wastewater infrastructure is available.

In lower density areas where no wastewater infrastructure is available or economically feasible (e.g. cost-share of infrastructure depreciation, maintenance and future replacement needs), on-site self-servicing or multiple self-servicing (decentralised) can both be suitable options subject to suitability and availability of land for the disposal of treated effluent. However, there can be risks and limitations with a self-servicing approach. These are documented in the main body of this report along with some discussion on when a self-servicing approach may be appropriate.

In areas where wastewater infrastructure capacity is constrained, multi-servicing options may be available to facilitate growth, such as pressure sewer and wastewater detention systems. These systems can make efficient use of infrastructure capacity by storing, regulating and pumping treated or untreated effluent into the network at controlled rates and outside peak flow periods. This can be

achieved either at a lot-level, where detention and primary treatment of wastewater and the electronic control of flows takes place in each lot, or through communal wastewater detention tanks. Preventative maintenance of these systems is critical.

Water Supply

Regarding water supply, DCC's main objective is to ensure a secure and reliable supply of drinking water to protect public health and meet firefighting requirements, while promoting water conservation, all at the lowest total lifecycle cost.

Where no water supply network is available, water supply through on-site servicing may be a suitable alternative in certain situations. Water supply options could include roof rainwater, bore supply, and surface intake from a watercourse.

Multiple lot self-servicing water supply schemes however are not encouraged in view of challenges experienced in the past with those types of schemes and difficulties with complying with relevant drinking water standards.

Regardless of the water supply source selected, the requirements of Drinking Water Standards for New Zealand (DWSNZ) and SNZ PAS 4509:2008 New Zealand Fire Service firefighting water supplies Code of Practice should be satisfied in regard to domestic and firefighting water requirements.

Conclusion

Self-servicing options could include on-site self-servicing, communal self-servicing (decentralised) or multi-servicing. However, in conclusion, whilst there are technical justifications for DCC's vision to support 3 Waters self-servicing through the consideration of other alternative technical options where infrastructure is constrained or non-existent, this approach may not be necessary if public servicing can be adequately planned and delivered within identified growth areas through DCC's 2GP and NPS-UDC provisions. 3 Waters infrastructure growth must be considered and planned in the context of other infrastructure (e.g. transport), and such that it is aligned with DCC's wider drivers for growth in Dunedin.

The documented high rate of failure identified by the Ministry for the Environment (MfE 890, 2008) of self-service wastewater systems in particular, poses a potential risk to DCC. The ARAL site specific assessments (2020) indicate that there is adequate provision of serviceable land to meet the growth pressures in Dunedin without the need for widespread self-servicing and that urban growth in Dunedin can be supported while achieving the DCC's vision and objectives, for both serviced and un-serviced areas. DDC does not have to compromise itself as a Territorial Local Authority (TLA) by enabling development in inappropriate locations from a 3 Waters servicing point of view as adequate provisions for growth are likely to be possible through the land identified through the Urban Development Capacity (NPS-UDC) site assessments.

However, in order to facilitate DCC's urban growth aspirations, an adequate 3 Waters policy framework needs to be established. This framework should set out specific procedures, standards and performance criteria that are clear and practical, and which ensure that the various objectives are met. The framework should also provide clarity on when and where self-servicing will be allowed.

The framework, and a Land Supply Strategy, could be used to release land for development as required and as servicing becomes available. This approach may restrict ad-hoc and small scale "infill" development and allow DCC to focus their budget and resources to the most viable areas rather than trying to keep up with the scatter gun approach to development that may otherwise occur across the entire Dunedin area.

1 // Introduction

Dunedin City Council (DCC) has developed the 2nd Generation Plan (2GP) with new zones, objectives and policies for the city compared to the previous District Plan. The decisions for the 2GP were notified on 7 November 2018.

Some of the zone changes made under the 2GP will result in an increased pressure on the existing 3 Waters infrastructure network and either new infrastructure or upgrades to the existing infrastructure will be required.

Whilst the 2GP was being developed by DCC, central government released the National Policy Statement on Urban Development Capacity (NPS-UDC). The NPS-UDC identifies the projected growth for Dunedin, which is subsequently classified as a medium growth urban area. Dunedin is therefore required to ensure it has provision to meet the demand for residential development capacity over the short (3 years), medium (10 years) and long (30 years) term.

Dunedin has adequate provision through the 2GP to meet the short-term demand for residential growth, with available capacity that is feasible, zoned and serviced with development infrastructure. However, there is inadequate provision within the 2GP to meet all of the medium-term and long-term residential capacity needs. DCC is undertaking a variation to the 2GP, which will identify additional residential capacity to meet the NPS-UDC.

In addition to meeting the land supply requirements for growth provision, DCC as the Territorial Local Authority (TLA) is responsible for the provision of infrastructure to service both the existing and the expanding city.

As part of the appeals work associated with the challenges to DCC's strategic approach to 3 Waters infrastructure, a litigation strategy is required, in order to set out the appropriate strategic direction for DCC to address:

- when serviced / un-serviced / self-serviced is required or appropriate
- position, policy and standards with regard to wastewater detention
- position, policy and standards with regard to stormwater management (both quantity and quality).

This position paper serves to test, challenge and confirm DCC's strategic approach to 3 Waters infrastructure in relation to the above, as well as provide supporting evidence for appeals that challenge DCC's current strategic approach to 3 Waters infrastructure.

1.1 Background

The sustainable management of natural and physical resources while ensuring the strategic integration of infrastructure with land-use is proclaimed through the Resource Management Act 1991 (RMA). Regional Councils (Otago Regional Council in this case) are responsible for ensuring that infrastructure is strategically integrated with land use through the provision of objectives, policies and approaches. The Regional Policy Statement (developed and made partially operative in 2019) does not provide

adequate provisions to ensure good quality infrastructure is developed and provided, and also makes no differentiation between what must be provided for public network infrastructure or private community infrastructure that may be installed by developers.

This is promulgated through the Local Government Act 2002 (LGA 2002) in Section 10 which calls for current and future needs of communities to be met through good quality infrastructure in a cost-effective way. TLA's in New Zealand (DCC in this case) are responsible for ensuring sufficient development capacity is available in respect of housing and business land to meet the expected demands of the district. This responsibility includes the provision of good-quality local infrastructure in a way that is the most cost-effective for households and businesses served by that infrastructure. In the 3 Waters context, adequate and good quality infrastructure is efficient, effective and appropriate to both the current and anticipated future development scenarios. Infrastructure should be planned to consider future growth and development and also to manage the expected effects of climate change.

TLA's are also responsible for developing and implementing (including reviewing and updating as required) objectives, policies and approaches to ensure that there is adequate provision for development, both housing and business, to meet the district demands. Adequate provision or "development capacity" is defined as the "provision of adequate development infrastructure to support the development of the land" and refers to 3 Waters network infrastructure for water supply, wastewater and stormwater.

DCC has developed the 2GP as part of their responsibilities, with new zones, objectives and policies for the city compared to the currently operative District Plan.

As part of the work to inform the 2GP on 3 Waters infrastructure capacity, DCC undertook a very high-level assessment to identify potential capacity issues in the water supply and wastewater networks in 2017. Stormwater was not assessed. For the wastewater and water supply assessments, DCC utilised the current network hydraulic models to identify areas with low water pressure or wastewater manhole flooding. The DCC assessment reviewed both the existing modelling network and the future "2031" network with planned increases in development under the District Plan. Further details on the DCC initial capacity assessment may be found in the Memo from the Asset Planning Team (Water and Waste Services) to City Planning entitled Water & Waste Services – Assessing submissions to 2GP which seek rezoning of land and have been classed as Urban Land Supply – Request for Technical Assessment (January 2017).

A more detailed assessment was subsequently carried out to inform the necessary planning, budgeting and programming of work for the 3 Waters networks and can be reviewed in more detailed in the AR & Associates draft Residential Capacity Assessments report (March 2020).

1.2 2GP Strategic Direction

DCC's Strategic Direction for the 2GP is set out in Section 2 of the 2GP. This section of the plan identifies key issues for the city and establishes the overall management approach for the 2GP, including zoning, and reflects:

- the strategic directions of the Spatial Plan for Dunedin, which were adopted in September 2012.

- The key goals identified by the community in development of the Plan, and
- The purpose and principles of the Resource Management Act 1991.

Dunedin has adopted six overall strategies, each of which includes objectives and policies which outline key approaches or methodologies to achieving these outcomes. Included are spatial distribution policies necessary to achieve strategic city-wide objectives. The strategic directions and their associated objectives and policies that have been identified by DCC as having the most relevance to 3 Waters infrastructure are outlined in **Table 1** below. The table also includes relevant City-Wide Provisions for Public Health and Safety. The City-wide provisions acknowledge that land use and development activities have the potential to affect the health and safety of people, including threats to the City's water, wastewater and stormwater systems.

There are also additional objectives and policies in the 2GP that may also have some relevance to the 3 Waters infrastructure provisions. These have been outlined in **Table 2** below along with additional commentary as to the relevance of these objectives and policies in the context of provisioning of 3 Waters infrastructure, and self-servicing.

The proposed infrastructure provisions in the 2GP (**Table 1**) seek to manage capacity issues in the network serviced areas, and promote self-servicing where zones are not serviced.

However, it is not clear from the Regional Policy Statement, and nor is it clarified in the current 2GP where larger higher-density areas supported by self-servicing might be appropriate, e.g. to enable infrastructure constraints to be avoided and development to continue. Nor is there clarity on an approach around the potential future shift whereby self-serviced areas become publicly serviced.

DCC seeks to have clarity around these issues by considering the following questions:

1. Is large-scale self-servicing or self-servicing of high-density areas an appropriate approach, or are council resources better directed at identifying and obtaining developer contributions and how to utilise these to bring infrastructure work programmes forward to address infrastructure constraints or network extensions?
2. Why is it necessary to have land serviced or programmed to be serviced before land is zoned? Can the land be zoned first, and the infrastructure servicing undertaken later at the time of subdivision or development?
3. Why, if there is no infrastructure capacity, can't self-servicing simply be allowed (on-site water tanks, composting toilets, private wastewater systems etc)?
4. Where, if ever, would these types of solutions be acceptable?

1.3 2GP Objectives and Policies relevant to 3 Waters infrastructure

DCC, through its 2GP, aims to promote growth in the city while ensuring the sustainable management of natural and physical resources to meet the needs and provide for the wellbeing of current and future generations, in accordance with Part 2 of the RMA. The 2GP infrastructure provisions provide a framework for the planning and managing of infrastructure, including 3 Waters.

Policy 2.2.5.2 encourages on-site drainage management where it does not endanger groundwater and is not in conflict with efficient use of infrastructure.

Similarly, Objective 9.2.1 and related policies allow for development only where there is capacity or it does not compromise the ability of public infrastructure to service activities permitted within the zone. In non-serviced areas, development is allowed through self-service within individual lots or decentralised schemes, providing it does not impact on 3 Waters infrastructure or adverse effects are insignificant.

Objective 2.7 highlights the need for affordable and efficient use of public infrastructure, including 3 Waters. This includes managing the location of new housing to ensure the efficient and cost-effective use of infrastructure (Policy 2.7.1.1), and the provision for public infrastructure networks that represent the least possible cost long term to the public (Policy 2.7.1.2). It also promotes incentives to minimise impervious surfaces and promote infiltration.

The efficient use of infrastructure referenced above is also aligned with Objective 2.2.4, which calls for the development of Dunedin as a compact and accessible city.

Objectives 10.2.1 and 10.2.2 require that biodiversity values and natural character of coastal and riparian margins be maintained or enhanced.

A Low Impact Design (LID) approach (also known as Water Sensitive Design (WSD)) should be promoted pursuant to relevant objectives and policies which seek to retain the natural character of the land, natural landform, hydrology and other features through the minimisation of earthworks and protection of natural features wherever possible.

Additionally, Objectives 15.2.2, 15.2.3 and 15.2.4 require that residential activities, development and subdivision activities provide high-quality amenity within the lots, streetscapes and public spaces for residents.

These requirements are also consistent with LID principles which seek to retain and enhance the natural properties of the land through the design of integrated naturalised urban environments.

Table 1: Identified proposed 2GP Infrastructure Provisions with 3 Waters relevance

Strategic Direction	Objective	Policies
2.2 Dunedin is environmentally sustainable and resilient	**2.2.4 Compact and accessible city** Dunedin stays a compact and accessible city with resilient townships based on sustainably managed urban expansion. Urban expansion only occurs if required and in the most appropriate form and locations.	Policy 2.2.4.5 Limit areas where water supply, wastewater and/or stormwater network connections are allowed to zones where network connections are anticipated (including residential and other urban zones) in order to avoid future pressure for changes to the type or density of development provided for in rural or rural residential zones adjacent to areas where water supply, wastewater and/or stormwater infrastructure may pass through.
	Objective 2.2.5: Environmental performance Development in the city is designed to reduce environmental costs and adverse effects on the environment as much as practicable, including energy consumption, water use, and the quality and quantity of stormwater discharge.	Policy 2.2.5.2 Enable and encourage on-site stormwater and wastewater management, where this would not endanger groundwater and is not in conflict with the efficient use of existing public wastewater and stormwater infrastructure, through rules that provide for an alternative to connecting to public water supply, wastewater and stormwater infrastructure.
2.7 Dunedin has affordable and efficient public infrastructure	**Objective 2.7.1: Efficient public infrastructure** Public infrastructure networks operate efficiently and effectively and have the least possible long-term cost burden to the public.	Policy 2.7.1.1 Manage the location of new housing to ensure efficient use and provision of public infrastructure through: - Rules that restrict development density in line with current or planned public infrastructure capacity. - Consideration of public infrastructure capacity as part of zoning and rules that enable intensification of housing. - Consideration of public infrastructure capacity as part of the identification of transition overlay zones, assessment of changes to zoning, or assessment of any greenfield subdivision proposals. - Assessment rules that require consideration of whether any discretionary of non-complying activity would consume public infrastructure capacity provided for another activity intended in the zone and prevent it from occurring. - Rules that control the area of impermeable surfaces in urban areas to enable stormwater to be absorbed onsite and reduce the quantity of stormwater runoff. **Note:** this is a runoff quantity control approach and in-line with best practice in the UK where both peak discharges and volumes are controlled as much as practicable to pre-development levels if possible. Policy 2.7.1.2 Ensure areas of new urban development provide for public infrastructure networks that represent the least possible long-term cost to the public through: - Rules that require public infrastructure networks to be included as part of a structure plan or comprehensive plan. - Inclusion of relevant costs of additional public infrastructure needed as a result of growth in: a. the DCC development contributions policy; or b. conditions of consent that require developers to pay for or provide infrastructure prior to development. - Assessment rules for new urban development that require consideration of the long-term costs to the DCC of any new infrastructure, including up-front capital costs to the DCC; the extent of debt required to be taken on by the DCC including the costs of debt; and the on-going maintenance and renewals costs of new public infrastructure. - Assessment rules that require consideration of additional public infrastructure capacity to provide for future urban development on adjoining or nearby sites. Policy 2.7.1.3 Avoid future pressure for unplanned expansion of public infrastructure through rules that restrict the density of activity outside of areas reticulated for wastewater, water supply or stormwater to ensure these are able to be self-sufficient where public infrastructure is not provided.

		Note: There are no policies in this section that relate to the effect of any temporary self-servicing on the provision of public services.
9.2 Public Health and Safety	**Objective 9.2.1: Land use, development and subdivision activities maintain or enhance the efficiency and affordability of public water supply, wastewater and stormwater infrastructure**.	Policy 9.2.1.1 Only allow land use or subdivision activities that may result in land use or development activities where: a. in an area with public water supply and/or wastewater infrastructure, it will not exceed the current or planned capacity of that infrastructure or compromise its ability to service any activities permitted within the zone; and b. in an area without public water supply and/or wastewater infrastructure, it will not lead to future pressure for unplanned expansion of that infrastructure. **Comment:** The argument before us is therefore that any expansion will need to be planned. Policy 9.2.1.3 Require subdivision activities to provide any available public water supply and wastewater infrastructure services to all resultant sites that can be developed, unless onsite or multisite services are proposed that will have positive effects on the overall public water supply and/or wastewater infrastructure services, or any adverse effects on them are insignificant. Policy 9.2.1.6 Require developments in 'infrastructure constraint mapped areas' to be at a density that does not compromise current or planned capacity.
	Objective 9.2.2: Land use, development and subdivision activities maintain or enhance people's health and safety.	Policy 9.2.2.7 Only allow land use, development, or subdivision activities that may lead to land use and development activities, in areas without public wastewater and stormwater infrastructure where these activities ensure wastewater and stormwater will be disposed of in such a way that avoids or, if avoidance is not practicable, ensures any adverse effects on the health of people on the site or on surrounding sites will be insignificant.

Table 2: Additional 2GP Infrastructure Provisions with potential 3 Waters relevance

Strategic Direction	Objective	Policies and commentary
2.2 Dunedin is environmentally sustainable and resilient	**Objective 2.2.1 Risk from Natural Hazards** The risk to people, communities, and property from natural hazards, considering the potential effects of climate change, is no more than low.	Policy 2.2.1.7 – In hazard overlay zones, provide more lenient rules on the expansion of existing activities to acknowledge pre-existing financial investment and other operational ties in a site. **Comment:** Natural Hazards include flooding, flood conveyance, overland flows, sediment laden flows, commutative effects, consideration of climate change, coastal hazards, poor drainage, ground water inundation. Poorly managed stormwater from developed areas can increase the extent, frequency and likelihood of such hazards.
	Objective 2.2.3 Indigenous biodiversity Dunedin's significant indigenous biodiversity is protected or enhanced, and restored: and other indigenous biodiversity is maintained or enhanced, and restored; with all indigenous biodiversity having improved connections and improved resilience.	**Comment:** Poor management of Stormwater and Wastewater could have detrimental impacts on this objective. Current policies include wetland/riparian setbacks, management location and scale of development, requirement for esplanade reserves/strips (Policy 2.2.3.3). It may be sensible to include additional policy for restoring/enhancing degraded stream habitats, managing the quality of stormwater runoff and managing potential issues with wastewater effluent runoff in self-serviced areas.
	Objective 2.2.4 Compact and accessible city Dunedin stays a compact and accessible city with resilient townships based on sustainably managed urban expansion. Urban expansion only occurs if required and in the most appropriate form and locations.	Policy 2.2.4.1 Prioritise the efficient use of existing urban land over urban expansion by: a. Ensuring that land is used efficiently and zoned at a standard or medium density (General Residential 1, General Residential 2, Inner City Residential, Low Density, or Township and Settlement), except if: hazards; slope; the need for on-site stormwater storage; the need to protect important biodiversity, water bodies, landscape or natural character values; or other factors make a standard density of residential development inappropriate; in which case, a large lot zoning or a structure plan mapped area should be used as appropriate. **Comment:** If DCC opts to prioritise public network upgrades to facilitate increased density in already urbanised areas, this would be supportive of this policy. Allowing of self-servicing could potentially facilitate more piecemeal development and sprawl.
2.3 Dunedin is Economically and Socially Prosperous	**Objective 2.3.1 Land and facilities important for economic productivity and social well-being** Land and facilities that are important for economic productivity and social well-being which include industrial areas, major facilities, key transportation routes, network utilities; and productive rural land are protected and able to operate efficiently and effectively.	Policy 2.3.1.7 enables network utilities through rules that enable network utilities to be established, operated and upgraded efficiently and effectively, while managing any adverse effects on the environment as well as rules that require activities that may damage or impede access to network utilities, and activities that may be sensitive to their effects, to be set back an adequate distance from network utilities.
2.4 Dunedin is a Memorable City with a Distinctive	**Objective 2.4.1 Form and Structure of the environment.** Specifically, part (e) the amenity and aesthetic coherence of different environments.	**Comment:** Has no specific provisions for 3 Waters infrastructure. However, it is worth noting that a water sensitive design approach to stormwater management contributes towards amenity and aesthetic provisions.

Built and Natural Character	**Objective 2.4.4 Natural Landscapes and natural features** Dunedin's outstanding and significant natural landscapes and natural features are protected.	**Comment:** Stormwater management has an important role to play in terms of managing natural waterways through improved water quality and minimising erosion. Recommend a flexible policy here that will enable freshwater management targets to be met as required by National Policy Statement. In areas with landscape and landform amenity worth of protection, and unlikely to be developed, it may be better to allow self-service, providing that any failure of such systems, which could result in detrimental impacts on the environment, is very carefully managed.
2.6 Dunedin has quality housing choices and adequate urban land supply	**Objective 2.6.2 Adequate Urban Land Supply** Dunedin provides sufficient, feasible, development capacity (as intensification opportunities and zoned urban land) in the most appropriate locations to meet the demand over the medium term (up to 10 years), while sustainably managing urban expansion in a way that maintains a compact city with resilient townships as outlined in Objective 2.2.4 and policies 2.2.4.1 to 2.2.4.3.	The policies (2.6.2.1) associated with this objective will allow for a Residential Transition overlay zone for areas to be developed in the medium rather than the short term. **Comment:** This has relevance in that it is a development control measure that could be employed for areas where infrastructure servicing can only be provided in the medium to long term. The key approach is to facilitate an adequate urban land supply to meet demand over time. DCC must therefore provide sufficient, feasible development capacity in appropriate locations. This policy is relevant, as feasibility of land for development will also be somewhat dependant on 3 Waters infrastructure provisions. Policy 2.6.2.2 Manage subdivision, new buildings and site design in transition overlay zones to ensure that these activities do not restrict the future use of the land for urban development.
9.2 Public Health and Safety	**Objective 9.2.2: Land use, development and subdivision activities maintain or enhance people's health and safety.**	Policy 9.2.2.9 - requires all new residential buildings, or subdivision activities that may result in new residential buildings, to have access to suitable water supply for firefighting purposes. **Note** DCC will need to consider how to cater for this if self-servicing for water supply is allowed. Self-serviced communities may be less resilient in summer when tank supplies are low.

2 // Dunedin's Strategic Approach to 3 Waters Infrastructure

2.1 General Approach

DCC's main objective in terms of 3 Waters infrastructure in the context of urban growth is to provide a service that is based on the overarching principle of "good quality infrastructure outcomes for present and future generations".

There is however a clear need to better define the policy, standards and criteria to ensure the delivery of good quality infrastructure that is effective and cost-efficient, and to help understand when self-servicing is required or appropriate for each of the 3 Waters.

The traditional approach adopted by Council is to aim for infrastructure planning and implementation to be in place before the zoning of land takes place, in order to ensure that a consistent plan and approach is followed. This is because the upgrade of infrastructure in response to individual development projects is seen as a fragmented and inefficient approach.

However, the implementation of infrastructure can also take place gradually after the infrastructure is planned and designed to meet maximum probable development needs under a particular pre-defined zoning. Once the zoning is in place, the implementation of infrastructure works can be gradually progressed and funded through development contributions or similar as development takes place. The approach is for any parties wanting to develop land in the catchment to do so whilst working toward the same pre-defined infrastructure plan.

2.2 Self-servicing and multi-servicing approach

DCC's current position is that self-servicing is not appropriate for General Residential Zones 1 and 2, Inner City Residential Zone, Low Density Residential Zone and Township & Settlement Zone (unless already self-serviced or identified as not being serviced in the 2GP through a 'No DCC reticulated wastewater mapped area'). This leaves Large Lot Residential 1 and 2 Zones, and Rural Residential Zones open for the option of self-servicing.

Whilst the ability to self-service is largely dependent on the availability of land, the opportunities for self-servicing can also vary depending on the specific context of a particular area and the type of service being considered, whether it is stormwater, wastewater or water supply. The sections below discuss each of the 3 Waters in more detail, in respect of DCC's strategic approach and opportunities for self-servicing, and other options including multiple lot self-servicing (decentralised) and multi-servicing (which allows servicing through combined private and public infrastructure).

2.2.1 Stormwater

DCC in its Code of Subdivision and Development 2010 (CoP) has adopted Part 4 of NZS4404:2004 (now superseded by NZS4404:2010) for the design and construction or stormwater systems, with a number of additions and/or alterations.

NZS4404:2010 in Section 4.2.1 specifies the main objective of a stormwater system being to manage stormwater runoff to minimise flood damage and adverse effects on the environment.

To achieve this, NZS4404:2010 requires that stormwater systems be designed and constructed with adequate capacity to meet minimum level of service criteria for primary and secondary flows. Stormwater systems should also be robust, resilient, cost effective and able to be maintained to ensure long service life.

In addition, stormwater systems must comply with minimum environmental requirements and be designed to ensure minimum adverse environmental impacts and the protection of aquatic ecosystems.

The application of LID or Water Sensitive Design solutions as an overarching design principle is promoted through DCC's CoP (Section 4.1) and NZS4404:2010 (Sections 4.2.1 and 4.3.7). However, these documents recognise that conventional piped stormwater systems will be often required in conjunction with LID systems or as the primary system.

To justify self-servicing from a stormwater perspective, the core primary and secondary drainage functions prescribed in the standards must be met within the site itself and such that hydrological conditions downstream are maintained, in addition to achieving minimum stormwater quality and quantity objectives. The development of overarching operation and maintenance criteria should be clearly identified by DCC, to ensure they are consistently applied across the city.

Specific operation and maintenance requirements, such as periodic and reactive inspection procedures and protocols and routine and remedial maintenance activities, should conform to DCC's generic requirements and be incorporated into design documentation as part of the engineering approval and building consent processes.

Consideration should be given to sensitive receiving environments, for example, those that are ecologically sensitive receiving environments (e.g. sediment-sensitive receiving environments), areas that may be sensitive or prone to erosion, flood prone areas or where historical approaches to stormwater management have resulted in issues within a sub-catchment.

The key stormwater management design objectives include:

Primary and secondary drainage:

Primary stormwater systems are required to accommodate the 10-year Average Recurrence Interval (ARI) event. Larger storm events, up to the 100-year ARI storm are in turn required to be managed via secondary systems consisting of ponding areas and overland flow paths, to ensure flood risks and associated impacts on people and property are adequately managed. Where a secondary flow path is not available, primary systems should be designed to accommodate to 100-year ARI storm.

Design of primary and secondary stormwater systems should include allowance for climate change and potential sea level rise.

Stormwater quality:

NZS4404:2010 in Section 4.2.8 specifies the need for stormwater treatment devices to avoid adverse water quality effects on receiving waters. Stormwater quality objectives require that contaminants be identified and treatment devices designed to address the particular issues. Typically, contaminants arising from urbanisation may include sediment, total and dissolved metals, hydrocarbons, nutrients,

organics, pesticides, gross pollutants and thermal loads. These contaminants should be managed such as to minimise environmental adverse effects.

The trigger criteria to define when stormwater quality treatment is required (or not) do not seem to be clearly defined in DCC's CoP or NZS 4404, or the regional or district plans (2GP or Operative).

However, stormwater quality treatment performance standards used in other parts of the country could be used by DCC to develop criteria. For example, Auckland Council through their Guideline Document GD2017/001 ("GD01") have adopted a performance-based design on the basis of treating first flush flows from the 90th percentile 24-hour storm event (approximately 25mm), using a range of stormwater treatment devices for the treatment of runoff from target areas.

While there are many factors that come into play such as site context and sensitivity of the receiving environments, other councils in New Zealand have adopted overarching criteria. This includes the identification of high contaminant generating areas for which stormwater quality treatment is required, for example high use roads (>5,000 vehicles per day) or carparks of a certain size, the use of inert roofing and cladding products in buildings or other specific criteria. I would recommend that DCC adopt similar criteria subject to appropriateness to the Dunedin context.

Stormwater quantity:

The stormwater quantity function seeks to ensure that pre-development hydrological conditions are maintained as much as possible. This includes:

- Replicating pre-development conditions with respect to the timing and quantum of flows;
- Ensuring that stormwater runoff is discharged in a diffused manner, mimicking natural conditions while avoiding concentrated discharges; and
- Promoting infiltration of stormwater runoff for groundwater recharge and to maintain and support stream health during dry periods.

2.2.1.1 Single lot stormwater self-servicing

Where adequate primary and/or secondary stormwater systems are not available to facilitate development, the 2GP in Policy 2.2.5.2 supports a self-serviced approach providing it does not impact on 3 Waters infrastructure and adverse effects are insignificant.

With single-lot self-servicing the primary and secondary drainage functions would be managed in each lot, including hydrological (water quantity) and water quality mitigation to ensure that stormwater related risks to properties upstream and downstream are adequately mitigated.

2.2.1.2 Multiple lot stormwater self-servicing

Pursuant to Policy 2.2.5.2, the option of multiple stormwater self-servicing (decentralised), where communal devices are used for the management of stormwater from multiple properties, can be supported in certain conditions.

Multiple stormwater self-servicing has the advantage of consolidating stormwater management for more than one lot using a small number of communal devices (often a single communal device). This

option allows the operation and maintenance to be managed more centrally, potentially making the process simpler, more cost-effective (through economies of scale) and easier to monitor.

2.2.1.3 Multi-servicing for stormwater

The option of multi-servicing where stormwater mitigation takes place in the individual lots with attenuated discharges being directed to the public stormwater infrastructure is also an option, where public infrastructure is available; but capacity is constrained. As for single lot self-servicing, responsibility for on-site stormwater management would fall upon each individual lot owner, prior to discharge to the public infrastructure.

2.2.2 Wastewater

DCC in its CoP has adopted Part 5 of NZS4404:2004 (now superseded by NZS4404:2010) for the design and construction or wastewater systems, with a number of additions and/or alterations.

The objectives prescribed by these standards for wastewater systems include:

- Ensuring that the system is functional while providing a minimum level of service to DCC's customers;
- Ensuring compliance with environmental standards and minimal adverse environmental and community effects;
- Compliance with statutory Health & Safety requirements;
- Ensuring adequate hydraulic capacity to service the full contributing catchment under maximum probable development (MPD) conditions;
- Providing wastewater systems that are cost effective and able to be maintained to ensure long service life;
- Providing wastewater systems that are structurally sound with a low level of exfiltration / infiltration and resistance to root intrusion, corrosion and chemical degradation.

The occurrence of sewer overflows due to inflow and infiltration, and lack of adequate capacity within the wastewater network, needs to be addressed as part of council's infrastructure planning. Sewer overflows result in detrimental impacts on receiving environments and human health. Consideration should therefore be given to sensitive receiving environments and other land uses, for example, shellfish farming, as part of wastewater infrastructure planning.

As a result, DCC's current position is to not accept development unless capacity is available to accommodate the proposed zoning of the land under MPD conditions.

2.2.2.1 Single lot wastewater self-servicing

Where adequate wastewater systems are not available to facilitate development, 2GP in Policy 2.2.5.2 supports a self-serviced approach for wastewater providing it does not impact on 3 Waters infrastructure and that adverse effects are insignificant.

While individual lot, on-site self-servicing for wastewater may be appropriate for Large Lot Residential 1 and 2 and Rural Residential zones, its suitability in higher density situations is less certain.

2.2.2.2 Multiple lot wastewater self-servicing

In the case of multiple self-servicing (decentralised wastewater systems or similar), a more formal maintenance ownership structure is needed, often in the form of a body corporate, maintenance company or similar, with maintenance obligations enforced through consent conditions, consent notices or other controls.

The specifications and standards adopted for multiple self-serviced systems should be the same as for a public asset given the potential consequences of failure and in case it is ever vested into council.

2.2.2.3 Multi-servicing for wastewater

In areas where wastewater infrastructure capacity is constrained, multi-servicing options may be available to facilitate growth, such as pressure sewer and wastewater detention systems. These systems can make efficient use of infrastructure capacity by storing, regulating, and pumping effluent into the public network at controlled rates and outside peak flow periods.

Multi-servicing can be achieved either on a lot-level basis, where detention and primary treatment of wastewater takes place in each lot and effluent discharge is electronically controlled through a STEP system or similar; or through public wastewater detention tanks, where untreated effluent is gravity-fed to underground tanks and pumped back into infrastructure in a controlled manner.

2.2.3 Water Supply

DCC in its Code of Subdivision and Development 2010 (CoP) has adopted Part 6 of NZS4404:2004 (now superseded by NZS4404:2010) for the design and construction or water supply systems, with a number of additions and/or alterations.

The objectives prescribed by DCC for water supply systems include:

- Ensuring a secure and reliable supply of drinking water to protect public health and meet firefighting requirements, while promoting water conservation, all at the lowest total lifecycle cost.
- Ensuring compliance with environmental standards and minimal adverse environmental and community effects;
- Ability for the system to meet public health criteria for drinking water quality;
- Ensuring compliance with statutory Health & Safety requirements;
- Ensuring adequate firefighting supply capacity; and
- Providing a water supply system that is cost effective and able to be maintained to ensure long service life.

Potable water supply should generally meet the requirements of the latest edition of the "Drinking-water Standards for New Zealand 2005 Revised 2018" (DWSNZ), which came into effect in March 2019, or applicable standard for the life of the system.

Firefighting water should meet the requirements of SNZ PAS 4509:2008 New Zealand Fire Service firefighting water supplies Code of Practice, or latest edition.

2.2.3.1 Water supply self service

DCC through Policy 2.7.1.3 seeks to "restrict the density of activity outside of areas reticulated for wastewater, water supply, or stormwater to ensure these are able to be self-sufficient where public infrastructure is not provided". This policy supports a self-serviced approach in certain situations and subject to adequate development density being adopted.

Where no water supply network is available, single lot water supply self-servicing through alternative water source options could be considered under certain circumstances. Self-serviced water supply options could include roof rainwater, bore supply, and surface intake from a watercourse. The ability to self-service needs to be considered on a lot by lot basis, as it depends on a number of factors (e.g. roof size, availability of water from bores and/or surface intake sources).

Self-serviced situations should be subject to meeting the requirements of Section 10 of DWSNZ - "Small Water Supplies, Alternative Compliance Criteria".

For self-serviced areas, firefighting water supply should meet minimum storage criteria and requirements set out in Table 2 and Appendix B of SNZ PAS 4509.

2.2.3.2 Multiple lot self-serviced water supply

DCC is seeking to move away from multiple lot private water supply networks due to the many problems encountered in the past with legacy multiple lot private water supply networks. Council's current preferred approach is for water supply infrastructure to be designed, constructed and publicly vested in accordance with DCC's standards in their CoP.

2.2.3.3 Multi-servicing water supply

Multi-servicing schemes for water supply, where due to infrastructure constraints public supply is supplemented by privately owned tanks or similar, is not encouraged as an option. This however does not prevent lot owners who are serviced with public water supply, from installing their own rainwater tanks for non-potable re-use if they wish, subject to obtaining a building consent.

2.2.4 Operation & Maintenance

The development of overarching operation and maintenance criteria for both public and private three waters infrastructure, along with responsibilities and expectations for the parties responsible, should be clearly identified by council to ensure that consistent practices are applied across the city.

Preventative maintenance of all infrastructure systems, whether they are held in private or public ownership, is critical to ensure that DCC's Level of Service (LOS) is not compromised and that risks to people and the receiving environments are appropriately managed.

Specific operation and maintenance requirements, such as periodic, scheduled and reactive inspection procedures and protocols and routine and remedial maintenance activities, should conform to DCC's generic requirements and be incorporated into design documentation as part of the engineering approval and building consent processes.

When applied on a single-lot servicing basis (where three waters infrastructure in each lot is managed at source), operation and maintenance responsibilities fall upon the lot owner, and should be controlled by way of legal instruments such as consent notices or covenants in favour of the council registered on the titles (or similar forms of control).

In the case of multiple lot self-serviced situations, operation and maintenance of communal devices can be managed more centrally, potentially making the process simpler, more cost-effective (through economies of scale) and easier to monitor. Operation and maintenance of communal devices should be managed and monitored through an established maintenance company or body corporate type of arrangement, with maintenance records being reported to council on a periodic basis. Legal instruments should be placed on property titles allocating these responsibilities to the lot owners concerned, including their obligations to jointly contribute to operation and maintenance and a mechanism to allow council to inspect and monitor the systems as may be required.

In the case of multi-servicing, operation and maintenance responsibilities are jointly shared between lot owners and council for the private and public portions of the infrastructure, respectively. The mechanism for operation and maintenance management in the lots would be similar to the single-lot self-servicing scenario.

3 // Policy review of TLA District Plans

Dunedin is not the only city in New Zealand grappling with the best approach for when to allow self-servicing.

Generally, there are no district Council bylaws that provide specific policies relevant to the context of managing self-servicing approaches in New Zealand. References to on-site wastewater and water management are sparsely found within district plans across New Zealand and generally, the regional plan is always deferred to (e.g. discharges to land/water, groundwater take, surface water take).

Strategy documents, guidelines and other non-statutory documents often provide a glimpse into a Council's position on on-site management vs reticulated servicing, although this is often not reflected in the district plan. An example includes Christchurch's strategic documents.

Likewise, there is very little available in terms of New Zealand guidelines and standards for self-servicing. Auckland Council's TP58 provides design guidance for determining the design of daily wastewater production from a dwelling based on the number of bedrooms and potential bedrooms which are equated to peak occupancy and a per capita wastewater flow allowance depending on the water supply source.

A review of the approach to the management of on-site water supply and wastewater management by other large urban centres across New Zealand is provided below.

3.1 Wellington Water

Wellington Water is a utility provider that manages drinking water, stormwater and wastewater services in the Wellington Region. Wellington Water promotes water conservation and sustainability and works with local councils and communities to ensure emergency water supplies in the event of a major earthquake. The refined role for Wellington Water is to manage the drinking water, wastewater and stormwater services of their council owners.

"The Wellington Metropolitan Region (the region) is experiencing steady urban growth with population expected to increase by 21% over the next 30 years. At the same time, many of the region's water bodies have reached capacity in terms of acceptable water quality limits. Our communities and three water networks continue to be affected by natural hazards, which over time, will be exacerbated by climate change" (Castalia Strategic Advisors, 2016).

Central to the 3 Waters strategy are Wellington Water's three customer outcomes:

1. Safe and healthy water
2. Respectful of the environment
3. Resilient networks support our economy

Wellington's Regional Standard for Water Services (Wellington Water, 2019) was developed to consolidate the existing codes of practice for water services for Porirua City, Hutt City, Upper Hutt City and Wellington City in order to provide a regionally consistent method of design and implementation of water services across the Wellington region that will meet Wellington Water's 12 service goals.

The Regional Standard for Water Services document is subordinate to the council's district plan and is to be used in parallel with any operative subdivision or development codes of practice. Where, within the council's subdivision or development codes of practice, there is any cross-reference to the superseded sections below, or conflict with the Regional Standard, the provisions within the Regional Standard shall take precedence. Where there is a conflict between the Regional Specification for Water Services and each council's subdivision specification, the Regional Specification for Water Services shall take precedence over the council subdivision specification.

Wellington Water's Regional Standard take the below approaches to self-servicing. The approaches that align with DCC's strategic approach and associated objectives and policies have been highlighted in **bold text.**

3.1.1 On-site disposal of wastewater

- On-site disposal *shall* be designed to enable the safe hygienic disposal of all household wastewater by surface or subsurface land disposal **without creating any adverse environmental impact** outside the bounds of the lot.
- Such systems **may only be used in rural or rural residential developments where a connection to the existing reticulation is not considered reasonable** by the council.
- A **resource consent may be necessary** so reference to GW's discharge to land policies are required.
- Design shall be based on field testing and any other site investigations necessary to demonstrate that these requirements can be met. Reference can be made to:
    - GW "Guideline for on-site sewage systems in the Wellington Region" (Dec 2000);
    - AS/NZS 1546.1 "On-site domestic wastewater treatment units - Septic tanks";
    - AS/NZS 1546.3 "On-site domestic wastewater treatment units - Aerated wastewater treatment systems"; and
    - AS/NZS 1547 "On-site domestic wastewater management". See also section 5.4.10 for general specifications for on-site disposal.

3.1.2 General Specifications for Wastewater:

In the case of approval for on-site disposal for residential waste in rural and rural residential areas where there is no available potential for a connection to the public wastewater network, and the provision of a community system for vesting to the council is not considered appropriate by the council, there are three levels of treatment discussed:

Primary treatment may typically consist of:

- Approved multi-chamber septic tank; or
- home treatment plant such as aerated tanks or rotating disc systems.

Secondary treatment may typically incorporate discharge to land and consist of:

- soakage trenches, commonly dose loaded; or
- evapo-transpiration and seepage beds or trenches; or
- mounded evapo-transpiration and seepage beds; or
- land irrigation by low pressure spray or drip system.

Tertiary treatment includes options such as chemical or ultra-violet treatment where discharge to waterways is proposed. All discharges to waterways will require a resource consent.

A summary of the provisions within the District Plan's in the areas covered by Wellington Water are provided in **Appendix A** of this report.

One key difference between DCC's and Wellington Water's objectives and policies is Wellington Water's requirement that the design of wastewater self-servicing must rely on field testing and other site investigations. The intent of field test informed design is to ensure that there are no adverse environmental impacts beyond the lot boundary. Further, Wellington Water requires up to three treatment levels, with specific approaches for each treatment stage clearly defined in their Regional Standards.

3.1.3 On-site Wastewater self-servicing requirements:

Proof of the ability to provide a suitable system for each lot shall be submitted with the resource consent application. The preliminary design and supporting report must be based on field testing carried out on each lot and a string of minimum standards and requirements has been outlined that is relevant to the region, including testing requirements, design guidelines and standards, effluent-loading rates, planting etc (**Appendix A**).

If, at subdivision stage, an existing effluent disposal system on any lot within the proposed development is found to be more than 10 years old, it must then be proven to comply with the current minimum requirements for on-site effluent disposal.

Note: In situations of high permeability soils and/or high water table, where potential for environmental contamination is high, further treatment by filtration and/or disinfection is required.

In special circumstances the use of other than water-based sewage systems may be proposed. Such systems shall be designed according to current guidelines and supported by relevant design data. In such cases grey water shall be disposed of to land and adequate soil testing and design shall be provided to support the proposal for grey water disposal.

3.1.4 Connection to Water Supply

Water supply connections from the reticulated water supply to rural or rural residential will not be approved if the property is not connected to a reticulated municipal wastewater system. This is to limit the potential for an on-site wastewater system to be hydraulically overloaded. Connections may be considered by council if the supply is a restricted flow supply and is metered.

3.1.5 Summary of Wellington Water requirements

Although the Regional Standard for Water Services 2019 is subordinate to the council's district plan and is to be used in parallel with any operative subdivision or development codes of practice, this standard supersedes the Regional Standard for Water Services 2012 (Part D:Wastewater and Stormwater Network Design and Part C: Water Supply Design and Construction). On-site disposal for wastewater may only be used in rural and rural residential developments where a connection to the existing reticulation is not considered reasonable by the council. Design shall be based on field testing and any other site investigations necessary to demonstrate that these requirements can be met. Reference can be made to the abovementioned guidelines. Note, the use of word can, not must.

There are three levels of treatment under specification for wastewater. Requirements are put in place for subdivision on proposed on-site proposal application as well as requirements for effluent disposal fields. The Regional Standard allows, in special circumstances for other than water-based sewage

systems to be proposed. Moreover, in terms of design inputs, the document refers to actions to be undertaken along with the reference to be made to several standards as mentioned above (Wellington Water, 2019).

3.2 Queenstown Lakes District Council

Like Dunedin, Queenstown Lakes District Council (QLDC) has to make provision to the Regional Plan set by Otago Regional Council. QLDC has a number of relevant objectives in **Chapter 4 District Wide Issues** of the QLDC District Plan.

The objectives include requirements to manage the land resource and associated waste discharges in such a way as to protect the quality and quantity of water in the District to a standard consistent with the human consumption of fish, swimming and protects the mauri (life force) of the lakes and rivers.

A number of objectives and associated policies imply that new development shall be serviced by public infrastructure and that the collection, treatment, storage and disposal of waste shall be managed in such a way as minimises the adverse effects on the natural resources of the District.

Consent is required for decentralised or communal septic systems, but not necessarily for lot-based wastewater systems that service a single dwelling.

There are several policies which respond to the objective for the sustainable management of development, which essentially seek to make a strong distinction between urban and rural development. For example, it seeks to provide for the majority of urban development within Queenstown and Wanaka, while establishing Urban Growth Boundaries to provide clear edges between urban and rural. This is further elaborated on in the QLDC 'Explanation and Principle Reasons for Adoption' section.

A strong motive to providing public services for water supply and wastewater disposal is implied for urban locales, while it is also implied that rural locales will be self-serviced.

The **Chapter 7: Residential** section of the plan recognises that there may be a significant cost associated with the extension of networks to future development areas. Despite the cost implications, the Chapter implies a clear preference for public infrastructure servicing for urban areas and includes a mandate that multi-unit developments are serviced by reticulated water supply and wastewater networks.

Chapter 9: Townships recognises that the majority of townships in QLDC have community water supplies, with some also having community sewerage disposal facilities. For many of the district's townships, the provision of reticulated water supply and wastewater disposal is identified as an issue, namely Luggate, Glenorchy and Kingston. Growth in the district will primarily be enabled through new development, which is planned to be provided with reticulated water supply and wastewater services.

This serviced development approach articulates a certain 'obligation' whereby the council is obligated to provide reticulated services, to the extent that the nature of the development will be limited, insofar as it is possible to provide capacity within the reticulated network.

QLDC expects that where there is no wastewater network (implying in areas where self-servicing will be relied upon), density will be kept low in order to maintain water quality and disposal quantity.

Chapter 15 subdivision, development and financial contributions requires that public infrastructure will be provided to new development areas, including a potable water supply. However, there does appear to be some leeway to allow for self-servicing or for an increase in density beyond the provisions, and with an associated infrastructure upgrade, with the cost explicitly falling within the responsibility of the developer.

Policy 1.6 To ensure that the provision of any necessary additional infrastructure for water supply, stormwater disposal and/or sewage treatment and disposal and the upgrading of existing infrastructure is undertaken and paid for by subdividers and developers in accordance with Council's Long-Term Community Plan Development Contributions Policy.

Just like DCC's Policy 2.7.1.2, here, the QLDC is responsible and requires the provision of infrastructure capacity beyond that required to service a particular sub-division, for example, to cater for future growth at adjacent or nearby sites. Whilst encouraging reticulated public systems, the QLDC policies below do not prevent self-servicing as long as the anticipated land uses are provided with a means of treating and disposing of sewerage that maintains public health and avoids or mitigates adverse effects on the environment. However, where a reticulated water supply, stormwater network and or sewerage treatment and disposal systems are available, all new lots must be provided with a connection to the 3 Waters networks.

QLDC's explanation and principle reasons for adoption of these policies point towards the need for regular monitoring and testing of on-site water supplies and the risks associated with self-servicing. A public reticulated water supply is preferred from a water quality adequacy and reliability perspective.

Likewise, the policies promote a public reticulated wastewater network over self-servicing in urban areas:

While self-servicing practices are allowed for, the policies and objectives imply that this is only endorsed in rural areas and townships and only in specific circumstances, for example, where reticulated networks are not practical, and there are no adverse effects on the environment or public health. And where self-servicing is considered an appropriate response, the design must be informed by appropriate onsite testing.

Likewise, QLDC refer to the role and responsibilities of the Regional Council, which governs water abstraction and stormwater and wastewater discharges.

QLDC's District Plan Chapter 17 on Utilities provides a clear direction that sites of new developments will have reticulated services and that these services must be provided prior to subdivision.

However, the policies do not immediately state that un-serviced established urban areas are to be serviced, only that the priorities for servicing these areas shall be assessed. This policy possibly allows room for existing self-serviced areas to remain self-serviced. Presumably, they will be prioritised under the same framework under which new development areas are allowed to be self-serviced.

QLDC provides explanation and principal reasons for the adoption of self-servicing approaches.

The second part of policy 1 allows development of parts of the District which may not be easily serviced, but where development may be desirable on other policy grounds (e.g. visual considerations, minimal risk through hazards, transport costs, urban consolidation or soil protection). This policy allows the Council to sustain resources by managing the form and extent of urban growth

by promoting appropriate areas for development. This approach allows for on-site self-servicing practices, but these developments should be allowed based on other planning grounds, which lend credence to the development.

Historically in QLDC, some rural areas have included ad hoc urban activities and residential use with a general lack of reticulated services. QLDC prefers a reticulated network and recognises that a reticulated public network is often necessary to ensure sewerage and stormwater are disposed of in a way to avoid any environmental detriment. In some rural areas, there are isolated residential pockets which are not necessarily appropriate for servicing, as this infers that these areas are permanent, and may be contrary to providing a cost-effective public network. If QLDC provides reticulation in these areas, this may signal development, which may be unsustainable in terms of energy use, soil protection, groundwater qualities, visual and landscape amenity etc. However, providing network servicing to these areas may be unavoidable and necessary to protect groundwater qualities, supply and public health. Thus, whilst some remote communities may simply be too impractical to service, in which case on-site management is the only reasonable solution, the QLDC maintains that network servicing may be necessary regardless in order to protect the environment and public health.

QLDC's Objective 2 is for the Efficient Use and Establishment of Utilities. Policy 2.7 encourages development in areas which are already serviced and have the capacity for additional development and takes into account economic costs; or in new locations where the development has regard to efficiencies through consolidation of activity. Policy 2.9 endorses the prioritisation of a public water supply and aims to achieve sustainability of the District's water supplies by:

- encouraging water conservation
- ensuring development is able to be serviced by the water supply system
- assessing the impact of development on water quality and quantity.

The costs of providing services should be minimised, thus the development and redevelopment of areas which are already serviced and have capacity for additional development is encouraged by QLDC. However, this approach must be balanced against other considerations, such as the type, character and density of living areas sought by the community and the style and density of development in the town centres. Where new areas of the District are to be developed, the economic costs of servicing an area are to be assessed including the demand on resources (e.g. the water resource). This will promote efficient use of services, sustainable management of resources and minimise costs to the community. Better utilisation of services within existing and new built up areas of activity is a factor encouraging a consolidation strategy for urban growth. This is a very similar approach to DCC's Objective 2.7.1.

In addition to the above considerations, QLDC's water resources are vulnerable in some areas due to quantity limits and the susceptibility of their water resources to contamination. The effect of land use and development on water quality and quantity is a key element that all new development proposals must consider when accounting for the cost of providing drinking water. QLDC has therefore incorporated Policy 17.1.4 Environmental Results Anticipated to ensure the provision of sewer and water reticulation in rural areas where required to prevent degradation of groundwater resources.

3.3 Selwyn District Council

The Selwyn District Council's District Plan has a number of provisions relating to 3 Waters infrastructure.

3.3.1 Water Supply

In terms of water quality, the plan has been developed to require "activities to have reticulated sewage treatment and disposal where the Regional Council will not issue discharge permits for on-site effluent disposal"

The district plan identifies townships which require reticulated wastewater management to avoid adverse effects on groundwater Some townships have been identified as requiring on-site management systems be designed by specialists in accordance with the requirements set out by the Transitional Regional Plan.

Water supply to all buildings must be reticulated for all townships, apart from some exceptions. The rationale for this is to minimise the potential for groundwater to become contaminated as a result of land use.

Buildings which are connected to a reticulated water supply network are permitted within all Living (Residential) zones. The only permitted activity which pertains to on-site water supply is Policy 4.4.2, which applies to the Living 1 Zone at Lincoln, which allows for rainwater storage tanks with a minimum capacity of 3000l for non-potable uses.

3.3.2 Wastewater

Selwyn District Council has a different approach and makes provisions that enable on-site self-servicing for wastewater. Buildings within specified [rural] townships must be large enough to accommodate on-site wastewater treatment. Buildings in most residential zones (other than some exceptions specified in rules 4.5.1 and 4.5.1A) are permitted if they are serviced by on-site effluent treatment and disposal systems.

The district plan often makes reference to requiring a discharge permit from Environment Canterbury in some cases for on-site sewage disposal.

For subdivision, on-site effluent disposal for specified townships is enabled with the condition being whether the allotment is of appropriate size, shape and has appropriate ground conditions to accommodate the system. Subdivision provisions also defers to the requirements of the regional plan as well as the Building Code.

There are also additional regional rules which apply to the Selwyn Te Waihora zone and fall under the Environment Canterbury Land and Water Regional Plan.

Section 4.15 and 4.16 are policies which strongly encourage all urban development to be connected to a reticulated wastewater network. Section 4.14A requires that domestic wastewater disposal is to be managed so that there is minimal impact on surface and ground waters. Community reticulated systems are encouraged where residential density is more than 1.5 dwellings/ha and the population is greater than 1000. Other measures can be employed such as secondary treatment systems and septic tank warrants of fitness.

Selwyn District Council has some specific requirements for the discharge of wastewater.

Discharge of wastewater from an on-site system which may enter water is a permitted activity, provided that specific requirements are met (**Appendix C**).

3.4 Thames-Coromandel District Council

Thames-Coromandel District Council (TCDC) published their Water Demand Management Strategy in 2017. The strategy encourages people to recycle their used water through water treatment systems, as well as collecting their own rainwater. The strategy explicitly mentions that there will be no requirements for rainwater tanks, and TCDC provides information about how to install and maintain rainwater harvesting systems.

The operative District Plan seems fairly open to the idea of on-site wastewater management and it reads as being quite open to any method of disposal, on a best solution basis. It states that any new lot can be serviced by reticulated services, or otherwise be completely self-contained. Consideration will be given to the best solution for wastewater treatment and disposal, ranging from totally self-contained servicing, communally owned shared systems and communally used systems to be vested in Council.

3.5 Waikato Regional Council

The Waikato Regional Plan covers off water take (Chapter 3.3) and discharges (Chapter 3.5). The discharges chapter allows on-site sewage discharges but refers to the Auckland Regional Council (1994) approach for the on-site wastewater disposal from household and institutions (TP58) or any update or equivalent code of practice. They recommend that on-site systems are managed in accordance with Auckland Regional Council 2004 on-site wastewater systems design and management manual – technical publication third edition.

The following are permitted activities:

- Discharge of domestic sewage from existing onsite systems prior to 28 September 1998, subject to conditions (note that 'grandfathering' type rules in district plans often result from litigation through the plan making process. While this approach is relatively common, t is not considered best practice in terms of environmental effects management).
- Discharge of domestic sewage from new on-site systems onto or into land outside the Lake Taupo Catchment
    - Maximum discharge per system of 1.3m^3 per day (average over one month)
    - Minimum septic tank size of 3000l
    - No direct discharge into water
    - At least 600mm separation between groundwater level and bottom of disposal trench during times of normal wet winter groundwater level
    - No emission of objectionable odour
    - Disposal area at least 2500m^2
    - Not within 20m of a Natural State Water Body or Fisheries Class Water Body in the Water Management Class Maps; 10m away from any other water body
    - At least 30m away from potable water supply unless it is from a separate, confined aquifer
    - At least 20m away from Significant Geothermal Feature
    - The septic tank must be fitted with an effluent outlet filter

- The system to be managed such that groundwater quality is not adversely affected

3.6 Nelson City Council

Nelson City Council manages 3 Waters under the Nelson Resource Management Plan. The management plan identifies large areas in Nelson as having limited availability and capacity for services including water supply and wastewater. This is managed through an overlay tool which introduces additional rules over and above those that apply to the underlying zone - the Services Overlay. Any development must satisfactorily address these limitations before the development can proceed.

In general, activities which propose to connect to onsite services require a more stringent resource consent assessment as a discretionary activity. The plan is more enabling (permissive) in respect of proposals which seek to connect to reticulated networks; these generally are considered as a restricted discretionary whereby the council limits the matters for discretion affecting the way in which the consent is assessed.

3.7 Auckland Council

Auckland Council Proposes the use of additional subdivision controls in areas where there are constraints pertaining particularly to provision of water supply and wastewater provision.

Commentary from submitters on the proposed Auckland Unitary Plan make some useful comments that could be considered by the DCC. Some examples are provided in Appendix E.

4 // Effects associated with on-site self-service wastewater systems

The Ministry for the Environment (MfE) published a Proposed National Environmental Standard for On-site Wastewater Systems with a report on the feedback and submissions on the proposed standard (Barry Johnson, Anja Feise-Preston, 2009) and a discussion document published in 2008 (MfE 890). A summary of some relevant information from the report is provided below.

4.1 Potential adverse effects

Self-service or on-site wastewater systems with inadequate levels of treatment or which experience failure can result in adverse effects on human health and the environment, including:

- Reduced water quality in lakes, rivers, estuaries and beaches which may then be unfit for swimming, gathering of seafood and marine farming activities such as mussel farming.
- Contamination of groundwater and surface water. This may also impact the quality of drinking water obtained from ground water bores or surface water abstraction. Contamination of surface water may also result in increased algal blooms.

Adverse effects such as those described above may occur or be exacerbated for a number of reasons such as:

- Poor maintenance;
- Sensitivity of the receiving environment (ground water, lakes, rivers, streams, etc);
- Excessive development density;
- Shallow groundwater table;
- Unsuitable soil types; and
- Inadequate clean water runoff management.

The MfE makes it clear that regular inspection and maintenance practices play an important role in maintaining and improving the performance of wastewater self-service systems. Further, they highlight the need for adequate tools to address failure of existing self-service systems, as well as preventing failure of self-service wastewater systems.

4.2 Council's role

TLAs can manage the installation of new self-service systems by developing a policy framework which acknowledges that "one size does not fit all." For example, any provisions may not be representative of all uses, which may include baches, rural homes and urban homes.

Council needs to consider a number of factors when planning where or when to allow self-servicing. These may include:

- The expected growth/target rates in each area;
- The capacity and availability of reticulated systems;
- Where reticulated systems can be proposed to give effect to urban growth;
- How on-site wastewater can be appropriately implemented based on zoning, density and infrastructure availability; and

- The provision of education and awareness to self-servicing communities to improve the uptake of the necessary maintenance of these systems.

The MfE has identified the issues associated with the use of self-servicing in high-density urban areas but likewise acknowledges that these issues can also occur in low density or rural areas. Typical issues include:

- The installation of self-service systems in unsuitable locations;
- Poor design which can cause effluent seepage;
- Inadequate installation and maintenance; and
- Failed disposal areas.

Whilst one failure may have a minor detrimental effect, it is important to be cognisant of the cumulative effects of multiple individual failing systems – in particular where this occurs over an extended period of time without any or little recourse from the council to require replacement or fixing.

The 2009 report on the submissions to the proposed standard highlights the main concerns of submitters around development controls for self-service wastewater systems. These include:

- Inappropriate subdivision consents allowing on-site systems where reticulation should be required or is available;
- Building permits issued for an on-site system with inappropriate design for the soil conditions, or systems not installed to design specification but approved by TLAs who may not have the technical background or capability for inspecting such systems;
- TLAs not requesting as-built plans to include the location of the on-site system for their records; and
- TLAs not knowing, or lodging on their records, what special approvals they have permitted (eg, advanced on-site systems), or whether the reuse of greywater has been permitted. (Barry Johnson, Anja Feise-Preston, 2009).

In addition, submissions from TLAs provide clarity on some of the causes of failures of self-service systems. These include historical subdivision approvals that allowed inadequate lot sizes, enabling the cheapest practical option for sewage treatment systems at the time of subdivision or district plan development. This approach prioritises maximum lot yields and has poor consideration for other activities or the whole design life (and associated maintenance costs) of the infrastructure. A number of submitters also highlighted the issues around the long-term cumulative effects on the environment from large numbers of low-performing septic systems in small areas.

4.3 Homeowner-related issues

Other issues highlighted by submitters to the MfE proposed standards (Barry Johnson, Anja Feise-Preston, 2009) related to issues specific to homeowners. Generally, homeowners are not equipped with the knowledge required to understand what on-site self-service systems they have, what constitutes acceptable performance of that system and how to resolve problems with the system. For example, the disposal fields provide an important function of these systems and appropriate maintenance is critical to performance remaining adequate.

Other submissions consider that changes in occupancy rates/densities, or an increased use of dishwashers with a resultant increase in wastewater loading contribute to the failure of self-service systems. Other considerations include the infrequent usage of holiday homes which can result in performance problems with the treatment and disposal of effluent. Maintenance of new systems is typically dropped after a few years or after a change in property ownership. Other common issues identified by submitters include operational issues such as blocked drains and chemical usage that are inappropriate for septic systems.

Self-service wastewater systems can therefore contribute to reduced water quality in sensitive environments or where there is a high density of self-service systems. The discharge of inadequately treated wastewater also has risks for human health.

The reliance on self-serviced systems in New Zealand is high in some regions, with up to 20 per cent of homes in some areas relying on these systems. Whilst the majority of the issues include ageing septic tanks and other infrastructure, new homes equipped with high-tech, modern systems capable of treating wastewater to a very high standard, also require regular and ongoing maintenance to ensure they function effectively.

Failure rates for self-service wastewater systems are estimated to range from 15 to 50 per cent (COVEC Ltd, 2007) across New Zealand. Failure of these systems can be attributed to a range of factors such as geology, climate, design and installation, lot size, and the age of the system.

The MfE discussion Document (MfE 890, 2007) provides further details on communities (approximately 250 of them) across New Zealand that have experienced reliability problems with self-serviced wastewater systems. MfE 890 (2007) references sanitary surveys carried out by a number of local authorities which found failure rates as high as 64 per cent and 77 per cent in urban areas in some regions.

4.4 Self-service system failure

'Failure' of a self-serviced wastewater system is defined in MfE 890 (2007) as “the situation where inadequately treated wastewater enters groundwater or surface water, creating an environmental risk, or rises to the ground surface, creating a risk to human health.” The discussion document highlights specific causes of failure as:

- Inadequate management/use of the system (disposing of unsuitable items or chemicals);
- Inadequate maintenance (eg, septic tanks should be pumped out regularly);
- Septic tank leaks through cracks and joints, discharging effluent directly into the ground;
- Intentional or accidental connection to stormwater pipes or drains;
- Blockage of pipes in the disposal field, causing concentrated effluent to discharged into the ground;
- Inadequate permeability of disposal field soils. This can cause effluent to run-off as surface water or discharge to ground water through cracks in the soil;
- High permeability of disposal field soils (eg, coarse sands or gravels). Again, this allows effluent to enter groundwater without adequate treatment in unsaturated soils (removal

of contaminants such as pathogens is much more effective in unsaturated than saturated soils);

- High ground water levels, which allow wastewater to enter the groundwater without adequate treatment; and
- Inadequate system design, e.g. the system has inadequate capacity for the size of the dwelling.

4.4.1 Main causes of failure

Effective operation of self-service systems requires adequate design, installation, operation and maintenance. The household residents have an important role in managing what enters the system (including chemicals) and ensuring regular servicing and maintenance of the system. This ensures the system continues to perform and effectively treat household effluent. The MfE discussion report (MfE 890, 2007) notes that a lack of ongoing servicing and regular maintenance contributes to the high numbers of septic system failures.

4.4.2 Risk to Human Health

The discharge of untreated or inadequately treated domestic wastewater from failing self-service systems can lead to the higher concentrations of *E. coli* bacteria. *E. coli* can cause digestive and respiratory diseases in people who come in contact with, or drink, contaminated water.

Where self-serviced wastewater systems are considered in proximity to offtakes for drinking water, through ground water bores, or surface water abstraction, consideration should be given to drinking water standards.

Subsequent to the publication of MfE proposed standards, the Government has reacted to failures in drinking water standards, such as the Havelock North drinking-water issues in 2016. It is worth noting that revisions to the drinking water standards by central government are anticipated in the near future. Allowing the treatment of wastewater through self-serviced wastewater systems can have indirect implications for drinking water standards, where the water take might be impacted, and where treatment of drinking water is inadequate.

The effects of untreated or partially treated effluent discharging to the environment can include:

- Disease (especially in young children) having direct contact with wastewater on the ground surface;
- Disease in people caused by drinking contaminated water (usually from shallow groundwater bores located near disposal fields);
- Flies and mosquitoes breeding in ponded effluent;
- Methemoglobinaemia ('blue baby syndrome') caused by elevated nitrate concentrations in groundwater used for drinking-water;
- Disease in people (most often young children) from contact recreation (swimming and paddling) in contaminated stormwater drains, streams, lakes, estuaries and beaches;
- Disease in people caused by eating contaminated shellfish, either from private or commercial shellfish gathering;

- Economic effects caused by having to close shellfish farms (even if no disease is actually caused) **Note:** Anecdotal comments by DCC staff suggest this is also an issue due to wastewater overflows from the public wastewater network;
- Nuisance weed growth and/or algal blooms caused by elevated nutrient levels, which can have secondary effects on people and aquatic animals from algal toxin reactions;
- The deterioration of freshwater ecosystems due to reduced water quality; and
- Permanent soil degradation caused by high levels of sodium and other salts from washing powders and other chemicals being disposed of through disposal fields.

In addition, conservative estimates indicate that more than 100 streams and over 100 coastal sites are potentially being affected by effluent discharging from failing on-site systems across New Zealand (EMS Ltd, 2007). The National Policy Statement for Fresh Water Management requires that water quality in freshwater bodies are adequate.

4.4.3 Legislative controls

Legislative controls on on-site, self-serviced systems are currently in place, and include:

- The Building Act 2004 (through the Building Code)
- The Health Act 1956
- The Resource Management Act 1991 (RMA)
- Local Government Act 2002.

In 2007, a review of all regional plans and bylaws related to consenting and maintenance of on-site self-serviced systems was undertaken by the MfE (MfE 890, 2008). The findings are summarised below.

Controls applied to on-site systems by local government vary and include requirements for resource consents, the provision of comprehensive information for the public and permitting all on-site systems through rules in their regional plans.

Very few Councils were found to monitor the performance of on-site systems or have formal requirements for property owners to maintain their on-site systems.

Councils are not able to directly recover the costs of monitoring permitted activities and have competing demands for limited financial resources for environmental monitoring. An exception is the Environment Bay of Plenty (EBOP) which does monitor the performance of on-site systems. EBOP developed an On-site Effluent Treatment Regional Plan due to a recognised need to reduce the well-documented impacts that domestic sewage discharged from on-site systems was having on the region's rivers, lakes and estuaries.

Marlborough District Council undertook a plan change (Plan Change 7) to include "On-site Discharges of Domestic Wastewater" in the Marlborough Sounds Resource Management Plan. This was in response to poor water quality attributable to on-site systems in the area. On-site systems were recognised as having adverse effects on marine farming and the tourism industry, both of which rely on a high standard of water quality in the Marlborough Sounds. These issues are very similar to those faced by DCC. Despite this, in Marlborough, the Council has ongoing challenges with addressing ongoing management of onsite systems. The Council is limited to responding to instances of non-compliance with permitted activity rules and resource consents. Communities have prioritised other

issues in the regional plan over on-site sewerage issues, even though they acknowledge that this is an issue. However, the MfE recommends that where there is a history of poor performance, a higher priority should be given to addressing the performance of on-site systems. The MfE acknowledges that the current regulatory regime does not appear to recognise the significance of the problem.

There are also situations where improving the management of existing on-site systems is best managed through the provision of public reticulation, which may be the only cost-effective and environmentally sound solution, for example in areas with poorly draining soils, high water tables, and small lot sizes.

The MfE 890 report (MfE, 2008) lists a wide range of environmental risk considerations that should be taken into account by Councils when allowing on-site self-servicing. These include, but are not limited to:

- Climate;
- Slope;
- Aspect;
- Soil;
- Erosion potential;
- Drainage;
- Building density and property size;
- Groundwater levels;
- Groundwater recharge zones and/or groundwater protection zones;
- Proximity to waterways;
- Sensitivity of the local environment;
- Flood hazards;
- Buffer zones; and
- Rules in regional plans relating to on-site systems.

As per the MfE recommendation, DCC may want to consider undertaking a GIS based risk assessment using the above, and any other relevant criteria, to identify high and low risk areas for on-site wastewater self-servicing as a first step to avoiding the risks associated with failure of these systems.

4.5 Dunedin Context and local issues

Dunedin households are serviced for wastewater and water supply through a range of approaches including:

- Public network servicing with the provision of reticulated, treated drinking water and/or a reticulated wastewater network;
- On lot, private self-servicing using private wastewater treatment and disposal systems and/or onsite water supply through roof rainwater collection, bore supply or other means;
- Public network servicing supplemented by roof rainwater collection, bore supply or other means for non-potable water supply, if desired by property owners;
- Water supply for drinking water from surface water takes; and
- Water supply for drinking water from ground water bores.

Associated issues in Dunedin may include:

- Contamination of freshwater and marine receiving environments through poorly managed (or maintained) and often outdated private wastewater systems. Wastewater overflows occur in a number of locations across the city;
- Contamination of freshwater, groundwater and marine receiving environments through untreated overflows from the public wastewater network (although understood to not be a frequent occurrence);
- Water take from river systems, that are likely to be affected with increased salinity associated with sea-level rise;
- Water take from ground water bores that must be protected from contamination or adequately treated;
- Influx of sea water into the wastewater network in low lying areas such as Dunedin South;
- An aging water supply pipe network, including private water supply pipes;
- Low pressure issues in places in the water supply network that may limit growth;
- Low volume, low pressure and septicity/staticity/acidity issues; and
- E1 pumps for wastewater in some locations to combat limited waste network capacity and low pressure or poor gravity flows.

Further to the above, water take from river systems which may be affected by increased salinity associated with sea-level rise and climate change effects is a known issue in various parts of New Zealand which regional councils are currently investigating.

The Dunedin network is generally considered to be old, and under capacity in areas. Whilst an ongoing renewals programme is underway, and DCC is addressing many of the issues outlined above, the 2GP zone changes will result in an increase in pressure on the network, which may exacerbate the current network problems.

In order to help inform the infrastructure planning for the servicing of both the existing and the growing city, DCC have undertaken a 3 Waters network capacity assessment to understand the likely effects of the 2GP residential zone changes on the existing network. In addition to this, the DCC have put forward a number of potential additional sites to be considered for a change to residential zoning or an increase in the density of residential zoning to meet the additional growth forecasts for the city under the NPS-UDC. The results of this study can be found in the AR & Associates (ARAL) Report, 2GP / NPS-UDC & Appeals Support - 3 Waters Capacity Assessment – Site Assessments and LTP Budgeting (March 2020).

The 2GP provisions seek to manage capacity issues in the network serviced areas, and promote self-servicing where zones are not serviced by a 3 Waters network. However, it is not clear from the Regional Policy Statement, and nor is it clarified in the 2GP, where larger higher-density areas of self-servicing might be appropriate, for example to enable infrastructure constraints to be avoided and development to continue. Nor is there clarity on an approach around the potential future shift whereby self-serviced areas may become publicly serviced.

Discussion on self-servicing in Dunedin in the context of the outcomes of the ARAL capacity assessment report are provided in the sections below.

4.6 Climate Change

In addition to all the above considerations, DCC will need to consider the appropriateness of a self-servicing approach in the long term within the context of climate change. Climate change is acknowledged to impact sea-level and rainfall patterns and soil saturation, which may have implications for:

- Water supply from roof rainwater
- Quality and quantity of water supply from river takes
- Treatment of effluent in soils

The National Institute of Water and Atmospheric Research (NIWA) is a Crown-owned company established to undertake research for the New Zealand Crown. In 2019, NIWA published climate change projections for the Otago Region (Macara et al, 2019).

NIWA, through HIRDS V4 provide climate change rainfall projections based on Representative Concentration Pathways (RCP), being greenhouse gas concentration trajectories adopted by the Intergovernmental Panel on Climate Change (IPCC) for a range of climate futures. The following four RCP scenarios are adopted by NIWA for their data:

- RCP2.6: CO2 emissions start declining by 2020 and go to zero by 2100 (best-case scenario);
- RCP4.5: CO2 emissions peak around 2040, then decline (intermediate scenario);
- RCP6: CO2 emissions peak around 2080, then decline; and
- RCP8.5: CO2 emissions continue to rise throughout the 21st century (worst case scenario).

The NIWA projections for Dunedin include the following likely outcomes.

4.6.1 Dry days per year

Dunedin and the Taieri Plains typically average approximately 225-250 dry days per year (see **Table 3**. Winter is typically the driest season, with 60-80 dry days across all of the Otago Region. Spring typically has the fewest dry days, in the range of 50-70 dry days across the Region.

By 2040 (RCP4.5) it is expected that the number of dry days per year will decrease near the coast (1-4 fewer dry days per year). This change is expected to be amplified under the RCP8.5 climate change projection (see **Table 3**).

By 2090 (RCP8.5) decreases in annual dry days are projected for coastal areas of Otago in the range of 2-6 fewer dry days per year. In other words, the Dunedin area can expect more wet days on average in a year. In terms of seasonal changes, by 2090 (RCP8.5), it is anticipated that winter, spring and Autumn are likely to be wetter for Dunedin (fewer dry days) and drier in summer (more dry days) (**Table 3**).

Table 3: Modelled seasonal and annual average number of dry days (<1mm) for present and 2090 at RCP8.5
Taken from NIWA's climate change report for Otago, 2019.

	Present					2090 RCP8.5				
	Sum	Aut	Win	Spr	Ann	Sum	Aut	Win	Spr	Ann
Brighton	53	59	62	55	229	+1	-1	-2	-1	-3
Dunedin	53	59	62	55	229	+1	-1-	-3	-1	-4
Middlemarch	56	62	67	58	224	+1	-1	-3	0	-2
Mosgiel	55	62	67	57	241	+1	-1	-3	-1	-4
Waikouaiti	63	71	76	66	275	0	-2	-3	-1	-6

4.6.2 Rainfall

Annual rainfall depths are expected to increase across Dunedin as a result of climate change. The increases are anticipated to be in the range of 10-20% for most of the region by 2090, for the RCP 8.5 climate change scenario. Winter rainfall (currently the dry season in Dunedin) is projected to increase considerably, by 20-40% by 2090 for RCP8.5. In Middlemarch, the current summer wet season is anticipated to get drier, with summer rainfall projections showing a 5-10% reduction around Middlemarch by 2090 (**Table 4**).

Table 4: Modelled seasonal and annual average rainfall for present and 2090 at RCP8.5
Taken from NIWA's climate change report for Otago, 2019.

	Present					2090 RCP8.5				
	Sum	Aut	Win	Spr	Ann	Sum	Aut	Win	Spr	Ann
Brighton	219	187	151	216	773	+3	+12	+24	+12	+13
Dunedin	259	216	174	255	904	+2	+9	+26	+14	+13
Middlemarch	146	117	93	144	500	-6	+7	+22	+4	+7
Mosgiel	198	166	132	198	694	+2	+10	+27	+11	+12
Waikouaiti	179	134	107	165	585	+3	+13	+30	+11	+14

4.6.3 Average Temperature

NIWA projections suggest that seasonal average temperatures across Otago will increase by 1.5-2.5 ˚C in coastal areas (including Dunedin), and 2.0-3.5˚C inland for the 2090 RCP8.5 scenario.

Table 5: Modelled seasonal and annual mean temperature for present and RCP8.5 scenario for 2090
Taken from NIWA's climate change report for Otago, 2019.

	Present					2090 RCP8.5				
	Sum	Aut	Win	Spr	Ann	Sum	Aut	Win	Spr	Ann
Brighton	13.1	10.2	6.2	9.6	9.7	+1.6	+1.9	+1.9	+1.6	+1.8
Dunedin	13.6	10.6	6.6	10.0	10.2	+1.6	+1.9	+1.9	+1.6	+1.8
Middlemarch	14.7	9.8	4.7	10.8	9.8	+2.3	+2.4	+2.2	+2.1	+2.3
Mosgiel	14.0	11.1	7.0	10.5	10.6	+1.6	+1.9	+1.9	+1.6	+1.8
Waikouaiti	14.1	10.3	6.0	10.3	10.2	+2.0	+2.4	+1.9	+1.8	+2.0

Soil saturation levels are an important factor in secondary wastewater treatment in self-serviced systems. Excessively dry soils can result in effluent running through the cracks in the soils and reducing secondary treatment as a result. Likewise, overly saturated soils may have less capacity for the infiltration and treatment, in addition to risks of effluent runoff being generated overland and contaminating surface waters.

Climate change may have different effects in different areas of Dunedin, for example, in Middlemarch, soils in summer may have a reduced capacity for secondary wastewater treatment due to projected increases in temperatures, number of dry days and associated reduced rainfall.

5 // Discussion

When it comes to site specific development and appeals promoting self-servicing approaches, DCC will need to consider whether self-servicing of a development is affordable, resilient and meets the relevant objectives and policies. I.e. is self-servicing adequate and appropriate?

The residential capacity assessments undertaken by ARAL (2020) provide the basis for where self-servicing may be an appropriate approach for individual areas. However, proposing self-servicing for an area should be considered within the wider DCC context and the availability of serviced land, within the timeframes required by the city's demand for housing.

DCC seeks clarity around these issues by considering the questions outlined in the sections below.

5.1 Large scale self-servicing

This section deals with the question*, "Is large-scale self-servicing an appropriate approach, or are Council resources better directed at identifying and obtaining developer contributions and how to utilise these to bring infrastructure work programmes forward to address infrastructure constraints or network extensions?"*

Self-servicing, both on a large, urban scale and a discrete rural scale has risks for both the environment and human health. These are well documented and are well detailed in the MfE Discussion Report (MfE 890, 2007). A number of Councils, notably QLDC, whilst making provision for self-servicing, prioritise the provision of land for development that can be serviced, the implication being that public network servicing is prioritised over self-servicing. The QLDC objectives and policies recognise the risks associated with self-servicing (particularly for wastewater) and make provision to provide public network servicing, even where this may be hard or expensive to achieve. The additional capital costs to Council should be weighed up against the potential costs associated with environmental harm and risks to human health. QLDC also makes provision for developers to contribute to the cost of public networks that will be extended to service their development sites.

5.1.1 Stormwater

Where adequate primary and/or secondary stormwater systems are not available to facilitate development, 2GP in Policy 2.2.5.2 supports a self-serviced approach for stormwater providing it does not impact on 3 Waters infrastructure and adverse effects are insignificant.

Self-servicing can be achieved on a single lot basis, or as multiple self-servicing (decentralised), where a communal device is used to manage (treat and/or attenuate) stormwater flows from multiple lots.

Alternatively, stormwater mitigation can be undertaken in the individual lots with attenuated discharges discharged to the public stormwater infrastructure, through a multi-servicing scheme.

When self-servicing from a stormwater perspective, the core primary and secondary drainage functions prescribed in the standards must be met within the site itself (whether it is an individual lot or a group of lots). This includes maintaining hydrological conditions in order to manage stormwater risks both upstream and downstream of the site, in addition to achieving minimum stormwater quality and quantity objectives.

To address the question of whether large-scale self-servicing is an appropriate approach (or not), stormwater is perhaps the best suited infrastructure out of the 3 Waters for self-servicing, through the incorporation of a well-designed and implemented Low Impact Design (LID) approach. LID is an effective way of achieving a self-serviced stormwater solution to meet primary and secondary drainage, water quality and water quantity objectives, while ensuring the management of stormwater takes place in a way that is sensitive to the natural environment and hydrology.

LID is also consistent with other 2GP objectives such as the focus on minimising impervious surfaces, promoting infiltration, maintaining and enhancing biodiversity values, protecting and preserving the natural character of coastal and riparian margins, and creating high-quality amenity within private and public urban environments.

Therefore, for Dunedin, LID should be generally promoted as an over-arching approach to stormwater management for self-serviced situations through relevant objectives and policies, to ensure that:

- Stormwater systems are resilient, robust and fit for purpose;
- Stormwater systems are designed in conjunction with urban, landscape, roading and other design elements as to achieve integrated, naturalised urban environment outcomes that reflect the natural character of the land while achieving primary and secondary drainage, stormwater quantity and stormwater quality functions and objectives; and
- The preservation of the natural landform and hydrology is achieved through integrated design which seeks to manage stormwater at source, minimise earthworks and retain coastal and riparian margins and natural drainage patterns.

The development of overarching operation and maintenance criteria for LID systems should be clearly identified by council, to ensure they are consistently applied across the city.

Specific operation and maintenance requirements, such as periodic, scheduled and reactive inspection procedures and protocols and routine and remedial maintenance activities, should conform to DCC's generic requirements and be incorporated into design documentation as part of the engineering approval and building consent processes.

5.1.2 Wastewater

Where adequate wastewater infrastructure is available to facilitate development, 2GP in Policy 2.2.5.2 supports a self-serviced approach, providing it does not impact on 3 Waters infrastructure and adverse effects are insignificant.

Large-scale wastewater self-servicing requires careful consideration from both the land availability and technical viability perspectives. While individual lot, on-site self-servicing for wastewater may be appropriate for Large Lot Residential 1 and 2 and Rural Residential zones, it may not be suitable for higher density situations.

The ability to adequately self-service for wastewater is dependent on the availability of land for disposal, the capacity of the soils to effectively accept and assimilate treated effluent, in addition to ground stability and topographical (slope) considerations. As such, the viability of self-servicing (whether it be on a single-lot or multiple lot basis) will require consideration on a case by case basis.

In serviced areas where wastewater capacity is limited, there may be merit in considering options for multi-servicing, such as pressure sewer and wastewater detention systems. These systems can make efficient use of infrastructure capacity by storing, regulating, and pumping effluent into the public network at controlled rates and outside peak flow periods.

Multi-servicing can be achieved either on a lot-level basis, where detention and primary treatment of wastewater takes place in each lot and effluent discharge is electronically controlled through a pressure sewer system (STEP similar); or through public wastewater detention tanks, where untreated effluent is gravity-fed to underground tanks and pumped back into infrastructure in a controlled manner.

With pressure sewer systems, effluent from each lot can be electronically controlled to be pumped outside peak times and in a staggered way, through SCADA or equivalent technology that allows the automated regulation and distribution of flows to manage capacity constraints within downstream infrastructure. The tank units are fitted with electronic panels which communicate via phone line with the system operator (potentially council's operations team) to allow the performance from all tanks in the network to be monitored and controlled electronically and from a single point.

The on-site wastewater detention and pump systems would be privately owned as they would be located in each individual lot, but the rising main network would be public or communally shared as it would be located in the road reserves. Pressure sewer systems have been successfully adopted for a number of small communities in New Zealand, and as part of these schemes local councils have taken over maintenance responsibilities, including the public rising mains as well as the privately owned tanks and pumps.

Another way of achieving multi-servicing is the use of communal or public wastewater detention systems. With these systems, wastewater effluent is gravity-fed to underground pump stations with over-sized wet wells that effectively function as wastewater detention tanks. Wastewater effluent is temporarily stored during peak flow periods, with pumped discharges being electronically controlled to take place outside peak times.

An advantage of public wastewater detention is that they can be either planned as part of the new infrastructure to support growth areas connecting into existing public systems, or they can be retro-fitted into existing public networks, to help control existing capacity issues in addition to facilitating future growth.

Given the potentially significant consequences of system failure associated with self-serviced or multi-serviced wastewater systems, adequate operation and maintenance practices should be put in place and strictly followed. This includes preventative and scheduled maintenance to reduce the risk of system failure and maximise the life of the same, as well as reactive maintenance protocols in response to system problems or inefficiencies.

For any self-serviced developments, the establishment of a legal mechanism (consent notices or equivalent) is necessary to ensure that landowners understand and accept the maintenance responsibilities associated with such systems.

For multiple lot self-service developments, the establishment of a management company, body corporate, resident's association or equivalent, along with relevant legal instruments such as consent

notices or covenants registered on the titles is necessary to ensure that maintenance responsibilities are assigned to relevant parties and fulfilled for the life of the system.

On the other hand, operation and maintenance responsibilities for multi-serviced wastewater schemes connecting to the public system should ideally sit with council. This includes pressure sewer systems where even though ownership is help by the lot owners, maintenance can be electronically controlled and centrally coordinated by council's operations teams. Public wastewater detention systems would normally be located in public road reserves or other public areas and publicly maintained (with the maintenance costs usually recovered and spread over time through rates billing).

5.1.3 Water Supply

DCC is seeking to move away from legacy private water supply networks due to the many problems encountered in the past. Council's current preferred approach is for water supply infrastructure to be designed, constructed and publicly vested in accordance with DCC's standards as outlined in the DCC CoP.

Where no water supply network is available, water supply self-servicing on a lot by lot basis could be considered under certain circumstances. Providing that domestic water supply for self-serviced areas can be suitably complemented with tanked or other alternative supplies, an average yearly percentage water supplied of 80% or more is considered feasible for purposes of self-servicing (Chapter 11 of Auckland Regional Council's TP10, 2003). Similarly, an average yearly percentage water supply between 50% and 80% is classified as constrained and would therefore need consideration on a case-by-case basis. Any supply below 50% is would be classed as unfeasible.

NIWA's climate change projections for the Dunedin area include likely increases in annual seasonal and annual rainfall by 2100 (RCP 8.5) compared to current rainfall depths. However, in summer, the number of dry days is anticipated to increase, along with a projected increase in temperatures which may result in reduced water availability and increased water consumption. Any proposed self-servicing for water supply will therefore need to consider climate change projections which may impact on the reliability of supply through on lot tank supply.

DCC need to consider their position around provisioning drinking water of an adequate standard to their customers, being part of a TLA's roles and responsibilities. Self-serviced water supply is subject to meeting the requirements of Section 10 of DWSNZ - "Small Water Supplies, Alternative Compliance Criteria". DCC's drinking water standards, policies and objectives for drinking water therefore need to reflect this standard, while being flexible enough (but not lenient) to enable DCC to respond to any changes coming from Central Government.

In addition to self-servicing, multi-servicing should be considered where public water supply infrastructure exists, but it is of limited capacity. Under such schemes, council may provide low pressure water supply as a drinking water supply, and to supplement on-site water supply which would in turn be separately managed for dedicated non-drinking water uses (non-potable and/or fire-fighting supply) and to deal with backwater prevention risks.

5.2 Servicing vs Zoning

This section deals with the question, *"Why is it necessary to have land serviced or programmed to be serviced before land is zoned? Why can't you zone the land and worry about infrastructure at the time of subdivision?"*

Land should be either able to be serviced, or programmed to be serviced in advance of landowners being given a right to receive servicing, because this helps the DCC achieve S10 LGA – provision of "good quality infrastructure" i.e. that is cost-effective, efficient, effective, and appropriate to present and anticipated future circumstances.

If servicing was only considered at the time of subdivision, the approach could likely result in piecemeal, inefficient, ineffective and costly outcomes. This could be particularly pronounced if a subdivision was undertaken in stages, or if the entire subdivision was made up of larger lots to be later developed into smaller lots, or where there are different landowners undertaking development at different times.

However, there are some examples where the land has been zoned in advance to infrastructure being planned or implemented. These are provided below, including commentary on potential constraints or opportunities that this approach might have for DCC.

5.2.1 Whangaparaoa Peninsula – Auckland

Where there is pressure from developers to move forward with development in an area where the TLA is not yet ready to provide a public network, the TLA may consider allowing self-servicing as a temporary measure. An example where this has occurred is in Rodney District Council. The Council zoned the Whangaparaoa Peninsula for urban residential development, but at the time was unable to provide a public water supply network. Development was therefore allowed to proceed in a self-servicing basis. Watercare has since provisioned a water supply network that was funded through planned future connection fees to the network. However, there has been a limited uptake of residents connecting to the network, meaning that in this particular case, the reliance on connection fees to cover the cost of infrastructure has put the council and infrastructure providers at risk. The cost to pay for the infrastructure is not recovered through new connections, and the infrastructure rate of depreciation vs cost in effect results in a greater cost to the council and by default the ratepayers.

An alternative approach could be to require a local network to be constructed at the time of subdivision that meets the design requirements of the public network. However, in the short-term, the local network could be connected to a communal, decentralised system. Such a system could be owned, managed and operated either by the TLA or privately through a body-corporate or similar. Where the latter has been used as the approach from the outset, the body-corporate has often ended up approaching the council to 'take-over' the infrastructure which has often resulted in high litigation costs and frustrations by the community.

As such if pursuing such an approach, the council should identify funding mechanisms to fund any future public network extensions to such areas. This could possibly be achieved through a targeted rate,

or development contributions, the latter maybe being by way of a bond secured at the time of subdivision (prior to the completion of s224c stage).

5.2.2 Takanini South – Auckland

In Takanini South, Auckland, the legacy Papakura District Council zoned a proposed development area before planning of infrastructure had been carried out. The area is prone to significant surface water flooding and flood hazard. There are no major streams or water courses draining the area, and much of the area overlays peat soils, which makes the construction of large pipe infrastructure technically unfeasible.

The eventual stormwater solution was the construction of wide floodway channels to provide a comprehensive solution for the conveyance of surface water runoff and containment of flood flows. However, the land take for the floodway is significant, and Council had to retrospectively "buy back" the land for stormwater management purposes at market rates as the zoning had already occurred.

The Takanini South experience highlighted that the zoning of land ahead of planning infrastructure, particularly stormwater infrastructure, could impact on costs to Council and developers who have the expectation that the entire area can be developed into lots. This issue is particularly important in areas that cover multiple landowners, with some landowners potentially being impacted more than others. Signalling likely land take (and location) by stormwater management devices at the time of live-zoning would go some way to managing this effect.

More recently, through the Auckland Unitary Plan, the Auckland Council has applied a "Future Urban Zone" overlay to another significant area in Takanini North with similar issues to Takanini South. Whilst the land has not yet been live-zoned, developers and land bankers have the expectation that the area will be zoned for urban development and are applying pressure through the private plan change process. Whilst any one proposed development going ahead is unlikely to have much impact on the wider catchment and network, if not adequately planned, the cumulative impact of multiple developments could severely constrain the development potential of the area. It is therefore critical that the re-zoning and development of land is done comprehensively with infrastructure requirements used as the basis to plan the staging of any growth initiatives. These issues were discussed in a paper by Dowson and Nikkel (2018) and highlight the need for early integrated planning to a sufficient level of detail so that Council can be confident that the needs of future development can be met.

5.2.3 Provisioning of Catchment Management Plans as part of the structure Plan Process

The legacy Auckland Regional Council prepared a guide to Structure Planning that emphasises the need to develop Integrated Catchment Management Plans (ICMPs) as part of the structure planning process (ARC, 2005), see **Appendix F**. The Guide also includes funding options for preparing ICMPS and structure plans. The requirement for providing ICMPs through the structure planning process was successfully defended at Environment Court, so case law supporting this approach is available.

An example of where this was applied was in the legacy Rodney District Council, where Council did not have the funds, or the resources to develop the necessary ICMPs for the areas under growth pressure. The developers themselves developed the ICMPs, in collaboration with Rodney District Council to ensure that Council's future infrastructure needs could be met.

5.2.4 Funding models for the provisioning of public infrastructure

The legacy Rodney District Council estimated the requirements for stormwater wetlands and ponds in areas planned for development and included considerations of the value of these assets, the maintenance costs and other cost implications for Council, including funding mechanisms. A paper published by Ira and Buchanan (2009) discusses a range of approaches to funding through Developer Contributions using lifecycle costing.

5.3 Criteria for self-servicing

This section deals with the question, *"Why, if there is no infrastructure capacity, can you not simply allow self-servicing (on-site water tanks, composting toilets, private wastewater systems etc)?"*

Individual site self-servicing may be appropriate in the rural environment. However, as development intensifies individual site self-servicing may not be appropriate and again the DCC must consider if this approach meets the test of "good-quality local infrastructure" – particularly given the foreseeable future circumstances (i.e. that this will become unpalatable to most landowners very quickly). Wastewater discharges to the environment can have an adverse environmental effect in terms of both surface runoff, groundwater quality, ground stability and odour (environment and public health and safety), and there can be cumulative effects. The ORC is responsible for discharges of contaminants to the environment. Lots must be appropriately sized to include appropriate allowance for effluent disposal fields. Homeowners also need a certain level of knowledge and skill sets to ensure their on-site wastewater and water systems are well maintained.

Multiple lot self-servicing also sometimes occurs where a number of lots share a single communal device, which may be either publicly owned and managed, or managed privately. As with on-lot systems, there can be issues with ensuring ongoing maintenance and responsibility, and it is critical that an adequate mechanism is put in place to ensure accountability by those responsible is in place, and for council to have the ability to monitor the management of these systems.

For single-lot self-serviced developments, the establishment of consent notices or equivalent mechanism is necessary to ensure that landowners understand and accept the maintenance responsibilities associated with such systems.

For multiple lot self-service developments, operation and maintenance should be managed through a management company, body corporate, resident's association or equivalent. In view that private systems such as those managed with a maintenance company or body corporate do not allow council the ability to monitor performance, consent notices or covenants (or equivalent mechanism) could be placed on the titles to ensure that shared maintenance responsibilities are assigned to relevant parties and to provide council with a level of control.

On the other hand, operation and maintenance responsibilities for multi-serviced infrastructure should lie with council in the first instance.

For water supply, there are greater public health risks, and some suppliers would become registered drinking water suppliers subject to the drinking water standards. It has previously been mooted that territorial authorities have a role in helping the Drinking Water Assessor enforce its requirements on

small private water schemes. This matter is subject to further investigation as further legislative requirements are being reviewed and awaiting confirmation from Taumata Arowai – central government's water regulator.

While self-servicing may be an acceptable approach to a developer, it may not be palatable to future landowners who may not be actively aware of the requirement to self-service, or of any difficulties/pitfalls of self-servicing. Again, future landowners might anticipate self-servicing in a rural environment, but they are unlikely to anticipate it in any higher density urban development. If the matter is not well addressed at the time the development is approved, then these future communities will most likely approach the DCC at some point to request public infrastructure services.

In its role under the LGA, the DCC must determine whether any higher density self-servicing approach meets the test of "good-quality local infrastructure", when foreseeable circumstances include a likely desire to receive public infrastructure services in the short-medium term.

Another consideration for DCC is around how they will manage development in the scenario that they allow on-site self-servicing as a short-term solution to releasing land for development. Certainly, in brownfield areas, much of the growth could be expected to come from two-lot subdivisions through so called "Mum and Dad" developers. If the local public network is under capacity, and DCC allows such developments to self-service, DCC is losing the opportunity to obtain DC's for public network provisioning. In Auckland, funding to address many of the existing network constraints occurs through DC's from growth areas. Developers are unlikely to want to wear the cost of paying both a DC for a future network connection and on-site self-servicing infrastructure.

Whilst it may be possible to apply a self-serviced approach to new growth areas immediately and permanently, this should not be the default solution if it means that network planning could be more complicated and require more time to design, fund and construct.

The NPS-UDC Housing Capacity Assessment for Dunedin (2019) identified the demand, capacity and shortfall for housing provision in Dunedin under the 2GP (**Table 6**). We note that this capacity assessment is programmed to be updated towards the end of 2020.

Table 6: NPS-UDC housing demand, capacity and shortfall

Development Timeframe	Demand	Capacity	Shortfall
Short Term (0-3 years)	3,692	4,354	+662
Medium Term (3-10 years)	3,424	2,396	-1,028
Long Term (10-30 years)	7,261	2,567	-4,694

The DCC is under pressure by developers to allow self-servicing for areas where public network servicing is either not yet available or is under capacity. However, the network capacity assessment work carried out by AR & Associates (P19-037 R01, 2020), which considers both the 2GP zoning demands on the existing network as well as potential future growth areas, identified that much of the shortfall can actually be addressed through sites that area able to be serviced in the short-term.

For the purposes of considering whether DCC require self-servicing at all, AR & Associates, through this report and the capacity assessment work, removed all "medium-term" sites on the basis that all of these sites cannot be network serviced in the short-term and could instead be potentially self-serviced. The overall housing demand shortfall in Dunedin is 4,694 homes (Table 6), comprising the combined shortfall from both the medium-term and long-term development timeframes.

From the Capacity Assessment report, up to 1,116 lots can potentially be serviced with public infrastructure for all three waters in the short term, assuming maximum possible development density is achieved from DCC's proposed UDC sites. These lot numbers are similar to the residential shortfalls identified in the NPS-UDC assessment over the short and medium term.

The public network servicing is reliant on DCC being able to secure adequate funding and resourcing to implement the necessary network extensions and upgrades to support this growth within the necessary timeframes. Meeting this demand highlights the need for DCC to focus its resourcing and funding to obtain the best outcomes, including potential staging and prioritisation. If growth occurs across the entire area on Developer's timeframes, DCC resources may become stretched, and they may be unable to target infrastructure upgrades effectively.

When considering Stormwater, the maximum serviceable lot provisions in the short term (1,116 lots) do not meet the shortfall beyond the medium-term without requiring self-servicing. Additionally, if any sites cannot be developed due to zoning or other constraints, serviceable sites will not be able to meet the medium-term shortfall.

However, the best practice approach for the management of stormwater is essentially self-servicing, with on-site treatment and management of stormwater through a LID approach to manage the treatment, attenuation, detention and retention of stormwater provided at source or on-site. This approach prevents any increase in flood risk downstream by retaining the natural landform and hydrology to the maximum extent possible and by managing peak flows to match pre-development flows.

In some cases, it may be preferential to provide on-site or at-source treatment and erosion control only, with all other post-development flows passed forward. This approach can be followed in the downstream portions of catchments, and these areas would need to be specifically identified through detailed catchment planning and the development of a catchment specific stormwater management plan. The assessments undertaken by AR & Associates include a consideration for the land take required for stormwater management on an on-site self-servicing basis and this is reflected in the maximum possible lot numbers for the NPS-UDC growth sites proposed by DCC.

As an option, the re-zoning of areas with allowance for stormwater self-servicing could be undertaken along with the requirement that a stormwater management plan be completed prior to subdivision, which could be done by developers in collaboration and/or in consultation with DCC. While greenfields areas would be best suited for this purpose, this approach may also be possible in brownfields or combined developed / undeveloped areas.

However, it is recommended that a more detailed assessment be undertaken against all infrastructure types (including 3 Waters, transport and other constraints and planning considerations) to further refine which of these sites are taken forward for up-zoning through a plan change process.

Another consideration is that allowing self-servicing where the network is not yet in place, or is under capacity, may set a precedent which could increase the likelihood that development will occur across the Dunedin area. DCC would then need to make provision for network extensions and network upgrades everywhere, and as a reactive process. By not allowing self-servicing and releasing areas for development only as an adequate network service is provided, DCC is enabled to focus their funding and resources to meet only the minimum requirements in terms of network planning and provisioning.

DCC already utilises an infrastructure constraint overlay as a development control to limit development and growth in some areas where the existing wastewater network is under capacity. This overlay, along with equivalent overlays for stormwater and potable water, could be extended to the proposed growth sites to limit development. Likewise, DCC may want to consider a Future Urban Land Supply Strategy as part of the Variation to the 2GP. Such a strategy would further signal to developers that the growth sites zoned through the 2GP Plan Change process are only available for development once infrastructure is in place to service these sites. The strategy could, for example, adopt a 3-decades development rollout with funding programme for each of '*decades 1, 2 and 3*'.

5.4 Where are alternative servicing solutions acceptable?

This section deals with the question*, "Where, if ever, would these types of solutions (self-servicing, STEP tank systems etc) be acceptable?"*

Self-servicing is often better suited to low density, more rural settings, where the cost of providing public network servicing may be too high, due to a lower number of lots. However, even in these situations, and based on the evidence from the MfE (MfE 890, 2008), DCC may want to limit the zoning to those areas that are best suited to self-servicing. Additionally, opportunities for infill housing or development within already urbanised areas should be considered where practical, to prevent urban sprawl and to meet DCC's compact city objectives.

Leveraging intensification, growth, new and redevelopment opportunities provides a potential funding stream for renewing, upgrading and extending existing 3 Waters networks to meet both the current and future needs. Funding mechanisms include Development Contributions (DC's) and targeted rates, both of which may be used to resolve existing and future network capacity issues.

If the number of existing properties with existing network capacity issues is relatively small compared to the proposed growth area, the costs to upgrade the existing network can likely be absorbed through the growth works. On the other hand, for already established urban areas, where the proportion of existing properties is high in comparison with growth prospects, growth opportunities may be achieved through self-servicing (single or multiple lot), private / public multi-servicing or a combination of these.

Where DCC considers allowing self-servicing or multi-servicing in the short-term to facilitate development, it is essential to consider the following:

1. If allowing *single lot self-servicing* for intensification or infill development in already urbanised areas, Council will have little control over privately owned devices apart from the consented design process. The risk is that in the future lot owners are unlikely to want to pay to connect to the public network, as they are already self-sufficient, meaning DCC would potentially lose this funding source for upgrading the existing network in the area. To address this risk, Council

may need to consider the option of placing consent notices or covenants on the titles (or similar mechanism) as part of the consent process at the time of development, to require lot owners to:

a. Abide by the operation and maintenance obligations for their private systems, including reporting to council on scheduled monitoring/inspections and maintenance activities on a regular (e.g. yearly) basis; and
b. Disconnect their private systems and pay to connect to the public network when it becomes available.

As an alternative to (b), the eventual connection to the public network may be funded through a DC to be used at the time building the connection to the public system.

2. *Multiple lot self-servicing* may be suitable for greenfield areas but less likely to be practical in already urbanised areas. To give DCC a level of control over the performance of privately owned communal infrastructure, all communal infrastructure should be designed and constructed in accordance with DCC's public standards and their maintenance should ideally be undertaken by DCC. Funding may be achieved through DC's collected at consenting stage to cover the necessary infrastructure upgrades followed by rates to lot owners for the maintenance in subsequent years. DC's and rates can also be used to fund the upgrade and extension of local public networks to eventually service the development. Similarly to (1) above, an additional DC, also collected at the time of consenting, can be used to cover the eventual decommissioning of the temporary infrastructure and connection to public infrastructure once capacity becomes available in the future.
3. *Private/public multi-servicing* may be privately funded by developers at the time of subdivision, with DC's collected at consenting stage to help fund the eventual decommissioning of temporary infrastructure and connection to the public system once capacity becomes available. Similarly to multi-lot self-serving, all communal infrastructure should be designed and constructed in accordance with DCC's public standards. Maintenance of temporary public infrastructure (such as stormwater or wastewater detention tanks, for example) may be achieved through DC's collected at consenting stage to cover the initial years of maintenance, followed by local targeted rates to lot owners for the maintenance in subsequent years. DC's and rates can also be used to fund the upgrade and extension of local public networks to eventually service the development.

DCC may want to consider a decision matrix for allowing self-servicing within each of the residential zones as per **Table 7** (Stormwater), **Table 8** (Wastewater) and **Table 9** (Water Supply) below.

Figure 1 below provides a further decision framework to be used where self-servicing is identified as a preferred or possible option, to further test whether such a system is able to perform adequately for the lifetime of the development without any environmental effects.

Table 10 in turn provides some guidance on how funding and maintenance of infrastructure may be approached for self-serviced and multi-serviced situations. It provides an example of an easy-reference tool to identify a pathway for funding and maintenance responsibilities to unlock potential self-serviced or multi-serviced infrastructure growth opportunities.

Table 7: Stormwater Serviceability Matrix - 2GP Residential Zones

	RESIDENTIAL ZONES									
Servicing Type Scenarios	General Residential 1	Inner City Residential	Low Density Residential	Large Lot Residential 1	Large Lot Residential 2	General Residential 2	GR2 within Mosgiel infrastructure constrained mapped area	GR2 within South Dunedin Mapped Area	GR2 not within infrastructure constrained mapped area or South Dunedin mapped area	Township and Settlement Zone
Self-servicing - Individual lot attenuation device discharging through a stormwater outlet.	No - development density too high to have multiple outlets.	No - development density too high to have multiple outlets.	Yes - possible option subject to suitable conditions for SW discharge[1]	Yes - preferred method[1]	Yes - preferred method[1]	No - development density too high to have multiple outlets.	No - development density too high to have multiple outlets.	No - development density too high to have multiple outlets.	No - development density too high to have multiple outlets.	Yes - possible option subject to suitable conditions for SW discharge[1]
De-centralised - Individual lots discharging to a communal attenuation device.	Yes - possible option[2]	Yes - possible option[2]	Yes - possible option[2]	No - number of properties too low to off-set cost of servicing	No - number of properties too low to off-set cost of servicing	Yes - possible option[2]	Yes - possible option[6]	Yes - possible option[7]	Yes - possible option[8]	Yes - possible option[2]
Multi-servicing - Individual lot attenuation device connected to public infrastructure or approved outlet.	Yes - possible option if infrastructure capacity is constrained[3]	Yes - possible option if infrastructure capacity is constrained[3]	Yes - possible option if infrastructure capacity is constrained[3]	No - number of properties too low to off-set cost of servicing	No - number of properties too low to off-set cost of servicing	Yes - possible option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible option if infrastructure capacity is constrained[3]
Upgrade or extend infrastructure to provide full reticulated service - Reticulated infrastructure available however requires an upgrade or extension to satisfy the required level of service.	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	No - number of properties too low to off-set cost of servicing	No - number of properties too low to off-set cost of servicing	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]
Full service - Un-attenuated lots connected to public infrastructure or approved outlet.	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	No - number of properties too low to off-set cost of servicing	No - number of properties too low to off-set cost of servicing	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]
Lot size m^2 (min)	500	200	750	2000	3500	500	300	300	300	500
Building coverage (max)	40%	60%	35%	30%	30%	50%	50%	50%	50%	40%
Impermeable area (max)	70%	80%	65%	50%	50%	80%	80%	80%	80%	70%

Notes:

1. Self-servicing option suitability is dependent on the ability to discharge to the downstream environment via private outlet structure (e.g. rip rap apron or flow dispersal trench)
2. De-centralised stormwater on-site servicing is subject to favourable topographical conditions and availability of land for communal attenuation device
3. Multi-serviced stormwater subject to capacity of public infrastructure not being compromised by the discharge of attenuated flows from individual lots.
4. Feasibility of infrastructure network upgrade and/or extension dependant on benefit/cost analysis.
5. Fully serviced option is subject to adequate capacity within downstream infrastructure.

Table 8: Wastewater Serviceability Matrix - 2GP Residential Zones

	RESIDENTIAL ZONES										
Servicing Type Scenarios	General Residential 1	Inner City Residential	Low Density Residential	Large Lot Residential 1	Large Lot Residential 2	GR2 within infrastructure constrained mapped area excluding Mosgiel	General Residential 2	GR2 within South Dunedin Mapped Area	GR2 not within infrastructure constrained mapped area or South Dunedin mapped area	Township and Settlement Zone (within DCC reticulated wastewater mapped area)	Township and Settlement Zone (not within DCC reticulated wastewater mapped area)
Self-servicing - AWTS or equivalent secondary packaged treatment plant and on-site disposal.	No - won't get yield and lot size too small	No - won't get yield and lot size too small	No - won't get yield and lot size too small	Yes - option if public infrastructure is not available[1]	Yes - preferred option if public infrastructure is not available[2]	No - won't get yield and lot size too small	No - won't get yield and lot size too small	No - wont get yield and lot size too small	No - wont get yield and lot size too small	No - won't get yield and lot size too small	Yes - preferred method[1]
De-centralised - private wastewater reticulation connecting to shared WWTP and communal disposal field.	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	No - lot size too large to justify cost.	No - lot size too large to justify cost.	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	Yes - possible preferred method[2]
Multi-servicing - Wastewater detention with controlled effluent discharge to public wastewater network through pressure sewer system.	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is available but constrained[1]	Yes - possible preferred option if infrastructure capacity is constrained[2]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	No - this zone is not reticulated for wastewater.
Upgrade or extend infrastructure to provide full reticulated service - Reticulated infrastructure available however requires an upgrade or extension to satisfy the required level of service.	Yes - possible preferred option subject to cost - benefit viability[5]	Yes - possible preferred option subject to cost - benefit viability[5]	Yes - possible preferred option subject to cost - benefit viability[5]	Yes - preferred option - if existing infrastructure is avaialble and adequate.[5]	Yes - preferred option - if existing infrastructure is avaialble and adequate.[5]	Yes - possible preferred option subject to cost - benefit viability[5]	Yes - possible preferred option subject to cost - benefit viability[5]	Yes - possible preferred option subject to cost - benefit viability[5]	Yes - possible preferred option subject to cost - benefit viability[5]	Yes - possible preferred option subject to cost - benefit viability[5]	No - this zone is not reticulated for wastewater.
Full service - reticulated infrastructure available (assume treatment capacity available)	Yes - preferred option[4]	Yes - preferred option[4]	Yes - preferred option[4]	Yes - preferred option[4]	Yes - preferred option[4]	Yes - preferred option[4]	Yes - preferred option[4]	Yes - preferred option[4]	Yes - preferred option[4]	Yes - preferred option[4]	No - this zone is not reticulated for wastewater.
Lot size m^2 (min)	500	200	750	2000	3500	500	300	300	300	500	1000

Notes:

1. On-site servicing viabilty is subject to suitable topographical and soil conditions and minimum offset clearances to disposal fields being met.
2. De-centralised wastewater treatment and disposal viability is subject to availability of land for wastewater disposal.
3. Wastewater detention tank and pumps privately owned, effluent pumped outside peak times and at controlled rate to public network.
4. Fully serviced option is subject to adequate capacity within downstream infrastructure.
5. Feasibility of infrastructure network upgrade and/or extension dependant on benefit/cost analysis.

Table 9: Water Supply Serviceability Matrix - 2GP Residential Zones

	RESIDENTIAL ZONES									
Servicing Type Scenarios	General Residential 1	Inner City Residential	Low Density Residential	Large Lot Residential 1	Large Lot Residential 2	General Residential 2	GR2 within Mosgiel infrastructure constrained mapped area	GR2 within South Dunedin Mapped Area	GR2 not within infrastructure constrained mapped area or South Dunedin mapped area	Township and Settlement Zone
On-site servicing - On-site water supply via tank, bore and/or surface intake.	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	Yes - possible preferred option subject to on-site water supply available[1]	Yes - preferred option if public infrastructure is not available[1]	Yes - preferred option if public infrastructure is not available[1]	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	No - this zone is expected to be serviced.	Yes - possible preferred option subject to on-site water supply available1
De-centralised - Shared communal reservoir.	No - not econonically feasible to meet potable water standards.	No - not econonically feasible to meet potable water standards.	No - not econonically feasible to meet potable water standards.	No - not econonically feasible to meet potable water standards.	No - not econonically feasible to meet potable water standards.	No - not econonically feasible to meet potable water standards.	No - Private communal supplies undesirable.	No - Private communal supplies undesirable.	No - Private communal supplies undesirable.	No - not econonically feasible to meet potable water standards.
Multi-servicing - Water supply from public mains supplemented by tank water.	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	No - number of properties too low to off-set cost of servicing	No - number of properties too low to off-set cost of servicing	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]	Yes - possible preferred option if infrastructure capacity is constrained[3]
Upgrade or extend infrastructure to provide full reticulated service - Reticulated infrastructure available however requires an upgrade or extension to satisfy the required level of service.	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]	Yes - possible preferred option subject to benefit / cost viability[4]
Full service - Reticulated infrastructure available.	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]	Yes - preferred option[5]
Lot size m^2 (min)	500	200	750	2000	3500	500	300	300	300	500

Notes:

1. Self-servicing dependant on minimum 80% yearly water supply demand being available via rainwater tank, bore and/or surface intake, the ability to meet drinking water standards and tanked water service being available in the area.
2. De-centralised water supply on-site servicing to be assessed on a case by case basis and is subject to availability of water, the ability to meet drinking water standards and availability of a suitable reservoir location.
3. Multi-serviced water supply subject to availability of public water supply infrastructure in the area and capacity of the same to provide low pressure supplementary water to rainwater tanks in lots.
4. Feasibility of infrastructure network upgrade and/or extension dependant on benefit/cost analysis.
5. *Fully serviced option is subject to adequate capacity within infrastructure.*

Table 10: 3-Waters Self Servicing & Multi-Servicing Funding Mechanisms & Responsibilities

	Servicing Type Scenarios	CONSTRUCTION		MAINTENANCE YEARS 0-2		MAINTENANCE YEAR 3 - ONWARDS		UPGRADE / EXTEND PUBLIC SYSTEM TO SERVICE DEVELOPMENT		DECOMMISSION TEMPORARY INFRASTRUCTURE AND CONNECT TO PUBLIC SYSTEM	
		Source of Funding	Party Responsible	Source of Funding	Party Responsible	Source of Funding	Party Responsible	Source of Funding	Party Responsible	Source of Funding	Party Responsible
STORMWATER	**Self-servicing -** Individual lot attenuation device discharging through a stormwater outlet.	Developer	Developer	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	DC's and/or Rates	DCC	DC's, Rates and/or Lot owner (CN's)	DCC
	De-centralised - Individual lots discharging to a shared communal attenuation device.	Developer	Developer	DC's	Developer	Rates	DCC	DC's and/or Rates	DCC	DC's and/or Rates	DCC
	Multi-servicing - Individual lot attenuation device connected to public infrastructure.	Developer	Developer	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	DC's and/or Rates	DCC	DC's, Rates and/or Lot owner (CN's)	DCC
WASTEWATER	**Self-servicing -** AWTS or equivalent secondary packaged treatment plant and on-site disposal.	Developer	Developer	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	DC's and/or Rates	DCC	DC's, Rates and/or Lot owner (CN's)	DCC
	De-centralised - private wastewater reticulation connecting to shared WWTP and communal disposal field.	Developer	Developer	Developer	Developer	Lot owner (CN's)	Private Maintenance Company or similar	Lot owner (CN's)	Private Maintenance Company or similar	Not Applicable - Private	Not Applicable - Private
	Multi-servicing - Wastewater detention with controlled effluent discharge from lots to public wastewater network through STEP or similar pressure sewer system.	Developer	Developer	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	DC's and/or Rates	DCC	DC's, Rates and/or Lot owner (CN's)	DCC
	Multi-servicing - Wastewater from lots draining to communal wastewater detention tank with controlled pumped effluent discharge to public system.	Developer	Developer	DC's	Developer	TR's	DCC	DC's and/or Rates	DCC	DC's and/or Rates	DCC
WATER SUPPLY	**Self-servicing** - On-site water supply via tank, bore and/or surface intake.	Developer	Developer	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	DC's and/or Rates	DCC	DC's, Rates and/or Lot owner (CN's)	DCC
	De-centralised - Shared communal reservoir.	n/a[5]	n/a[5]	n/a[5]	n/a[5]	n/a[5]	n/a[5]	n/a[5]	n/a[5]	n/a[5]	n/a[5]
	Multi-servicing - Water supply from public mains supplemented by tank water.	Developer	Developer	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	Lot owner (CN's)	DC's and/or Rates	DCC	DC's, Rates and/or Lot owner (CN's)	DCC

Notes *Table 11: 3-Waters Self Servicing & Multi-Servicing Funding Mechanisms & Responsibilities*:

1. CN's = Consent notices, covenants or equivalent controls on lot titles.
2. DC's = Development Contributions or similar control.
3. TR's = Targeted Rates or similar control.
4. DCC = Dunedin City Council
5. De-centralised communal private water supply not recommended for DCC.

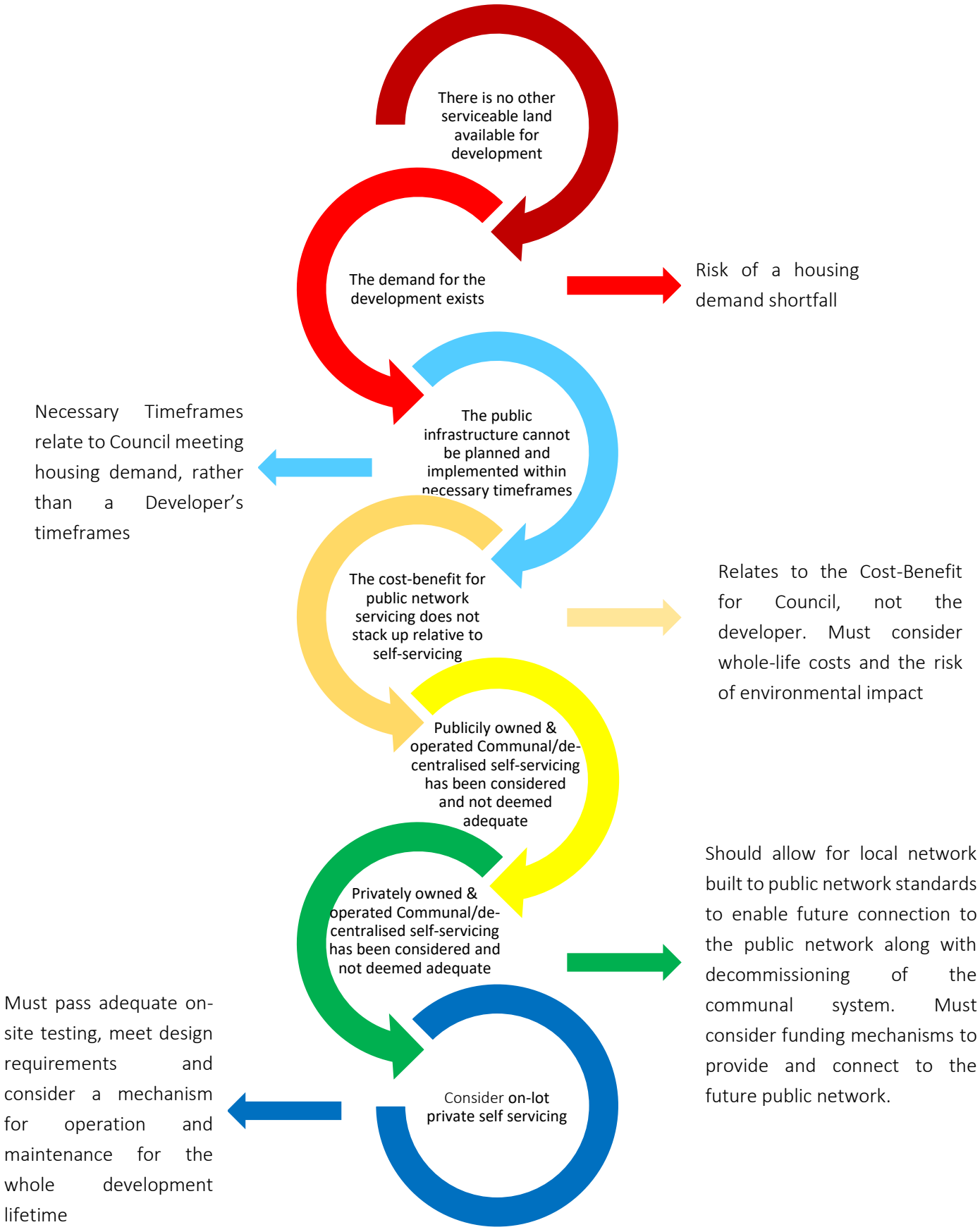

Figure 1: Example Decision Framework for Allowing Self Servicing

6 // Conclusion

Self-servicing options for 3 Waters infrastructure could include on-site self-servicing, communal self-servicing (decentralised) or multi-servicing. However, whilst there are technical justifications for DCC's vision to support 3 Waters self-servicing through the consideration of other alternative technical options where infrastructure is constrained or non-existent, this approach may not be necessary if public servicing can be adequately planned and delivered within identified growth areas through DCC's 2GP and NPS-UDC provisions.

3 Waters infrastructure growth must be considered and planned in the context of other infrastructure (e.g. transport), and such that it is aligned with DCC's wider drivers for growth in Dunedin.

The documented high rate of failure identified by the Ministry for the Environment (MfE 890, 2008) of self-serviced wastewater systems in particular, poses a potential risk to DCC. The ARAL site specific assessments (2020) indicate that there is adequate provision of serviceable land to meet the growth pressures on Dunedin without the need for widespread potable water and wastewater self-servicing, and that urban growth in Dunedin can be supported while achieving the DCC's vision and objectives, for both serviced and un-serviced areas. Stormwater self-servicing or multi-servicing will be necessary to meet medium term growth targets, however often this is readily achievable through the appropriate use of a Low Impact Design (LID) approach, which is considered best practice for stormwater management in any case.

In view of these considerations, DDC does not have to compromise itself as a TLA by enabling development in inappropriate locations from a 3 Waters servicing point of view as adequate provisions for growth are likely to be possible through the land identified through the NPS-UDC site assessments.

Notwithstanding this, in order to facilitate DCC's urban growth aspirations, an adequate 3 Waters policy framework needs to be established. This framework should set out specific procedures, standards and performance criteria that are clear and practical, and which ensure that the various objectives are met. The framework should also provide clarity on when and where self-servicing will be allowed.

The framework, and a Land Supply Strategy, could be used to release land for development as required and as servicing becomes available. This approach may effectively restrict and/or manage ad-hoc and small scale "infill" development and allow DCC to focus their budget and resources to the most viable areas rather than trying to keep up with the scatter gun approach to development that may otherwise occur across the entire Dunedin area.

7 // References

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Appendix A – District Plan Provisions in the Wellington Region.

Appendix B – 2GP Residential Zone site assessments

Appendix C – District Plan Provisions in Selwyn

Appendix D – District Plan Provisions in Nelson

Appendix E – Unitary Plan Submissions – Auckland Unitary Plan

Appendix F – An ARC Guide to Structure Planning

Wellington City - District Plan

Mention of provisions in the following chapters:

1. Residential Areas: The Residential Areas of Wellington City are characterised by low-rise single dwelling houses onindividual lots. Marked variations exist in the character of partic ular neighbourhoods or suburbs

7. Centres Rules - Controlled activities:
SUBDIVISION:
7.2.2 Company lease, cross lease and unit title subdivision is a Controlled Activity in respect of:
7.2.2.1 stormwater, sewerage and water supply

14. Rural Area: The Rural Area extends from the outer boundary of urban areas of the city to the coastal margins and boundaries of Hutt City and Porirua City to the north. About 65 percent of the total City land area is included in the Rural Area.

27. Urban Development Area: The land between Johnsonville and Tawa forms part of the natural land corridor that provides one of the two main access routes to and from the city. The recent history of the area has been one of progressive urbanisation. Pastoral farming has continued to decline and has been replaced, in the main, by suburban residential development.

Summary: Although the Regional Standard for Water Services 2019 is subordinate to the District Council's district plan, there appears to be no mention of any water supply or waste water provisions within the plan

Hutt City District Plan

Chapter 11 Subdivision

11.1.2 Engineering Standards

Issue
Subdivisions need to be serviced in a manner that adverse effects are avoided, remedied or mitigated and that adverse effects on the health, safety and wellbeing of residents are no more than minor.

Objective
To ensure that utilities provided to service the subdivision protect the environment and that there are no adverse effects on the health and safety of residents and occupiers.

Policy
(a) To ensure that utilities provided comply with specified performance standards relating to such matters as access, street lighting, stormwater, water supply, wastewater, gas, telephone, electricity and earthworks.

Summary: HCDP only mentions water-supply and wastewater once under the subdivision chapter to ensure utilities (including water supply and wastewater) provided to the subdivision protect the environment and that there are no adverse effects on the health and safety of residents and occupiers. No further mention of provisions

Infrastructure Strategy 2018-2048

Hutt City has a series of well-developed and modern infrastructure networks and the overall condition of these networks is good. The total capital replacement value for Council owned infrastructure included in this Strategy is over $2 billion. Each year Council spends on average, $15m in capital replacements and $17m to improve and upgrade this infrastructure. A summary of the Council infrastructure networks and capital expenditures budgeted for each asset category is presented in the following table. All the figures are based on current dollars, with no adjustment for inflation.

Category	Total length	Replacement cost*	Capital Replacements	Capital Improvements	Condition	Key components
Water Supply	681km (pipes)	$280m	Years 1-10 $20m Years 11-30 $47m	Years 1-10 $22m Years 11-30 $17m	80% good or very good 8% moderate	• Reservoirs • Water mains • Pump stations
Wastewater	671km (pipes)	$536m	Years 1-10 $40m Years 11-30 $117m	Years 1-10 $73m Years 11-30 $142m	47% good or very good 23% moderate	• Treatment plant • Sewage trunk mains • Pump stations • Storage tanks • Outfall pipeline
Stormwater	526km (pipes)	$341m	Years 1-10 $9m Years 11-30 $13m	Years 1-10 $27m Years 11-30 $39m	70% good or very good 17% moderate	• Stormwater mains • Pump stations
Transport	484km (roads) and 728km (footpaths)	$904m	Years 1-10 $80m Years 11-30 $137m	Years 1-10 $121m Years 11-30 $77m	1.6 = Very good condition**	• Roadways and bridges • Footpaths and walkways • Cycleways • Retaining walls and seawalls • Traffic services • Street lighting

* Estimate of the cost of reproduction or replacement of assets as at December 2017. Wastewater includes approximately $44m owned by Upper Hutt City Council.
** NZTA's "Surface Condition Index" measures the condition of the road surface in relation to surface defect. A score is given between 0 to 100 where a lower number indicates a better condition.

Table 1. Summary of the Council Infrastructure networks and capital expenditures budgeted for each asset category

- **Wastewater in Hutt City**

  There are two main trunk sewer pipelines for the Hutt Valley – one follows the western Hutt River stop-bank, and the second passes through the eastern suburbs of Taita and Naenae, before following the rail corridor through to Moera. The trunk sewers convey wastewater from Lower Hutt and Upper Hutt to the treatment plant at Seaview. Treated effluent from the Seaview plant is then conveyed to an outfall at Pencarrow Head.

During wet weather, there is the possibility of stormwater entering the wastewater system (inflow), or groundwater entering the wastewater system (infiltration), leading to possible overloading of the system and consequent overflows which present health, water recreation and water quality issues. Existing infiltration/inflow reduction strategies, including pipeline inspection and renewal programmes, are designed to minimise the entry of stormwater or groundwater to the wastewater system.

- **Water supply:** Hutt City's water supply system consists of a network of water mains, pumping stations, and reservoirs. All of this water meets the required drinking water standards. Most areas of the city meet expected standards for water storage (in reservoirs or storage lakes) and water pressure, while some areas for improvement have been identified. Critical assets include large diameter pipes, together with all reservoirs and pumping stations. Good health outcomes are achieved through careful management of the water supply and distribution infrastructure.

  Summary: The Infrastructure strategy 2018-2048 precludes the mention of self-servicing options

Porirua City District Plan

E5 – WATER SUPPLY
E5.1 Purpose To provide a supply of potable water for the estimated domestic and commercial/industrial consumption, and for fire fighting.

E5.2 Contributions as a Condition of a Permitted Activity

E5.2.1 Circumstances in which a contribution is required as a condition of a permitted activity
(a) Plimmerton/Mana Water Storage Levy. Prior to the commencement of construction of a new dwelling or other building (excluding buildings accessory to the principal use of a dwelling), in the Plimmerton/Mana Water Storage Levy Area. (b) Papakowhai/Harbour Heights/Ascot Park Water Supply Levy. Prior to the commencement of construction of a new dwelling or other building (excluding buildings accessory to the principal use of a dwelling), in the Papakowhai/Harbour Heights/Ascot Park Water Supply Levy Area.

C03 – SUBURBAN ZONE OBJECTIVES AND POLICIES
C3.1 objective to encourage suburban activities to utilise land most suitable for that purpose.

Explanation

The Council will encourage the suburban use of land within the Suburban Zone, which is suitable for urban development on the basis that the land can be serviced with reticulated water and sewerage systems …
C3.1.2 Policy – To encourage the maximum utilisation of the existing infrastructure and resources by encouraging suburban activities in areas which are already serviced.

District Plan rules require a resource consent for all subdivision in the Suburban Zone. Where subdivision occurs, the Council may impose conditions on a resource consent to ensure the existing infrastructure is used efficiently.

Secondly, where new land is being developed, the Council will ensure the utilities needed to service the development are provided. Reticulated urban services will be required. Council will retain discretion over the appropriate level of such services, and other services and utilities required to be constructed at the time of the development, and the manner of their construction. This is to ensure that while future development potential of the land is not comprised, some services that are required to be constructed at the time of subdivision may be commensurate with the impact of the proposed development.

Principal Reasons Considerable investment has been put into the establishment of urban infrastructure such as roading, and reticulated water supply and sewerage systems. The efficient utilisation of this existing infrastructure is considered to be a sustainable use of public resources, and development will be channelled in the first instance to these areas.

C3.2.1 – Policy To protect and enhance the amenity and character of the residential resource by defining standards for the bulk and location of buildings, the provision of open space, and the nature and scale of activities.

Principal reasons

Other activity standards have been imposed which relate primarily to controlling the scale of activities. In particular controls have been imposed on vehicular movements, water usage from the public mains, and waste water discharges.

> Note: Standards for both waste water and water supply both refer to discharge and water supply from either public sewerage system or public water supply system. No mention of on-site or self-service standards.

Kapiti Coast District Council

D.1.2 Residential Zone Standards
D.1.2.1 Permitted Activity Standards

WATER DEMAND MANAGEMENT
(i) All new or relocated dwelling units where public potable water supply is available to a dwelling unit shall be fitted with one of the following:

a) Rainwater storage tanks with a minimum capacity of 10,000 litres for the supply of non-potable water for outdoor uses and indoor toilets.
b) Rainwater storage tanks with a minimum capacity of 4,000 litres for the supply of non-potable water for outdoor uses and indoor toilets, and a greywater reuse system for outdoor irrigation. The greywater reuse system shall re-use all water from bathrooms (excluding toilets) and laundry washing machines.

(ii) All new or relocated dwelling units where a rainwater storage tank supplies toilets shall be fitted with separate plumbing, including backflow prevention devices, for these non-potable uses to prevent cross contamination of drinking water. Non potable water pipes between the rainwater tank and outlets (toilets and outdoor taps) shall be clearly labelled and coloured to differentiate them from potable water pipes and there shall be permanent non-drinking water signage over outdoor taps connected to rainwater tanks. Roof gutters are required to have leaf guards or screens and mosquito screens on all rain water tank vents. A restricted top-up from the public potable water supply will be provided to the tank to ensure that sufficient water to flush toilets is available.

(iii)Where a development will contain more than one dwelling unit, e.g. a retirement home or village or a multi-unit residential development, a common rainwater storage facility with a volume of 10,000 litres per dwelling unit can be provided so long as access to operate and maintain the facility is secured via an easement or it is located within an area of 'common property'.

Note: In both rainwater storage tanks and greywater re-use systems, backflow prevention shall comply with the legislative requirements of the Water Supply Protection Regulations 1961 or equivalent, in particular, where connections to a potable water supply exist.

D.1.2.2 Controlled Activity Standards

SUBDIVISION

(xv) **Effluent Disposal**
Where subdivision occurs on land that is not serviced by an existing community sewage system, it shall be demonstrated in terms of AS/NZS 1547:2000 "On Site Domestic Wastewater Management" that on–site domestic effluent disposal is suitable for each proposed lot or multiple lots.

Note: Any discharge into land, air or waterbodies may require a resource consent from the Wellington Regional Council. Applicants should contact the Regional Council to confirm whether or not a consent is required.

D.1.2.3 Discretionary Activity Standards

(A) The following are **Restricted Discretionary Activity Standards:**

WATER DEMAND MANAGEMENT
The following shall be complied with: Any application to provide an alternative water demand management system other than those permitted shall include an assessment that demonstrates the system proposed will permanently reduce water demand associated with the dwelling unit(s) by at least 30% from Household 2007 Summer Average Water Use, without adverse impacts on hydrological, ecological systems and public health.

The system shall include a non-potable supply for all outdoor uses associated with the dwelling, including garden irrigation, and ensure that no outdoor taps can be connected to the potable public water supply system.

D.2 RURAL ZONE RULES AND STANDARDS

D.2.1 Rural Zone Rules

D.2.1.1 Permitted Activities

EFFLUENT DISPOSAL:

Note Any discharge to land, air or waterbodies may require a resource consent from the Wellington Regional Council. Applicants should contact the Regional Council to confirm whether or not a consent is required.

POTABLE WATER SUPPLY:

A potable water supply shall be provided where human habitation of a building is intended. Compliance with the New Zealand Drinking Water Standards 1995 and the New Zealand Building Code 1992, to the extent that is applicable, shall be one means of complying with the Standard.

Note: The quantity of potable water available for use should be on the basis of 250 litres per person per day and there should be sufficient storage capacity to supply 4 people for up to 30 days, i.e. a capacity of 30,000 litres

SUBDIVISION:

(iii) General Standards

(e) Protection of Water Resources

It shall be demonstrated (as evidenced by a report including an environmental impact report from a suitably qualified and experienced person) that:

- A water supply of sufficient quality (potable for drinking purposes) and quantity can be provided for the activities proposed for the subdivision.
- The proposed water supply will have no significant adverse effects on other water users.
- The proposed supply will have no significant adverse effects on the water resource.
- The proposed supply will have no significant adverse effects on natural and physical resources.
- The disposal of wastes generated by the activity proposed for the subdivision will have no significant adverse effects on ground water or surface water quality.
- The disposal of wastes will have no significant adverse effects on consumptive water uses.
- Where subdivision occurs on land that is not serviced by an existing community sewage system, it shall be demonstrated in terms of AS/NZS 1547:2000 "On Site Domestic Wastewater Management" that on-site domestic effluent disposal is suitable for each proposed lot and multiple lots.

Note: All activities shall have regard to Regional Council plans including Regional Discharges to Land Plan, Air Quality Management Plan and Kapiti Fresh Water Plan.

(vi) Boundary Adjustments Boundary adjustments are a controlled activity, provided the subdivision complies with the following standards:

…

- For those lots which are dependent on “on site wastewater and surface water disposal”, no lot shall be reduced to a size where it cannot dispose of domestic waste

…

D.2.2.3 Discretionary Activity Standards

(A) The following are Restricted Discretionary Activity Standards:

EXTRACTIVE ACTIVITIES:

(ii) Site Development

- All waste, dust and effluent shall be kept to a minimum and disposed of to the satisfaction of Council.

D.3.2 Commercial/Retail Zone Standards

D.3.2.1 Permitted Activity Standards

OTHER REQUIREMENTS (not part of this plan) Attention is drawn to the requirements of the Kapiti Coast District Council Tradewaste, Wastewater Drainage and Water Supply Bylaws and subsequent amendments. With respect to discharges to land, air or water all activities shall have regard to Regional Council plans including Regional Discharges to Land Plan, Air Quality Management Plan and Kapiti Fresh Water Plan.

D.7.2 River Corridor Zone Standards

D.7.2.1 Permitted Activity Standards

EFFLUENT DISPOSAL:

Septic tanks (or other on-site treatment and disposal systems) shall not be located within 50 metres of any waterbody. The site shall be capable of adequate sewage disposal to a safe environmental standard as evidenced by a report from a suitably qualified and experienced person, including an environmental impact assessment (EIA) of the proposed on-site treatment and disposal facilities to be used. There shall be dual effluent disposal fields or room for a duplicate and shall have filtered outlets to disposal beds.

The EIA report shall include:

- a detailed soil and, if necessary, geotechnical assessment;
- identification of relevant topographic and drainage features;
- an assessment as to any actual or potential effects of effluent disposal on existing water bores and surface and groundwater in the vicinity;
- an assessment of the likely volumes of effluent to be treated;
- certification that the on-site disposal system proposed will ensure that adverse effects are avoided.

The Council may waive the requirement for particular information (e.g. the EIA report) where it is satisfied that such information is not necessary in the circumstances. For the purposes of this standard, a "safe environmental standard" is where the effluent disposal will not, either on its own or cumulatively, lead to adverse environmental or health effects either within or beyond the boundaries of the site (including ground or surface water contamination, odours or surface runoff from land).

Note: Any discharge into the land, air or waterbodies may require consent from the Wellington Regional Council. Applicants should contact the Regional Council to confirm whether or not a consent is required.

Regional Plan for Discharges to Land for the Wellington Region

2.4.6 Agricultural activities are making a significant contribution to non-point source pollution of groundwater and surface water in the Wellington Region.

…

While difficult to control, non-point sources of agricultural contaminants have the potential to cause adverse environmental effects on water quality. For example, Environment Waikato estimated that the volume of effluent collected in dairy sheds is only 10-20% of the effluent deposited outside dairy sheds.

…

Water quality of catchments in the Wellington Region has been compared where the predominant land use is agricultural, with catchments in native bush.17 Results showed that rivers and streams draining agricultural catchments are four times more turbid than those draining native bush catchments.

…

These effects can alter the ecology of the waterways and render them unsuitable for other uses (recreation, domestic water supply etc.). Effects on surface water quality detected through monitoring programmes in the Region include:

- excessive nutrient levels in the lower Waiohine River; and
- excessive turbidity and nutrient levels in the middle and lower Ruamahanga River, reflecting drainage from agricultural land and the discharge of community wastewater to the river.

3. Interpretation

On-site sewage treatment and disposal: means a system which is designed to treat and dispose of human effluent and domestic wastewater on the same legal property as the premises from which the discharge originates

4. Objectives and Policies

1.2.16 To ensure that on-site sewage treatment and disposal systems are sited, designed and maintained in such a way as to avoid, remedy or mitigate any adverse effects on groundwater, surface water or human health, the Council will have particular regard to:
(1) the groundwater characteristics of the site, including depth, velocity, and existing uses;
(2) the soil characteristics of the site and surrounding area, including depth to gravels, texture, drainage, and soil variability;
(3) site constraints including topography, slope, lot size, location of any bores and existing structures; and
(4) the anticipated flow rate to the system.

Explanation: On-site effluent disposal can be an acceptable means of sewage treatment and disposal, provided that the system is sited, designed and maintained in a manner which ensures that there are no adverse effects on human health, groundwater or surface water. This Policy sets out the matters which the Council will consider if a consent is required. The Policy does not limit any other matters that may be considered.

1.2.17 To promote the following provisions for sewage treatment and disposal in relation to new developments:

(1) reticulated sewerage systems should be used, where available and practicable;
(2) on-site sewage treatment and disposal systems should be designed and located in a manner which reflects the characteristics of the site (including lot size), in order to avoid, remedy or mitigate adverse effects on water quality and human health.

Explanation:

- This policy provides guidance for territorial authorities on the general requirements that the Council considers should be addressed through provisions in district plans (or alternative means, as appropriate). The policy applies to new developments (including subdivisions, single dwellings, institutions, and clusters of dwellings).

Clause (1) indicates that in areas which are vulnerable to groundwater contamination (see Map 1), connection to a reticulated sewerage system should generally be required, if such a system is available.
Clause (2) links the design of the system to the characteristics of the site. In order to fulfil this requirement, a site investigation is required (see Appendix 5).

1.2.18 To improve the performance of on-site sewage treatment and disposal systems by:

(1) promoting good practice in using and maintaining the systems, including:

- maintaining the system regularly;
- keeping solids out of the system as much as possible;
- conserving water;
- avoiding the use of strong detergents; and
- protecting the disposal field; and

(2) encouraging, and eventually requiring, the replacement of sub-standard existing systems with systems more suited to the characteristics of the site (including connection to reticulated sewerage, where appropriate).

Explanation:

- The performance of many existing on-site systems in the Region could be improved through better management. In other cases, poor installation may be a problem, in which case improvements could be made to the system.
- However, sometimes the system may be inappropriate to the site. In these cases, the installation of new systems which meet the standards in this Plan will be encouraged, starting in those areas where there is evidence that inappropriately designed or located systems are contaminating groundwater or surface water.

5.2 Regional rules for the discharge of contaminants to land

Rule 1 Discharges of contaminants not entering water

The discharge of any contaminant onto or into land is a **Permitted Activity** provided

(a) the contaminants are stormwater discharged into a pipe which then discharges to surface water; or

(b) with the exception of Rule 2, the discharge is not regulated by any rule in this Plan; and

(c) the discharge will not

(i) result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water in any water body, water supply race, farm drain, or the coastal marine area; or

(ii) create a contaminated site.

Explanation:

- This rule applies to all discharges to land, whether the discharge is from an industrial or trade premise or any other source, whether moving or not.
- This rule allows all discharges where there will be no contamination of water in a water body (including aquifers) or other specified surface water, unless there is a specific rule in the Plan regulating the discharge.
- Rule 1 (a) does not exempt owners of stormwater systems from compliance with Rule 3 (stormwater discharges into or onto land) or with the Regional Freshwater Plan.
- Rule 1 (a) does not allow discharges of contaminants other than stormwater into stormwater systems.
- This rule applies to discharges such as cleanfill, but does not exempt cleanfill operations from compliance with provisions in a district plan.

<u>Rule 2</u> Discharges of contaminants not otherwise provided for

The discharge of any contaminant onto or into land that is

(a) not allowed as a Permitted Activity by Rule 1; or

(b) provided for as a Permitted Activity by Rule 3, 4, 9(2), 11, 12, 14, 16 or 18 but does not meet any condition of the rule; or

(c) provided for as a Controlled Activity in Rule 13, 17, 19 or 22 but does not meet any standard of the rule and that is

(d) not described as a Discretionary Activity in Rule 8, 10, or 20; or

(e) not described as a Non-Complying Activity in Rule 15.

is a **Discretionary Activity.**

Applying for a resource consent

An application for a resource consent for an activity described in Rule 2 shall include:

(1) information about the matters specified in section 5.3 of the Plan; and

(2) for discharges provided for in Rule 3 that do not meet the standards of the rule:

(a) a description of the collection, treatment and disposal system; and

(b) a contingency plan for addressing equipment failure or other emergencies such as spills; or

(3) …

<u>Rule 6</u> Aerobically treated sewage discharged on-site

The discharge of aerobically composted sewage, or aerobically treated sewage effluent, onto or into land is a **Permitted Activity** provided

(a) the discharge is more than 20 metres from any surface water body, farm drain, water supply race, or the coastal marine area;

(b) the discharge is more than 5 metres from any neighbouring property boundary; and

(c) for aerobically composted sewage

(i) the sewage originates from a composting toilet system;

(ii) the material has been subject to aerobic composting decomposition for at least 12 months from the last addition of raw sewage;

(iii) for at least 12 months after application, only people operating or maintaining the system have access to the disposal area; and

(iv) compost is not applied to any food crop for animal or human consumption; and

(v) the composted sewage is ploughed into the soil, or buried to a depth of up to 200 mm.

(d) for aerobically treated sewage effluent onto land

(i) the application rate throughout the disposal area is not greater than 5 mm/day;

(ii) the maximum discharge does not exceed 2000 litres per day;

(iii) the carbonaceous five day Biochemical Oxygen Demand concentration in the effluent discharged from the system is not greater than 20 mg/litre;

(iv) the discharge does not cause ponding on or runoff from the disposal area;

(v) the discharge is not by way of spray irrigation or other method that produces any aerosol discharge to air;

(vi) people (except persons involved with maintaining/managing the system) are prevented from entering the disposal area for a period of at least 48 hours following the last application of effluent; and

(vii) stock are prevented from entering the disposal area for a period of at least six months following the last application of effluent; and

(viii) there is no discharge of any effluent to a water body.

(e) for aerobically treated sewage effluent into land

(i) the application rate throughout the disposal area is not greater than 15 mm/day;

(ii) the maximum discharge does not exceed 2000 litres per day;

(iii) the discharge does not cause ponding on or runoff from the disposal area; and

(iv) there is no discharge of any effluent to a water body.

Explanation

- This rule allows discharges of well-treated sewage effluent and sewage compost above or below the soil surface.
- Aerobically composted sewage may be applied onto land in accordance with this rule, but the sewage must not originate from any sewage treatment system other than a composting toilet system.
- That is, composted sewage from composting toilets, such as those in the Conservation Estate and Regional Parks, may be discharged to land in accordance with this rule, but composted sewage from community systems may not.

Rule 7 On-site sewage treatment and disposal

The discharge into or onto land of any water or contaminants other than septage, from on-site sewage treatment and disposal systems is a Permitted Activity if:

EITHER

(1) the system is already in use at the time this Rule comes into force; and

(2) the discharge does not exceed 1300 litres per day (calculated as a weekly average);

provided

(a) the discharge shall consist only of contaminants normally associated with domestic sewage;

(b) no stormwater shall be allowed to enter the system;

(c) there shall be no direct discharge from the system to groundwater, surface water, or above the soil surface; and

(d) the system shall be maintained on a regular basis.

(e) the discharge is more than 50 metres from any surface water body, farm drain, or water supply race in any catchment being managed for water supply in the Regional Freshwater Plan (see Appendix 6 of the Regional Freshwater Plan); and

(f) the discharge is more than 20 metres from any surface water body, farm drain, water supply race, or the coastal marine area in all other areas

OR

(3) the system is a new or upgraded system; and

(4) the discharge does not exceed 1300 litres per day (calculated as a weekly average); and
(5) the system shall be installed on the same property as the premises to which the system is connected; and
(6) there shall be no direct discharge above the soil surface;

provided that conditions (a)-(f) above and the following conditions are complied with:
(g) a site investigation shall be carried out. The matters to be addressed in a site investigation are set out in Appendix 5 of this Plan;
(h) the system shall be designed, constructed and operated to meet the following performance criteria:

(i) the system shall be designed with sufficient effluent retention time to enable adequate treatment in relation to any constraints identified in the site investigation;
(ii) the effluent shall be evenly distributed to the entire filtration surface of the disposal field;
(iii) the bottom of the effluent disposal system shall be sufficiently above the groundwater at its highest level, in relation to any constraints identified in the site investigation, to prevent any contamination of groundwater;
(iv) the area available for treatment shall be appropriate for the volume of the discharge and any constraints identified in the site investigation.

The Council will accept as compliance with criteria (h)(i)-(iv) an effluent treatment and disposal system designed, constructed, and operated in accordance with the principles and procedures outlined in [Guidelines for on-site sewage in the Region WRC/RP-G-00/47].

Explanation:

- Rule 7 applies to discharges from on-site sewage treatment and disposal systems. These include septic tank/effluent disposal field systems, evapotranspiration systems, and community systems serving a number of houses.
- The on-site systems may be new (i.e., constructed after this Plan becomes operative) or existing systems, and may serve dwellings, institutions, workplaces, or clusters of dwellings, so long as the daily discharge volume is less than 1300 litres. This is equivalent to the amount of effluent produced by a large household.
- This rule does not apply to septage (solid materials collected from septic tanks), or the compost from a composting toilet when discharged to land, or to systems designed to discharge above the soil surface (e.g., where effluent is used for irrigation) or to systems which are located on a separate legal property to that on which the premises creating the discharge
- The conditions relate to "good practice". The specific maintenance requirements which comprise "good practice" will vary depending on the type of system used and the volume and quality of effluent produced. All such requirements should be made available by the manufacturer or designer of the system at the time of installation. For example, regular desludging will be necessary to ensure that the system does not overflow.
- New and upgraded systems (new systems are those installed after the date on which this plan became operative, and upgraded systems are those which were installed and in use before the Plan became operative, and subsequently require improvement to avoid, remedy or mitigate any adverse environmental effects being caused by the system) must also comply with the specified design criteria and be designed to reflect any constraints identified in the site investigation. Systems designed and installed in accordance with the principles and

procedures outlined in the specified guidelines, are deemed to comply with these design criteria.

Rule 8 Discharges containing human sewage not otherwise provided for

Any discharge containing human sewage onto or into land is a **Discretionary Activity** unless the discharge is allowed by Rule 3, 5, 6, or 7.

Applying for a resource consent
An application for a resource consent for an activity described in Rule 8 shall be made on the prescribed form and shall include

(1) information about the matters specified in section 5.3 of the Plan;
(2) for on-site sewage systems, a site investigation covering the matters set out in Appendix 5; and
(3) for all other discharges, information about the types of contaminants in the discharge, including typical concentrations of heavy

Explanation:

- This rule applies to any discharge that contains human sewage, whether as sewage effluent, sewage sludge, or sewage compost, except discharges specifically allowed by Rule 5 (pit latrines), Rule 6 (aerobically treated sewage), or Rule 7 (on-site sewage treatment and disposal).
- Applications for resource consents for activities covered by this rule will be assessed with regard to Policies 4.2.12-4.2.14 and 4.2.16. Matters that will be considered for all applications are included in section 5.3.4 of the Plan.
- Existing landfills in the Region have been granted resource consents, as required under sections 418(1A) and (1B) of the Resource Management Act 1991. Some consents allow the co-disposal of sewage sludge subject to conditions. No additional consents are required to discharge sewage sludge at these landfills during the term of their existing consents.

Rule 9 Refuse disposal and composting The discharge of any contaminants into or onto land in connection with: (1) refuse disposal at farm (including factory farms) landfills or domestic (residential) waste disposal sites; and (2) farm composting operations (including factory farms) and domestic composting operations; is a Permitted Activity provided

NOTE: The design of any on-site sewage system is controlled by district councils under the Building Code ("G13.3.4 Where no sewer is available, an adequate on-site disposal system shall be provided for foul water ..."). Also, where a sewer connection is available, the drainage connection shall be made to the sewer (see G13.3.3 of the Building Code).

Appendix 5: Site Investigations for On-site Sewage Treatment and Disposal

Site investigations must:
(a) be undertaken by suitably qualified and experienced people;
(b) be fully documented (an example of appropriate documentation is provided in Appendix E of "On-Site Wastewater Disposal from Households and Institutions" (Auckland Regional Council, 1994));
(c) include the following matters:

(1) Groundwater Information

Map 1 of this Plan shows general information on the vulnerability of groundwater in the Wellington Region. The Regional Council should be contacted for more detailed information on groundwater. If information is lacking and a large development is proposed, additional investigations may be required.

The following factors are relevant:
(a) depth to groundwater, and seasonal variation of the water table;
(b) direction and rate of flow of saturated groundwater.

(2) Soil Information

The following factors are relevant:
(a) depth to gravels;
(b) texture - amount of sand, silt and clay;
(c) infiltration and drainage characteristics - a percolation test may be used;
(d) soil variability within the site.

(3) Other Site Information

The following factors are relevant:
(a) topography, slope, and slope stability;
(b) rainfall and susceptibility of site to temporary flooding and ground saturation during rain;
(c) evapotranspiration potential (exposure to sun and wind);
(d) proximity to water bodies and drainage flow paths for surface runoff;
(e) site vegetation;
(f) location of bores, structures, paved areas and site boundaries;
(g) section size and shape, and the availability and location of potential disposal areas;
(h) water supply source;
(i) surrounding land uses;
(j) other local experience with on-site sewage treatment and disposal.

More information about site investigations is in "On-site Wastewater Disposal from Households and Institutions" (Auckland Regional Council, 1994).

Chapter 4 District Wide Issues in the QLDC District Plan

Objective 5 – Wai (Water): The management of the land resource and associated waste discharges in such a way as to protect the quality and quantity of water in the District to a standard consistent with the human consumption of fish, swimming and protects the mauri (life force) of the lakes and rivers.

> *Policy 5.2 In the development and upgrading of public sewage treatment and disposal systems in the development of new and extended settlements.*

This objective and associated policy imply that new development shall be serviced by public infrastructure.

Objective 9 – Protection of Water Resources encourages waste treatment which produces minimal quantities and maximum quality through:

1. The collection, treatment, storage and disposal of wastes in a way that minimises the adverse effects on the natural resources of the District.
2. Minimising the quantities of waste requiring disposal within the District.
3. To continue to implement programmes to reduce the discharge of untreated or partially treated waste to lakes and rivers.
4. To avoid, remedy or mitigate the adverse effects of eutrophication.

   Policy 9.1 To consult with the appropriate Kai Tahu Runanga when developing waste management strategies for the District.

   Policy 9.2 To ensure all waste is treated to a high standard.

   Policy 9.3 To recognise and promote land use regimes that do not contribute to the eutrophication of the District's lakes and rivers.

This objective encourages waste treatment which produces minimal quantities and maximum quality. An issue with this objective is that it often seems to conflate solid and liquid waste. The objective seems to allude specifically to solid waste, but the implementation methods then go on to make reference to liquid waste.

The following implementation methods are identified for this objective:

(i) District Plan

> *(a) Rules in the Plan requiring consent to be obtained for:*
>
> > *(ii) the treatment and disposal of liquid wastes on the surface of land, and for the composting or processing of any other wastes, other than the wastes produced from a single dwelling.*

Consent is therefore required for decentralised or communal septic systems, but not necessarily for lot based wastewater systems.

Objective 9 - Sustainable Management of Development: The scale and distribution of urban development is effectively managed.

There are several policies which respond to this objective, which essentially seek to make a strong distinction between urban and rural development. For example, it seeks to provide for the majority of urban development within Queenstown and Wanaka, while establishing Urban Growth Boundaries to

provide clear edges between urban and rural. This is further elaborated on in the following 'Explanation and Principle Reasons for Adoption' section:

- *The spatial distribution of urban zones is an integral factor in achieving the sustainable management of natural and physical resources. A sustainable pattern of urban development is one that:*
    - *Meets local needs – enabling communities to meet their social, economic and cultural needs*
    - *Optimises the use of urban resources – promoting the efficient use of physical resources and services, including developable land and infrastructure*
    - *Achieves cohesive urban areas through urban design that provides for efficient and effective network connectivity and coordination with existing systems at the same time as far as practicable avoiding adverse effects upon the environment.*
    - *Avoids the need to provide urban services such as water supply and sewer reticulation to any land outside urban zones.*

A strong motive to providing public services for water supply and wastewater disposal is implied here for urban locales, while it is also implied that rural locales will be self-serviced.

The Chapter 7: Residential section of the plan, recognises that there may be a significant cost associated with the extension of networks to future development areas.

> *In 7.1.1 Issues, the following is identified as a matter of relevance in meeting the residential needs of the district:*
>
> > *(d) Servicing: Servicing infrastructure is a major physical resource and its efficient utilisation is of concern to the District. The costs of providing infrastructure to the community and future land areas is an important factor where the success of resource management can be measured in terms of efficiency. Efficient use of existing infrastructure must also be measured against other fundamental District objectives such as residential forms and protection of the visual amenities.*

The Chapter implies a clear preference for public infrastructure servicing for urban areas:

> *7.1.2 District Wide Residential Objectives and Policies*
>
> *Objective 2 – Residential Form: A compact residential form readily distinguished from the rural environment which promotes the efficient use of existing services and infrastructure*

It is mandated that multi-unit developments are serviced by reticulated water supply and wastewater networks:

> *7.1.3 High Density Residential Zones – District Wide*
>
> *Objective 2 – Multi-Unit Developments: Multi-unit developments that are designed to a high standard, integrate well with their neighbourhood and streetscape, are located where they are supported by physical and social infrastructure, and any adverse effects on amenity values are avoided or mitigated where possible.*
>
> > *Policy 2.2 To ensure that multi-unit developments are located in areas served by all of the following:*

2.2.4 Essential public services such as water supply, wastewater and stormwater management, and refuse collection.

Chapter 9: Townships recognises that the majority of townships in QLDC have community water supplies, with some also having community sewerage disposal facilities. For many of the district's townships, the provision of reticulated water supply and wastewater disposal is identified as an issue, namely Luggate, Glenorchy and Kingston. Growth in the district will primarily be enabled through new development, which will be provided with retirculated water supply and wastewater services.

9.1.2 District Wide Township Issues

Servicing is identified as an issue for townships in Queenstown, in which:

Servicing constraints place limits to growth and urban form – The townships have limitations to growth because of the level of public services available, in particular reticulated water supply and sewage disposal.

This serviced development approach articulates a certain 'obligation' whereby Council is obligated to provide reticulated services, to the extent that the nature of the development will be limited, insofar as it is possible to provide capacity within the reticulated network.

9.1.4 Objectives and Policies – Townships

Objective 1: Recognition and consolidation of the townships. Recognition of the low density open space residential amenity of the townships. Recognition of the particular character, built environment and range of uses existing in the individual townships.

Policy 1.3 To limit the extent and density of development of the townships in recognition of:

1.3.2 the need to provide options for reticulated services

QLDC expects that where there is no wastewater network (implying in areas where self-servicing will be relied upon), density will be kept low in order to maintain water quality and disposal quantity.

9.1.5 Environmental Results Anticipated

iv) Low density development in specific areas in the absence of sewage reticulation, to maintain water quality and availability for domestic use.

Chapter 15 subdivision, development and financial contributions implies that public infrastructure will be provided to new development areas.

15.1.3 Objectives and Policies

Objective 1 – Servicing: The provision of necessary services to subdivided lots and developments in anticipation of the likely effects of land use activities on those lots and within the developments.

Policy 1.5 To ensure water supplies are of a sufficient capacity, including fire fighting requirements, and of a potable standard, for the anticipated land uses on each lot or development.

However, there does appear to be some leeway to allow for self-servicing or for an increase in density beyond the provisions, and with an associated infrastructure upgrade, with the cost explicitly falling within the responsibility of the developer.

> *Policy 1.6 To ensure that the provision of any necessary additional infrastructure for water supply, stormwater disposal and/or sewage treatment and disposal and the upgrading of existing infrastructure is undertaken and paid for by subdividers and developers in accordance with Council's Long Term Community Plan Development Contributions Policy.*

Just like DCC's objectives, here, the QLDC is responsible for the rovision of infrastructure capacity beynd that required to service a particular subudivision, for example, to cater for futre growth at adjacent or nearby sites. Whilst encouraging reticulated public systems, the QLDC policies below do not prevent self-servicing,

> *Policy 1.7 To ensure that the design and provision of any necessary infrastructure at the time of subdivision takes into account the requirements of future development on land in the vicinity, with Council being responsible for meeting any additional capacity of infrastructure above that required for the subdivision then being consented to in accordance with Council's Long Term Community Plan Development Contributions Policy.*
>
> *Policy 1.9 To ensure, upon subdivision or development, that anticipated land uses are provided with means of treating and disposing of sewage in a manner which is consistent with maintaining public health and avoids or mitigates adverse effects on the environment.*
>
> *Policy 1.10 To ensure, upon subdivision or development, that all new lots or buildings are provided with connections to a reticulated water supply, stormwater disposal and/or sewage treatment and disposal system, where such systems are available.*

QLDC's explanation and principle reasons for adoption of these policies?? point towards the need for regular monitoring and testing of on-site water supplies and the risks associated with self-servicing. A public reticulated water supply is preferred from a water quality adequacy and reliability perspective:

- *Notwithstanding regular monitoring and testing programmes, individual wells run the risk of contamination, variable quantity and inadequate levels of supply at some times of the year. Connections to a public supply provide much greater certainty as to the adequacy of the water quality and the reliability of the supply.*

Likewise, the policies promote a public reticulated wastewater network over self-servicing in urban areas:

- *Treatment of sewage effluent requires adequate provision for treatment systems and a means of disposal for the waste generated by the subdivision. In the existing urban areas where the Council provides or intends to provide for public sewage reticulation, treatment and disposal, there is a greater assurance that public health risks and adverse effects on the environment will be avoided.*

While self-servicing practices are allowed for, the policies and objectives imply that this is only endorcsed in rural areas and townships and inly in specific circumstances, for example, where reticulated networks are not pratical, and there are no adverse effects on the environment or public health.

- *In rural areas and townships, where connection to public reticulated systems is impracticable, care must be exercised to ensure the individual treatment and disposal system does not cause contamination of any adjoining lakes and rivers or groundwater, particularly if that could affect public health and the quality of a locality's water supply.*

Likwise, they refer to the role and responsibilities of the Regional Council, which governs water abstraction and stormwater and wastewater discharges:

- *The taking of water and the discharge of the contaminants in stormwater and sewage are also the responsibility of the Otago Regional Council and consents may also be required from this Council in conjunction with a subdivision consent from the District Council.*

Objective 2 – Costs of Services to be Met by Subdividers: The costs of the provision of services to and within subdivisions and developments, or the upgrading of services made necessary by that subdivision and development, to the extent that any of those things are necessitated by the subdivision or development to be met by subdividers.

Policy 2.1 To require subdividers and developers to meet the costs of the provision of new services or the extension or upgrading of existing services (including head works), whether provided before or after the subdivision and/or development, and which are attributable to the effects of the subdivision or development, including where applicable:

- roading and access;
- water supply;
- sewage collection, treatment and disposal;
- stormwater collection, treatment and disposal;
- trade waste disposal;
- provision of energy;
- provision of telecommunications.

Policy 2.2 Contributions will be in accordance with Council's Long Term Community Plan Development Contributions Policy.

Chapter 17 Utilities provides a clear direction that sites of new developments will have reticulated services.

17.1.3 Objectives and Policies

Objective 1 – Coordination of Utilities: Coordinate the provision of utilities with the development of the District.

Policy 1.1 To ensure possible areas for new development:

(i) are readily able to be serviced;

(ii) are located in selected areas where the Council will meet the costs of major works (to be recovered from developers as development proceeds);

(iii) are located in other areas, provided the full costs of upgrading reticulation systems attributable to that development are met and paid for by the developer, and an efficient pattern of development is promoted.

Policy 1.3 To ensure the costs of servicing development are:

(i) met by the developer directly or through contributions made to Council at the time of development or the issuing of titles; or

(ii) initially met by Council but recovered as development proceeds; or

(iii) indirectly paid for by the wider public through rating.

However, the policies do not immediately state that unserviced established urban areas are to be serviced, only that the priorities for servicing these areas shall be assessed This policy possibly allowed roomf or existing self-serviced areas to remain self-serviced. Presumably, they will be prioritised under the same framework under which new development areas are allowed to be self-serviced.

Policy 1.6 To assess the priorities for servicing established urban areas, which are developed but are not reticulated.

Policy 1.7 To ensure reticulation of those areas identified for urban expansion or redevelopment is achievable, and that a reticulation system be implemented prior to subdivision.

Explanation and Principal Reasons for Adoption

- The second part of policy 1 allows development of parts of the District which may not be easily serviced, but where development may be desirable on other policy grounds (e.g. visual considerations, minimal risk through hazards, transport costs, urban consolidation or soil protection). This policy allows the Council to sustain resources by managing the form and extent of urban growth by promoting appropriate areas for development.
- Historically, some parts of the rural area have provided for urban activities and residential use in an ad hoc manner. These activities have not generally been reticulated with services such as sewerage. Reticulation of services is desirable and often necessary to ensure environmentally acceptable disposal of sewage and stormwater. Some isolated residential pockets within the District may not however be appropriate for servicing as this assumes a permanence which may be contrary to cost effective provision of physical infrastructure. Reticulation may signal development in areas which is unsustainable in terms of energy use, soil protection, groundwater qualities, visual and landscape amenity or for other reasons. However, servicing of areas may be unavoidable and necessary to protect groundwater qualities, supply and public health.

Objective 2 – Efficient Use and Establishment of Utilities: The establishment, efficient use and maintenance of utilities necessary for the well being of the community.

Policy 2.7 To encourage development in areas which are already serviced and have the capacity for additional development and takes into account economic costs; or in new locations where the development has regard to efficiencies through consolidation of activity.

Policy 2.9 To achieve sustainability of the District's water supplies by:

- encouraging water conservation

- ensuring development is able to be serviced by the water supply system

- assessing the impact of development on water quality and quantity.

Explanation and Principle Reasons for Adoption

- To minimise the costs of providing services, development and redevelopment of areas which are already serviced and have capacity for additional development is encouraged. However, this must be balanced against other considerations, such as the type, character and density of living areas sought by the community and the style and density of development in the town centres. Where new areas of the District are to be developed, the economic costs of servicing an area are to be assessed including the demand on resources (e.g. the water resource). This will promote efficient use of services, sustainable management of resources and minimise costs to the community. Better utilisation of services within existing and new built up areas of activity is a factor encouraging a consolidation strategy for urban growth.
- The District's water resources are vulnerable in some areas because there are limits in terms of quantity and because it is susceptible to contamination. The effect on water quality and quantity will be a key element in assessing land use and development patterns and all new development will have to take into account the cost of providing water supplies.

17.1.4 Environmental Results Anticipated

ix) Further sewer and water reticulation in rural areas where this is necessary to prevent degradation of groundwater resources.

Selwyn District Council

District plan provisions

Chapter B1.2 – Water: In terms of water quality, the plan has been developed to require "activities to have reticulated sewage treatment and disposal where the Regional Council will not issue discharge permits for on-site effluent disposal"

Policy B1.2.1 – The district plan identifies townships which require reticulated wastewater management to avoid adverse effects on groundwater (Policy B1.2.5). Policy B1.2.6 identifies townships where on-site management requires a system designed by specialists in accordance with the requirements set out by the Transitional Regional Plan.

Policy B1.2.3 – Requires that water supply to all buildings be reticulated for all townships, and the Living 3 Zone, excepting in Living 1 Zone at Doyleston. The rationale for this is to minimise the potential for groundwater to become contaminated as a result of land use.

Policy B1.2.6 requires that buildings within specified townships are large enough to accommodate for on-site waste treatment.

The following is a non-complying activity: 1.1.3.2(b) Any facilities for the treatment and/or disposal of solid or liquid waste delivered or conveyed on to the site.

4.4 Buildings and water supply

- 4.4.1 Buildings which are connected to a reticulated water supply network are permitted within all Living zones. Non-compliance with this rule is non-complying
- The only permitted activity which pertains to on-site water supply is 4.4.2, which applies to the Living 1 Zone at Lincoln, which allows for rainwater storage tanks with a minimum capacity of 3000l shall be installed for non-potable uses. Non-compliance with this rule is discretionary

4.5 Buildings and sewage treatment and disposal

- 4.5.2 In all Living zones other than some specified in rules 4.5.1 and 4.5.1A, buildings are permitted provided that they are serviced by on-site effluent treatment and disposal systems. Non-compliance with this rule is non-complying

The district plan often makes reference to requiring a discharge permit from Environment Canterbury in some cases for on-site sewage disposal.

Section B1.3 of the rural volume of the district plan: Many rural properties in the district have private water supplies for domestic use and irrigation. These may be surface water takes or from bores. Environmental Canterbury controls the taking of water under the Act.

The strategy notes that most issues pertaining to ground and surface water are managed by Environment Canterbury, while the district plan manages only to:

- Require people keep the zones of influence from wells and septic tanks within property boundaries

In C3 of the rural volume – on-site effluent disposal is managed by regional rules, as well as sinking any bore to abstract water.

For subdivision in chapter C12 – the following activities are restricted discretionary: on-site effluent disposal for specified townships, with the condition being whether the allotment is of appropriate size, shape and has appropriate ground conditions to accommodate for the system. The chapter notes that the consent authority will defer to the requirements of the regional plan as well as the Building Code. For allotment sizes, for those specified townships, the are to be of appropriate size to accommodate for on-site effluent disposal, but no less than 800m^2

Selwyn District Council Water Supply Bylaw 2008

Not relevant

Selwyn District Council Wastewater Drainage Bylaw 2016

Not relevant

Environment Canterbury Regional Plan – Selwyn Te Waihora

There are also additional regional rules which apply to the Selwyn Te Waihora zone

Environment Canterbury Land and Water Regional Plan

Section 4.15 and 4.16 are policies which very strongly encourage all urban development to be connected to a reticulated wastewater network.

Section 4.14A – domestic wastewater disposal is to be managed so that there is minimal impact on surface and ground waters. Community reticulated systems are encouraged where residential density is more than 1.5 dwellings/ha and the population is greater than 1000. Other measures can be employed such as secondary treatment systems and septic tank warrants of fitness

5.7 discharge of wastewater from an on-site system which may enter water which was established prior to 1 November 2013

5.8 Discharge of wastewater from an on-site system which may enter water is a permitted activity, provided that:

- Volume is no more than 2m^3 per day
- It is onto a site that is at least 4ha, and it is not located in an area which exceeds 1.5dwellings/ha and the population is greater than 1000
- It does not take place in or on land where:
    - A sewerage network is available
    - Contaminated
    - It is an archaeological site
    - Where discharge will enter a surface waterbody
    - 20m of a surface waterbody or the Coastal Marine Area
    - 50m of a bore used for water abstraction
    - Within Community Drinking-water Protection Zone
    - If there is less than 1m of vertical separation between discharge point and groundwater
- In accordance with sections 5 and 6 of AS/NZS 1547:2012
- In accordance with the system's maintenance specifications, or in the absence of such specifications, section 6.3 of AS/NZS 1547:2012
- Does not result in visible wastewater on the ground surface
- Does not contain hazardous substances

Non-compliance with rules 5.7 and 5.8 result in the activity become restricted discretionary, with discretion being restricted to the following matters:

- The actual and potential environmental effects of not meeting the condition or conditions of Rule 5.7 for an existing system; and
- The actual and potential direct and cumulative environmental effects of not meeting the condition or conditions of Rule 5.8 for a new, modified or upgraded system; and
- The actual and potential environmental effects of the discharge on the quality and safety of human and animal drinking-water; and
- The effect of on-site wastewater treatment system density in the local area including known on-site wastewater treatment system failures, the material health status of the community, groundwater quality, the nature of effects of current sewage disposal methods, treatment options available and affordability.

5.12 Discharge of greywater where contaminants may enter water

5.84 – 5.88 Sewerage systems

5.111 – 5.115 Small and community water takes

5.123 – 5.127 Take and use surface water

5.128-5.132 Take and use groundwater

Nelson City Council

In volume 3 of the NRMP, establishment and discharges to on-site effluent disposal fields are permitted, if it is for single residential units on lot sizes 15ha or greater (FWr.29) subject to specific criteria being met (Appendix D):

- It is located no closer than:
  - 20m from any permanently flowing bank
  - 20m from a boundary other than a road boundary
  - 10m from a road boundary
  - 50m from any domestic water supply if an evapotranspiration system is being used, otherwise 300m from any other system
- Volume does not exceed 2000l per day (weekly average)
- There is no discharge into surface water
- A minimum 500mm vertical separation from groundwater
- There is no discharge from disposal field to ground surface
- The septic tank is regularly desludged such that the liquid volume is not less than one third of the tank volume
- No objectionable odour is produced beyond the site boundary
- Discharge meets the requirements of AS/NXS 1547:2000)
- Discharge does not adversely affect the stability of the lot or buildings

Community effluent disposal fields associated with subdivisions of 10 or more lots are a controlled activity, with Council having control over the following matters:

- Location of the effluent field
- Volume and quality of effluent
- Method of discharge and its/their associated effects
- The maintenance plan for the infrastructure and quality assurance of the discharge
- Potential effect of disposal field on water quality

Establishment of, and discharges to, effluent disposal fields are discretionary in non rural zones if:

- Discharges to new on-site effluent disposal fields for residential, commercial or industrial activities of less than 10 lots are a discretionary activity.

Discharges to subdivisions of more than 10 lots are non-complying.

(FWr.15.4) Conditions for water intake structures in Appendix 28.3 – "Rainwater storage and use, or out of stream dams, is encouraged", the benefits of which are:

- Reduced demand for mains water, and therefore costs and strains on the system
- Reduced peak stormwater flow by way of retaining water, which reduces risk for property damage by flooding
- Reduced risk of sewer overflow due to reduced ground infiltration intensity to streets without stormwater
- Hydrologically neutral developments which maintain natural water balance

Water Supply Asset Management Plan 2015-2025

This strategy discusses on-site rainwater take in terms of 'Other Demand Management (1.16.2)', where it identifies rainwater tanks and greywater reuse as being possibly problematic for the following reasons

- Ministry of Health/Department of Building and Housing having reservations towards greywater reuse
- Financial cost to householder
- Size of tank versus Nelson rainfall (both seasonal and total)
- Siting of rainwater tanks on the property
- The need to consider rainwater tanks within the wider purview of sustainability e.g. environmental cost of production, transport and disposal of the tank
- Potentially more effective water conservation methods. It cites the necessity of new technological developments in Australia due to drought. Such technologies include low water usage dual flush toilets, low water use clothes washer, low flow shower heads.

Auckland Council Unitary Plan – submissions on the proposed Unitary Plan

Amendments to proposed settlements without access to reticulated networks to ensure adequate on-site servicing. For example, recommends additional subdivision control for Bombay to have a 3000m^2 site size for sites serviced by on-site wastewater treatment and disposal.

  - These controls would apply primarily to SH zoned areas, as well as serviced villages outside of the RUB.
  - Because there may be areas which are of suburban or metropolitan nature, which are serviced by reticulated networks, those additional controls may not apply and be aligned with their purposes
  - Different zones may require different controls for minimum site size to accommodate for on-site wastewater systems
  - Notes how the on-site wastewater systems at Kawakawa Bay were failing due to the cumulative effects they were having upon the coastal environment. Consequently, the Kawakawa Bay wastewater treatment plant had to be established. This is not within the typical nature of why such infrastructure upgrades are established.
  - It is essential that minimum site sizes are established to accommodate for on-site wastewater treatment, avoid adverse effects on surrounding environment, cumulative adverse effects of many sites
- *Alexander William Ormiston – statement of rebuttal – Engineering – density in the rural and coastal settlement zones*
  - Based on this evidence, a 3 bedroom dwelling on a site which includes on-site disposal system can be accommodated on lot areas of 2500 and 3000m^2, but not 2000 or under.
- *Alexander William Ormiston – Engineering – Density in the rural and coastal settlement zone*
  - This evidence relates to wastewater management within the Rural and Coastal Settlements (RCS) zone. Many of these settlements are not connected to a municipal sewer system. Therefore, on-site management must be employed via discharge into the ground.
  - The RCS zone specifically focuses on the potential for on-site wastewater management. To this point, while the Large Lot zone relies on on-site management where there is available reticulated connections, the purpose for minimum lot size in this zone is to maintain a spacious character.
  - In events of heavy rainfall, resulting in contaminated stormwater runoff, there are environmental impacts of partially treated effluent discharge into water. Many of these older coastal settlements have older on-site wastewater systems which were not initially designed for the high production of wastewater brought on by modern appliances and water use practices. These impacts are more pronounced where there are smaller lot areas with a higher density of on-site systems
  - There are several factors which must be considered:
    - Modern holiday homes have a much larger footprint than in the past
    - Modern appliances have higher rates of water consumption
    - Because most holiday homes are on serviced lots, owners typically have a limited understanding of the need for water conservation and wastewater discharge minimisation.
    - There is the potential for holiday homes to be permanently occupied, and therefore the effectiveness, scale and size of the on-site system must be designed with permanent occupancy in mind.

- For the reasons above, lot areas of under 3000m^2 are no longer sufficient for permanently occupied dwellings in rural and coastal settlements.
- The cumulative risks are increased when lots are less than 3000m2 due to the higher density of activity
- Cites older subdivisions on Waiheke Island which have some lots smaller than 1000m2 – this has had a cumulative effect which has adversely affected road side drains and bathing beach water quality. A similar case occurred at Kawakawa Bay.
- A number of factors result in contamination:
  - Large number of on-site systems
  - Small lot areas
  - Number of permanent residents
  - Upgrading of household appliances
  - Shallow groundwater
  - Poorly draining soils
- TP58 does not include limitations upon potential area available for on-site wastewater land disposal systems with separation distances including:
  - Dwelling coverage
  - Garage coverage
  - Ancillary building coverage
  - Driveways
  - Swimming pools
  - Outdoor living areas
  - All of these above factors impact the actual useable area available for on-site wastewater management systems.
- Concludes that a minimum lot area of 3000m2 within the RCS zone is necessary to prevent cumulative effects.

Topic 049 – discharges

- *Ian David Mayhew – statement of evidence on behalf of Auckland Council (planning – wastewater network management rules)*
  - Asserts that there should be a distinction of activity status between public and private wastewater networks.
    - The public network has significant infrastructure in place to manage the network, including physical infrastructure, personnel, experience and knowledge, existing operations procedures, design standards, etc.
    - Private wastewater networks are unlikely to includes these factors, which elevates the risk of failure, with the subsequent consequence being that Watercare must then intervene.
  - For the reasons listed above, recommends that these private networks be discretionary
  - Recommends amendments to differentiate between public and private wastewater networks, so that it is explicit as to whether chapter H4.15 or H4.16 applies.
    - To this end, proposes a threshold of 6m3/day to fall within the purview of the on-site wastewater management chapter. This volume equates to around 10 dwellings.
    - This distinction is important so that it is clear and apparent what part of the plan users should refer to.

- *Ian David Mayhew – statement of evidence on behalf of Auckland Council (planning – on-site wastewater)*
    - Recommends amendments to TP58 to provide stronger guidance. TP 58 has demonstrably become inextricably linked to the rules of the chapter – this indicates that there is significant value in guidelines documents
    - Potential for an integrated section which relates to on-site wastewater management and wastewater networks which relates to *wastewater conveyance, treatment and disposal*, with a single set of rules for both on-site and network provisions. This would establish greater coherence.
    - Clarification of scope – where does trade waste come in? Where do small scale wastewater disposal systems fall under? These could be decentralised systems, which are essentially standalone wastewater networks, treatment and disposal
    - Disagrees with activities related to discharge of treated wastewater directly to water as a prohibited activity – rather should be articulated as an unpreferred activity, though there are acceptable circumstances in which it may occur.
    - Must take into account cumulative effects

Topic 077 – Sustainable design

- *Timothy Robinson – statement of evidence on behalf of Auckland Council (sustainable design)*
    - Discusses the notion of incorporating a star-rating system for buildings within the AUP in the same vein as Homestar. One of the sustainability criteria for this rating system is water, which includes recycling and reuse of water.

An ARC Guide to Structure Planning: A Regional Practice and Resource Guide 2005

Auckland
Regional Council
TE RAUHITANGA TAIAO

24 March 2005

Foreword

This second edition of Structure Planning: A Regional Practice and Resource Guide 2005 (the Guide) seeks to support good practice and a consistent approach to Structure Planning across the Auckland region. The key users of the Guide are staff of councils across the region, infrastructure planners and others involved in structure planning. The Auckland Regional Council (ARC) hopes practitioners find the guide useful. The ARC would like to acknowledge the valuable input of council staff throughout the region, to both this updated and the original Guide.

This edition is being made available in advance of the notification of Change 6 to the Auckland Regional Policy Statement at the end of March 2005. The Auckland Regional Policy Statement changes seek to be consistent with the Regional Growth Strategy, and to give effect to its growth concept, as required by the Local Government (Auckland) Act 2004. The Auckland Regional Policy Statement changes reinforce requirements for Structure Planning to be used, after appropriate strategic planning has occurred, and preferably before (re)development is envisaged in a particular area. The final form of the Auckland Regional Policy Statement changes may impact on this Guide. It is recommended that users of the Guide also refer to the 2005 Auckland Regional Policy Statement Change 6, and to the wider Auckland Regional Policy Statement provisions.

Structure Planning seeks to support the effective planning for, and management of, growth. It is a process, with a plan as an output, that is then used in more detailed planning for an area, and/or changes to the District Plan. Structure Planning is an area where good practice is subject to ongoing change. This edition builds on experience with structure planning, and with the first edition since its publication in 2000. Over that period it was found to be a useful guide as Structure Plans have been developed across the region for developments to accommodate 400 people at East Fields in Pukekohe, to 44,000 people at Flatbush in Manukau.

The involvement of the local community is one important component of the structure planning process. There may well be some tensions between expectations agreed by the councils of the region through strategic planning processes, the local council, and the local community. The latter may at times have mixed awareness of how Auckland's natural and regional growth may affect their local area. Some in the community may want development, others may prefer the status quo, and some may want to protect key environmental values. Councils should ensure the community is informed about the wider as well as the local context, so that there are realistic expectations of the process, including timeframes, the immediate outcomes of the

structure planning process, and what is likely to happen after that. This also includes the links between structure planning and other planning, for example, Integrated Catchment Management Planning and open space planning.

Successful Structure Planning occurs within a wider strategic framework. Scoping, designing and appropriately funding the Structure Planning process; identifying the area involved; and monitoring implementation are all key elements. The early and ongoing involvement of the ARC may assist with these, and in helping set the wider context with the local community. The Auckland Regional Transport Authority (ARTA) should be consulted on transport matters.

There are three areas in particular where the Guide has been updated to reflect changes in practice. These are

- First, this Guide now contains information on Integrated Catchment Management Plan for those undertaking Structure Planning. It is important that the two processes are integrated as urban development has significant impacts on the environment. Such integration supports better protection of environmental outcomes and improved management of the adverse effects of development. ARC and TA thinking, policy and practice in this area is evolving to keep pace with best practice. The Regional Plan: Coastal and The Regional Plan: Air, Land and Water include requirements about Integrated Catchment Managemnt Plans. The ARC is also developing an Integrated Catchment Management Plan guide.

- Secondly, the Guide acknowledges redevelopment in existing urban areas, particularly outside areas earmarked for redevelopment in the Auckland Regional Policy Statement Change 6. In existing urban areas, structure planning provides an opportunity to remedy poor urban design, transport, stormwater and other outcomes. Rather than ad hoc development of individual sites that may not work well together, structure planning has the potential to improve the amenity in local urban areas. This could be through improving heritage protection, stormwater, local landscape elements, open space and connectivity.

- The third focus of change is Structure Planning in rural areas. There, possible outcomes include the protection of key environmental values, and/or the enabling of comprehensive countryside living areas in identified locations. In areas where there are proposals for countryside living, other strategic tools should be in place prior to structure planning. These include rural sector agreements which provide a broad strategic context across relevant council areas, and rural district strategies developed in accordance with sector agreements.

Any development that emerges from the structure planning process is expected to meet the Auckland Regional Policy Statement and relevant regional plan requirements; be consistent with the Regional Growth Strategy, give effect to its growth concept, and consider relevant sector agreements; take into account the Regional Land Transport Strategy, the Passenger Transport Plan, and other documents; consider other strategic local and regional documents; and the matters covered in this and other relevant ARC guides.

Structure Planning is an iterative process. It needs strong links across a wide number of matters, including Integrated Catchment Management Plan, and open space planning. Its outcomes may lead to changes to more strategic documents, for example where growth envisaged by this is found to be unrealistic, given environmental constraints. It also identifies where more detailed work may be needed. Structure planning needs to respond to the particular circumstances of the area being considered. The focus of necessary technical and other work should reflect this.

The ARC welcomes feedback on this new edition, Structure Planning: A Regional Practice and Resource Guide 2005. Such feedback, further experience with structure planning, and reviews of key strategic documents are likely to lead to future updates, facilitated by the ARC and with the involvement of the other councils in the region. Depending on the need one option may be to focus a future guide on a particular type of development, for example, intensification.

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1. Introduction

1.1 Growth in the Auckland Region

Auckland has a history of above average growth of population, household numbers, and economic activity. About 50-70% of immigrants to New Zealand settle in Auckland, and about 40% of Auckland's growth is the result of migration to the region from overseas or from other parts of New Zealand - the balance (approximately 60%) is the result of natural increase[1].

In the last decade or so, growth has moved from a predominant focus on peripheral urban expansion, to the situation today where more than 50% of growth occurs in existing urban areas through redevelopment and infilling.

Accommodating growth gives rise to various forms of development in many parts of the region. Within the developed urban area higher densities are encouraged at locations which offer good access to services and employment, and where the infrastructure has capacity to support growth and/or additional infrastructural capacity can be provided.

"Greenfields" land at the edge of the urban area is converted to urban use at places where infrastructure exists or to which it can be extended, and where adverse effects on the environment can be avoided, mitigated or remedied. Countryisde living or rural "lifestyle" development occurs in selected rural areas, where significant natural resource values will not be adversely affected.

The pattern of activities which result from growth related (re)development may have different effects, both positive and negative. The effects will depend on the extent to which opportunities are maximised, valued features and qualities of the environment are protected; infrastructure and services to support urban activities are available or provided; and (re)development processes are regulated and managed. To anticipate the effects of growth, and to guide (re)development so that its location, form and intensity has minimal adverse effects and maximum positive on the environment, requires an integrated approach by all agencies and interest groups involved in the (re)development process. This will also help to ensure high standards of amenity and convenience are achieved.

[1] Statistics provided by the ARC, June 2003

1.2 Structure Planning and Integrated Catchment Management Planning

This Guide describes the context for Structure Planning in the Auckland region, and relates those processes to other processes through which growth in the region is managed, including Integrated Catchment Management Planning. Figure 1.1 (page 4) provides an overview of this.

The Guide is intended as a reference for the ARC, Territorial Authorities (TAs), providers of infrastructure and services, and other stakeholders in the (re)development process. The objective is to promote a consistent approach to Structure Planning and Integrated Catchment Management Planning in the Auckland region. Application of the Structure Planning process is provided for by the Auckland Regional Growth Strategy 2050: A Vision for Managing Growth in the Auckland Region, and is required by the Auckland Regional Policy Statement for a diverse range of areas, including when urban and rural intensification (the latter generally through countryside living) is planned. The Proposed Auckland Regional Plan: Air, Land and Water (2001) provides for Integrated Catchment Management Planning.

1.3 What is Structure Planning?

In Auckland, Structure Planning is applied to the process of formulating a physical plan to guide development so the form and intensity is appropriate to the character of the land, the surrounding area, the sector or sub-region and region. A Structure Plan is a plan that guides the development or redevelopment of a particular area of land.

Structure Planning is a process through which, in association with regional and sector planning, significant growth in the region can be managed. Strategic regional and sector planning is currently developed through the Auckland Regional Growth Forum. In 1999 the Forum launched the Regional Growth Strategy , and councils in different geographic sectors have since developed sector agreements under this to provide for anticipated growth in specific areas. Structure planning takes place within this context, and is expected to accord with the higher level strategic planning documents. Further information on the Forum is in Section 2.

Structure Planning considers the natural and physical resources of the land, including its values, the location and scale of infrastructure (with specific emphasis on transport infrastructure), and identifies the future pattern of significant land uses based on a consideration of alternatives. This process includes identifying the constraints to growth and development as well as the

formulation and commitment to programmes for the provision of services such as utilities (and their funding), open spaces and reserves, access, and social facilities required to support any future community. The long-term form and design of the area, and how it integrates with the wider area is also important.

Structure Plans are desirable for the following areas:

- The intensification of identified high density centres and corridors, and other urban areas of 5,000 m^2 where redevelopment is occurring.
- Identified new greenfield urban expansion areas.
- Rural town expansion areas.
- Countryside living, and other rural development.

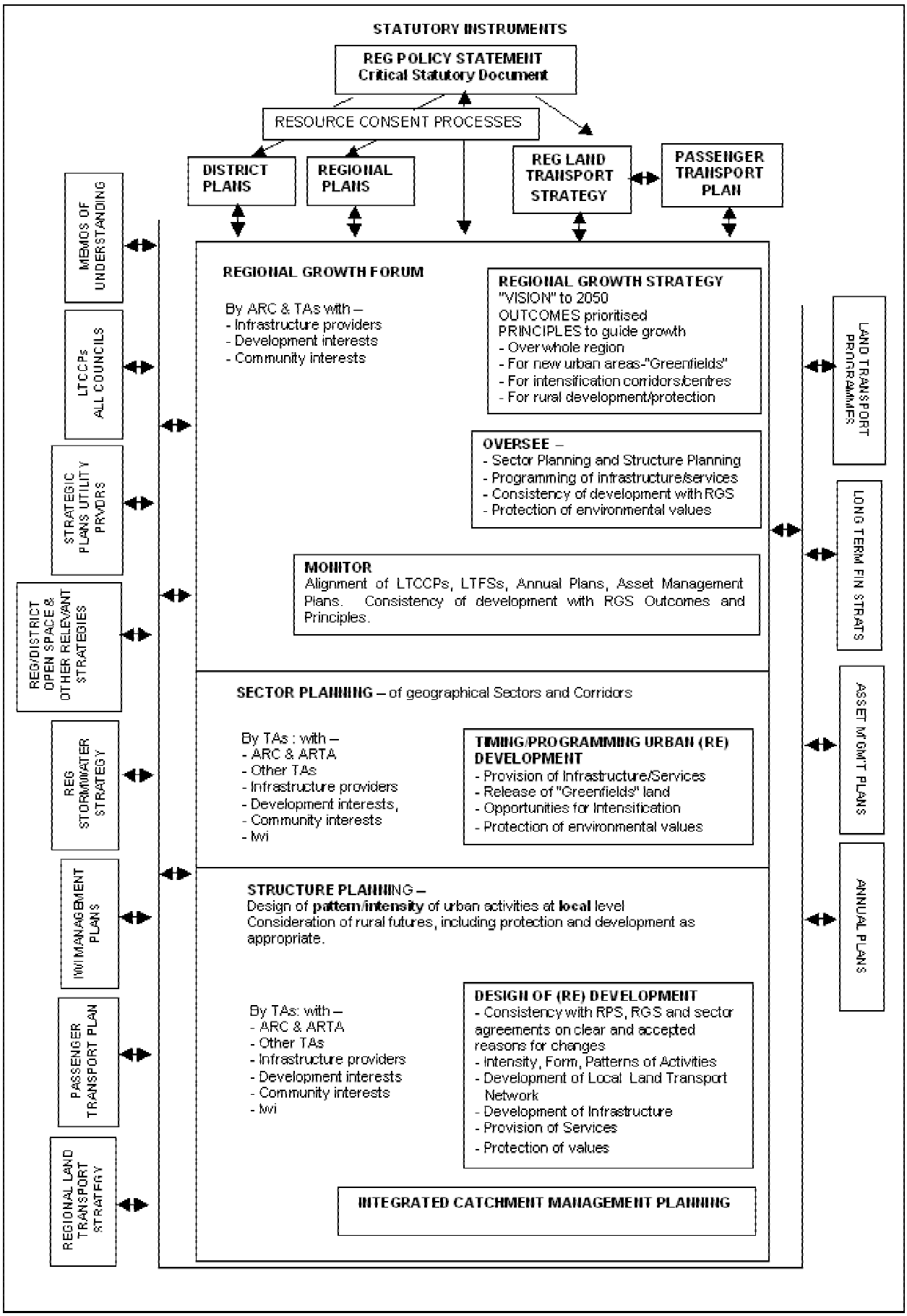
1.4 What is Integrated Catchment Management Planning?

Integrated Catchment Management Plan is a process which manages water resources and land use on a catchment scale. It is a management tool to integrate receiving environment values and the risk of discharges. It considers catchment, stormwater and wastewater network management. This includes environmental sensitivity, catchment values, effects from the quality and quantity of discharges, affordability and proposes a management plan for discharges while balancing these considerations. It is often linked with Structure Planning, and is particularly important in areas to be urbanised, and for countryside living areas.

The Integrated Catchment Management Plan identifies important characteristics of a catchment in which resource management problems exist or may occur as a result of (re)development or other major changes in activity patterns. An Integrated Catchment Management Plan identifies the natural and physical constraints of the catchment that control the form and intensity of growth/land use. It may describe alternative futures and identify and evaluate the cost-effectiveness of addressing their consequences/adverse effects on the catchment environment, particularly on the hydrological cycle.

The Regional Plans use a two tiered approach for stormwater and wastewater discharges. The Regional Plan: Air, Land and Water requires the development of Integrated Catchment Management Plans and Network Management Plans. The latter is required to support a resource consent application and implements the direction of the ICMP and documents a detail implementation plan and timetable. This two tiered approaches recognises the organisational structure of Auckland local authorities where several TAs have separate departments or Council Controlled Organisations for infrastructure management.

Figure 1.1
Structure Planning in the context of Auckland Region Growth Management Processes



It is also acknowledged that Integrated Catchment Management Planning can also have links to TA planning for open space, including reserves, and the development of ecological habitats, for example, through green networks. Where possible, this planning should also be integrated with ICMP and structure planning.

1.5 Why do we need both Integrated Catchment Management and Structure Planning?

Integrated Catchment Management Planning is of particular value in rural areas to be urbanised, and in areas where countryside living is being considered. The preparation of an ICMP for an area targeted for significant growth includes the identification of natural and physical resources, and identification of areas susceptible to natural hazards. This process assists with identifying the natural and physical constraints on the form and intensity of growth that can be achieved in the Structure Plan Area. An ICMP can also signal parts of a catchment that should not be developed, or will require appropriate mitigating measures to be provided, and/or assists in avoiding on-going costs associated with managing cumulative adverse effects associated with hazards (e.g. flooding and erosion). Redevelopment can provide opportunities for remedying problems in existing urban areas.

In instances where Structure Plans are prepared without an ICMP, natural resource constraints may only become apparent after major infrastructural components such as roading have been established. Development potential may be foregone in parts of a catchment if natural and physical constraints identified in a subsequent ICMP process are realised after a Structure Plan has been completed and implemented.

1.6 How can the two processes work together?

Integrated Catchment Management Planning and Structure Planning are iterative processes that continually inform and mutually support each other. When an ICMP and a Structure Plan are integrated then the additional costs of needing to revisit or reconfigure a Structure Plan Area are avoided or substantially reduced. An ICMP supports the Structure Plan and provides certainty for the TA, the developers, and the community. The Structure Plan may be less likely to be challenged significantly in the process of incorporating it into the District Plan on catchment related issues, where the process takes these into account. It

should be noted that Integrated Catchment Management Planning may be undertaken for purposes other than to support Structure Planning.

1.7 Who prepares the Plans?

Structure Planning (with associated Integrated Catchment Management Planning) will usually be initiated and undertaken by the TAs in whose area (re)development is to occur. Where development crosses TA boundaries more than one TA may be involved or combine in the development of the structure plan. Sometimes, however, Structure Planning processes may be initiated by land-owning and/or developmental interests. Where this occurs it is important that the TA is involved in a co-ordinating or auditing role in order to achieve consistency with the relevant planning documents.

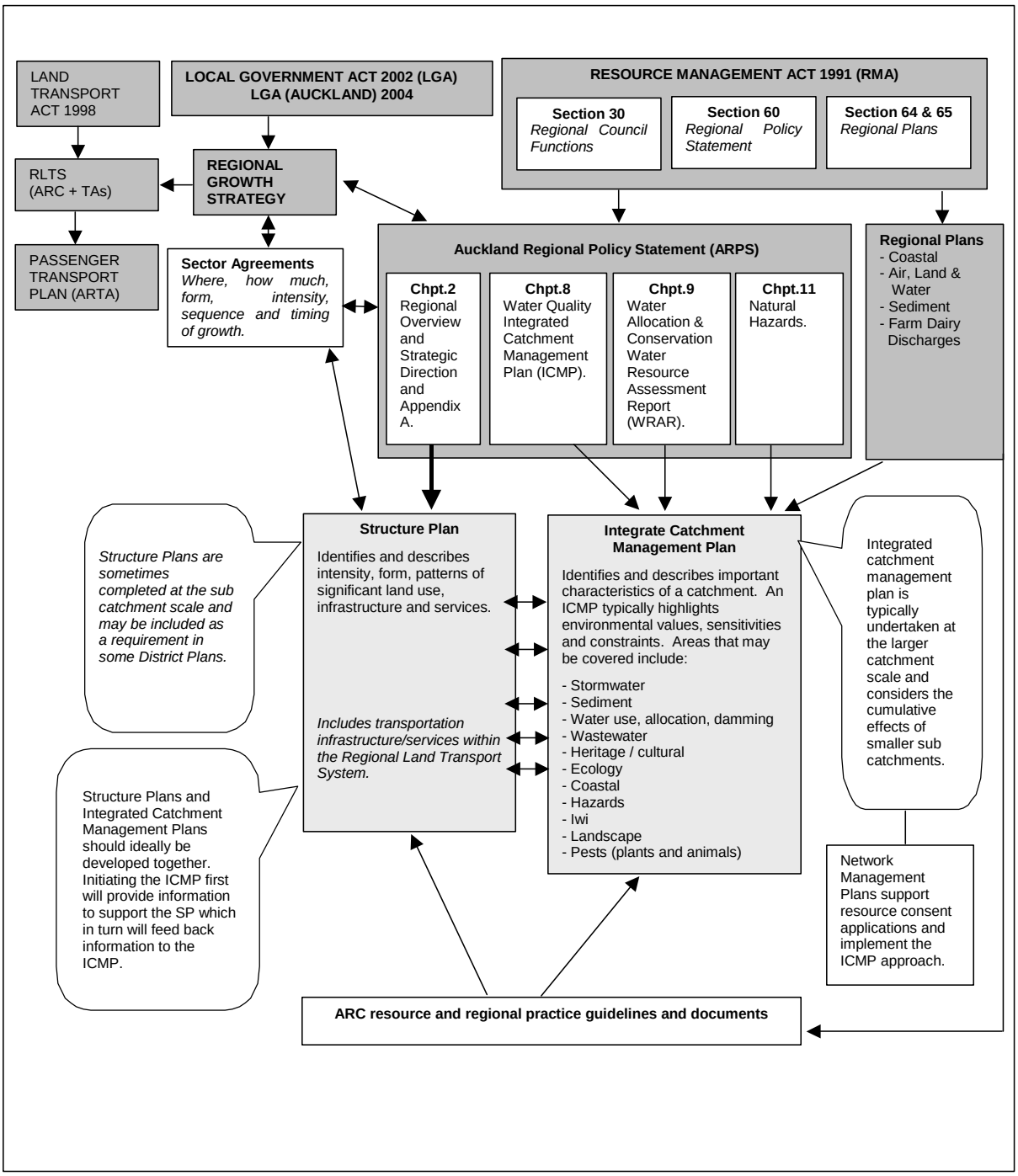
It is essential that the TA discuss the structure plan with the ARC and ARTA early in the process and have ongoing contact during the development of the structure plan.

An Integrated Catchment Management Plan is usually undertaken by a TA, although it may be initiated by the ARC, usually in conjunction with TAs. Coincidence of structure plan area boundaries with Integrated Catchment Management Plan boundaries is highly desirable. Where this is not achievable, the Structure Plan and the Integrated Catchment Management Plan must take into account the effects of the Structure Plan on the whole catchment, including any cumulative effects. The scale of the assessment may vary and should be confirmed with the ARC.

TAs undertaking structure planning will want to check to see whether other linked planning processes should be included in the structure planning process, or at the very least linked with it, to ensure integrated outcomes. This includes, for example, the links to their open space, natural and cultural heritage, and weed and pest strategies, and the work that may be needed to ensure sound outcomes. Figure 1.2 shows the relationship between the different planning documents for the region.

Figure 1.2

Relationships between Auckland Regional strategic/environmental planning documents



2. Planning for and Managing Growth

2.1 Introduction

This section indicates some of the key strategic documents and processes for planning for and managing growth, and provides some comments on structure planning. There are a wide number of other documents that those with responsibility for structure planning should consider in the light of the particular structure plan area. These documents are included in Appendix A.

2.2 The Auckland Regional Policy Statement and Change 6, March 2005

The Auckland Regional Policy Statement 1999 (ARPS), developed to meet the requirements of the Resource Management Act, sets out policies to promote sustainable management and to achieve the integrated management of natural and physical resources in the region. It includes provision for the control of urban growth such as defined metropolitan urban limits to contain urban development.

Change 6 to the Auckland Regional Policy Statement notified at the end of March 2005 seeks to be consistent with the Regional Growth Strategy, and to give effect to its growth concept, as required by the Local Government (Auckland) Act 2004. The Auckland Regional Policy Statement Change 6 reinforces requirements for structure planning to be used, after appropriate strategic planning has occurred, and preferably before re-development is envisaged in a particular area. The requirements for structure planning for areas of potential countryside living are clearer; in addition potential (re-)development of small urban areas (of 5000m^2 or more) is included to support improved urban outcomes.

The new Change 6 strategic objectives and policies in Chapter 2 also provide clear guidance for those undertaking structure planning. Relevant policies focus on urban containment; urban structure: high density centres and corridors, and future and existing urban areas; urban design; land use and transport; supporting infrastructure; and rural development control. Change 6 introduces both Schedule 1 that indicates new urban growth and redevelopment areas, and Appendix H that highlight densities to be achieved to better support public transport; these should also be considered. The final form of the Auckland Regional Policy Statement changes may impact on this Guide, and how structure planning is undertaken. It is recommended that users of the Guide also refer to the 2005 ARPS Change 6, and to the wider Auckland Regional Policy Statement provisions.

2.3 Auckland Region's District Plans and March 2005 changes

District Plans play a vital role in resource management and provide for the control of the effects on the environment of subdivision, (re)development and use of land, and promote the sustainable management of urban and rural areas. Some District Plans define areas for future urban development and some indicate the sequence and/or timing of development of those areas. This information can be important in defining areas for Structure Planning.

Changes to the Auckland region's District Plans notified in March 2005 seek to be consistent with the Regional Growth Strategy, and to give effect to its growth concept, as required by the Local Government (Auckland) Act 2004.

District Plans are the key mechanism for implementing Structure Plans. Once a Structure Plan for an area has been prepared the pattern of roads and other transport infrstructure, and provision for open spaces, reserves and green networks and public facilities such as schools and recreation facilities should be included in District Plans.

2.4 RMA Statutory Documents

Regional Plans offer a means for the Regional Council to give effect to its responsibilities under the RMA to control discharges to land, air or water; to control use and development in the Coastal Marine Area; to manage the use of water resources; and to control the use of land for reasons of soil conservation, protection of water quality and quantity, and avoidance or mitigation of the effects of natural hazards. The following plans provide the policy framework and explicit requirements for permitted activities and consents associated with a Structure Plan process:

- The Auckland Regional Plan: Sediment Control 2001.
- The Operative Auckland Regional Plan: Coastal (Highlighted to Indicate Provisions Appealed) 1999, and Variation 1 to this Plan.
- The Proposed Auckland Regional Plan: Air Land and Water 2001, with decisions and Variation 1 to this Plan. Chapter 5 of the Proposed Auckland Regional Plan: Air, Land and Water specifies when a ICMP for stormwater management should be prepared.

The New Zealand Coastal Policy Statement is a statutory document that provides guidance on the management of the coastal environment. The New Zealand Coastal Policy Statement directs that local authority policy statements and plans should identify areas in the coastal environment where natural hazards exist.

2.5 Long Term Council Community Plans

Long Term Council Community Plans (LTCCPs) describe the activities of the local authority, the community outcomes for the region, city or district, and provide a long-term focus for the decisions and activities of the local authority. This is required by the Local Government Act 2002; such plans must look out at least ten financial years, be reported on at least every three years, and updated at least every six years.

Such Plans should incorporate the Regional Policy Statement, Regional Growth Strategy and Sector Agreements as well as district plan requirements Future Regional Growth Strategy reviews and Sector Planning may lead to a need to update the Long Term Council Community Plan of councils having responsibilities for the Structure Plan area. This would include resourcing for the Structure Plan preparation process and, when the Structure Plan is in place, the delivery of services to co-ordinate with (re)development programmes.

2.6 Key Transport Documents

The Regional Land Transport Strategy sets out the development of the transport system for the next 10 years. It is usually updated every three years. The Regional Land Transport Strategy integrates investment in transport infrastructure and services, with the overall pattern of projected development and land-use in the region.

ARTA, the Auckland Regional Transport Authority, is responsible for the Passenger Transport Plan. This states the timing and provision of public transport facilities and services and is critically related to the more intensive forms of growth related (re)development namely "greenfields" urban development, rural town expansion, and urban intensification. It is therefore essential that the policies and programmes of the passenger transport plan, and programmes to prepare and to implement Structure Plans, are co-ordinated.

Land Transport Programmes outline projects to be undertaken along with their costs and the improvements being made to road, public transport and walking and cycling improvements and should also also be recognised and coordinated in the structure planning process. They are developed by all public organisations undertaking land transport implementation on an annual basis. This includes the region's TAs, ARTA, Transit New Zealand and NZ Railcorp.

2.7 Regional Growth Forum and Regional Growth Strategy

The Regional Growth Forum is a standing committee of the ARC with representation from the ARC and the region's TAs. To give effect to its role of managing the effects of growth in the region it has formulated an Auckland Regional Growth Strategy to 2050. The Regional Growth Strategy articulates a vision for managing growth and describes a growth concept plan. It also sets out and prioritises the outcomes to be achieved, and states the principles to be adhered to in the course of managing the form and direction of growth in the region through to 2050. The Forum and the Regional Growth Strategy have been given statutory recognition through the Local Government Act 1974, and the Regional Growth Strategy is a key focus of the Local Government (Auckland) Amendment Act 2004.

Responsibility for implementing the Regional Growth Strategy lies with partners of tthe Growth Forum and all other stakeholders in the growth process. Chapter 4 of the Regional Growth Strategy spells out the ways in which this is to be achieved and emphasises the need for a cooperative and integrated approach to the management of (re)development in order to achieve the outcomes identified in the Strategy.

Implementation of the Regional Growth Strategy relies on four themes:

- Establishing partnerships and relationships between stakeholders in the development process, including infrastructure and service providers, and development interests, along with the wider public. Good communication, co-operation, and the use of instruments such as Memoranda of Understanding between interested parties are essential for effective management of the growth process.

One example, the Memorandum of Understanding, to which the primary partners, the councils, of the Regional Growth Forum are signatories. This requires the parties to undertake sector planning to determine more specifically where, in what form, and when growth in each sector is to be accommodated. It also requires that structure planning be undertaken as a means of achieving integrated management of growth areas, whether they are to take the form of intensification within the urban area, greenfields development around the urban edge, expansion of rural towns, or countryside living.

- Policies and funding programmes of the primary partners must be brought into alignment with the Regional Growth Strategy and sector agreements. To achieve this will require active commitment of the various parties to adjust their policies and funding programmes so that infrastructure and services are provided where and when they are needed and development occurs in a coordinated manner across the region.

The process of preparing a Structure Plan is a means of securing the necessary commitments, and the Structure Plan itself is an instrument for recording those commitments.

- Commitment to a long term vision by all stakeholders is needed to manage short term growth in ways which achieve the outcomes identified in the Regional Growth Strategy, and direct (re)development toward this long term vision. The vision is a means whereby stakeholders share a common sense of direction. Preparing Structure Plans is a means of translating that common direction into concrete plans and programmes which establish the location, form and timing for growth related (re)development in the region.

- A flexible approach to implementation - which makes use of a wide range of adaptable techniques. These are described in Chapter 4 of the Regional Growth Strategy. Structure Planning and Integrated Catchment Management Planning are two of those techniques.

2.8 Sector Planning

The Regional Growth Strategy provides for the preparation of plans for Regional Sectors as an intermediate level between the Regional Growth Strategy and locally focused Structure Planning. Sectors are usually defined geographically (Figure 4 of the Regional Growth Strategy) but may also include Transit Corridors, which cross sector boundaries. The primary partners to the Regional Growth Strategy committed themselves through Memoranda of Understanding, to preparing plans for each geographical sector of the region. Sector Agreements have been prepared for the southern, central and northwestern urban sectors; the south is currently considering one for its rural area.

With the Regional Growth Strategy as a base these Agreements show:

- How much growth is expected to be accommodated within the sector, and where it is and is not to occur.
- What form and intensity each growth area will take.
- What infrastructure and services will be needed to support the planned growth.
- The sequence and timing for each area of growth.

- The actions needed to implement the expected growth in each area.

Sector Planning identifies areas to accommodate growth related (re)development. For each such urban area a Structure Plan will need to be prepared. The Western Strategic Corridor (Auckland City Council) illustrates how intensification can be focused on activity centres within a corridor. This corridor extends across the central sector to a western sector component (Waitakere City Council). Changes to this and other such corridors occur through reviews of sector agreements.

Structure planning is also relevant to more compact urban areas, for example, where significant redevelopment is possible in urban areas as small as 5,000m^2. The impacts of developments in a strategic location, or redevelopment in a particular suburb or area, can be more effectively managed, and design and amenity outcomes improved when a proactive approach to the whole area is taken.

2.9 Structure Planning

Structure Planning is essentially a tool for TAs to manage development pressures and set a framework for the development of growth. The outcome of this is generally the inclusion of appropriate aspects of the Structure Plan into the District Plan to give it statutory weight. Other outcomes will both be influenced by and will also impact on, non RMA documents such as Long Term Council Community Plans, Annual Plans, and Asset Management Plans.

Some aspects of planning, including for example, Integrated Catchment Management Planning are included in a number of statutory documents like the regional policy statement and regional plans. Others, like structure planning, are included in the Regional Policy Statement; however there is only limited guidance and reference to structure planning in regional plans. This document guide therefore fulfils an important role, particularly in areas where other guidance is limited.

2.10 Structure Planning in Urban Areas

For each area identified to accommodate urban growth, or where the District Plan enables development, and significant (re)development is likely, a Structure Plan will need to be prepared. Structure Planning identifies land which is to be urbanised and areas where intensification of development is to be provided for. The process produces a plan to guide development so that the form and intensity of development is appropriate to the natural and physical constraints of the land, and sound urban design and amenity outcomes are achieved.

Structure Plans may indicate programming and funding of infrastructure and should identify the future pattern of significant urban land uses, including:

- arterial and collector roads
- public transport provision
- walking provision
- cycling provision
- commercial centres
- urban and rural densities, including matching these to public transport provision
- schools
- other community facilities
- areas with natural and built heritage value, that can be used to support local identity, even given changes to more intensive forms of development
- parks/land required for active or passive recreation and public access to water bodies
- other areas where strategic public land acquisition may be needed, including areas set aside for hazard avoidance or land use buffer purposes
- land to be reserved for environmental protection purposes, including green networks across the urban area.

Structure Planning for Urban Intensification Areas can be somewhat different. Intensification areas are High Density centres and corridors identified in the Regional Policy Statement and District Plans March 2005 changes and other areas over 5,000m^2 which are already urbanised but undergoing redevelopment. An example, of an issue that may arise in existing urban areas, is the need for site re-amalgamation so as to support development more sustainable into the longer term, through improved urban design, including amenity and transport outcomes.

Structure Planning for these areas should consider all of those aspects outlined above, to be considered in Structure Planning in Urban areas but should also consider matters which are more particular to areas undergoing urban redevelopment. These aspects include:

- Achieving urban densities which support planned public transport investment particularly in areas on the proposed Rapid Transit Network.
- Improvements which result in improved patronage on the public transport system.

- Achieving higher densities of development closer to the main public transport stop and/or commercial centre with the lower densities being achieved at the fringe of the high intensity centre or corridor.
- Providing high quality (not necessarily large) public open spaces which encourage public interaction.
- Providing for a large range of activities rather than a restricted range of activities i.e. developing a mixed use or multi-functional centre or area.
- Recognising where the amalgamation of existing sites would result in a better urban design outcome, along with higher household and/or employment yields.
- Ensuring that any planned public and private redevelopments are well integrated.
- Consideration of parking issues, while also addressing the second bullet point.
- Paying particular attention to improving connections throughout the structure plan area to improve walking and cycling accessibility, to provide safer and more direct connections to public transport but also to improve vehicle permeability within the area.
- Where changes are made to existing arterial roads, ensuring that there is an alternative solution to accommodate the displaced traffic which will inevitably affect an adjoining area.
- To maximise all opportunities to remedy environmental effects created by the existing development. This may include, for example, storm water detention, retrofitting and treatment, creating more pedestrian links, reducing community severance and reducing air quality impacts.

2.11 Structure Planning in Rural Areas for Countryside Living

As with urban areas, it is expected that in rural areas structure planning will occur within the context of broad strategic planning and other statutory and regulatory instruments. These include a rural sector agreement, which ensures consistency with the Regional Growth Strategy, a rural population and growth strategy for the sector, a strategic overview across the sector area, key values to be protected, and a coherent, integrated approach to development across different council areas.

In other words structure planning is expected to occur within higher order strategies, and be consistent with them. Where rural development, including countryside living, is not anticipated structure planning is not needed. It is only where higher order strategies deem development to be potentially suitable that structure planning need occur. The more detailed technical work required may highlight issues around the suitability or otherwise of the area for further development. Where this is at variance

with the higher order documents it would then be fed back into reviews of those documents.

Structure Planning may be used to consider the long term future of areas to remain partially or fully rural, or rural areas where countryside living has been suggested as a future possibility. As with structure planning for urban areas, a strategic environmental assessment should be undertaken, and as a minimum the following matters should be be considered. They include

Strategic Matters:

- How any proposed growth accords with the Regional Policy Statement, the Regional Growth Strategy, rural sector agreements, the district growth strategy, and integration requirements of these.
- Whether any part of the rural area should not be compromised by development such as countryside living as the area may potentially be considered suitable for future urban development given its proximity to public transport, or because of other factors, such as key environmental values to be protected.
- Whether and how the rural area could accommodate further population growth without compromising rural working environments.
- Where the structure plan area abuts an urban area, how the urban/rural boundary is to be maintained and pressure for urban type development will be avoided.
- Consideration of the avoidance of urban activities locating in rural areas, and how this will be achieved For a definition of urban activities see the Definitions section.
- The presence of regionally significant infrastructure, or likely future need for regional infrastructure, particularly transport, including public transport and community facilities.
- The presence of and/or need for strategic links to areas outside the structure plan area.
- The avoidance of the creation of conflicts between land uses with incompatible effects or requirements, and the explicit consideration of any potential conflicts and how these can be effectively managed into the longer term.

General Matters

- The range of legally established rural land uses, any existing conflicts between these and how they are managed, consideration of potential land use conflicts to be avoided, and those that can realistically be effectively managed into the longer term.

- The likely future needs of current legally established or potential rural land uses and activities.
- The range of rural amenity values in the area; this includes consideration of areas that are generally rural and/or working rural environments, as distinct from more closely settled areas where countryside living is in existence; in some areas consideration of landscape may be included within this amenity work.
- The current legal development potential of the area, whether this accords with the values to be protected, possible management to protect values and where appropriate possible future options beyond the current identified capacity.
- The range of tools that could be used to accommodate growth, and the most appropriate means for doing so; this includes consideration of minimum lot sizes; site re-amalgamation to trigger development and protection opportunities, transferable development rights, development potential linked to protection and/or enhancement of identified environmental values for identified outcomes, and covenants and other methods to enable appropriate development while protecting values into the longer term.

Natural Opportunties and Constraints

- Links with integrated catchment management planning .
- Natural hazards, for example, land instability, coastal and stream erosion, flooding.
- Biodiversity in the area, as well as present or potential corridors supporting and linking biodiversity.
- Streams, coastal and other areas that need protection if their values are to be maintained.

Infrastructure Issues

- The likely need for and appropriateness of any needed community facilities.
- Roading both existing and planned, and transport options, including public transport.
- Social infrastructure requirements, including schools, and likelihood of these being met.
- Links between the range of matters, and how these can be usefully integrated, for example, open space planning with biodiversity and heritage protection.

Heritage Matters

- Heritage values, including sites of significance to Maori and/or to Pakeha and/or other communities.

- The identification of landscape values, and landscape areas that may warrant protection and where further development should be avoided, and areas that can assimilate appropriate development.

Consideration of possible futures

- Future options for the area, what these mean for the matters identified above, and a preferred option.
- Explicit evaluation of the trade-offs between general rural amenity values and character which support a working rural environment, and the creation of countryside living with its semi-rural semi-urban character (through closer subdivision and potentially changing land use patterns).

The structure plan will provide guidance on possible future development of rural and identified countryside living areas.

Further guidance on the scoping and design of structure planning is given in later sections.

2.12 Integrated Catchment Management Planning

It is essential when defining an area for Structure Planning that its context within a catchment or catchments is addressed. Integrated Catchment Management Plans are likely to be more important in areas to be urbanised, and in rural areas, to the structure planning process. In urban areas, particularly for structure plans considering relatively small areas, while there may be some opportunity to consider and address Integrated Catchment Management Plans matters, this is likely to be more constrained than in the other situations. Historically, catchment management plans relating to flood management have been prepared by TAs with guidance from the ARC. These have been implemented by granting to the TA a comprehensive discharge consent regulating the volume of stormwater which may discharge from the lower end of a catchment.

Integrated Catchment Management Plans take a wider approach.and must consider the quantity and quality of discharges and natural resources. Flooding, erosion, water allocation are key water quantity issues. Water quality issues to be addressed are the adverse effects of contaminants associated with stormwater and other discharges on the freshwater or marine receiving environment. The value of freshwater systems and the impact that stormwater discharge volumes and quality can have on these values should also be considered. Urban development can also have adverse effects on groundwater recharge when aquifer recharge areas are covered with impervious surfaces such as buildings, driveways, roads, etc. This imperviousness can reduce the amount of water that can be abstracted from an aquifer and affect the recharge needed to maintain stream flows.

Integrated Catchment Management Planning also assists in making management decisions with respect to streams to be protected and those with little potential to be enhanced. Issues associated with areas of unstable land can be addressed, as can the cumulative effects of multiple dams associated with stormwater management and/or ornamental ponds in countryside living areas. Integrated Catchment Management Planning should be undertaken concurrently with the Structure Plan so that the information generated in each process influences and supports each other and the Integrated Catchment Management Plan can be used to justify the quantum, form and intensity of growth in the Structure Plan Area.

2.13 Linkages

Structure Plan and Integrated Catchment Management Plan preparation for each growth area identified in the Sector Agreements enables major stakeholders to be involved in planning the physical form of development in each such area, including ensuring the protection of identified environmental values, and coordinating programmes for infrastructure and service provision. This ensures that development occurs in a manner which meets Regional Policy Statement requirements, achieves the outcomes of the Regional Growth Strategy and is consistent with its vision and principles, while ensuring that potential cumulative and co-dependent effects of the proposed development on the Structure Plan's receiving environment is addressed.

Appendix A provides further information on the range of strategic documents, non statutory documents, and financial instruments that are relevant to structure planning generally. All of the instruments include matters that need to be taken into account in the course of preparing Structure Plans and the instruments will to varying degrees condition the future potential of each Structure Plan Area. As the Structure Plan takes shape matters will also arise, such as programming and funding of work by infrastructure providers, which will subsequently need to be provided for in those instruments. The relationship between the instruments and areas being Structure Planned is interactive - the instruments condition the provisions of Structure Plans, and the process of preparing Structure Plans can make it necessary to amend or update the Instruments.

The work of preparing Structure Plans and Integrated Catchment Management Plans will involve expenditure, not only by the TAs initiating and facilitating their preparation, but also by other parties who will need to participate in the process. TAs should include in the Annual Plans, a programme for Structure Plan and Integrated Catchment Management Plan preparation, which covers at least the three year period that is required as a background to Annual Plans.

The Structure Plan programmes of TAs and identification within Annual Plans growth-related (re)development expenditure will also enable the Regional Growth Forum to monitor progress toward implementation of the Regional Growth Strategy, and to meet Regional Policy Statement requirements. In addition, such a programme will enable other stakeholders to plan for and to resource their involvement in Structure Planning, and will facilitate co-ordination of the stakeholders in the structure planning process.

It is of key importance, that Structure Planning be undertaken within the wider contexts of the Catchment(s), Sector and Region.

3. Scoping the Structure Planning and Integrated Catchment Management Planning Process

3.1 Introduction

This section of the guide refers to the process involved with scoping Structure Plans and Integrated Catchment Management Plans. This includes identifying the need for Structure Plan, identifying time-lines in the plan preparation, defining the area to be planned and the stakeholders involved, and funding the processes.

3.2 Identifying the need for a Structure Plan

Structure Plans are generally initiated by TAs in response to a diverse range of development pressures, and by Auckland Regional Policy Statement requirements. The Regional Growth Strategy has established a process for managing growth pressures and Sector Agreements have set out an agreed process for this within the different sectors, and anticipate the preparation of Structure Plans. On other occasions, TAs will prepare Structure Plans in response to drivers outside this process.

The Regional Growth Strategy:

- Indicates in broad terms the location and form of (re)development to accommodate growth in the region.
- Establishes the "Vision" for 2050, the outcomes to be achieved as (re)development occurs.
- States the principles that will guide the (re)development process.
- Sector Planning Studies, particularly for urban areas.
- Define in more detail the extent of (re)development in sectors and cross-sector corridors.

- Establish programmes for the provision or extension of necessary services.
- Set out the sequencing and timing for release of new development opportunities.

The Sector Planning process is likely to establish the need for Structure Plans and within each sector the timing for Structure Planning to be undertaken. Local factors such as the roading network, access to essential utilities, topography, historic zone boundaries, and local perceptions of the value or utility of resources need to be considered when defining the area for Structure Planning. This may lead to the adjustment of areas for urban structure planning which were originally identified at the Sector level. Structure planning that occurs as a result of sector agreements may well be broad brush. In urban areas where (re)development of a local area is the focus, and the structure plan area is 5,000m² or more, a more specific focus is likely.

Where possible, in rural areas, structure planning should focus on the whole catchment see also 3.6 on this point).

3.3 Identifying the Stakeholders

Structure Planning and Catchment Management Planning include a wide range of stakeholders. In structure planning key stakeholders are likely to focus on organisations and representative groups. Stakeholders include:

- The ARC, and other relevant TAs.
- ARTA.
- Other organisations responsible for the provision or operation of physical infrastructure (stormwater drainage, sanitary sewers water supply reticulation, communications networks, energy networks).
- Organisations responsible for the provision or operation of social/ community infrastructure (e.g. Ministry of Education (schools), health services, emergency services, Transit NZ, Department of Conservation).
- Property owners, particularly those with significant property (i.e. either large or strategically placed holdings), and others whose property may be affected.
- Representative community groups that identify with particular interests, such as resident and ratepayer associations, school boards, conservation groups, community care groups, sports clubs, recreation groups, community service organisations.
- Iwi/hapü for the area affected.

- Other people with property interests in the area.
- People whose living or working environment is directly affected (Note these are expected to be represented by representative community groups.
- Those who may live, work, or use the area in the future.
- Public agencies with an interest in the particular issues in the area, for example, heritage, environment, and so forth.
- The general public.

For each Structure Plan, the TA will need to decide who the stakeholders are, and appropriate means of communicating with the different stakeholders to meet their differing needs. Advantages of establishing efficient working contacts with each stakeholder grouping include continuity of personnel/team throughout most if not all of the process, an acceptance of final outcomes, or at least an understanding of the reasoning behind those outcomes, and an acceptance of the process used.

Further material relevant to stakeholders is included in Section 4, in subsections on relevance rather than comprehensiveness (about the information needs for the structure plan), and on consultation with stakeholders.

3.4 Time-lines for Structure Plan preparation

Three 'time factors' affect the timing of Structure Planning processes.

3.4.1. Programming Structure Plan Preparation Relative to Growth Needs

Sector planning programmes undertaken for each geographical sector by TAs will establish the sequence and timing for (re)development of each growth area in the sector. However, it is seldom possible to forecast the timing and rate of development with precision. Ongoing monitoring of growth and development will be undertaken by the ARC and TA for the Growth Forum and will indicate the need for periodic updating of these Sector agreements to ensure that development opportunities are co-ordinated with capacity requirements, and that key values are protected.

3.4.2 Programming the provision of key infrastructure

As a result of earlier urban planning and programming in some areas (such as the Albany Basin), essential services may already be in place before Structure Planning is undertaken. In other areas, while Sector Planning may have identified the need for extension or upgrading of services in urban areas, programming work will need to be done in the context of Structure Plan preparation.

Some elements of infrastructure are needed before urban (re)development occurs, and provision of these may determine the timing of development. Programming of key facilities such as major sanitary sewers, or road upgrading must be undertaken in anticipation of (re)development occurring. ARTA will need to be involved for public transport infrastructure.

Other elements of infrastructure and some services, such as schools, and social services, may be put in place concurrently with or follow development. Establishing the appropriate timing should be done as the Structure Planning process proceeds.

3.4.3 Structure Plan Timing and Major Stakeholders

The timing of Structure Planning processes should consider major stakeholders. Key infrastructure providers are subject to annual planning and budgeting processes. In order to resource the provision of services to Structure Planning Areas particularly in urban areas, and their participation in the planning process, infrastructure providers may need advance advice of forthcoming structure planning processes (preferably over twelve months notice).

This step is also likely to be influenced by the Stormwater Action Plan as it is also attempting to facilitate the preparation of Integrated Catchment Management Plans and the stormwater and wastewater network consent applications associated with existing network discharges.

3.5 Defining the Structure Plan Area

The ARC recommends that a formal scoring system is used to identify the Structure Plan area. This is useful for documenting the reasons for the area chosen and balancing conflicting interests. The process works best where the area being planned relates to an identifiable community of interest. In urban areas, this may be an existing or future node of economic and community activity (such as a shopping area), or a transport corridor. In rural areas, it is likely to coincide with catchment

boundaries. Some of the comments on defining the Integrated Catchment Management Plan area are also relevant for structure planning.

Although the Sector planning process will define areas, form and timing of (re)development, the boundaries of each area to be structure planned should be reviewed at the outset of the process. Factors to be considered are generally the same ones that condition the pattern and form of urban development within a Structure Plan Area. However, the incidence of those factors in the wider context of the Structure Plan Area, such as the visual or service catchment in which it is situated, must also be considered.

The weight given to various factors will depend on whether the Structure Plan Area will accommodate intensification, greenfields development, rural town expansion, or possibly provide for countryside living. Possible variations are illustrated in Figure 3.1.

The factors and weightings indicated in Figure 3.1 are illustrative and the actual weight to be given to each factor must be decided in the particular context of the Structure Plan Area being considered.

Figure 3.1: Defining Structure Plan Areas: Possible Factors and Their Importance

DEFINING	FACTORS	INTENSIFICATION	GREEN-FIELDS EXPANSION	RURAL TOWN EXPANSION	COUNTRYSIDE LIVING
LAND SUITABILITY	CATHCHMENT BOUNDARIES	✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
	STEEPNESS/STABILITY/ FLOODING/EROSION	✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
	WATER QUALITY	✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
	VEGETATION	✓	✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
	HABITAT VALUES	✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓ ✓
	OPEN SPACE / RESERVES / GREEN NETWORK	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
	LANDSCAPE VALUES	✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
	GENERAL RURAL CHARACTER	✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
	SEMI RURAL/SEMI URBAN CHAR	✓	✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
	URBAN FORM/DESIGN	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓ ✓
	URBAN AMENITY	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	
	HERITAGE/LOCAL CHARACTER	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓
UTILITY SERVICE THRESHOLDS	SANITARY SEWERAGE	✓ ✓ ✓ ✓ ✓	✓ ✓	✓ ✓ ✓	✓
	WATER SUPPLY	✓ ✓	✓	✓ ✓ ✓ ✓	✓
	STORMWATER SEWERAGE	✓ ✓ ✓ ✓	✓	✓ ✓ ✓ ✓	✓
ACCESSIBILITY	STRATEGIC ROAD NETWORK	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓	✓ ✓
	LOCAL ROADS	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓
	PUBLIC TRANSPORT NETWORK	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓	✓
	WALKING	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓
	CYCLING	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓
COMMUNITY FOCUS	CENTRE	✓ ✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓
	CORRIDOR	✓ ✓ ✓ ✓	✓ ✓	✓ ✓	✓
SOCIAL FACTORS	SENSE OF COMMUNITY	✓ ✓ ✓	✓ ✓ ✓	✓ ✓	✓
	FACIILTY CAPACITY (SCHOOLS, HALLS, LIBRARIES ETC.)	✓ ✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓ ✓	✓
	SAFETY, SECURITY (SOCIAL STATUS, SOCIAL SERVICES)	✓ ✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓	✓

(Ticks represent weighting i.e. importance of the issue to be considered for the Structure Plan Area.)

4. Scoping the ICMP Process

4.1 Identifying the need for an Integrated Catchment Management Plan

Policy 5.4.6 of the Proposed Regional Plan: Air, Land and Water recommends the preparation of ICMPs. An ICMP will always be required where significant (re)development is anticipated, for example, brownfields, greenfields, coastal and rural areas. An ICMP may also be required in existing urban areas where no (re)development is proposed; where significant land use change is anticipated; and situations where land use practices are having adverse effects on the environment.

4.1.1 Existing Urban Areas where no (re) development is Proposed

Section 386(3) of the Resource Management Act requires renewal of resource consents for stormwater and wastewater discharges where existing use authorisations have expired.

The Proposed Auckland Regional Plan: Coastal and the Proposed Auckland Regional Plan: Air, Land and Water set out objectives, policies, rules and methods relating to stormwater and wastewater discharge management in the Auckland Region. Policies recommend TAs prepare Integrated Catchment Management Plan and require network utility operators to prepare Network Management Plans that identify and investigate environmental risks from stormwater and wastewater discharges respectively and the means for avoiding, remedying or mitigating those risks. The ARC does not support applications for changes to the Urban Areas, without the preparation of an Integrated Catchment Management Plan.

4.1.2. Land use change and land use practice issues

In both urban or rural situations where significant growth is not occurring but where significant land use change may have, or land use practices are having, adverse effects on aquatic receiving environments an Integrated Catchment Management Plan process can address multiple interrelated issues. Rather than setting up separate projects/programmes for wetlands protection, flood control, and water supply etc, a comprehensive Integrated Catchment Management Plan can be developed. There may also be concern over such issues as water quality, flooding, low flows , and sedimentation. Numerous small dams in a catchment may be having adverse effects on fish passage and/or other water users. Issues may also be raised by the community or identified through the ARC or TA monitoring.

4.2 Time-lines for Integrated Catchment Management Plan Preparation

Timelines for Integrated Catchment Management Plan preparation will be influenced by the Auckland Regional Discharges Project, which is managing stormwater and wastewater network discharge consent renewals. Factors which affect time-lines for Integrated Catchment Management Plan preparation under 3.4.2 check will include the availability of financial resources and development pressures. Integrated Catchment Management Plans are living documents and also subject to review.

4.2.1 Defining the Integrated Catchment Management Planning Area

In situations where a Structure Plan is not required the area of the Integrated Catchment Management Plan should be as follows:

The area for an Integrated Catchment Management Plan prepared to support an application for a Stormwater Network Discharge Consent (as required by the Proposed Auckland Regional Plan: Air, Land and Water) must cover the existing/future network and must be broad enough to cover areas upstream which may affect the consent area and areas downstream to ensure cumulative effects are considered. This is generally on a catchment boundary basis.

The area for an Integrated Catchment Management Plan prepared in a rural catchment should include the whole catchment where there are wider catchment scale hydrological issues to be addressed. In cases of very large catchments they may be prepared at the sub-catchment scale with hydrological issues forming the boundary conditions for the sub-catchment.

Where an Integrated Catchment Management Plan is prepared in conjunction with a Structure Plan it is vital that they are prepared in parallel, both in time and in space. The area to be covered by an Integrated Catchment Management Plan should include all of the Structure Plan Area and ideally the whole catchment as the catchment is the basic hydrological unit. A primary purpose of the Integrated Catchment Management Plan is to identify physical constraints on the development caused by elements of the hydrological cycle, and to assess the effects, including cumulative effects, of the proposed development on all elements of the hydrological cycle. This can only be done on a catchment scale. Where there are very large catchments, it may be sufficient to work at the sub-catchment scale as long as the downstream effects of the sub-catchment are considered. Where the Structure Plan Area is smaller than the catchment, the development will be affected by and may be constrained by the upstream hydrology, and will affect elements of the hydrological cycle downstream.

The consideration of cumulative effects, the effects of the development in combination with surrounding land uses, on the hydrological cycle is vital. Physical processes such as infiltration, run-off and evapotranspiration that occur on the land's surface are part of the hydrological cycle, and as a consequence activities on land affect the hydrological cycle.

Coincidence of Structure Plan Area boundaries with Catchment boundaries is desirable, but not always easily achievable. Factors such as TA boundaries, roading patterns, and the availability of utility services such as sanitary sewerage mean that at times the boundaries of Structure Plan areas do not coincide with catchment boundaries. In addition, some property owners at times seek to have their land excluded from the Structure Plan. However this can undermine a consistent considered approach to an area. It can also be costly if the owner later changes their mind, or the ownership changes and the new owner wishes the land to be included, but the work is complete and the council focus has shifted to other matters.

It is, essential that the implications of future change within the Structure Plan Area be considered in the context of the catchment(s) in which it is situated. This necessitates cooperation between TAs where district boundaries divide a catchment and requires consideration of the potential for (re)development to occur in other parts of the catchment. That is, the longer term future parts of the catchment outside the Structure Plan Area, or even beyond, which is identified for eitherfuture urban or rural purposes must be considered. As previously indicated, the extent and nature of the wider context for each Structure Plan Area should also be considered and articulated during the Sector Planning process.

4.3 Identifying Stakeholders

Stakeholders for Structure Planning and Catchment Management Planning are likely to be very similar. It is therefore suggested the reader refer back to subsection 3.3 on stakeholders for structure planning.

4.4 Funding the Structure Planning and Catchment Management Planning Process

Structure Planning and Catchment Management Planning are key processes through which the purpose of the Resource Management Act can be given effect. Therefore, responsibility for them will usually lie with TAs and the costs of planning and managing the process will be funded from rate revenue, while the costs of key stakeholders will remain with those parties.

Situations may occasionally arise, however, where preparation of a Structure Plan serves the interests of a small number of easily identified commercial operators such as where the land in a greenfields area is owned by a few land developers. In those situations it may be more equitable for the interests which will benefit commercially from the structure planning process to meet the costs.

In the event that developers fund a Structure Plan or Integrated Catchment Management Plan it is important that the TA has clear, transparent and independent responsibility for managing the plan, including its consultation process.

A further alternative might be to fund the preparation of a Structure Plan and associated Integrated Catchment Management Plan as a deficit to be recovered from developers by way of financial contributions as development occurs in the Structure Plan Area. In this case provision may need to be made in the relevant district plan ahead of commencement of the Structure Plan process and this requirement may limit the practical application of this option.

Integrated Catchment Management Plans are now able to be partially funded by the ARC through the Stormwater Action Plan funds.

5. Designing the Structure Planning Process

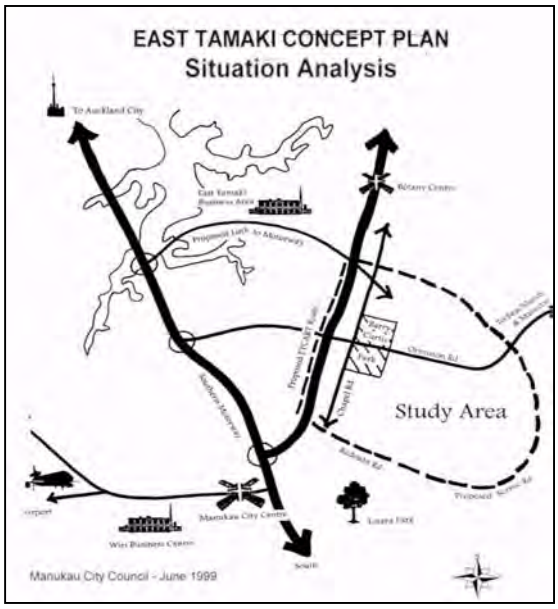
5.1 Preparing the initial Inputs to the Structure Planning Process

5.1.1 Creating the Cross Linkages from the Outset

Structure Planning requires a multi-disciplinary approach and team. The earlier these are brought together to ensure cross linkages are made and taken into account throughout the process, the more chance there is of effective outcomes on the ground. At times relevant work may be occurring in different processes. Integrated catchment management planning is one such example. Others include planning for the transport system, including public transport, broad urban form and design issues, open space, including reserves planning, and access to waterbodies. Comments in 2.9 - 2.11 are also relevant when considering design.

5.1.2 The Expected Strategic Growth and Development Context

A strategic overview should be provided. This would range from information about the dynamics of growth affecting the area and the form and intensity of development expected, as well as information from all the instruments that comprise the structure planning framework (refer to Figure 1.1 and 1.2). Information will include:



- Quantification of growth needs and the timing, location, and form of development (from the Regional Growth Strategy and Sector Agreements).

- Programmes for the provision of infrastructure and services (Sector planning, infrastructure providers' plans).

The information should describe the area in the context of the region and the Sector, outline the form which any development in the area is expected to take and the timing of (re)development. It is often helpful to provide information on existing land ownership patterns, their legal development potential, how both of these may impact on the future of the area, and what action, if any, may be needed to support key outcomes. For both rural and urban Structure Planning the approach should consider the values to be protected and how these support local character and amenity values, and ensure links with reserves and open space planning. The East Tamaki Concept Plan is an example of providing a context for structure planning in a greenfields urban growth area.

5.1.3. Natural and Cultural Resource Constraints and Opportunities

Constraints from Integrated Catchment Management Plans relating to the hydrological cycle, natural hazards and natural values should be summarised and incorporated into the Structure Plan.

Hydrological cycle

The natural resources of the Structure Plan Area and the catchment must be identified and described. This includes ecosystems and all elements of the hydrological cycle, including water quality, and the interactions between these elements. Most importantly the interaction between the land and landuse and the hydrological cycle must be described and the effects of changed land use on the hydrological cycle evaluated. The natural character of any coastal environment also needs to be identified and described.

Natural Values

The values of the natural resources must then be evaluated and the effects of urban and/or rural development on those values must be evaluated. An appropriate method for assessing potential cumulative adverse effects of land use intensification in the Structure Plan Area on freshwater and marine receiving environments will assist in determining growth constraints and opportunities. Other guidelines can assist with this.

Hazards

The need for protection or special treatment of particular features should be identified (as appropriate). Information about hazards, including coastal erosion, earthquake hazards, flooding, land instability for reasons of steepness or geotechnical conditions, and possible climate change impacts, should be assembled and the implications for future development of the Structure Plan area anticipated

(See Hazard Guide, ARC, 2003). This should include consideration of the context of the Structure Plan Area and will cover the "Land Suitability" factors in Figure 3.1. Where existing information is incomplete, investigations may be appropriate, e.g. to identify the areas susceptible to hazards. Issues such as public access to, along and from the Coastal Marine Area should also be considered.

Natural Heritage

The ecology and natural features of the catchment and Structure Plan area should be described, and set within the context of the broader area and sector. This should include information on the remaining areas of native vegetation, wetlands, riparian vegetation and habitats for native flora and fauna (both terrestrial and aquatic). It should also identify potential areas for ecological restoration such as riparian areas and the creation of ecological linkages and corridors. This information should be compiled by a qualified ecologist.

Landscape

The landscape values of the Structure Plan area, and how these relate to and fit within the broader area, and, where relevant the sector, should be evaluated. This is particularly important for rural areas, where there may be significant local or regional as well as outstanding landscape values. Landscape assessments will provide an indication of what is valued, how significant the values are, what should be protected and how, and what development is consistent with differing levels of protection. It may point to the need to provide guidance so that potential development enhances rather detracts from landscape values in the longer term.

In urban areas, different development scenarios may have different impacts on landscape, and on local urban amenity. As urban landscapes contribute to local character and identity, it is important to manage urban landscapes so that critical values remain.

Open Space and Reserves Planning

It is helpful for the community if Structure Planning and open space and reserves planning can be done in tandem, or at the very least at the same time, and informed by both processes. While this can complicate the processes for the council/s involved, it enables the community to get a sound understanding of the complete picture and all the factors that influence the final outcomes on the ground.

Consideration should be given through open space and reserves planning to potential ecological restoration, ecological linkages and corridors, and landscape as well as to form and design, cultural and built heritage, and public access to waterways and key local features.

5.1.4 Physical Resources Constraints and Opportunities

Form and Design Considerations

In both rural and urban situations, Structure Planning provides an opportunity to evaluate the effectiveness of current form/structure, the integration of land use and transport, and how these impact on the ability of local services and facilities to effectively meet local needs. It enables a strategic overview of the area, and the ability to consider key physical, natural and social infrastructure needs. It can also support both community and expert input on how to improve the workability of the area, while retaining local character.

In areas expected to provide an urban edge, and to protect rural environments into the longer term, consideration can be given to how to support such outcomes. This is particularly important where the natural and physical landform and landscape do not provide clear natural boundaries and it would be easy for growth to sprawl out.

There are different views on whether enabling countryside living is an appropriate way to provide an urban edge, albeit a soft edge with a gradation from urban to semi-urban/ semi-urban to rural character. For some, this type of development can blur the line between urban and rural areas, and impact positively or negatively on the amenity values of either or both. Others see such development, when occurring between two urban areas, as providing something of a green belt. It can however be a barrier to efficient urban development, so the long term future of the area needs careful consideration before such development is provided for. On key transport corridors, medium to high density development may provide for longer term development, a more visible edge, and a very clear urban rural line. There are also issues of long term economic efficiency if development occurs which is expected to be replaced relatively quickly.

Amenity Values

With development and/or redevelopment there are likely to be changes to the area's amenity values. In new urban areas, particularly in public transport corridors where densities are expected to be higher, it is important to ensure that public facilities, including streets, parks and other community facilities such as libraries are developed early in the process. Appropriate protection of natural areas, including streams, or improvement in their values, and access to these can support local amenity outcomes. In urban areas to be redeveloped, it is useful to consider those aspects of amenity that should be protected and built on, those which are likely to change and how, and new amenity elements that will enhance local character. In medium high density mixed use areas, for example, some uses may be more appropriate for ground floors, while other activities are located on higher floors. Care also needs to

be taken as to how transitions between different land use intensities and types are to be managed both within and between zones.

In rural areas, it is important that councils and communities understand that general rural environments that provide rural working opportunities are usually of a different character to rural residential or countryside living areas for people often working in urban areas. Closer subdivision patterns can restrict the range of possible land uses, and together with a mix of urban style fences and practices can alter the rural character to that of a semi-rural or semi-urban character. In this way a sense of rural character can be undermined. In addition countryside living can lead to requests for urban type services, while being a barrier to efficient future urban development.

Infrastructure Constraints and Opportunities

Information on constraints and opportunities affecting the provision of services to the Structure Plan Area need to be assembled. This is likely to be required to be done on consultation with those responsible for utility services, transport networks and other services.

The analysis should identify elements of infrastructure, which have capacity to support additional development, those that must be provided before development is commenced, and those that will require extension or expansion during development.

When infrastructure thresholds are identified the elements of services where difficulty of provision or cost may affect timely provision should be outlined. These situations may need special attention so that the service or facility is available to the community when needed.

5.1.5 Transport constraints and opportunities

In meeting the goals of the Growth Strategy, the Regional Policy Statement and the Regional Land Transport Strategy it is essential that the structure planning process recognise and accommodate the principle of land use and transport integration.

It is expected that the region will invest approximately $10 billion in the transport system over the next 10 years. In many cases this investment (particularly the public transport investment) needs to be supported by appropriate urban development. For public transport this generally means increased intensity and a mix of urban activities in and around transit stops. Appendix H of the Regional Policy Statement states the densities required to support different levels of public transport.

Population and employment densities greatly influence:

- Transport demand.
- The provision of transport infrastructure, and the viability of public transport services.
- The utilisation of the infrastructure.
- The rate of consumption of greenfield land.

Increasing densities and the number of local connections allow a greater proportion of the population the ability to undertake trips by foot or by bikes to transit stops and/or the commercial centres or employment opportunities. The Structure Planning process needs to identify where opportunities to improve access exist and recommend actions to secure these access routes.

ARTA is the main body responsible for the implementation of transport improvements in the Auckland region. It needs to be a key stakeholder in any structure planning exercise. Consideration should also be given to including Transit New Zealand and NZ Railcorp as stakeholders where their transport investment decisions affect or are affected by an area undergoing a structure planning process.

The following are aspects of transport issues that should be considered when developing a structure plan for a regional growth area:

- Determine the level of planned public transport improvements to the area
- Identify opportunities for increasing accessibility levels for all modes within growth centres.
- Improve links to public transit stops.
- Look to provide the highest densities for redevelopment and employment opportunities close to public transit stops.
- Within regional centres, town centres and corridors provide opportunities for improved pedestrian and cycle modes.
- Provide for residential and business density increases appropriate to the level of planned public transport improvements (see ARPS Appendix H).

5.1.6 Social and Cultural Constraints and Opportunities

Social

The community's needs and values should also be identified and described. This includes consultation with the community to hear their desires relating to growth and development, in addition to the Regional Growth Strategy process. This can be a challenging process, with both support and concerns about growth and development. In addition, future residents and workers are hard to identify, even though they will live with the outcomes.

Social infrastructure is provided by a range of central and local government agencies, as well as the private sector. It is useful to engage with these providers, though it can be difficult to get them to focus on potential development given other demands.

Cultural

Information about cultural heritage should be assembled and/or researched. Heritage can include natural heritage, including places of historic significance to Maori and/or other cultural groups, as well as built heritage. This should include information about features and qualities of particular value to Maori, and also about early Pakeha settlement of the area. Expert archaeological assessment may help uncover significant heritage that may be useful in supporting or re-creating local identity and character. In contrast, in other situations all that may be possible may be to record the site/s. Built heritage may include orchards, farmhouses and sheds, jetties, early schools, and so forth. Heritage staff of TAs and the ARC may already have access to some information.

5.1.7 Relevance rather than Comprehensiveness

The information should identify the nature of the growth the Structure Planning Area is expected to accommodate, the development opportunities it offers and also the constraints, including the values to be protected. Information sources should be noted, and where possible factors prioritised, or at least imperative factors differentiated from conditional ones. Relevance rather than comprehensiveness should determine what is identified.

Structure Planning focuses on public interest type matters, rather than the more detailed technical work that is the interest of private landowners. What is required for Structure Planning is likely to be a "once over lightly" assessment to ensure that the issues are identified and the approach is correct, rather than the kind of in-depth assessment required when subdivision may occur. As already indicated, the assessment focus should be to assist the identification of values to be protected, and development constraints and opportunities. This high-level,broad and

multifaceted focus can at times be a source of tension between the council and the community.

Community members, particularly those interested in how development options may influence their own development opportunities, are often unaware that further work will be required by them before development can occur. This is particularly the case where the majority of the community is is not familiar with council requirements, including those for resource consent applications, including for subdivision, and the payment of financial contributions, biodiversity protection, the need for reserves and public access alongside waterbodies, and/or planting to protect catchment outcomes. The time needed to complete all relevant studies can also be an issue if the community is not briefed about the time the process is likely to take.

It is therefore important to ensure that early and ongoing consultation with all the stakeholders clearly outlines the processes and indicative timeframes needed for structure planning, as well as briefly indicating what may or will be required for any resulting development. This helps set realistic expectations, while also acknowledging that timeframes cannot be guaranteed. It is also useful to acknowledge that there is often tension between specific landowner/development objectives, and council and community objectives, and the outcomes may be a mix of what different parties envisage.

5.1.8 Examples of Aspects of Structure Planning

The following two examples are taken from the Greenhithe Structure Plan. As such, they give an indication of Structure Planning where areas are to be urbanised, and/or where urban areas may be redeveloped. Some issues not explicitly covered as separate matters in these two tables include urban form/structure and design, urban amenity values,walking and cycling opportunities, and open space and reserves planning. Other urban areas may give rise to other issues. In addition, other issues are likely to arise in rural areas, and further work may be required, for example if the strategy for the sector does not explicitly consider rural development, and within this, a rural population strategy.

Table 5.1
Examples of Work Done on Natural and Physical Resource Constraints

12.14 *Major Constraints*

12.14.1 Constraints Summary

The significant constraints affecting the GSPA are summarised in Table 12.1 below:

Table 12.1: Constraints Summary

FACTOR	HIGH CONSTRAINT	MEDIUM CONSTRAINT	LOW CONSTRAINT
Climate			Potential for some climatic change (not a site constraint)
Air Quality			Nearby industrial emissions and raised vehicle exhaust levels
Soils		Poor draining soils	
Flooding	Some flood sensitive areas. Potential for increased stormwater runoff. 100 year floodplain to be identified		
Water Quality	Potential for increased contamination of Lucas Creek and Upper Waitemata Harbour		
Geotechnical Analysis	Steeper slopes and areas with geotechnical instability are unsuitable for extensive suburban development without significant recontouring	Moderate slopes and areas of potential instability requiring further investigation	
Flora	Existing areas of native bush have significant intrinsic and visual value		
Fauna	Lucas Creek and tributaries have value as ecological corridors Areas of native bush linking to other significant habitats outside of the study area have value as habitats		
Archaeological Heritage	Identified sites confirm 50m. fringe of Lucas Creek and its arms as archaeologically sensitive		
Landscape	Areas rated 6 or 7 have significant sensitivity that will severely restrict development options Areas rated 5 have considerable sensitivity that will restrict some development options	Areas rated 3 or 4 have moderate sensitivity but landscape features should still be preserved where possible	Areas rated 1 or 2 have low sensitivity but landscape features should still be preserved where possible
Existing and Future Development	Fragmented ownership pattern and existing rural/residential dwellings will be a significant constraint on the pattern of development.		Relatively open, spacious form of development of Greenhithe Village adjacent to GSPA.
Transportation Network	Arterial route alignment will cut through the planned residential areas and will be a major physical and visual constraint. Noise will be major constraint beyond motorway boundaries. Pollution and vibration may be potential problems		
Bulk Services		Adequate provision has to be made for stormwater detention ponds	

Source: North Shore City Council: Greenhithe Structure Plan Background Report

Table 5.2 Examples of Work Done on Natural and Physical Resource Opportunities

12.15 Major Opportunities

12.15.1 Opportunities Summary

The opportunities available in planning for the urbanisation of the GSPA are summarised in Table 12.2 below:

Table 12.2: Opportunities Summary

FACTOR	OPPORTUNITY
Flora and Fauna	To build on existing significant vegetation and streams to form ecological corridors
Landscape	To utilise existing views, streams, vegetation and landforms to form a key component of the development form and design
Existing and Future Development	To capitalise on the employment opportunities available close to the GSPA
Transportation Network	To utilise the access provided by the planned arterial route

Source: North Shore City Council: Greenhithe Structure

5.2 Scoping the Structure Plan Design Process

The nature, content, and purpose of each step in the Structure Plan process should be worked out. The right hand column of the Figure 4.1 illustrates the form that scoping the process might take, particularly for an urban area.

For the structure planning process to achieve its purposes it needs to be efficient, relevant, accessible, and orderly. Stakeholders should be provided with a "map" of the process which helps them to understand the reasons for, and outputs expected from, each step, as well as an indicative timeline. An example of contents in this process is illustrated in Figure 4.1.

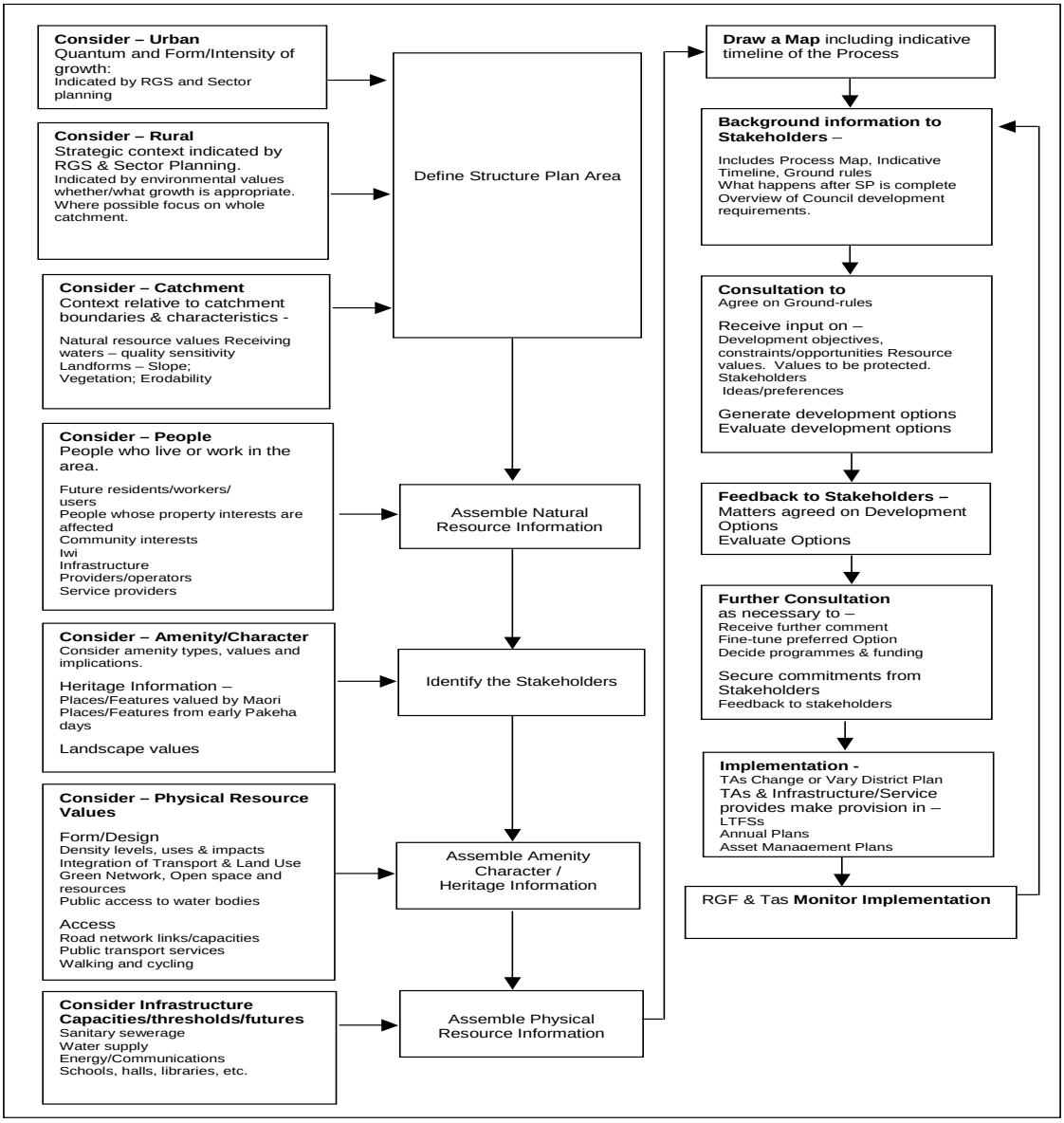
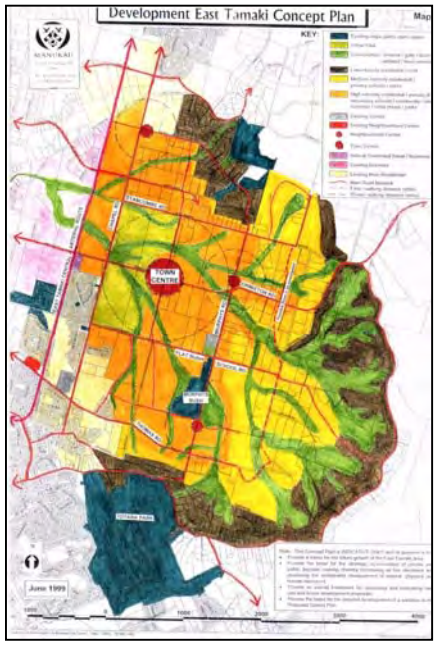


Figure 4.1: STRUCTURE PLANNING PROCESS

5.3 Defining Responsibility

Responsibility for each step in the process should be clear. Many of the people taking part are donating their time voluntarily, and those managing the process have a responsibility to ensure that the process is efficient, purposeful, and accessible to all the participants.



It is desirable to contact key stakeholders before the public consultation phase commences. This is to manage the process in a manner that best takes account of their varied interests.

Stakeholders could include competing commercial interests and decisions may need to be made on whether all or parts of the process should be in closed sessions, and whether the media/public are to be given access to the process and its outputs. It is essential that the TAs maintain control of the structure planning process while stakeholders are given equitable opportunities to make their inputs.

Where development interests take an initiating role in Structure Plan preparation it will be essential for the TA in whose district the Structure Plan Area is situated to take an active part. This is necessary to achieve consistency with the Regional Growth Strategy and the Regional Policy Statement and also to ensure that the process takes appropriate account of all relevant factors, particularly for example, in ensuring sound urban form and design outcomes. Council involvement is vital to ensure public interest outcomes are promoted and protected.

There are a range of infrastructure providers etc, for example, council related (e.g. CCOs: Council Controlled Organisations such as ARTA) and regional providers as well as central govt providers. It is useful for the council to undertake engagement with all such stakeholders, especially those for whom there may be potentially significant implications. Such liaison may be through existing relationship forums and channels, where these exist.

5.4 Consultation with Stakeholders

Directly involving stakeholders in the preparation of a Structure Plan is an essential part of the process. This is easier with some stakeholders, for example, agencies and even individual landowners, and more challenging with others e.g. future household owners, workers, and the like.

Early and ongoing involvement is important. Early involvement includes providing background information to stakeholders on what to expect during and from the process, and indicative timeframes. It can be useful to be clear about the ground rules. For example, that the council commit to tell stakeholders in a timely manner if there are significant changes to the process or to the timeline, and that stakeholders commit to use the agreed mechanisms provided for having input, and let the council know where these may be problematic.

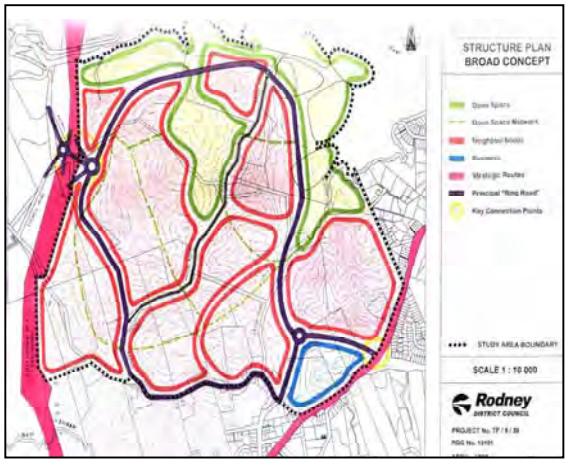
It is also important that the different information needs of different stakeholders is recognised, for example, if development in a Structure Plan area is likely to become possible. Infrastructure providers and large development companies may be aware of district plan requirements, and likely costs associated with obtaining consents. Many landowners and small developers who may not know either the process or the likely costs, may develop unrealistic expectations. It is therefore useful for the council to provide relevant information at an early stage, so as to help manage both relationships and expectations.

A clear, transparent and consistent approach to the issues is also important. Focussing on the whole of the structure plan area, and avoiding focussing strongly on particular individuals, groups or properties pursuing their own specific interests, is important. At times, particularly in urban redevelopment, there may need to be a focus on a specific property, or group of properties. Having discussions in a broader context, as in a charette, where the wider community is involved, can see the broader issues, how these may be resolved, and the implications for specific properties, can help maintain the credibility of the process. Specific discussions may then occur with particular parties, within this context.

In developing technical assessments, it is helpful if the methodology ensures a consistent approach. This can avoid the perception that particular landowners had opportunities to inappropriately influence the process by using it to advocate for particular outcomes. Rewarding those who actively repeat the same single outcome may simply increase development expectations among some stakeholders.

Knowing about the process, and having the ability to have input at key stages can contribute to building acceptance of the Structure Plan and commitment to its

implementation. Appropriate consultation techniques may include open days, workshops or charrettes.

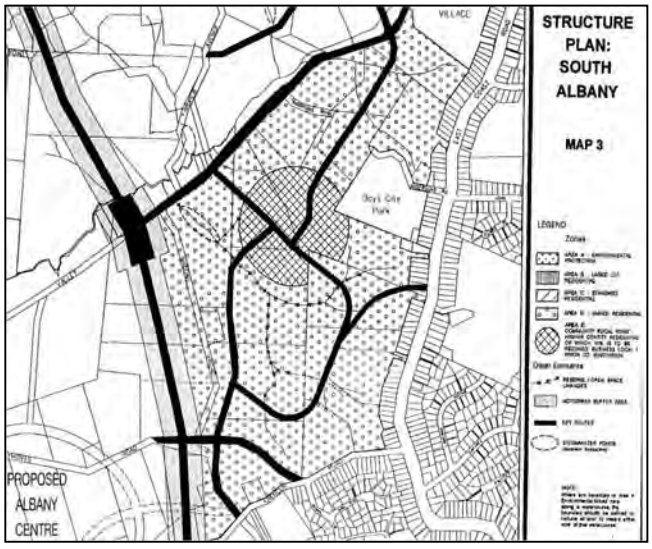


Four different techniques for enabling stakeholder input to the Structure Planning process are described in Appendix B. These techniques will suit various circumstances within intensification, greenfields, and rural situations.

In selecting a technique for directly involving stakeholders, it is important to recognise that stakeholders in areas subject to infill and intensification are likely to be more diverse and may include more conflicting interests than may be the case with greenfields areas or rural areas where countryside living may be considered. The selection of a process for stakeholder involvement may be influenced by the desirability of avoiding unconstructive confrontation between divergent interests. An advantage of having events with diverse stakeholders is that hearing the views of different groups means many stakeholders become more aware of the multiple interests and pressures on the council, and the importance of decisions that the whole community can live with. Effective facilitation of such events is however important.

The essential elements of this stage of the process are outlined below.

5.4.1 Stakeholders are provided with a common information base, and a guide to the process. It can be useful to ensure that all participants are familiarised with the structure plan area together. This may, in the case of workshops or charrettes, include a conducted tour of the area.



5.4.2 Consensus is sought on the priority/significance of constraints and opportunities affecting the development of the Structure Plan Area. This must be done with regard to the evaluation of constraints and opportunities and with reference to relevant

guidelines. Where consensus is not realistic, it is still helpful to be clear about the common ground, and areas of difference, and the significance of these.

5.4.3 Objectives and Policies for (re)development of the Structure Plan Area are developed from the wider strategic context, including reference documents (RMA, Regional Policy Statement, Regional Growth Strategy, Regional Land Transport Strategy, District Plan), environmental values to be protected, and consideration of constraints and opportunities, such as offsetting mitigation particularly in urban areas.

5.4.4 Development options are articulated and evaluated with reference to the Regional Growth Strategy, the Regional Policy Statement, the Regional Passenger Transport Plan, and priority/significance of constraints and opportunities, and the consensus sought regarding a preferred option. In urban areas, this may mean substantial change to an area, while in rural areas, it may mean confirmation of values to be protected, and a result in either limited or more development.

5.4.5 Stakeholder input is facilitated so that:

- All participants are able to contribute their ideas for the long term future of the area.
- Participants are aware of legal requirements, and the regional and local strategic context, and work within these
- Infrastructure costs, constraints and opportunities are effectively taken into account.
- Preferably ideas held by many, most or even all participants contribute to the base on which development options are articulated.

5.4.6 Differences between parties are identified, examined and resolved so far as possible, during the process.

5.4.7 The plan which emerges from the process has the support of many, most or all of the participants, and can be developed into a Structure Plan for the area. Participants need to be aware the initial plan may need to be further developed and also that District Plan changes will be promulgated to give effect to the Structure Plan along with other statutory and non-statutory instruments.

5.4.8 Ways of carrying out particular works will need to be explored and decisions made whether developers are required to undertake such works as development proceeds or whether the council should carry out the works and recover the costs by means of financial contributions/development contributions.

5.4.9 Stakeholders must be kept up-to-date with progress on the Structure Plan. The manner in which this is to be done, for example by newsletter or follow-up workshops should be decided and stakeholders informed at or before the Workshop.

5.5 Documenting Basis of Final Structure Plan

A range of supporting documents, reports, etc. are prepared throughout the Structure Plan process. An analysis of these documents including the recommendations carried forward into the Structure Plan need to accompany the Plan so that the basis on which final decisions are made are clearly apparent. Documentation is also important as proof that process requirements under RMA section 32 and the Local Government Act have been met, and can be a useful reference point should a structure plan be challenged or is reviewed in the future.

6. Integrated Catchment Management Planning

6.1 Scoping the Integrated Catchment Management Planning process

The nature, content and purpose of each stage in the Integrated Catchment Management Planning process needs to be determined at the outset of the process. The roles and responsibilities of the stakeholders need to be specified at the outset with a clear indication of when and how they can be involved.

In urban areas applications for stormwater and/or wastewater discharge permit applications have been lodged to replace authorisations that have expired, and reference needs to be made to the Proposed Auckland Regional Plan: Air, Land and Water. While the following gives a summary of the key information requirements expected in Integrated Catchment Management Process, the summary is not necessarily complete. Reference should be made to the above documents and to the Integrated Catchment Management Process guide to be published by June 2005.

6.2 Preparing Initial Inputs to the Integrated Catchment Management Plan Process

An Assessment of Effects on the Environment is required to form part of an ICMP. Policy 5.4.10 of the Regional Plan : Air, Land And Water details the matters to be addressed. In summary, these include effects on public health, flooding hazards, effects on watercourse hydrology, sediment and water quality monitoring results, aquatic habitat and ecological health, natural and amenity values, riparian vegetation, extent of open stream channels, fish passage, erosion and sedimentation, litter and coastal processes.

To assess this, preliminary catchment inventory information needed at the outset of the process is required as follows:

- Geology, soils, and topography
- Hydrology
- Ecology and biodiversity
- Vegetation types

- Land uses and anticipated significant changes in use
- Water uses and anticipated significant changes in use.
- Nature and location of resource consents
- Natural hazards
- Land ownership
- Wähi tapu, sites and areas of significance to Tangata Whenua and archaeological sites

This inventory provides baseline information of the state of the catchment at the outset of the process and can be used to determine the potential nature and scope of the issues and then as a point against which to measure progress in the future.

6.3 Consultation with Stakeholders

Early involvement of stakeholders in the process has the potential to lead to support for management options and involvement in the Integrated Catchment Management Plan implementation. Effective leadership will ensure that sufficient time is allowed for stakeholders to gain an adequate understanding of the nature of the issues raised, including those raised by other stakeholders, and to appreciate the effects of an activity in one part of the catchment can have on another. Information needs to be presented in a manner that can be understood by stakeholders. Trust in the staff of the organisation facilitating the process requires time to be established, and stakeholders need to have confidence that their views are being considered. At the same time stakeholders may become tired of, or disillusioned with, a drawn-out, lengthy process.

In time stakeholders may be prepared to bring additional resources and energy to the process if it is addressing their issues. The essential steps of the process are as follows:

6.3.1 Identify the Key Issues

Actual and potential resource management problems (such as demands for natural water resources which exceed sustainable supply, flooding, land stability, effects of sediment laden stormwater on estuarine areas, or degraded water quality) associated with achieving the vision are identified. It can be assumed that at least one key issue has already been identified for the process to have been initiated (see Section 3.2.2).

Consideration will be given to where pressures are coming from; technical information and anecdotal evidence provided by locals will inform such questions. There may be a need for technical information to enable a better understanding of any/some/all of the key issues (for example, assessment of potential adverse effects land use practices on water quality).

6.3.2 Develop Integrated Catchment Management Objectives

Integrated Catchment Management Plan objectives need to reflect the identified problems/issues and statutory objectives and in so doing give strategic direction to the Plan.

6.3.3 Consider and Select Management Options

Options need to address the issues and assist in achieving the Integrated Catchment Management Plan objectives. There is a need to consider values previously identified and whether enough information is known to enable their protection.

Catchment constraints and opportunities must be taken into account when describing alternative future scenarios and analysing their consequences. Some management options may have the potential to achieve multiple benefits.

Establishing criteria and a prioritising/weighting system ensures that evaluation of management options is undertaken in a consistent and even-handed manner. This includes determining the cost/effectiveness of adopting alternative options for avoiding, remedying or mitigating adverse effects, including cumulative effects, on the environment and of protecting and enhancing conservation and amenity values.

6.3.4 Best Practicable Option

The Integrated Catchment Management Plan will evaluate and consider the various options and recommend an overall approach. The Regional Plan: Air, Land and Water requires that this be the Best Practicable Option in terms of:

- The need to achieve [Plan] objectives.
- The nature of the discharges and sensitivity of the receiving environment.
- The management options available and the financial implications of the selected option.

- The current state of technical knowledge.

6.3.5 Implementing the Integrated Catchment Management Plan

This will occur through a resource consent process, e.g. stormwater discharge consents, and/or through non-statutory processes and mechanisms.

The Integrated Catchment Management Plan will be implemented either through individual discharge consents or the Network discharge consent and network management plan.

6.3.6 Monitoring

Network Discharge Consents will generally require monitoring as a condition of consent to identify the extent of adverse effects and success of the proposed management approach.

A monitoring strategy should identify what aspects of the Integrated Catchment Management Plan are to be monitored, including which receiving environments and specific sites within them, monitoring criteria, who will undertake the monitoring and how frequently. Monitoring assists in assessing whether the Integrated Catchment Management Plan objectives are being met.

7 Implementing the Structure Plan

7.1 Introduction

Most structure planning occurs in areas where land is to be urbanised, or urban land is to be redeveloped. In these situations, the focus is likely to be on development. In contrast, structure planning in rural areas may or may not result in significant development opportunities, and may focus on key environmental values to be protected. This should be remembered when reading the rest of this section.

7.2 Securing Commitments

Key elements are identified - both precedent requirements for infrastructure and development of necessary facilities and services - and commitments for their provision secured. This may involve agreements between the council and providers of infrastructure and services. All such agreements should be recorded in the Structure Plan as "Other Methods" and the agreed provision should be included in the Annual Plans or work programmes of the agencies providing services (see Section 5.3).

7.3 Making Provision in the District Plan

Decisions must be made on the way the district plan is to be reviewed, varied or changed in order to enable the development of the Structure Plan Area.

This will involve working out in detail the manner in which the objectives, policies and rules of the District Plan should provide for the development of the area, as well as the protection of environmental values, and how the Plan for the area (which in urban situations will show the pattern of roads, open spaces, community foci, and so on) is to be fitted into the District Plan. It is important that the District Plan provisions have some flexibility so that the initial design for the area can be adjusted as development proceeds. Usually, the design for the area produced through the structure plan process will be diagrammatic or illustrative, rather than prescriptive.

It is also important that provision in the District Plan is in sufficient detail so that its requirements will be given effect when resource consents are granted. For

example, it will be necessary to ensure that intended pedestrian linkages and/or cycle-ways are indicated in the Plan so that provision is made for them as subdivision plans are processed. Such provision may be indicated diagrammatically rather than in a way that implies a designation by the Council.

In rural areas, where some development potential is made available, it may be important to consider methods to ensure that this does not undermine the general rural - working – environment, and that key environmental values are protected into the longer term. As regards the latter, the council may wish to consider the use of trusts and covenants, to prevent ongoing subdivision pressure, while enabling appropriate development.

Two issues can arise because of the statutory process to change or vary the district plan:

- The extent of the Structure Plan area or the form and/or pattern of development may become the subject of litigation giving rise to uncertainty as to the substance of the Structure Plan.
- The statutory process (submissions, further submissions, and referrals to the Environment Court) may result in uncertainty as to the timing of development.
- Either or both of these contingencies may affect the manner in which services or access can best be provided to support development and can also affect the timing of such works and thus the timing of (re)development within the Structure Plan Area. The significance of these uncertainties must be assessed in each situation through liaison with the agencies providing services to the area. Services and so forth may be vital to further urban development; in contrast, the focus in rural areas may be protecting their rural character, and avoiding the encroachment of urban type services.

7.4 Regional Resource Consent Provisions

Resource consents that could be required for the Structure Plan Area include: coastal permits, stormwater and wastewater discharge, taking, damming and diverting water, earthworks, and works in a watercourse. Applications are made in accordance with the Auckland Regional Plan: Sediment Control, the Auckland Regional Plan: Coastal and the Proposed Auckland Regional Plan: Air, Land and Water.

Concurrent notification and processing of these consent applications with notification of District Plan provisions is desirable in order to streamline the

process and to keep costs to a minimum. Concurrent processing also removes some risk of conflicting decisions of the TA and the ARC.

7.5 Making Other Provisions

7.5.1 Statutory: Other Methods

The Structure Plan will include programmes that are the subject of agreements between the TAs and major stakeholders. These may be recorded as "Other Methods" in any variation or change to the District Plan. These programmes need to be reflected in the financial instruments (e.g. Annual Plans) required of TAs by the Local Government Act 2002 and in the expenditure estimates and work programmes of other bodies, such as providers of infrastructure and social services. The instruments that need to give effect to the output from the Structure Planning process are in previous sections.

There are a range of infrastructure providers(for example, council related, regional providers, central government agencies or those they fund, and private providers. It is useful for the council to consider engaging with all such stakeholders.

Some items in these programmes will need to be provided in anticipation of development in the Structure Plan Area for example sanitary sewerage, water supply, electricity supply linkages, telecommunications capacity, and key roading links. Other items such as schools, bus services, community centres, sports facilities, or police services can accompany or follow development. Community outcomes are more likely to be positive where social and physical infrastructure is provided before or early during development. It is essential that the stakeholders responsible for all services bring their programmes to the Structure Plan process to establish that their timing fits with the overall plans for development of the area and confirm their commitments to funding and providing these service(s) to co-ordinate with the Structure Plan programme. Where commitments have still to be made, it is still helpful to know what is being envisaged and when.

In addition, the detailed work of preparing a Structure Plan may raise matters affecting the development of an area that did not show up during the preparation of the Regional Growth Strategy or the Sector planning process, but which significantly affects the development potential of the area. When this occurs it will be essential for that information to be fed back to the sector and regional

levels, so that adjustments can be made to Sector plans and the Regional Growth Strategy. It is of key importance that the Structure Plan preparation process be carried through at a level of detail, and in a manner, that maintains its relevance to the context in which the area will develop.

7.5.2 Non-statutory

Agreements that would not necessarily be included in a District Plan could include, for example, joint pest management strategies where a Structure Plan Area may adjoin a regional Park and adjacent landowners may be willing partners in such strategies.

7.6 On-going Facilitation

Ongoing facilitation with the key Stakeholders is necessary in order to bring about the coordinated implementation of a Structure Plan. Responsibility for ensuring that a Structure Plan is implemented should be clearly allocated to officers for technical and administrative action, and to a committee of the TA for political responsibility. A monitoring and reporting programme may also be established.

Ongoing contact with the key players is necessary to ensure that:

- Timely provision is made in the Annual Plans and Budgets of service providers to develop the necessary infrastructure.
- The development of services and facilities is undertaken in accordance with the Structure Plan programme.
- The implications of any unavoidable adjustments to the development programme are identified and consequential amendments made so that the integrity of the structure planning process is maintained.

Structure Plan implementation requires ongoing liaison, monitoring and coordination of the interested parties. This invariably becomes the responsibility of the TA, and must be adequately resourced if the process is to succeed.

Relevance rather than comprehensiveness is the key to successful Structure Planning.

8. Monitoring Implementation of Structure Plans

8.1. Monitoring and Reporting

The ARC will be monitoring Regional Policy Statement requirements, and, with the Regional Growth Forum, will be monitoring the implementation of the Regional Growth Strategy, including outputs from Sector planning processes and the programmes initiated at the local level to prepare and implement Structure Plans. A Structure Plan should specify responsibility for monitoring its implementation at the TA level, and also the reporting channels to ensure political accountability.

Regional Policy Statement requirements and Memorandum of Understanding to which the ARC and TAs in the Auckland region have become signatories to, requires TAs to identify growth related works and expenditure items in their Annual Plans. This will enable the Regional Growth Forum to monitor the steps being taken to implement the Regional Growth Strategy at a local level. The ARC will also monitor growth in the region by analysing the results of the five yearly Census of Population, and these results will be reported to the Regional Growth Forum and to TAs in the region.

Effective monitoring will ensure that the relevant TA and other providers of Infrastructure, facilities, and services in the structure planning area are fulfilling their commitments toward implementation of the Structure Plan. Ongoing liaison between the service providers will be desirable and may be facilitated by the ARC, the Regional Growth Forum and Sector Planning processes.

At the local level it is important that the take-up of particularly urban (re)development opportunities and remaining new development capacity should be monitored. This is to ensure that an appropriate variety and quantity of (re)development opportunities is maintained. It is also part of the essential information base for structure planning (see Section 4.1). It will also be important to monitor at regular intervals (and at the completion of each development stage/sequence) the key environmental values that were identified during the Structure Planning process as factors warranting special treatment, protection or preservation. The findings of the monitoring process may trigger the need to review or revise the Structure Plan.

8.2 Reviewing and Updating

Many different factors may give rise to the need for a Structure Plan to be reviewed and revised, including unforeseen adverse effects of early sequences/stages of development on important values that are to be protected. The risks of this occurring are minimised by the concurrent preparation of an Integrated Catchment Management Plan and an open space and reserves strategy with a Structure Plan. The degree to which it becomes necessary to carry out a review will depend on the magnitude of the issue/s and the extent to which the Structure Plan Area has been developed.

If a review or significant change to the Structure Plan becomes necessary stakeholders should be advised as early as possible as it will be important to maintain the communications network established during the original structure plan preparation process. Advising the stakeholders of the outputs of the monitoring process will be helpful in this regard. A significant review would be likely follow the processes outlined in this guideline.

9. Measuring the Success of the Structure Planning Process

TA officers with experience of Structure Planning comment that the key measure of success is the extent to which stakeholders, including the community, buy in to the Plan and are committed to giving effect to its provisions. Structure planning raises quality of life concerns and thus often includes contentious issues, both in urban and rural situations. In rural areas, the structure plan focus may be environmental protection, rather than enabling development, which is more often the focus in urban areas.

The appropriateness of the Structure Plan, and success of its implementation, may also be measured by relating it to the following criteria:

That the quantum, form, and intensity of growth for which the Structure Plan provides are consistent with:

- The vision, outcomes and principles of the Regional Policy Statement and the Regional Growth Strategy.
- The key implementation criteria of the Regional Policy Statement and the Regional Growth Strategy requirements.
- The objectives and outcomes sought from the Regional Land Transport Strategy, to the extent these are consistent with the Regional Policy Statement and the Regional Growth Strategy.
- The planning for that Sector or Corridor of the Auckland region, and the level of guidance this includes.
- Relevant city or district strategies, including Long Term Council Community Plans, asset management plans and the like and the extent these are consistent with the Regional Policy Statement and the Regional Growth Strategy.
- The environmental values to be protected in the long term.

- The urban/rural form and design that results, with the accompanying amenity values, including consideration of local character, including heritage, and the workability and attractiveness of the local environment.
- The access options, and the safety and attractiveness of these, including of public transport.
- The Green Network, including parks and reserves, ecological corridors and links, and public access to water.
- Environmental sustainability through mitigating, avoiding or remedying adverse effects identified with the Integrated Catchment Management Plan or Structure Plan process.

That the Structure Plan has given effect to relevant guidelines, including where apprpopriate those in Appendix B. Examples include the following:

- Integrated Catchment Management Planning Funding Eligibility Guideline (ARC, 2004).
- Urban Area Intensification: Regional Practice and Resource Guide (ARC, 2000) and any updates.
- Regional Passenger Transit Supportive Land Use Guidelines (ARC, 1995) and any updates.
- Low Impact Design Manual for the Auckland Region (ARC, 2000).
- Coastal Hazards Strategy and Coastal Erosion Management Manual (ARC, TP130, 2000).
- Water Quality Impacts of Land Use Intensification: Methods of Assessing Potential Adverse Effects (ARC, 2002).
- Local Urban Design Codes or Guidelines, such as Residential Design Guide for developments in residential zones in Strategic Growth Management Areas (SGMAs) (Auckland City Council, 2001).
- Hazard Guidelines (ARC, TP 106, 2003).
- Fish Passage Guidelines for the Auckland (ARC, TP131, 2000).
- Riparian Zone Management: Strategy/Guideline/Planting Guide (ARC, 2001).

That commitment by stakeholders to implementing the Structure Plan, is evidenced by the following:

- Resources to implement the Structure Plan are committed and identified in LTCCPs and Annual Plans.

- Adoption of appropriate policies in Long Term Financial Strategies and Asset Management Plans to give effect to the Structure Plan.
- Ongoing linkages between agencies responsible for implementing the Structure Plan.
- Effective involvement of key regional and national infrastructure providers, including central government agencies.
- Community acceptance of the structure plan, including by the development sector and iwi, and interest and possible involvement in implementation.

Definitions and Abbreviations

Definitions

Structure Plan/ Planning:	A Plan which guides development so the form and intensity of development is appropriate to the character of the land, and the environmental values to be protected. Structure Planning will consider the natural character of the land, the location and scale of infrastructure, and identify the future pattern of significant land uses based on a consideration of alternatives. TAs are responsible for structure plans/planning. They may be applied to greenfields expansion, intensification, rural town expansion, or urban (re)development areas as appropriate. In an urban context, Structure Planning has a very strong development focus. This is in contrast to structure planning in rural areas; this must consider the environmental values, constraints and opportunities of the area as well as the broader sector and regional context; it may or may not enable countryside living, depending on those values, and/or whether the area is to be urbanised in the longer term.
Stakeholders:	Persons or organisations which have a defined interest in the development and implementation of a structure plan area, over and above the general public. Major Structure Plan stakeholders include the ARC, ARTA, TAs, physical and social infrastructure providers,transport, funding agencies, Tangata Whenua, development interests, relevant community groups, for example, residents and ratepayers, landcare, conservation and recreation groups and so forth, affected property owners, people living or working in the area and those who may do so in the future.
Catchment:	A catchment is an area of land that drains water to a common outlet. Catchments are also referred to as watersheds or drainage basins. The topographic line separating adjacent catchments is called the catchment divide. Because of its physical continuity the catchment scale is extremely useful in many hydrological investigations. Groundwater also has a catchment, bounded by groundwater divides. Groundwater divides may or may not coincide with surface water catchment divides.

Integrated Catchment Management Plans/ Planning (ICMP)	A process / plan which manages water resources and land use on a catchment scale. It is a process which identifies the important characteristics of a catchment in which resource management problems already exist or may occur as a result of (re)development or other major changes in activity patterns. In particular, an Integrated Catchment Management Plan identifies the natural and physical constraints of the catchment that control the form and intensity of growth/land use. It may describe alternative urban and rural futures and identify and evaluate the cost-effectiveness of addressing their consequences/adverse effects on the catchment environment, particularly on the hydrological cycle. An Integrated Catchment Management Plan identifies and investigates risks from stormwater diversions and discharges to the environment; and identifies the best practicable options for avoiding, remedying or mitigating those risks (see Proposed Auckland Regional Plan: Air Land and Water 2001). An Integrated Catchment Management Plan may be initiated by a regional council, usually jointly with TAs, but are more often undertaken by TAs. Coincidence of structure plan area boundaries with Catchment Management Plan boundaries is highly desirable. Where this is not achievable, the Structure Plan and the Integrated Catchment Management Plan should take into account the effects of the Structure Plan on the whole catchment, including any cumulative effects.
Greenfields:	Non-urban land on the urban periphery which has been allocated for new/future urban development.
Biological Diversity (biodiversity):	Describes the variety of all biological life – plants, animals, fungi, and micro-organisms – the genes they contain and the ecosystems on land or in water where they live. It is the diversity of life on earth (N.Z. Biodiversity Strategy, 2000).
Ecosystem:	An interacting system of living and non-living parts such as sunlight, air, water, minerals and nutrients (N.Z. Biodiversity Strategy, 2000).
Habitat:	The place or type of area in which an organism naturally occurs (N.Z. Biodiversity Strategy, 2000).
Hydrological Cycle:	The hydrological cycle is the continual process of water being cycled from the ocean, to the atmosphere, to the land surface and back to the ocean via rivers or groundwater. It includes water in all its forms and environments including streams, groundwater, lakes and wetlands. It includes all processes where water in different environments

interact including, rainfall, evapotranspiration, infiltration, runoff, stream flow, groundwater flow and surface water/groundwater interactions. It also includes all aspects of water quality.

An extremely important aspect of the hydrological cycle is the interaction with land use. All aspects of the hydrological cycle are in a state of dynamic equilibrium. When one element of the cycle changes there is set in motion a chain of changes to other parts of the cycle until a new equilibrium is reached. Changes in land use set off changes in all the processes described above, both in terms of water quantity and water quality. As a result of the land use change, a new equilibrium will be reached by the hydrological cycle.

Intensification: An increase in density (of dwellings, activity units, population, employment etc) over the current density of a given area. See Regional Policy Statement Appendix H for intensification within high density centres and corridors (also refer to Urban Intensification: Regional Practice and Resource Guide, 2000, but note that Regional Policy Statement Appendix H updates the Guide's Appendix 4 Table 2).

Riparian Zone: The strip of land bordering a stream, lake or estuarine/coastal zone (Collier, pers. comm., 2000).

Rural Lifestyle and Countryside Living: Low-density residential development on rural land, including the concepts of rural residential development, large lot residential development, residential bush lots and the like.

Scoping and "mapping" a Process: Scoping a process includes identifying the need for the Structure and/or Integrated Catchment Management plan, ensuring an appropriate fit with the strategic planning context, identifying timelines in the plan preparation, defining the plan area and the stakeholders involved. "Mapping" is a diagrammatic form of the scoping process or of the subsequent design process (refer to Figure 3).

Urban activities: Means those activities which are expected to occur within urban areas. Urban activities are activities which serve the needs of the urban population and of the wider rural population. Urban activities include residential, commercial, retail, industrial and recreational activtities and public buildings, educational and health institutions, places of worship, visitor accommodation involving self-contained units, sports facilities and cemeteries.

Wastewater Network Environmental Management Plan (WNEMP):	A Management Plan that identifies and investigates risks from wastewater discharges to the environment; and identifies the best practicable options for avoiding, remedying or mitigating those risks (see Proposed Auckland Regiona Plan: Air Land and Water 2001).
For definitions of other terms:	Such as Asset Management Plans, Annual Plans, Long-term Financial Strategies, Sector plans/agreements, Strategic plans, Memorandum of Understanding and so on, refer to Auckland Regional Growth Strategy 2050 – A Vision for Managing Growth in the Auckland Region (1999).

Abbreviations

ICMP	Integrated Catchment Management Plan
RMA	Resource Management Act
RLTS	Regional Land Transport Strategy
LTP	Land Transport Programme
ARTA	Auckland Regional Transport Authority

APPENDIX A

Mechanisms and Documents Relevant to Structure Planning and Integrated Catchment Management Planning

This Appendix provides further information on the various mechanisms and documents available to the councils of the Auckland region to support structure planning. They are in addition to those outlined in Section 2. That section focused on key strategic documents and key Statutory instruments. The focus here is on non-statutory instruments, and financial policy instruments which should be brought into alignment and taken into consideration when meeting Regional Policy Statement requirements and giving effect to the Regional Growth Strategy, and to achieve the purposes of the RMA and the Local Government Act 2002. A list of relevant guidelines is also included.

These mechanisms condition the development potential of an area subject to Structure Planning and Catchment Management Planning. As the Structure Plan and Integrated Catchment Management Plan process proceeds the need for changes to these mechanisms may emerge.

1. Non-statutory instruments

Memoranda of Understanding

These are between partners involved in growth processes. The Memorandum of Understanding between the primary partners of the Growth Forum (the ARC and TAs) is an example. It commits the primary partners to undertaking Sector planning through which the location, form and timing of areas for growth related (re)development will be established, and to preparing Structure Plans for the areas so defined.

Strategic Plans for infrastructure providing agencies.

Agencies responsible for providing infrastructural services sometimes prepare Strategic Plans, as frames of reference for resourcing and coordinating the extension and delivery of their services. Before the requirement to prepare Long Term Council Community Plans, some TAs prepared Strategic Plans as a frame of reference within

which to coordinate development in their districts with the funding and delivery of services.

TA Strategic Plans

Focus on relevant areas, for example, walking and cycling, open space, natural and cultural heritage, weeds and pests, and other strategies.

TA guides

These provide relevant advice, for example, urban design guides.

The Stormwater Action Plan

Provides an overview and sets a direction for the management of stormwater in the region within which TAs can develop plans and programmes for stormwater management in their districts. The Stormwater Action Plan is one of the elements which help to establish the context for Structure Plan preparation.

The Regional Discharges Project

Is a project which was formulated by the ARC to take a strategic approach to stormwater and wastewater network discharge applications in the urban areas. This strategic approach recognises the interconnected nature of the stormwater and wastewater networks within the Metropolitan Urban Limit and the potential for cumulative adverse effects of multiple networks discharging to common freshwater or urban coastal receiving environments. The Project also aims to ensure that regional receiving environment priorities and objectives are achieved.

The Coastal Hazards Strategy

Contains the theoretical basis, philosophy and methodology towards coastal hazard management in the Auckland region. It provides a comprehensive and integrated approach to the avoidance and mitigation of coastal hazards. The Strategy includes a series of approaches and techniques to assess and evaluate the extent of hazardous areas in the coastal environment.

The Regional Open Space Strategy

Is currently being developed to determine the open space needs of a growing region and to develop a consistent approach to open space issues. Structure planning processes should have regard to this Strategy once it has been completed.

Iwi Management Plans

Through which Iwi identify and provide for the future management of their resources and taonga. Under sections 66 (A) and 74 (2A) of the RMA iwi management plans are required to be taken into account when preparing or changing regional or district plans.

Sector and Structure Planning processes will highlight or identify the potential effects of (re)development on places or features of particular significance to Maori. The initial stages of information gathering for Sector, Structure Planning and Catchment Management Planning processes should include contact with local Iwi. If sites, features or waterbodies of particular interest to them occur within the planning area consultation should occur to establish the nature of their concerns and the appropriate courses through which these concerns may be accommodated.

Relevant central government publications

Including the Urban Design Protocol, launched on 8 March 2005, the Ministry for the Environment's People, Places, Spaces: A Design Guide for Urban New Zealand, and Live, Work, Play that provides information on urban amenity processes and outcomes.

Informal agreements between stakeholders

2 Best Practice Guides Relevant to Structure Planning

The ARC has prepared a number of technical and other publications relevant to the preparation of Structure Plans and Integrated Catchment Management Planning processes. Those involved in the processes associated with and developing such plans will find these useful.

The Integrated Catchment Management Planning Guide (ARC, 2005)

This guide is expected to be published by 30 June 2005.

Low Impact Design Manual for the Auckland Region (ARC ,1999)

Presents an alternative approach to site design and development from a stormwater management context primarily applicable for residential development. The tool focuses on erosion and sediment control and stormwater management from both a structural and non-structural perspective in order to reduce the impacts of development, particularly that of stormwater runoff. Natural site features are incorporated into the site development process and may assist in reducing or possibly eliminating the need for structural stormwater management controls.

Required Household and Employment Densities to support Public Transport.

Found as Appendix H to the Regional Policy Statement this table sets goals for the densities that should be achieved within town centres to a sufficient level of land use support to the public transport investment provided to the growth areas.

Fish Passage Guidelines for the Auckland Region (ARC ,2000)

Provide guidance as to when fish passage should be considered, and design and implementation of fish passage facilitation (including construction and operation of in-stream structures such as culverts, channels and other devices).

Riparian Zone Management: Strategy/ Guideline/Planting Guide (ARC, 2001)

Has been prepared for the Auckland region. The Guideline and Planting Guides are practical manuals for use by landowners, developers, organisations and community groups who wish to retain, enhance or restore riparian zones. The Guide is aimed at both voluntary and mandatory riparian management situations and describes how to plan and prepare a riparian zone management plan. The Planting Guide sets out how to carry out a planting project as well as what to plant where.

Dam Safety Guidelines (ARC, 2000)

Provides guidance on assessing dam hazard category and performance standards for low to high hazard dams, amongst other matters. In the Auckland region dams are used for water supply, irrigation, farm waste treatment, stormwater treatment, sediment control, storing contaminated sediments and sewage treatment.

Water Quality Impacts of Land Use Intensification: Methods of Assessing Potential Adverse Effects (ARC, 2002)

Provides guidance on appropriate methods for assessing the potential adverse effects of cumulative discharges arising from catchment based land use intensification on natural aquatic receiving environments. In particular, the report recommends methods to assess the adverse effects of sediment generation, the result of soil disturbance and erosion; and water borne contamination (other than sediment), principally derived from stormwater and urban discharges.

The report also identifies catchments under pressure from land use intensification in the Auckland Region and summarises the information in a series of tables (Appendix B) and maps (Appendix C). Guidance is then provided on appropriate methods for assessing cumulative adverse effects of discharges on aquatic receiving environments within the identified catchments.

Urban Area Intensification: Regional Practice and Resource Guide 2000 (ARC, 2000)

Provides guidance on the regional framework (goal, outcomes, principles, criteria and monitoring factors) within which urban intensification is managed. The document also provides checklists to guide local intensification practice in structure plans, nodal centres and transit corridor development plans.

Guidelines for Comprehensive Catchment Discharge Consents (ARC, 2001)

Sets out the 'actual' and 'potential' catchment management issues, range of options and techniques for catchment management, planning concepts, technical methods and other matters which the ARC believes should be considered in the development of Comprehensive Catchment Discharge Consents.

The Hazard Guidelines (ARC, 2003)

Are made up of three separate guidelines. The first, Hazard Information Management, identifies sources of hazards information and looks at how this information is collected, sorted, recorded and stored in the Auckland region. The second, Hazard Identification and Risk Assessment provides guidance on establishing the context for risk analysis, identifying hazards and risks, and carrying out risk analysis and risk evaluation. The third, Risk Treatment and Monitoring of Hazards, sets out the hazards that affect the region and specifies the range of risk treatment options that can be used to minimise community risk from hazards.

The Coastal Erosion Management Manual

In conjunction with the Coastal Hazards Strategy, brings together the contemporary knowledge of coastal hazard management relevant to the Auckland region. The Coastal Erosion Management Manual provides guidance on management of areas susceptible to coastal erosion.

3 Financial instruments

Financial instruments

Provide the means for outlining how the costsof development will be met and establishing programmes to fund the costs of providing, upgrading, or extending infrastructure to areas to be (re)developed.

It is essential that all of these instruments be aligned with Regional Policy Statement requirements and the Regional Growth Strategy.

They include:

Long Term Financial Strategies

Which set out projected expenditure of TAs, including the ARC, for a 10-year time horizon.

- Long Term Financial Strategies for TAs in the Region, including the ARC, should include the programmes for ongoing Regional Growth Forum Planning, Sector Planning, Structure Planning and Catchment Management Planning for their respective districts.

Annual Plans

Which record the planned expenditure of Councils for a one year period against a three year outline of projected expenditure.

- The Memorandum of Understanding between the primary partners in the Regional Growth Forum requires identification in Annual Plans of the items that relate to planning and implementing (re)development. This will enable the processes of formulating and implementing Structure Plans to be monitored within the Auckland region and will facilitate their overall co-ordination.
- Funding for assessing the potential cumulative adverse effects arising from the anticipated development also needs to be anticipated in Annual Plans.

Asset Management Plans

Which record how Councils intend to fund the maintenance of assets for which they are responsible.

- Asset management plans will need to deal with the programmes for providing and funding the provision and maintenance of services to future (re)development areas. This includes outputs from Structure Planning processes.

Passenger Transport Plan

To be developed by ARTA, the Passenger Transport Plan will identify infrastructural and service provision improvements to the public transport system in Auckland. This will also include the timing and costings for various projects and service provision.

Land Transport Programmes

Developed by all public organisations undertaking land transport implementation on an annual basis, the Land Transport programme will outline projects to be undertaken along with their costs. The TAs of the region, ARTA, Transit New Zealand and NZ Railcorp are all required to undertake a Land Transport Programme.

APPENDIX B

CONSULTATION PROCESS

1. Individual contact with Stakeholders

2. Open Days

3. Workshops

4. Charrettes

Consultation is an area where experience and expertise are necessary in order to achieve a satisfactory outcome to the structure planning process.

1 Individual contact with Stakeholders and Stakeholder Groups

- This may be necessary at the stage of identification of stakeholders. Initial information gathered about interests and attitudes of each stakeholder, or at least each stakeholder group, and their perceptions of current issues and future prospects can be useful as background to later stages of consultation.
- Contact with individuals tends to be time consuming and of limited value in generating and evaluating options for the future of an area but can be helpful as a basis for identifying common perceptions of issues and for anticipating trouble spots or vexatious non-issues which may need to be disposed of early in the process. It is important to ensure that contact with individuals does not give others in the community the perception that the process is not fair, transparent or consistent, and that some individuals have been able to advocate unfairly for their own interests.
- Contact with individual groups of stakeholders can be useful, particularly where those groups have infrastructure or other responsibilities that the council needs to be aware of. Where the community is strongly divided, it can be useful to talk with groups separately. However while easier for those involved, this can mean that groups remain focussed on their own concerns and are not realistic about the wider, diverse interests the council needs to consider.
- Even where contact with groups of stakeholders is used,it will usually not be a substitute for a "Workshop" or "Charrette" as a means of bringing the wider collective energy to bear on the planning of an area, nor for building commitment to the structure plan process.

2 Open Days / Information displays

- This method of consultation is most applicable at a stage when the context of the Structure Plan Area has been established and preliminary development options outlined. Usually an exhibition of maps and illustrations is mounted at an easily accessible venue within the Structure Plan Area for a specified period and usually includes evening hours to enable wide involvement.

people (such as planners and technical officers of key service providers) are rostered to be in attendance for the hours of the Open Days. A record is kept of persons visiting the venue, their questions are responded to by those in attendance, and recorded.

- This method may be most relevant where intensification within existing urban areas is being considered. It has been used successfully by Auckland City in their Liveable Communities Programme.

3 Workshops

Workshops are a well established part of the planning process. A workshop brings the stakeholders together in a structured environment in which the participants:

- Define and agree to the objectives of the process, such as the production of a structure plan and agreement on the area to be planned.
- Build understanding of the context of the area including its sector/region/metropolitan setting.
- Identify and understand the constraints and opportunities for development of the area, including its environmental values.
- Have opportunities to each contribute their knowledge of the area and to express their vision for its future.
- Generate and evaluate options for development of the area.
- Achieve common ground and build consensus on the relative merits of development options.
- "Buy in" to the preferred plan.

Careful planning and experienced facilitation of a workshop is essential for a constructive outcome. It is important to maintain an open environment with clear ground rules and firm, purposeful facilitation in which participants feel safe to make their contributions. Visual aids are useful to the process. It is important to have a way of recording and tracking consideration of each significant point put forward by participants.

Depending on the size and complexity of the area and the numbers of stakeholders involved the workshop process may take a day, a weekend, or a number of sessions over a period of weeks or months to reach a conclusion. Maintaining good communications with and between participants is essential during and after the workshop process.

4 Charrettes

- A Charrette is a specialised workshop process which uses a team approach and scripted scenarios to generate a concept or Plan, usually for an urban area. The process has been applied widely, with success, in a number of contexts including structure planning.
- The process has the special merit of drawing on the energy of all participants through their involvement in teams that are small enough for all participants to contribute freely, but within a well-structured and facilitated process.
- Reference – The Charrette, Robin Riley Associates Ltd (1992).

Bibliography

Material in this bibliography is grouped as follows:

- Strategies
- RMA Statutory Documents
- Structure Plans and Guidance on Structure Planning
- Design and Design Processes
- Transport
- Catchment
- Other

Material in this Bibliography is included only once, and some documents may be relevant to more than one grouping.

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Dunedin City Council

Housing Framework Predictions

The Housing We'd Choose

Research Report | December 2019

Dunedin City Council

Housing Framework Predictions

The Housing We'd Choose

Research Report | December 2019

Prepared by: Greg Akehurst (Market Economics)
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Key Messages

1

This report, and the accompanying model, gives policy makers a key insight into the intended housing choices of Dunedin households in the immediate and near future. This work provides guidance on the levers required to effectively manage growth. The key insights from the report are:

The research has highlighted areas where demand may differ from supply; it has highlighted some differences between where people choose to live in an ideal situation and where they select once financial constraints are applied.

Dunedin is experiencing a period of challenging growth and change. Historically the city has been on a low growth path, but in recent years the nature of this growth has changed. This has been driven by a drift South (caused by higher house prices in the North Island) and is reflected in a growing number of working age families. As a result, Dunedin has been called 'the hottest town in the South' and is experiencing a mini construction boom.

Along with the incoming migration, the nature of housing demand in the city is changing, with a trend towards smaller homes and greater appetite for attached dwellings (e.g. apartments, terrace houses and duplexes). However, demand will remain for standalone houses, with a strong sentiment in the research for the desire to keep the 'Kiwi dream' and have a house with space outside. But demand for houses with more than four bedrooms is forecast to reduce dramatically. This is principally driven by the changing age profile of city residents.

Inner city demand does not feature highly in the research with the inner suburbs having the highest share of demand. However, respondents reported wanting to live near where they work or study. Future planning for housing should consider this and consider housing opportunities around future planned commercial development and infill around areas of redevelopment.

Introduction and Scope

2

This report outlines the approach and scope of work, then describes the outputs and conclusions that can be drawn from the model.

2.1 Scope and purpose

The key purpose of this research is to provide Dunedin City with an ability to reliably estimate current levels of demand for different dwelling typologies and locations. Dunedin needs to be able to forecast future demand for different housing typologies and locations based on scenarios of population and demographic projections. As outlined in the RFP, the work is expected to support;

- Responses to appeals on the Second Generation District Plan (2GP) seeking rezoning of land to residential or rural residential.
- A broader analysis of future housing demand that is being done to meet the DCC's monitoring and capacity assessment obligations under the National Policy Statement on Urban Development Capacity (NPS-UDC).

In order to achieve those objectives, we have built a housing choice model that integrates the findings from the primary research with population structures and projections such that the volume and location of future growth can be predicted. It is important to note that the model assumes locations and typologies captured and explored are realistic options and are not constrained by other factors such as planning regulations and price change.

The research and modelling provide insight into the trade-offs that households are most likely to make when faced with budget constraint. The prediction model is flexible enough to ensure that as the city grows, and high amenity areas become 'full' that the price/location/typology trade-offs are appropriately managed. The model in itself does not account for capacity in any given location, however the flexibility is such that if Council deems an area has exhausted its capacity to accommodate growth, that the next best locations have been identified.

The model is developed in excel and will form part of the delivery package to Council.

Approach and Data Sources

3

This section outlines the approach adopted for the modelling as well as outlining the data relied upon to develop the Housing Framework Model for Dunedin. In summary, results from the survey for each identifiable group are extrapolated to the population to provide snapshots of demand for different housing.

3.1 Method

3.1.1 Data Collection

Research First surveyed a representative sample of 770 respondents from Dunedin between 9 September and 23 October 2019 and quotas were set to ensure age, gender and geographic coverage.

This research project was based on a 2011 Australian study conducted by the Grattan Institute, entitled The Housing We'd Choose. Data was collected through a two-staged mixed method design. This involved a short telephone pre-recruitment of the sample population, who were then invited to complete a longer online survey. This ensured that the respondents participating were randomly selected and representative of the population.

Those who agreed to participate were sent an email containing a personal link to the online survey that they then could complete at their own time. This survey covered what respondents look for when choosing a place to live and asked for feedback on a range of housing options and designs. It was conducted online in order to give respondents the time they needed to make decisions, and to properly conduct the choice experiment, including accounting for financial limitations and presenting visuals, as exampled below.

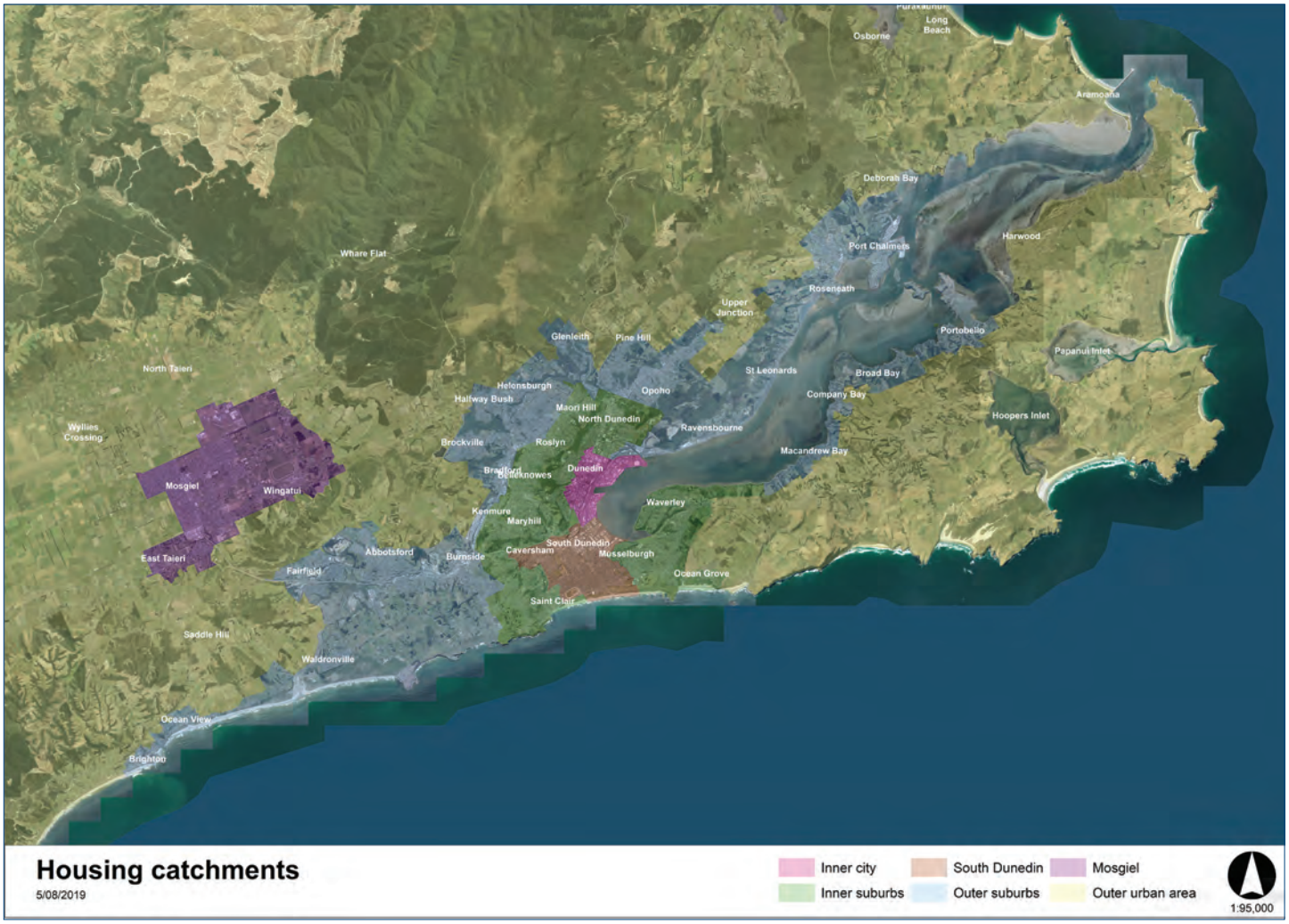
Figure 3.1: Example Choice Set, Housing We'd Choose Survey, 2019

3.1.2 Demographics and Analysis

With an achieved sample size of 770, the results have a margin of error of +/-3.5% at a 95% confidence level. The sample size also allows the sample to be split into multiple subsets that still offer evidentially compelling insights into housing preferences (such as wards, or suburbs).

The City has been divided into a set of catchments that are made up of suburbs with common locational characteristics (Figure 3.2). This effectively divided the city into broad areas based on proximity to the CBD.

Figure 3.2: Survey Catchments, Housing We'd Choose Survey, 2019



The Inner City is surrounded by the Inner Suburbs – from which South Dunedin has been identified separately. The remainder of the urban area is termed the Outer Suburbs with Mosgiel identified separately. The remainder of Dunedin City Council TLA is coded as Other Areas.

These 6 areas form the locational basis for analysis and reporting. Therefore, while respondents have been asked where they would choose to reside, and they were able to respond at the individual suburb level, these have been aggregated up to the 6 broad areas for analysis and reporting purposes. This ensures the results remain robust.

Approximately one-third of respondents were drawn from both the Inner Suburbs and the Outer Suburbs with 12% drawn from Mosgiel. 8% was drawn from both South Dunedin and the Outer Area and 4% from the Inner City.

Figure 3.3: Housing We'd Choose Survey Respondents by Location, Dunedin City 2019

Home location	Survey Count	Share
Inner city	29	4%
Inner suburbs	245	32%
Outer suburbs	276	36%
South Dunedin	59	8%
Outer area	65	8%
Mosgiel	96	12%
Total	**770**	**100%**

Source: Housing We'd Choose Dunedin, Research First & M.E

The data has also been weighted across household income and household types. The survey was weighted slightly towards households earning less than $100,000 (64% of the total) and heavily towards households made up of parents with children (46%) as these are the principal household types in Dunedin. Single person households accounted for 21% of respondents followed by couples with no children at 16% and multi person households also accounting for 16%.

Figure 3.4: Housing We'd Choose Survey Respondents by Household Income, Dunedin City 2019

Household Income	Respondents	Share
Less than $30,000	110	14%
$30,000 - $50,000	130	17%
$50,000 - $70,000	106	14%
$70,000 - $100,000	146	19%
$100,000 - $130,000	122	16%
$130,000 or more	156	20%
Total	**770**	**100%**

Source: Housing We'd Choose Dunedin, Research First & M.E

Figure 3.5: Housing We'd Choose Survey Respondents by Household Type, Dunedin City 2019

Household Type	Respondents	Share
Couple without children (aged under 65 years old)	86	11%
Couple without children (aged 65 years and over)	42	5%
Parent(s) or caregiver(s) with children	351	46%
One person households (aged 65 years and over)	73	9%
Other multi-person household (e.g., flatting/ student flat etc)	123	16%
One person households (aged under 65 years old)	94	12%
Other (please specify)	1	0%
Total	**770**	**100%**

Source: Housing We'd Choose Dunedin, Research First & M.E

By capturing responses with this level of demographic information allows results to be carefully matched against existing and future populations within Dunedin to provide insight into housing needs – both in terms of structure and location.

Housing Framework Model

4

In this section, results from Research First's Housing We'd Choose: Dunedin survey are analysed. The modelling framework is flexible in that it is able to be applied to a range of household projection scenarios to provide alternative views of future dwelling demands.

4.1 Approach

There is a difference between the categories of households from which data has been collected in the survey and the categories contained within the projections (Figure 4.1). This necessitated expanding the DCC projection series to match Market Economics 210 Household Market Model code frame (see Appendix 1 for details). This framework is based on the 2013 Census and allows Dunedin's household structure to be split in a fine grained way by income, household type and the age of the respondent.

Figure 4.1: Survey and Projection Household Classification

Survey Categories	DCC Projections
One person households (aged under 65 years old)	Couple only
One person households (aged 65 years and over)	Flatting
Couple without children (aged under 65 years old)	Couple with child(ren)
Couple without children (aged 65 years and over)	One parent withchild(ren)
Parent(s) or caregiver(s) with children	One-person household
Other multi-person household (e.g., flatting/ student flat etc)	
Other (please specify)	
Total Sample	**Total**

Once the structure was applied to the projections, it was also applied to the survey. This was a simpler task as the survey had been designed to match with the Household Market Model. It is worth noting that structural changes in Dunedin's households will be evident in the Census 2018 data which is not yet available at this level of detail. It is a relatively simple task to apply updated information, once it becomes available. At this stage the 2013 structure is the most up to date information available.

With the survey responses and household projections now on a common base, it is a relatively simple task to apply the proportions from the survey to the projections to obtain a first cut at future housing demands.

4.2 The Housing Chosen

Survey respondents were asked a series of questions about their current housing situation (location, the type of dwelling, ownership and how long they had been there). They were also asked questions about the type of features they looked for in a dwelling, and the level of importance they placed on these features as part of the purchasing decision. These features included locational features about the area plus accessibility to work, shops, schools etc. In addition, they were asked about the local environment and about dwelling features (orientation, title, aspect, section size, presence of a balcony etc).

Respondents were asked about their financial situation in terms of household income, debts and assets. Then, based on this and their living arrangements, the survey calculated the amount of money they would be able to spend on a dwelling[1].

Finally, by way of set up, respondents were asked where they worked. Then based on their knowledge of Dunedin suburbs and their own financial constraints and prices, they were asked to select a first and second choice in terms of where they would most like to live.

The survey then presented each respondent with a series of dwelling options that matched their affordability profile. The dwellings also accounted for their living situation and other preferences. However, if a respondent's desires did not match their budget, the survey provided options across the city that did match their budget. At each stage the respondent was shown 4 options and they were to select their preference. At the end of 4 rounds, respondents were shown their 4 selected options in order to make a final selection.

1 These calculations are based on a standard set of bank mortgage calculators. While the estimates did not take into account gifts and other government based incentives to purchase a dwelling, the model provides a robust base estimate of affordability.

4.2.1 Dwelling Demand by Location

The Dunedin Housing We'd Choose survey (along with other Housing We'd Choose surveys conducted in New Zealand and Australia) point to work location as being a key driver of dwelling locational choice. In total the survey is made up of 76% employed people (working within Dunedin at a business premise, or from home or working outside of Dunedin), 12% were retirees, 8% were currently not working and 4% were students (Figure 4.2).

While Students were heavily concentrated in the Inner City the Unemployed and Retirees' were more evenly spread across the city. In terms of total survey respondents, 4% were from the Inner City, 32% Inner Suburbs and 36% from the Outer Suburbs. Mosgiel accounted for 12% of respondents with 8% from both South Dunedin and the Outer Areas of Dunedin City (Figure 4.2).

Figure 4.2: Respondent Work Status by Home Location, Housing We'd Choose, 2019

	Respondent Work Status							
Home Location	Total Working	I am a student	I am not currently working	I am retired	I work from home	More than one part of Dunedin	I work outside Dunedin area	Total Survey
Inner city	51.7%	10.3%	6.9%	13.8%	6.9%	10.3%	0.0%	3.8%
Inner suburbs	61.6%	4.1%	9.0%	11.0%	7.8%	4.9%	1.6%	31.8%
Outer suburbs	62.7%	5.1%	7.6%	11.6%	4.7%	5.4%	2.9%	35.8%
South Dunedin	64.4%	1.7%	6.8%	16.9%	3.4%	5.1%	1.7%	7.7%
Mosgiel	63.5%	2.1%	8.3%	17.7%	0.0%	6.3%	2.1%	12.5%
Outer area	60.0%	1.5%	7.7%	7.7%	6.2%	10.8%	6.2%	8.4%
Total	**61.9%**	**4.0%**	**8.1%**	**12.3%**	**5.2%**	**6.0%**	**2.5%**	**100.0%**

Source: Housing We'd Choose Dunedin, Research First & M.E

The survey indicated that there is a strong correlation between home location and work location. With the exception of the Outer Suburbs, each broad catchment accommodates over 33% of local residents workplaces (as viewed along the diagonal in Figure 4.3). Outer Suburbs by their very nature are dormitory suburbs where residents commute from in towards more central employment nodes. The strongest shares occur in Mosgiel and in the Outer Areas. These are significantly removed from central Dunedin and have a high degree of employment self-sufficiency.

Note also that the survey has captured high percentages of employed people. With over 60% of respondents in each area (other than the Inner City) employed (Figure 4.3).

Figure 4.3: Respondent Work Location by Home Location, Housing We'd Choose, 2019

	Work Location						
Home Location	Inner city	Inner suburbs	Outer suburbs	South Dunedin	Mosgiel	Outer area	Total Working
Inner city	33.3%	0.0%	46.7%	13.3%	6.7%	0.0%	51.7%
Inner suburbs	45.7%	35.1%	7.9%	7.9%	2.0%	1.3%	61.6%
Outer suburbs	39.3%	21.4%	24.9%	7.5%	6.4%	0.6%	62.7%
South Dunedin	36.8%	21.1%	0.0%	36.8%	2.6%	2.6%	64.4%
Mosgiel	32.8%	4.9%	4.9%	9.8%	47.5%	0.0%	63.5%
Outer area	23.1%	12.8%	5.1%	2.6%	7.7%	48.7%	60.0%
Total	**38.8%**	**22.2%**	**14.0%**	**10.1%**	**10.1%**	**4.8%**	**61.9%**

Source: Housing We'd Choose Dunedin, Research First & M.E

4.2.2 Dwellings by typology and Location

The Choice experiment component of the survey asked respondents to choose up to 4 location and housing types when presented with 4 sets of options that both matched their family size requirements and budget. In the final round, respondents were re-presented with their 4 previous selected dwelling options in order to make a final decision that reflected their most preferred housing option given their financial position and their household characteristics.

Because these decisions are tied to household demographics, it is possible to translate survey responses into ratios and proportions that can be applied across the wider population and population growth scenarios.

4.2.3 Influence of Age on Dwelling Choice

Age and life stage play a role in determining dwelling choice. The presence of children in the home and home-owners mobility has a significant bearing on housing choice. These are indicated by age. For the purposes of this report we have assessed the age-related dwelling choices in two ways. First, the survey asked respondents to answer in an unconstrained manner what type of dwellings they would prefer and what location they would like to live in – based on their understanding of price and affordability (prior to the choice experiment). This paints a picture of the type and nature of housing by location respondents would prefer (Figure 4.4).

Figure 4.4: Unconstrained Dwelling Location Choice by Age, Dunedin City Total, 2019

Age of Respondent	Inner city	Inner suburbs	South Dunedin	Outer suburbs	Outer urban area	Mosgiel	Total
18 - 24	35%	31%	6%	20%	2%	6%	100%
25 - 29	18%	27%	6%	36%	6%	6%	100%
30 - 34	6%	34%	3%	29%	11%	17%	100%
35 - 39	7%	21%	3%	48%	14%	7%	100%
40 - 44	7%	30%	4%	37%	7%	13%	100%
45 - 49	4%	42%	5%	28%	10%	10%	100%
50 - 54	8%	45%	3%	26%	7%	12%	100%
55 - 59	9%	42%	5%	24%	9%	12%	100%
60 - 64	5%	28%	6%	27%	17%	17%	100%
65 - 69	7%	29%	11%	29%	11%	13%	100%
70 - 74	5%	36%	7%	19%	14%	19%	100%
75+	14%	22%	8%	27%	5%	24%	100%
Total	9%	34%	5%	28%	10%	13%	100%

Source: Housing We'd Choose Dunedin, Research First & M.E

Figure 4.4 indicates that 35% of 18-24 year olds prefer to live in the inner city and a further 31% in the Inner Suburbs with only 2% choosing to live in the Outer Urban Area – if they had a choice. This contrasts with 45-49 year olds, where only 4% would choose an Inner City residence but 42% would choose an Inner Suburb address.

In addition, respondents were asked what their second choice of location would be. Therefore, we are able to understand how a market adapts to constraints across different age groups. For example, we are able to report that 70% of under 35 year old respondents who choose the Inner City as their first choice, choose the Inner Suburbs as their second choice. Or that only 7% of the respondents in the 35 – 65 age group that selected the Outer suburbs as their first choice, selected the Inner City as their second.

Of those that chose to live in the Inner City, their second choice was strongly weighted towards being close to the centre with 67% selecting the Inner Suburbs as their second choice (Figure 4.5). This was the highest single concentration of locational second choices across the 6 areas, showing a high dependence or desire from those who would choose the inner City to be located centrally.

Figure 4.5: Respondents Second Choice Locations of Inner City First Choice

Age of Respondent	Inner city	Inner suburbs	South Dunedin	Outer suburbs	Outer urban area	Mosgiel	Total
18 - 24	0%	79%	16%	0%	0%	5%	100%
25 - 29	0%	67%	17%	17%	0%	0%	100%
30 - 34	0%	0%	50%	50%	0%	0%	100%
35 - 39	0%	100%	0%	0%	0%	0%	100%
40 - 44	0%	20%	40%	40%	0%	0%	100%
45 - 49	0%	75%	25%	0%	0%	0%	100%
50 - 54	0%	25%	0%	50%	0%	25%	100%
55 - 59	0%	100%	0%	0%	0%	0%	100%
60 - 64	0%	80%	0%	20%	0%	0%	100%
65 - 69	0%	67%	33%	0%	0%	0%	100%
70 - 74	0%	50%	50%	0%	0%	0%	100%
75+	0%	75%	0%	25%	0%	0%	100%
Total	0%	67%	14%	15%	0%	4%	100%

Source: Housing We'd Choose Dunedin, Research First & M.E

Second Choice Tables are Included in the appendices to this report.

4.3 Constrained vs Unconstrained Choice

There is a difference between where respondents would like to live in an ideal situation and their selections taking into account their financial constraints (Figure 4.6).

Figure 4.6: Unconstrained and Constrained Locational Choice (%), Dunedin 2019

Locational Choice	Unconstrained	Constrained
Inner city	6.0%	9.5%
Inner suburbs	34.9%	34.3%
Outer suburbs	32.2%	27.9%
South Dunedin	3.4%	5.5%
Outer area	8.2%	9.6%
Mosgiel	15.3%	13.2%
Total	**100.0%**	**100.0%**

Source: Housing We'd Choose Dunedin, Research First & M.E

Prior to imposing financial constraints on respondents approximately 6% opted to live in the Inner City as their first choice. However, given the financial realities of income, prices and assets, this rose to 9.5% in the constrained choice modelling.

The situation is reversed with respect to the Outer Suburbs. Over 32% of respondents opted to live in the Outer Suburbs as their first choice. However, the financial realities of house prices and incomes meant that once the choice experiment was run, this dropped to 28%. This implies that living in a more traditional sub-urban setting is important for a large portion of Dunedin residents. The same is true with respect to Mosgiel. A total of 15% of respondents selected Mosgiel as their first choice for residential location. However, the realities of prices, incomes and dwelling stock availability saw this drop to 13% following the Choice Experiment.

Finally, the less desirable areas of South Dunedin and the Outer Areas of Dunedin (selected by 3.4% and 8.2% of respondents respectively) ended up with 5.5% and 9.6% of dwellings once the choice experiment was run.

Conclusions

5

The Housing We'd Choose Research has gathered a significant amount of information about the housing preferences and locational choices of Dunedin residents. It has provided insights into the trade-offs between location, size and dwelling typology Dunedin residents are likely to make when faced with financial constraints in their locational decision making.

The research findings, when applied to Dunedin's anticipated household and population growth have highlighted some areas where demand may differ from supply. It has highlighted some differences between where people would choose to live in an ideal situation and where they select once financial constraints are applied.

A key component of this project has been to develop a model that will allow Dunedin City Council to run alternative growth futures that draw on the research findings to generate alternative views of future demand by type and location.

The "Housing Framework Model" spreadsheet that accompanies this report allows Council to adjust total population and/or household demand for the city as a whole (or locally) and assess future dwelling typology shifts.

The findings from this research provide insight into the demand characteristics of Dunedin's household market. In order to ensure that sufficient capacity is provided through Dunedin's Second Generation Planning documents, it will be necessary to assess Dunedin's Capacity to accommodate dwelling demand by type and location. The combination of both demand and capacity to meet that demand is important for Dunedin City in order to meet their obligations under the National Policy Statement for Urban Development Capacity (NPS – UDC) and the upcoming National Policy Statement for Urban Development (NPS-UD), that is set to replace it.

These national statements require large and high growth councils to assess demand and capacity every three years. The Housing We'd Choose research allows Dunedin City to ensure that the demand assessment captures different typologies and locations and that if the key drivers of demand change, that the assessment is flexible enough to capture the implications of that change.

Appendix 1

6

M.E Household Market Model 210 Household Type Code frame, Dunedin (Census 2013)

Household Type	Age of Respondent	Household Income	Households
One Person	15-29	< $30K	496
One Person	15-29	$30-50K	215
One Person	15-29	$50-70K	95
One Person	15-29	$70-100K	30
One Person	15-29	$100K +	7
One Person	30-39	< $30K	329
One Person	30-39	$30-50K	271
One Person	30-39	$50-70K	230
One Person	30-39	$70-100K	100
One Person	30-39	$100K +	35
One Person	40-49	< $30K	611
One Person	40-49	$30-50K	426
One Person	40-49	$50-70K	299
One Person	40-49	$70-100K	185
One Person	40-49	$100K +	66
One Person	50-64	< $30K	1,776
One Person	50-64	$30-50K	953
One Person	50-64	$50-70K	552
One Person	50-64	$70-100K	268
One Person	50-64	$100K +	157
One Person	65-74	< $30K	1,734
One Person	65-74	$30-50K	431
One Person	65-74	$50-70K	157
One Person	65-74	$70-100K	74
One Person	65-74	$100K +	46
One Person	75+	< $30K	2,802
One Person	75+	$30-50K	403
One Person	75+	$50-70K	100

Household Type	Age of Respondent	Household Income	Households
One Person	75+	$70-100K	32
One Person	75+	$100K +	28
Couple	15-29	< $30K	201
Couple	15-29	$30-50K	281
Couple	15-29	$50-70K	342
Couple	15-29	$70-100K	566
Couple	15-29	$100K +	408
Couple	30-39	< $30K	59
Couple	30-39	$30-50K	86
Couple	30-39	$50-70K	125
Couple	30-39	$70-100K	342
Couple	30-39	$100K +	470
Couple	40-49	< $30K	64
Couple	40-49	$30-50K	106
Couple	40-49	$50-70K	141
Couple	40-49	$70-100K	341
Couple	40-49	$100K +	467
Couple	50-64	< $30K	328
Couple	50-64	$30-50K	598
Couple	50-64	$50-70K	787
Couple	50-64	$70-100K	1,334
Couple	50-64	$100K +	1,797
Couple	65-74	< $30K	413
Couple	65-74	$30-50K	1,085
Couple	65-74	$50-70K	500
Couple	65-74	$70-100K	371
Couple	65-74	$100K +	387
Couple	75+	< $30K	341
Couple	75+	$30-50K	871
Couple	75+	$50-70K	203

Household Type	Age of Respondent	Household Income	Households
Couple	75+	$70-100K	119
Couple	75+	$100K +	67
2 Parents 1-2chn	15-29	< $30K	64
2 Parents 1-2chn	15-29	$30-50K	200
2 Parents 1-2chn	15-29	$50-70K	258
2 Parents 1-2chn	15-29	$70-100K	237
2 Parents 1-2chn	15-29	$100K +	130
2 Parents 1-2chn	30-39	< $30K	90
2 Parents 1-2chn	30-39	$30-50K	253
2 Parents 1-2chn	30-39	$50-70K	516
2 Parents 1-2chn	30-39	$70-100K	799
2 Parents 1-2chn	30-39	$100K +	818
2 Parents 1-2chn	40-49	< $30K	86
2 Parents 1-2chn	40-49	$30-50K	209
2 Parents 1-2chn	40-49	$50-70K	421
2 Parents 1-2chn	40-49	$70-100K	956
2 Parents 1-2chn	40-49	$100K +	1,558
2 Parents 1-2chn	50-64	< $30K	58
2 Parents 1-2chn	50-64	$30-50K	150
2 Parents 1-2chn	50-64	$50-70K	295
2 Parents 1-2chn	50-64	$70-100K	493
2 Parents 1-2chn	50-64	$100K +	1,309
2 Parents 1-2chn	65-74	< $30K	7
2 Parents 1-2chn	65-74	$30-50K	55
2 Parents 1-2chn	65-74	$50-70K	49
2 Parents 1-2chn	65-74	$70-100K	84
2 Parents 1-2chn	65-74	$100K +	70
2 Parents 1-2chn	75+	< $30K	2
2 Parents 1-2chn	75+	$30-50K	19
2 Parents 1-2chn	75+	$50-70K	34

Household Type	Age of Respondent	Household Income	Households
2 Parents 1-2chn	75+	$70-100K	30
2 Parents 1-2chn	75+	$100K +	12
2 Parents 3+chn	15-29	< $30K	20
2 Parents 3+chn	15-29	$30-50K	32
2 Parents 3+chn	15-29	$50-70K	47
2 Parents 3+chn	15-29	$70-100K	38
2 Parents 3+chn	15-29	$100K +	20
2 Parents 3+chn	30-39	< $30K	27
2 Parents 3+chn	30-39	$30-50K	101
2 Parents 3+chn	30-39	$50-70K	208
2 Parents 3+chn	30-39	$70-100K	261
2 Parents 3+chn	30-39	$100K +	202
2 Parents 3+chn	40-49	< $30K	37
2 Parents 3+chn	40-49	$30-50K	61
2 Parents 3+chn	40-49	$50-70K	128
2 Parents 3+chn	40-49	$70-100K	266
2 Parents 3+chn	40-49	$100K +	480
2 Parents 3+chn	50-64	< $30K	8
2 Parents 3+chn	50-64	$30-50K	12
2 Parents 3+chn	50-64	$50-70K	38
2 Parents 3+chn	50-64	$70-100K	43
2 Parents 3+chn	50-64	$100K +	117
2 Parents 3+chn	65-74	< $30K	0
2 Parents 3+chn	65-74	$30-50K	2
2 Parents 3+chn	65-74	$50-70K	0
2 Parents 3+chn	65-74	$70-100K	4
2 Parents 3+chn	65-74	$100K +	2
2 Parents 3+chn	75+	< $30K	0
2 Parents 3+chn	75+	$30-50K	0
2 Parents 3+chn	75+	$50-70K	0

Household Type	Age of Respondent	Household Income	Households
2 Parents 3+chn	75+	$70-100K	0
2 Parents 3+chn	75+	$100K +	2
1 Parent Family	15-29	< $30K	339
1 Parent Family	15-29	$30-50K	178
1 Parent Family	15-29	$50-70K	57
1 Parent Family	15-29	$70-100K	23
1 Parent Family	15-29	$100K +	16
1 Parent Family	30-39	< $30K	473
1 Parent Family	30-39	$30-50K	253
1 Parent Family	30-39	$50-70K	122
1 Parent Family	30-39	$70-100K	57
1 Parent Family	30-39	$100K +	21
1 Parent Family	40-49	< $30K	533
1 Parent Family	40-49	$30-50K	368
1 Parent Family	40-49	$50-70K	289
1 Parent Family	40-49	$70-100K	173
1 Parent Family	40-49	$100K +	82
1 Parent Family	50-64	< $30K	250
1 Parent Family	50-64	$30-50K	292
1 Parent Family	50-64	$50-70K	204
1 Parent Family	50-64	$70-100K	210
1 Parent Family	50-64	$100K +	108
1 Parent Family	65-74	< $30K	38
1 Parent Family	65-74	$30-50K	81
1 Parent Family	65-74	$50-70K	52
1 Parent Family	65-74	$70-100K	36
1 Parent Family	65-74	$100K +	15
1 Parent Family	75+	< $30K	32
1 Parent Family	75+	$30-50K	84
1 Parent Family	75+	$50-70K	44

Household Type	Age of Respondent	Household Income	Households
1 Parent Family	75+	$70-100K	20
1 Parent Family	75+	$100K +	15
Multi-Family Hhlds	15-29	< $30K	6
Multi-Family Hhlds	15-29	$30-50K	10
Multi-Family Hhlds	15-29	$50-70K	13
Multi-Family Hhlds	15-29	$70-100K	27
Multi-Family Hhlds	15-29	$100K +	56
Multi-Family Hhlds	30-39	< $30K	7
Multi-Family Hhlds	30-39	$30-50K	7
Multi-Family Hhlds	30-39	$50-70K	8
Multi-Family Hhlds	30-39	$70-100K	17
Multi-Family Hhlds	30-39	$100K +	32
Multi-Family Hhlds	40-49	< $30K	6
Multi-Family Hhlds	40-49	$30-50K	17
Multi-Family Hhlds	40-49	$50-70K	18
Multi-Family Hhlds	40-49	$70-100K	21
Multi-Family Hhlds	40-49	$100K +	78
Multi-Family Hhlds	50-64	< $30K	8
Multi-Family Hhlds	50-64	$30-50K	10
Multi-Family Hhlds	50-64	$50-70K	25
Multi-Family Hhlds	50-64	$70-100K	42
Multi-Family Hhlds	50-64	$100K +	179
Multi-Family Hhlds	65-74	< $30K	0
Multi-Family Hhlds	65-74	$30-50K	6
Multi-Family Hhlds	65-74	$50-70K	6
Multi-Family Hhlds	65-74	$70-100K	10
Multi-Family Hhlds	65-74	$100K +	24
Multi-Family Hhlds	75+	< $30K	0
Multi-Family Hhlds	75+	$30-50K	0
Multi-Family Hhlds	75+	$50-70K	2

Household Type	Age of Respondent	Household Income	Households
Multi-Family Hhlds	75+	$70-100K	0
Multi-Family Hhlds	75+	$100K +	9
Non-Family Hhlds	15-29	< $30K	1,165
Non-Family Hhlds	15-29	$30-50K	687
Non-Family Hhlds	15-29	$50-70K	365
Non-Family Hhlds	15-29	$70-100K	259
Non-Family Hhlds	15-29	$100K +	246
Non-Family Hhlds	30-39	< $30K	42
Non-Family Hhlds	30-39	$30-50K	60
Non-Family Hhlds	30-39	$50-70K	63
Non-Family Hhlds	30-39	$70-100K	77
Non-Family Hhlds	30-39	$100K +	100
Non-Family Hhlds	40-49	< $30K	33
Non-Family Hhlds	40-49	$30-50K	50
Non-Family Hhlds	40-49	$50-70K	44
Non-Family Hhlds	40-49	$70-100K	46
Non-Family Hhlds	40-49	$100K +	45
Non-Family Hhlds	50-64	< $30K	68
Non-Family Hhlds	50-64	$30-50K	112
Non-Family Hhlds	50-64	$50-70K	105
Non-Family Hhlds	50-64	$70-100K	57
Non-Family Hhlds	50-64	$100K +	55
Non-Family Hhlds	65-74	< $30K	23
Non-Family Hhlds	65-74	$30-50K	59
Non-Family Hhlds	65-74	$50-70K	28
Non-Family Hhlds	65-74	$70-100K	9
Non-Family Hhlds	65-74	$100K +	7
Non-Family Hhlds	75+	< $30K	13
Non-Family Hhlds	75+	$30-50K	41
Non-Family Hhlds	75+	$50-70K	9

Household Type	Age of Respondent	Household Income	Households
Non-Family Hhlds	75+	$70-100K	10
Non-Family Hhlds	75+	$100K +	6
TOTAL Dunedin City			46,518

Appendix 2:
Locational Second Choices

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Figure 7.1: Second Choice of Inner Suburbs First Choice Respondents by Age

Age of Respondent	Inner city	Inner suburbs	South Dunedin	Outer suburbs	Outer urban area	Mosgiel	Total
18 - 24	53%	0%	24%	24%	0%	0%	100%
25 - 29	33%	0%	33%	33%	0%	0%	100%
30 - 34	0%	0%	25%	75%	0%	0%	100%
35 - 39	17%	0%	0%	83%	0%	0%	100%
40 - 44	25%	0%	0%	60%	10%	5%	100%
45 - 49	27%	0%	5%	59%	5%	5%	100%
50 - 54	31%	0%	0%	49%	13%	7%	100%
55 - 59	21%	0%	5%	65%	5%	5%	100%
60 - 64	37%	0%	7%	47%	0%	10%	100%
65 - 69	23%	0%	0%	62%	0%	15%	100%
70 - 74	13%	0%	13%	47%	7%	20%	100%
75+	31%	0%	15%	31%	0%	23%	100%
Total	27%	0%	8%	53%	5%	7%	100%

Figure 7.2 Second Choice of South Dunedin First Choice Respondents, by Age

Age of Respondent	Inner city	Inner suburbs	South Dunedin	Outer suburbs	Outer urban area	Mosgiel	Total
18 - 24	0%	100%	0%	0%	0%	0%	100%
25 - 29	0%	100%	0%	0%	0%	0%	100%
30 - 34	0%	100%	0%	0%	0%	0%	100%
35 - 39	0%	0%	0%	0%	0%	100%	100%
40 - 44	0%	33%	0%	67%	0%	0%	100%
45 - 49	0%	20%	0%	60%	20%	0%	100%
50 - 54	33%	33%	0%	33%	0%	0%	100%
55 - 59	0%	0%	0%	60%	0%	40%	100%
60 - 64	17%	17%	0%	50%	0%	17%	100%
65 - 69	0%	60%	0%	0%	0%	40%	100%
70 - 74	33%	0%	0%	67%	0%	0%	100%
75+	20%	20%	0%	40%	0%	20%	100%
Total	10%	33%	0%	38%	2%	17%	100%

Figure 7.3: Second Choice of Outer Suburbs First Choice Respondents, by Age

Age of Respondent	Inner city	Inner suburbs	South Dunedin	Outer suburbs	Outer urban area	Mosgiel	Total
18 - 24	9%	45%	0%	0%	27%	18%	100%
25 - 29	0%	25%	0%	0%	42%	33%	100%
30 - 34	0%	50%	0%	0%	30%	20%	100%
35 - 39	7%	29%	0%	0%	29%	36%	100%
40 - 44	12%	28%	0%	0%	36%	24%	100%
45 - 49	4%	48%	4%	0%	41%	4%	100%
50 - 54	0%	27%	4%	0%	35%	35%	100%
55 - 59	8%	42%	0%	0%	42%	8%	100%
60 - 64	10%	28%	3%	0%	45%	14%	100%
65 - 69	0%	54%	8%	0%	23%	15%	100%
70 - 74	13%	50%	13%	0%	25%	0%	100%
75+	6%	31%	6%	0%	31%	25%	100%
Total	6%	36%	3%	0%	36%	19%	100%

Figure 7.4: Second Choice of Outer Urban Area First Choice Respondents, by Age

Age of Respondent	Inner city	Inner suburbs	South Dunedin	Outer suburbs	Outer urban area	Mosgiel	Total
18 - 24	0%	0%	0%	100%	0%	0%	100%
25 - 29	0%	0%	0%	100%	0%	0%	100%
30 - 34	0%	0%	0%	50%	0%	50%	100%
35 - 39	0%	0%	0%	50%	0%	50%	100%
40 - 44	0%	0%	0%	40%	0%	60%	100%
45 - 49	0%	10%	0%	50%	0%	40%	100%
50 - 54	0%	14%	14%	29%	0%	43%	100%
55 - 59	11%	11%	0%	67%	0%	11%	100%
60 - 64	6%	0%	0%	67%	0%	28%	100%
65 - 69	0%	0%	20%	20%	0%	60%	100%
70 - 74	17%	17%	0%	67%	0%	0%	100%
75+	33%	0%	0%	67%	0%	0%	100%
Total	5%	5%	3%	55%	0%	31%	100%

Figure 7.5: Second Choice of Mosgiel First Choice Respondents, by Age

Age of Respondent	Inner city	Inner suburbs	South Dunedin	Outer suburbs	Outer urban area	Mosgiel	Total
18 - 24	0%	0%	33%	67%	0%	0%	100%
25 - 29	0%	0%	0%	0%	100%	0%	100%
30 - 34	0%	17%	0%	17%	67%	0%	100%
35 - 39	0%	50%	0%	50%	0%	0%	100%
40 - 44	0%	0%	0%	33%	67%	0%	100%
45 - 49	0%	0%	0%	50%	50%	0%	100%
50 - 54	8%	33%	0%	33%	25%	0%	100%
55 - 59	8%	8%	0%	50%	33%	0%	100%
60 - 64	6%	11%	0%	39%	44%	0%	100%
65 - 69	17%	0%	0%	50%	33%	0%	100%
70 - 74	0%	38%	0%	38%	25%	0%	100%
75+	0%	43%	0%	21%	36%	0%	100%
Total	4%	18%	1%	37%	40%	0%	100%

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PROPERTY ECONOMICS

Beca

DUNEDIN PRODUCTIVE LAND

COST BENEFIT ANALYSIS

Project No: 51913

Date: November 2020

Client: Dunedin City Council

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SCHEDULE

Code	Date	Information / Comments	Project Leaders
51913.8	November 2020	Report	Tim Heath / James Taylor

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1. INTRODUCTION

Property Economics, in conjunction with Beca, have been engaged by Dunedin City Council (**DCC**) to undertake a high-level cost benefit analysis on 16 identified growth areas in wider Dunedin to assess their respective economic and social impacts on the High Productivity Land (**HPL**) resource in the city.

The primary purpose of this report is to quantify (where appropriate) and qualify the significance of (potentially) losing highly productive land in the context of specific characteristics of each identified area. This includes the economic, social and cultural costs and benefits of retaining the productive land against the provision of enabling its development for residential activity taking a longer-term perspective.

This outputs are structured to provide DCC with economic, social and cultural market intel that is designed to better inform DCC of the costs and benefits associated with the conversion of the highly productive land to residential activity, so DCC decision making relating to these growth nodes can be made in more confidence and off a sound information platform.

1.1. KEY RESEARCH OBJECTIVES

The main objectives of the research and analysis include:

- Identify the growth nodes, their geospatial extent, anticipated residential capacity and potential timing around uptake.
- Assess the permitted baseline of what can be developed in each growth area under the Operative District Plan (**ODP**).
- Evaluate the current level of productive value of each growth area, including estimated annualised primary production value.

- Assess the potential production under the ODP baseline (status quo) if there exists variance from the current land use.
- Assess the overall impact on primary production and compare against the potential uptake of the land for residential purposes.
- Outline any potential impacts from any reverse sensitivities.
- Determine the high-level potential economics costs and benefits resulting from the two alternative activities (primary production or residential development) against the baseline position.
- Identify the key social and cultural costs and benefits of each growth area.
- Identify some of the economic opportunity costs (lost production) associated with each growth node.

1.2. INFORMATION SOURCES

Information has been obtained from a variety of sources and publications including:

- Census of Population and Dwellings 2018
- Household and Population Projections – Statistics NZ
- Housing and Business Development Capacity Assessment (**HBA**) – DCC
- Identification of Growth Areas – DCC
- Distribution of Highly Productive Soils (**HPS**) – DCC
- GIS Data on each Growth Area – DCC
- Proposed National Policy Statement – Highly Productive Land Indicative Cost-Benefit Analysis – Market Economics (Land Productivities were adapted from this paper)

2. BACKGROUND CONTEXT

DCC are currently undertaking Variation 2 to the Proposed Second Generation Dunedin City District Plan (2GP). Variation 2 aims to respond to Dunedin's urban development capacity needs with the City being reclassified as a Tier 2 urban environment under the National Policy Statement on Urban Development 2020 (NPS-UD). As a Tier 2 urban environment, the DCC is required to ensure there is sufficient housing development capacity in the short-term (3 years), medium-term (10 years) and long-term (30 years).

As part of Variation 2, DCC is investigating potential greenfield sites located in the suburbs and fringes around Dunedin City. Of these, 16 are also classified as areas containing highly productive land due to their soil classification rating. The proposed National Policy Statement on Highly Productive Land (**NPS-HPL**) would require Councils to avoid urban development and growth on highly productive land, where possible. Policy 3 of the NPS-HPL states that:

"Urban expansion must not be located on highly productive land unless:

a. there is a shortage of development capacity to meet demand (in accordance with the NPS-UDC methodologies and definitions); and

b. it is demonstrated that this is the most appropriate option based on a consideration of:

- *a cost-benefit analysis that explicitly considers the long-terms costs associated with the irreversible loss of highly productive land for primary production;*
- *whether the benefits (environmental, economic, social and cultural) from allowing urban expansion on highly productive land outweigh the benefits of the continued use of that land for primary production; and*
- *the feasibility of alternative locations and options to provide for the required demand, including intensification of existing urban areas."*

3. REPORT APPROACH

In anticipation of the release of the NPS – HPL (the Ministry for Primary Industries (**MPI**) undertook an assessment of the potential costs and benefits associated with a requirement for territorial authorities to assess the impacts of enabling changes in land use on HPL either through activity changes or sub-division.

While the release of this guiding document has been delayed, due to in part insufficient information, the assessment utilised in the initial process is a useful guide to understanding the potential economic, social and cultural impacts associated with the uptake of HPL for residential activity. As such Property Economics and Beca consider this an appropriate approach to assessing the potential costs and benefits related to the changes proposed by DCC.

Overall, the approach seeks to quantify the loss in primary output as a result of the rezoning of HPL for residential activity. Alternatively, the identification and quantification of benefits relate to the relative location of these sites as well as the potential changes to the District economy as a result of the residential provision.

3.1. HPL LAND AND PRIMARY PRODUCTION

The development of HPL away from primary production has become an important economic issue with the expansion of urban areas and the trended development of rural lifestyle residential sites. HPS currently makes up 15% of the national land area with primary production making up 5% of the national economic composition.

According to the MPI cost benefit assessment Dunedin City has approximately 10% of its land area in HPS with primary production contributing 2% (based on employment) to district economy. In terms of the national 'significance' Dunedin City contributes 0.9% to the country's primary produce. The 'Town Area' defined by the same assessment represented 1.4% of the total land area

In context the sites identified by DCC account, in aggregate, for just over 300ha or less than 1% of the HPS land area.

In the context of the wider economy the 'Agriculture, Forestry and Fishing' sectors (through ANZSIC) contributed $156.4m to the Districts economy (2.5%).

3.2. METHODOLOGY FOR PRODUCTION

The methodology followed for the purpose of this report follows the cost benefit assessment undertaken for the assessment of the economic requirement for NPS on HPL. This calculates the net contribution to GDP (value added), per hectare, of HPL land (by category LUC 1-3) and attributes a discounted loss over the period to 2048.

There are several further assumptions including:

- Only sites with single ownership over 4 hectares[1] are expected to have any significant productive value, unless specifically recognised.
- The productive potential value of sites increases as the overall size increases (thus loss of partial blocks may impact the remaining sites).
- The discount rate applied is 6%.
- It is assumed that the value of production remains relative between sites.
- It is assumed that any indirect or induced economic impacts are proportional to the type of land and subsequent production value rather than specific sites or land areas.

For the purposes of this report, and in keeping with the NPS review process, the individual areas have firstly been assessed for their productive land areas, with sites that are below 4 hectares significantly discounted for long term production. A further consideration is the impact on the potential productivity of any remaining sites (land areas) that have been reduced through residential zone changes.

Productive values are based on national averages and factored for the levels associated with the Dunedin market by land type (HPL category) and the presence of high valued soils. Production value is based on potential activity rather than existing activity to understand the potential loss over time (for a highest and best use based on agricultural activity). In order to assess a Net Present Value (**NPV**) for comparison of any other costs or benefits over time, a 6%[2] discount rate has been applied.

The assessment applied to each area in relation to the level of potential economic costs and benefits are then based on 5 key factors:

1. The level of capacity provision and ability to meet future residential growth needs.
2. The continuity with existing urban areas, including accessibility to community infrastructure and amenity.
3. The level of reverse sensitivity associated with residential activity (at the level proposed) in each area.
4. The overall loss of agricultural production resulting from the land use change.
5. The level of land use efficiency

[1] *It is assumed that the potential for aggregation of sites over time is unlikely.*

[2] *While NZTA have more recently utilised 4% discount rates from the standard 6%, it is considered appropriate to assess with the 6% rate given the timeframe of this assessment*

4. GENERAL COSTS AND BENEFITS

The benefits and costs associated with allowing urban expansion to occur on highly productive land have been outlined generally in this section. A more detailed benefit-cost analysis for each individual site, based on its unique characteristics and production values, is undertaken later in the report.

4.1. ECONOMIC BENEFITS AND COSTS

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Ability to meet residential growth demand.	Overall reduction in agricultural output value.
Tempering impact on prices.	Increased need for infrastructure.
Urban continuity.	Reduced economies of scale in primary production.
Urban efficiencies through infrastructure provision and lower marginal costs.	Reduction in long-term HPL safeguarding.
Increased housing choice.	Inappropriate market signals (i.e. long-term economic value versus short-term capital gain).
Increased locational choice.	Loss of agricultural jobs.
Increased residential density - increased local service retention (local jobs).	Impact on rural amenity.
Improved national competitiveness.	Fragmented rural land holdings.

4.2. SOCIAL BENEFITS AND COSTS

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economy and jobs	
Additional residential development can increase the demand for new local businesses (e.g. a café) thereby creating more local jobs and associated economic benefits.	Potential loss of primary production jobs provided by the highly productive land, or loss of jobs that support rural processing factories / infrastructure.
Potentially enables more working environments and therefore the potential for communities to have better access to potential places of employment, access to goods and services, and therefore the potential to reduce commuting times between home, work and goods and services.	Loss of food production, or potential food production in the future (i.e. meat, orchards, crops) which could have associated transport and environmental (including climate change) costs associated with needing to potentially import food to serve the local market and communities.

	Potential loss of food security in the future, particularly when considering resilience of a population.
Transportation	
If the development is located near or on public transport routes, it could improve accessibility of urban environments and communities to public and active transport.	The potential increase in traffic congestion and the impacts of this on neighbours as well as greenhouse gas emissions and climate change.
Housing supply	
Potential to reduce housing shortages, arresting the increases in house prices in Dunedin and rents relative to the status quo. Between 25-30% of household income is often spent on housing in New Zealand, and home ownership is the primary way of accumulating wealth in NZ but has rapidly declined over the last decade.	
Potential for a wider range of housing types and choices (with a resulting broader range of house prices) to be available in the future, as a result of increased enablement for differing densities of development (e.g. no longer a predominance of single dwellings).	
Social cohesion (both urban and rural)	
If located near or adjacent to existing residential development and community facilities, the development could create a better social cohesion.	Potential reverse sensitivity effects if the residential development is located close or near to a sensitive activity or industrial / commercial activity.
	Potential to exacerbate the urban-rural divide if good rural land is lost to urban expansion.
	The costs of additional infrastructure and public services.

4.3. CULTURAL BENEFITS AND COSTS

The Käi Tahu Ki Otago Natural Resource Management Plan 2005 has been used to help determine the potential cultural benefits and costs of urban expansion occurring on highly productive land.

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Housing and development	
Opportunities for papakāinga and kaumātua housing.	
Increased enablement of intensification has the potential to provide additional opportunities for Iwi as developers within urban areas.	
Potential for a wider range of housing types and choices (with a resulting broader range of house prices) to be available in the future, as a result of increased enablement for differing densities of development (e.g. no longer a predominance of single dwellings).	
Archaeological and heritage sites	
The development could disturb and unearth archaeological sites or objects that were previously unknown to iwi, further adding to local iwi's historical knowledge and cultural story.	Potential disturbance of an archaeological site (Maori heritage and archaeological values).
	Potential disturbance of Statutory Acknowledgement Areas or Wāhi tūpuna (either known or unknown).
Water Quality and Biodiversity	
Water quality (both ground and surface water) may improve due to the environmental effects of agriculture being removed (e.g. point discharges of dairy effluent, application of fertiliser and agrichemicals, sedimentation).	Potential loss of mauri associated with development.
	Potential decreases in water quality due to increases in stormwater discharges associated with residential development to urban streams.
	Potential for increased pressure on natural resources (e.g. such as water quality) if urban intensification is not appropriately managed in

	relation to potential adverse effects on the natural environment.
Food Gathering and other traditions	
	Potential loss of mahinga kai, particularly Nohoaka sites.
Social	
	Potential loss of iwi jobs or businesses associated with the primary production industry.
	Potential for increased pressure on Aukaha in relation to identification / documentation of sites of significance / wāhi tapu, as enablement for intensification may spur an increase in development applications for higher density developments in urban areas.

4.4. ENVIRONMENTAL BENEFITS AND COSTS

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Water Quality and Quantity	
Water quality (both ground and surface water) may improve due to the environmental effects of primary production being removed (e.g. point discharges of dairy effluent, application of fertiliser and agrichemicals, sedimentation).	Potential decreases in water quality due to the increases in stormwater discharges to urban streams and other urban pollutants associated with residential development.
Less demand for water (stock water and irrigation), thereby allowing surface and groundwater to replenish.	Potential for increased pressure on natural resources (e.g. such as water quality) if urban intensification is not appropriately managed in relation to potential adverse effects on the natural environment.
	Potential to create or exacerbate flooding issues.
	Potential for hazard and land instability effects arising from residential development.
Biodiversity	
Potential improvement in aquatic ecosystems and habitats due to the improvement in water quality and quantity effect described above.	Potential negative effects on aquatic life due to increased impermeable surfaces and/or increased soil-runoff from soil compaction (soil compaction occurs when the soil is compressed and cannot absorb water, making it drought-

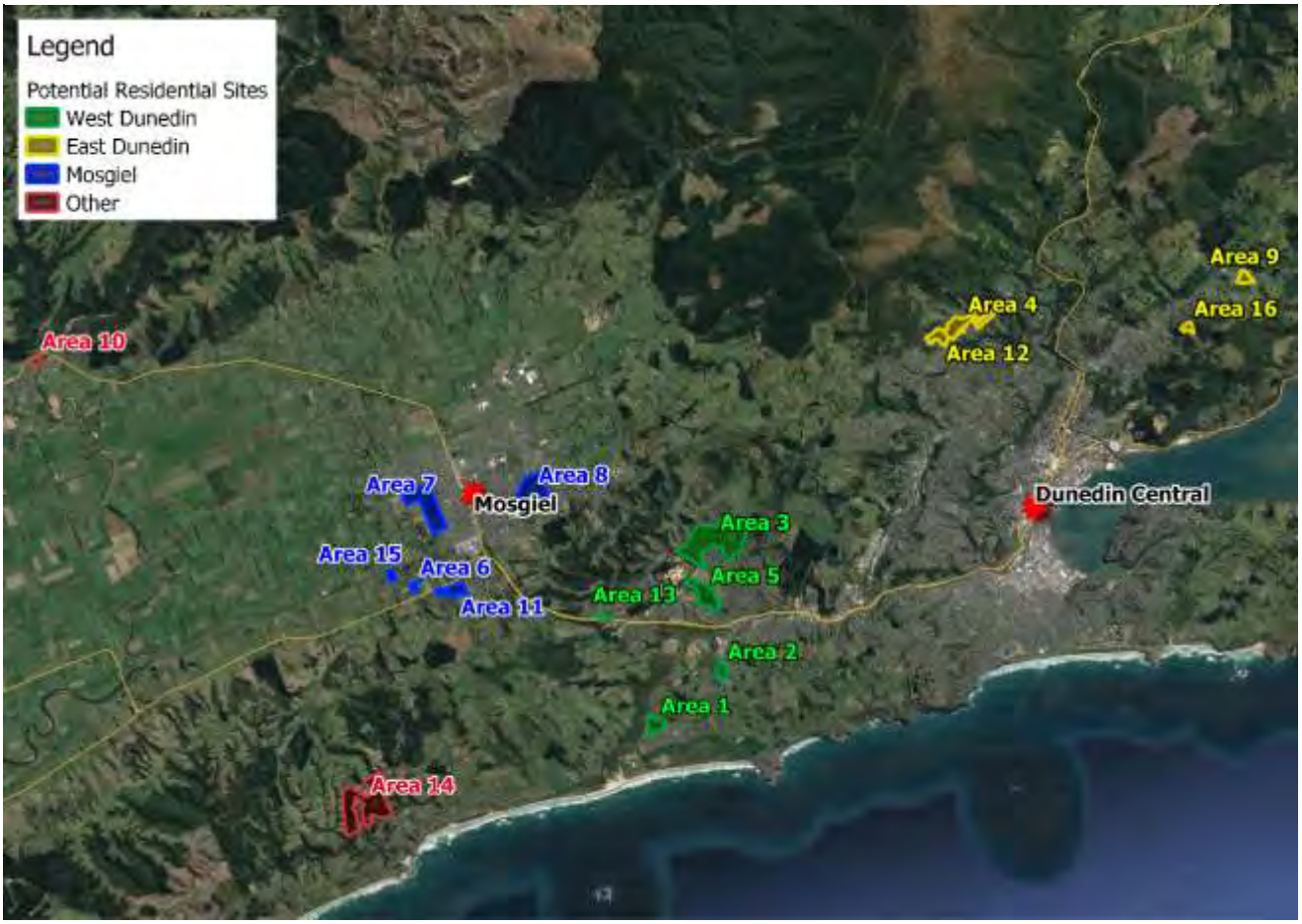
	prone). This is especially a risk for high quality soils.
	Potential for a reduction in native habitats and biodiversity from urban sprawl and development.
	Potential to disturb ecological sites as part of any development.
	Potential loss of vegetation cover and trees due to urban sprawl and development.
Climate Change	
A potential reduction in greenhouse gas emissions associated with primary production (e.g. emissions from dairy cows and machinery), thereby reducing the impact of climate change.	A potential increase in greenhouse gas emissions due to an increase in vehicle emissions thereby increasing the impact of climate change (e.g. greenfield site developed to residential that is not well connected to public transport).
A potential reduction in carbon emissions generated from private vehicle use if the residential development is located near or on public transport routes.	A potential increase in air pollution (i.e. more fires built in new residential dwellings).
Amenity Values	
Potential to provide access to public open spaces, such as the coast or waterways, which were previously not easily accessible. Potential benefit both for the immediate occupants of new developments as well as for the wider local community who may also benefit from such enhancements.	Reduction or loss of amenity values, including public viewpoints, arising from development (e.g. going from a green, open space to a developed, built environment).

5. SITE SPECIFIC BENEFITS AND COSTS

The following outlines the specific sites identified by DCC for this assessment. The associated information has been utilised to assess the overall production of each site, its ability to meet residential demand and likely implications of the irreversible loss of Highly Productive Land.

The 16 sites in question are shown on Figure 1 below and have been grouped according to the relative location

FIGURE 1: OVERVIEW OF DUNEDIN HPL SITES

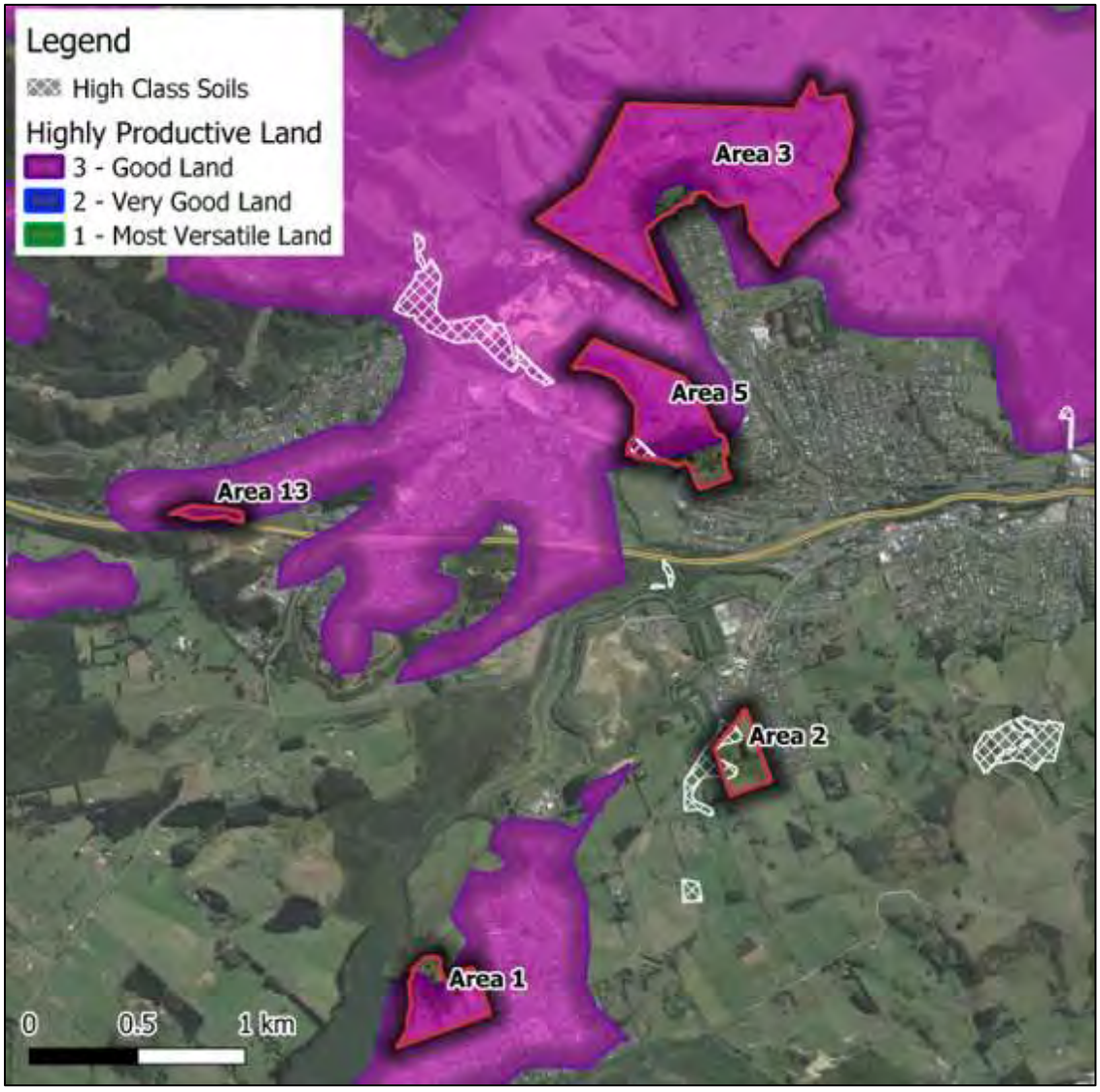


Source: Property Economics, Dunedin City Council

5.1. DUNEDIN WEST

Figure 2 provides a high-level view of the HPL sites in Dunedin West. This is centred around State Highway 1 travelling from Dunedin towards Mosgiel.

FIGURE 2: DUNEDIN WEST HPL SITES AND HIGH PRODUCTIVE LAND COVERAGE

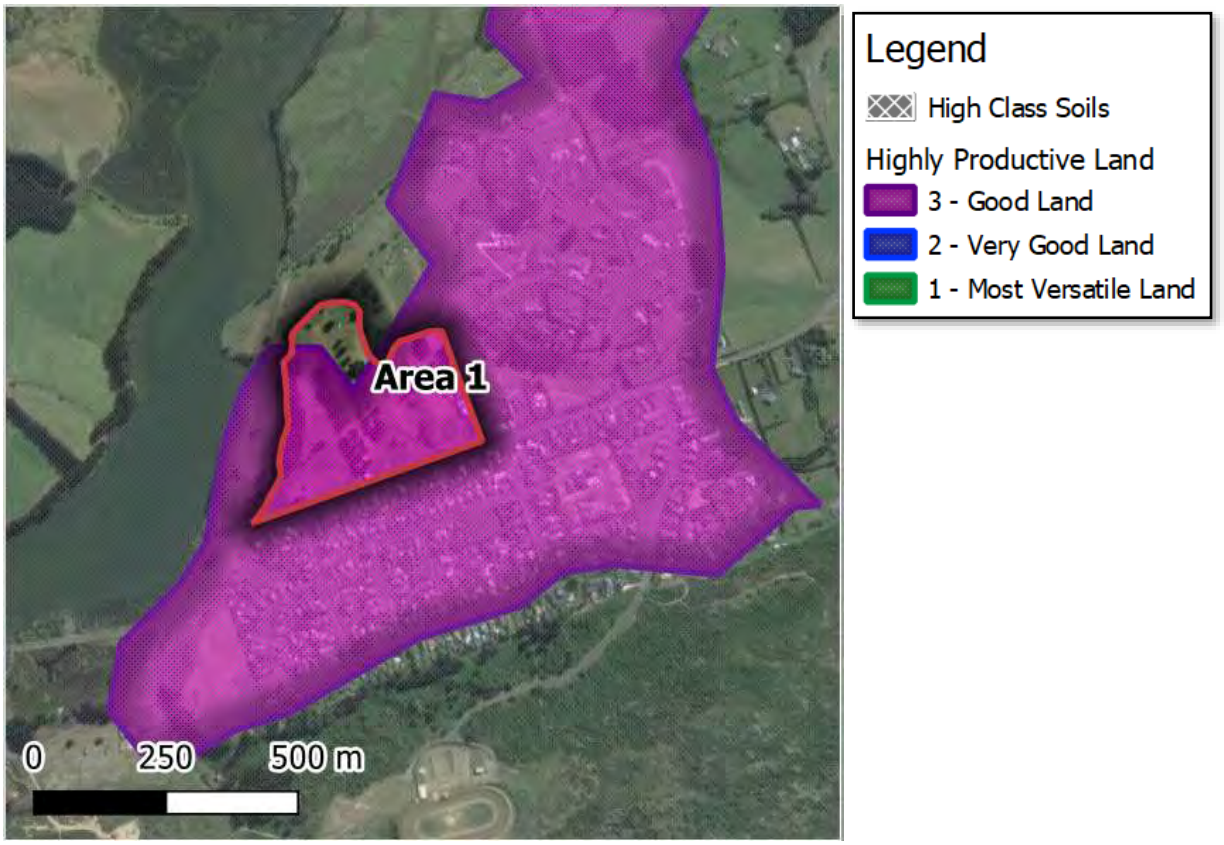


Source: Property Economics, Dunedin City Council

AREA 1

Area 1 is located at 336 Brighton Road, Waldronville. The current land use is Recreation (it is currently the Island Park Golf Club). The site is located within the suburb of Waldronville and thus there is residential land use located to the south and large lot residential land use located to the east. Kaikorai Stream runs immediately to the west of the site, with greenfield located to the north.

FIGURE 3: MAP SHOWING AREA 1 WITHIN THE WALDRONVILLE AREA



Source: Property Economics, Dunedin City Council

In terms of transport, Brighton Road is classified as a Strategic Road under the 2GP and there is a public bus stop located within 200m of the site. There are no primary or secondary schools located within Waldronville, with the nearest primary school being Green Island Primary School (located approximately 4km north-east). No significant labour market is known to be located within Waldronville.

There are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas).

The hazard 2 (flood) overlay zone surrounds the site but is not located within the site itself, as does the hazard 3 (coastal) overlay.

TABLE 1: CHARACTERISTICS OF AREA 1

Area 1	
Location	Waldronville Golf Course
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	9.74
Anticipated Dwelling Capacity	12
High Class Soil Coverage	-
HPL - 3 Coverage	86%
HPL - 1 Coverage	-

Source: Property Economics, Dunedin City Council

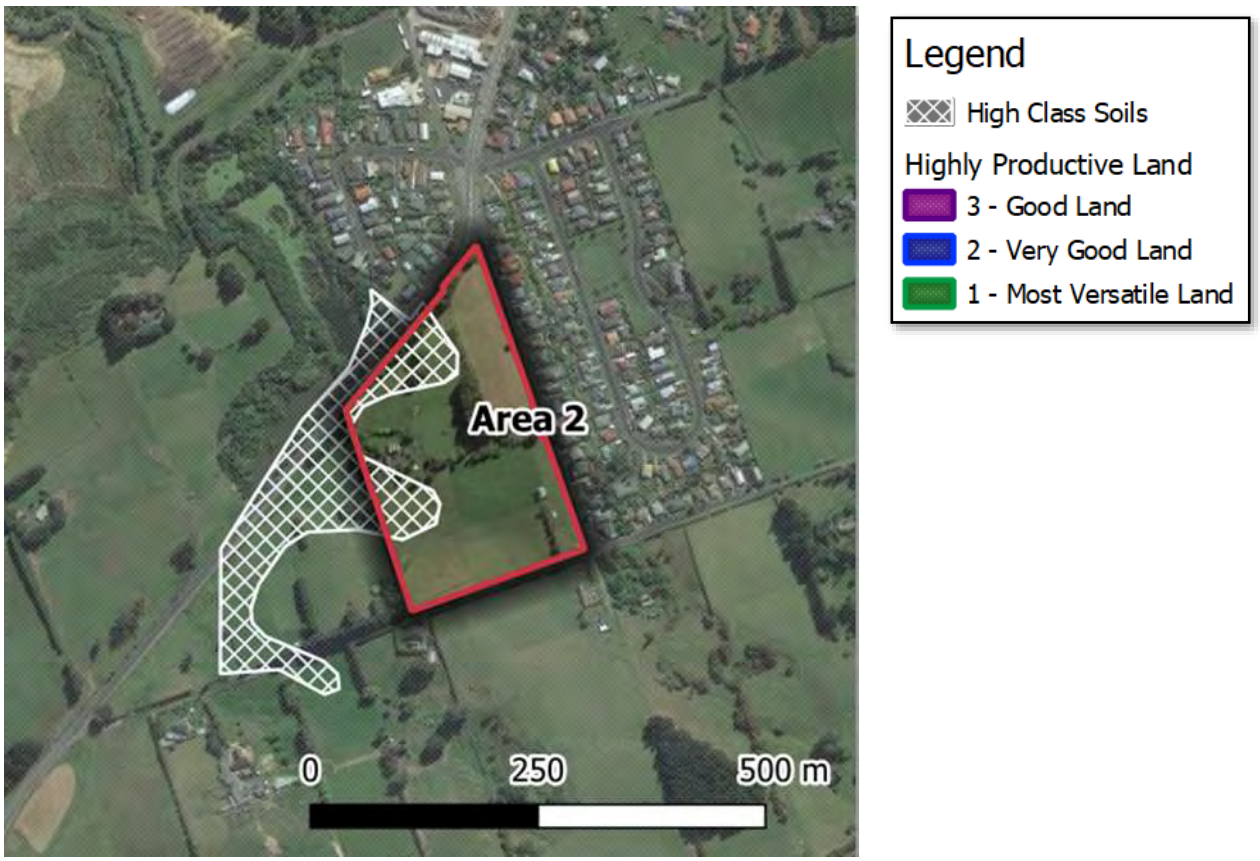
The following benefits and costs have been identified specific to Area 1's characteristics. It is important to note that the anticipated capacity of 12 units is based on only a strip of housing development along the road.

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
The area provides for lower density residential sites with good accessibility to existing urban area.	Productive Land Area: (Due to the nature of the current active and the likelihood of this reverting to a lower value activity). The loss of the golf course may have limited economic cost as a going concern however the development is unlikely occur unless the development is of a greater value. Reverse Sensitivity Risk: Low to None.
Social	
The site is located near a public transport route, thereby it could improve accessibility to jobs and services via public and active transport.	Loss of a social recreational activity / asset, being the Golf Course, which is used by the local Waldronville community but also the wider Dunedin community.
Located adjacent to an established suburb and other residential development so could create a better social cohesion for the community.	
Environmental	
	Potential for flooding issues due to the presence of the flood hazard overlay.
	Potential decrease of water quality in the nearby aquatic habitat of Kaikorai Stream due to the urban intensification.
Cultural	
Opportunities for a wide range of housing given the range of housing in the surrounding area (large lot residential to general residential size).	Potential loss of mahinga kai due to the presence of the nearby Kaikorai Stream.

AREA 2

Area 2 is located at 1 Allen Road South and 27 Weir Street in Green Island. The current land use is Rural Industry: Stock Finishing with a small portion of Lifestyle: Single Unit. The site is located on the outskirts of the Green Island suburb. Residential subdivision is located to the north and east of the site, with the Green Island Landfill located on the northern side of Brighton Road. The southern side of the site appears to be surrounded by farmland and / or lifestyle blocks.

FIGURE 4: MAP SHOWING AREA 2



Source: Property Economics, Dunedin City Council

In terms of transport, Brighton Road (located within 300 metres of the site) is a Strategic Road under the 2GP with Allen Road South and Weir Street being local roads. There is no public transport located within 1km of the site.

The nearest primary school (Green Island Primary School) is located approximately 2km north. There is retail and shops (including a supermarket) within Green Island, which is less than 2km from the site.

In terms of overlay sites, there are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas or hazard areas).

TABLE 2: CHARACTERISTICS OF AREA 2

Area 2	
Location	Brighton Rd, Allen Rd (Green Island)
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	5.76
Expected Dwelling Capacity	25
High Class Soil Coverage	17%
HPL - 3 Coverage	-
HPL - 1 Coverage	-

Source: Property Economics, Dunedin City Council

The following benefits and costs have been identified specific to Area 2's characteristics.

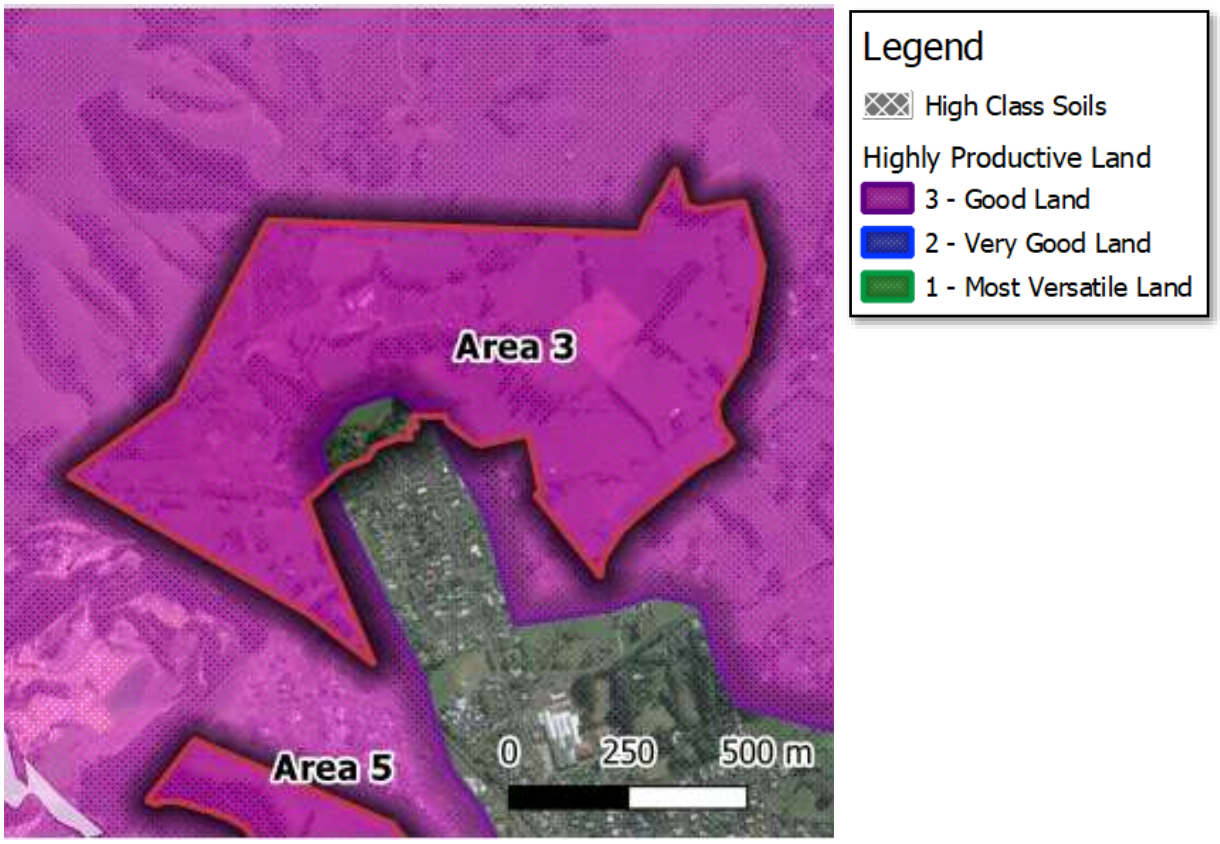
Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Increased residential development with access to local shops, potential to increase amenity retention through household spend. (this is considered low based on the relative benefit associated with the only 25 dwellings anticipated for this area and the value-added loss per dwelling).	2.2 ha of the affected 5.76 ha is currently located within a lifestyle site with the remaining 3.5 ha located within a productive site. A mitigating factor is that only 17% of the affected site is HCS. Total expected reduction in output to 2048: $33,600 (discounted). Reverse Sensitivity Risk: Low.
Environmental	
Nothing more specific than those listed in the general benefits and costs (Section 2.1 of this memorandum).	
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum).	

Social	
Provides social cohesion due to its close proximity to existing residential housing, and schools and retail in Green Island.	May create a potential reverse sensitivity effect given the Green Island Landfill is located north-west across Brighton Road.
May provide more employees for local businesses located in Green Island.	Loss of food production, or potential food production in the future (i.e. meat, orchards, crops) given some of the current land use is stock finishing.
	Potential loss of agricultural jobs or businesses given some of the current land use is stock finishing.

AREA 3

Area 3 is located adjacent to Lambert Street, Hyslop Street, Freeman Close and McMeakin Road in Abbotsford. The site is currently a mixture of Rural Industry: Stock Finishing and Lifestyle: Single Unit. The site is located to the north of the Abbotsford suburb. Residential subdivision is located to the south of the site, the Main South Railway Line is located to the south-west and the surrounding area is Greenfield.

FIGURE 5: MAP SHOWING AREA 3



In terms of transport, North Taieri Road is a Collector Road under the 2GP with the other surrounding streets being local roads. There is public transport located within 200m of the site. Abbotsford School is located within 1km.

In terms of overlay sites, there are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas or hazard areas).

TABLE 3: CHARACTERISTICS OF AREA 3

Area 3	
Location	Freeman Cl, Lambert St, Abbotsford
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	70.28
Expected Dwelling Capacity	617
High Class Soil Coverage	-
HPL - 3 Coverage	97%
HPL - 1 Coverage	-

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Provides for significant residential capacity with close proximity to the existing urban environment. Increased amenity and highest and best use.	While several sites are impacted only 2 currently operate with primary production. A further site has potential for primary production. In total 52 productive hectares are impacted with a total expected reduction in output to 2048: $524,000 (discounted). Reverse Sensitivity Risk: Medium.
Environmental	
	Potential erosion and sedimentation effects when developing as the site is located on a hill slope.
	Potential hazard and land instability effects arising from the residential development.

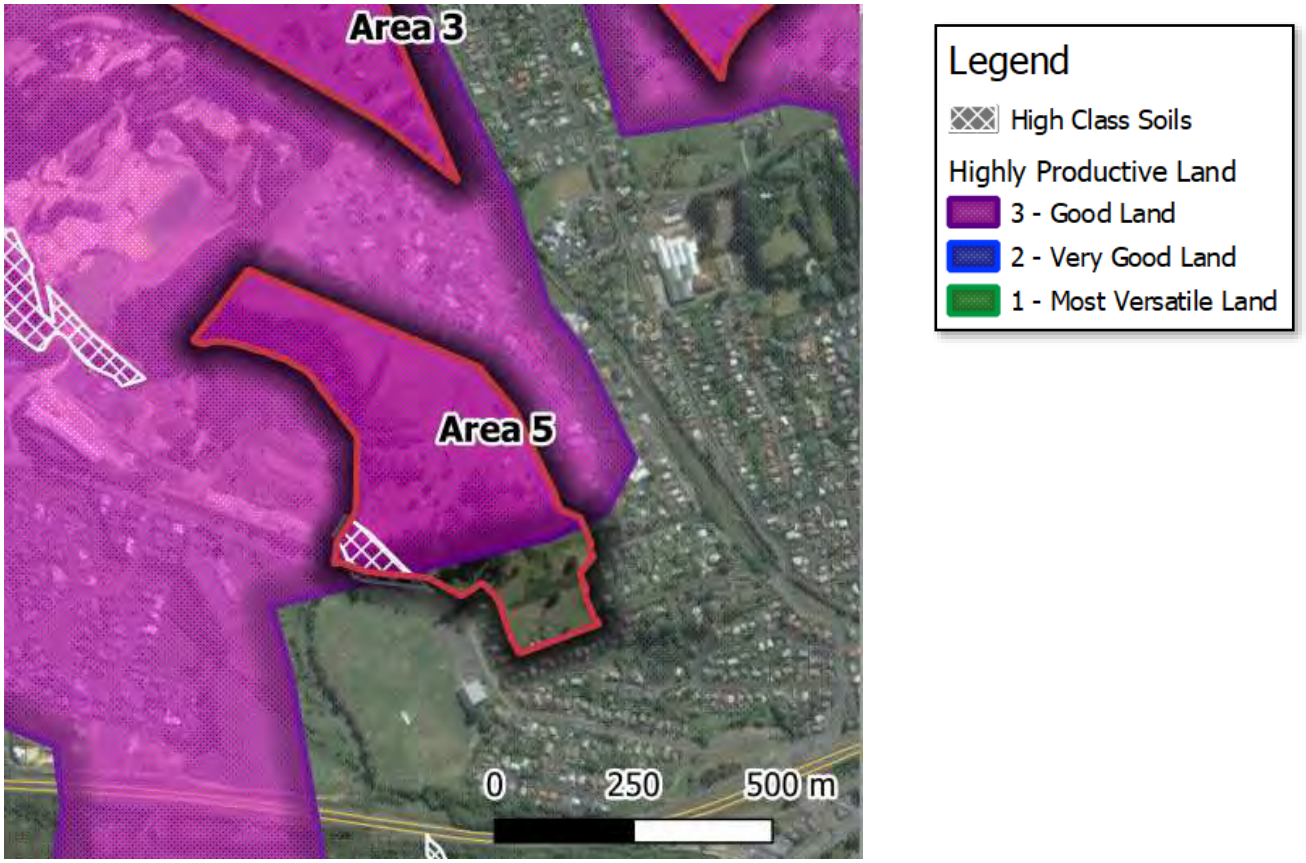
	Reduction or loss of amenity values, including public viewpoints, arising from development due to its location on a hill.
	Due to the capacity of the site, may be an increase in greenhouse gas emissions as a result of vehicle congestion.
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	
Social	
The site is located near a public transport route, thereby it could improve accessibility to jobs and services via public and active transport.	May create a potential reverse sensitivity effect given there is a quarry located south of the site and the Main South Railway Line is located to the south.
Provides social cohesion due to its close proximity to existing residential housing, and schools and retail in Abbotsford.	
Due to the capacity of the site, could potentially create more working environments and therefore the potential for communities to have better access to potential places of employment, access to goods and services, and therefore the potential to reduce commuting times between home, work and goods and services.	

AREA 5

Area 5 is located adjacent to Main South Road, Fairfield. The site is currently a mixture of Lifestyle: Single Unit and Lifestyle: Vacant.

Existing residential subdivision is located to the north and east, with Sunnyvale Park (sports fields) located across Main Road to the south. To the west is the Blackhead Quarries site.

FIGURE 6: MAP SHOWING AREA 5



In terms of transport, Main South Road is an Arterial Road under the 2GP. There is public transport located within 400m of the site.

In terms of overlay sites, there are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas).

TABLE 4: CHARACTERISTICS OF AREA 5

Area 5	
Location	Main South Road, Fairfield
Current Zone	Rural Residential 2
Proposed Zone	General Residential 1
Size (ha)	19.72
Expected Dwelling Capacity	70
High Class Soil Coverage	3%
HPL - 3 Coverage	82%
HPL - 1 Coverage	-

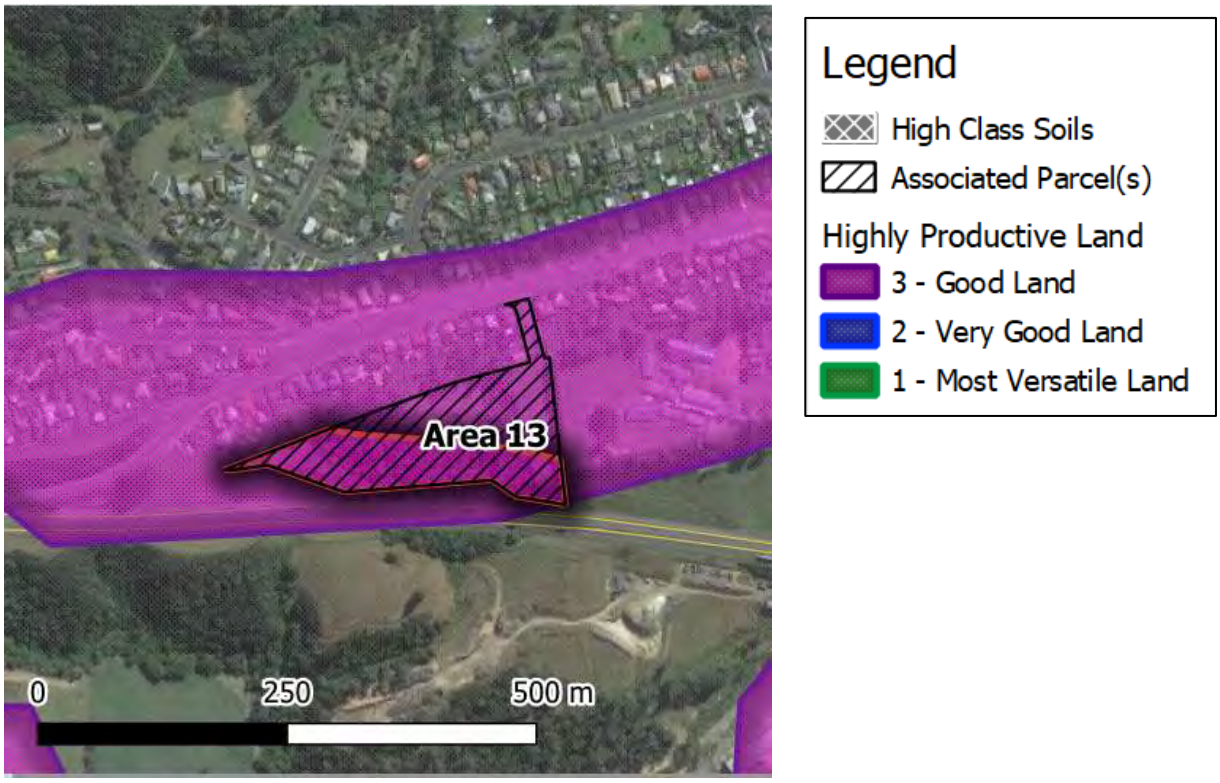
Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
The area provides for lower density residential sites with good accessibility to existing urban area.	With only 3% HCS and LUC HPL 3 over 82% of the area this represents a relatively low productive value. Only 1 site is over 4 ha a with the potential for primary production output to 2048 equating to: $145,000 (discounted). Reverse Sensitivity Risk: Low.
Environmental	
	Potential decreases in water quality due to increases in stormwater discharges to urban streams (particularly Abbots Creek) associated with residential development.
	Potential erosion and sedimentation effects when developing as the site is located on a hill slope.
	Potential hazard and land instability effects arising from the residential development.
	Potential to create or exacerbate flooding issues given the flood overlay zone.
Cultural	
Social cohesion as the Te Kura Kaupapa Maori O Otepoti is located across Main Road to the south.	
Social	
The site is located near a public transport route, thereby it could improve accessibility to jobs and services via public and active transport.	Potential reverse sensitivity effects with Blackhead Quarries located to the west.
Provides social cohesion due to its close proximity to existing residential housing, and schools and retail located in Abbotsford.	
Due to the capacity of the site, could potentially create more working environments and therefore the potential for communities to have better access to potential places of employment, access to	

goods and services, and therefore the potential to reduce commuting times between home, work and goods and services.	

AREA 13

Area 13 is located at 127a Main Road, Fairfield. The site is currently Greenfield (Lifestyle: Vacant). State Highway 1 (the Southern Motorway) is located to the south of the site, with residential development to the north and Fairfield School immediately east of the site. In addition to the usual map details, Figure 7 identifies the extent of the associated parcel where the balance of land outside of the HPL area is zoned General Residential 1.

FIGURE 7: MAP SHOWING AREA 13 AND ASSOCIATED PARCEL



In terms of transport, the site is adjacent to the State Highway (the Southern Motorway) and Main Road is an Arterial. The site is located within the Fairfield suburb with good access to shops, schools and community facilities. Public transport is available within 400m of the site.

In terms of overlay sites, there are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas or hazard areas).

TABLE 5: CHARACTERISTICS OF AREA 13

Area 13	
Location	127a Main Road Fairfield
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	1.35
Expected Dwelling Capacity	6
High Class Soil Coverage	-
HPL - 3 Coverage	100%
HPL - 1 Coverage	-

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Fits the current urban form and contributes to both economies of scale in the area, public infrastructure utilisation and likely to increase demand for local services.	Consists of 1 small site unlikely to be materially productive in primary output. Reverse Sensitivity Risk: Low to None.
Environmental	
Nothing more specific than those listed in the general benefits and costs (Section 2.1 of this memorandum)	
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	
Social	
Located near a public transport route, thereby it could improve accessibility to jobs and services via public and active transport. This could support emissions reduction – thereby reducing carbon emissions generated from private vehicle use.	
Provides social cohesion due to its close proximity to existing residential housing, and schools and retail in Fairfield.	

5.2. EAST DUNEDIN

FIGURE 8: SPATIAL OVERVIEW OF EAST DUNEDIN

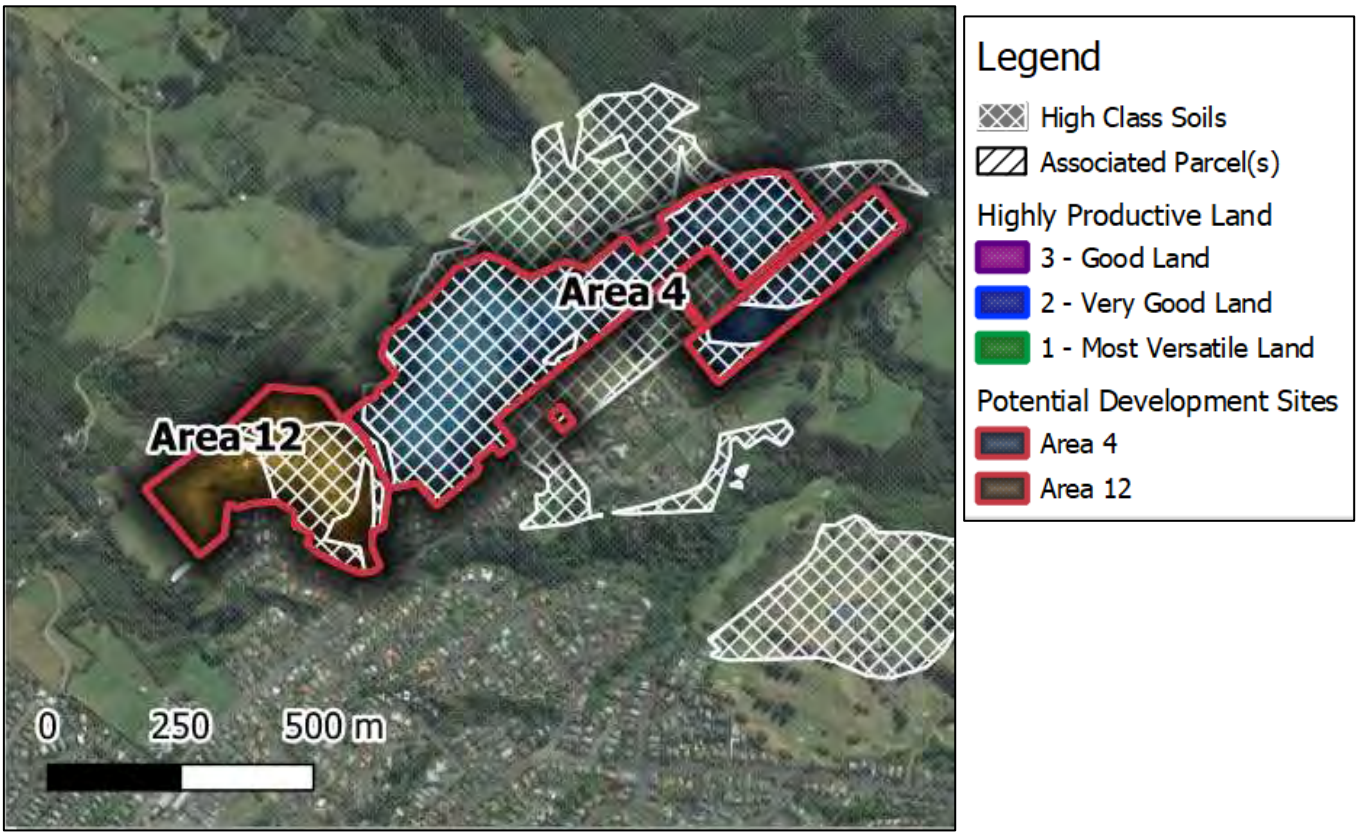
AREAS 4 AND 12

Areas 4 and 12 are located adjacent to each other and consequently have similar costs and benefits.

Area 4 is located adjacent to Wakari Road and Polwarth Road in Helensburgh. The current land use is a mixture of Lifestyle: Vacant, Lifestyle: Single Unit and a small portion of Residential: Public Communal (Unlicensed) and it is understood to be used for livestock. Existing residential subdivision is located to the south, large lot residential across the road to the east and to the north of the site is greenfield.

Area 12 is located adjacent at 32/45 Honeystone Street in Helensburgh. The current site is Lifestyle: Single Unit and Residential: Single Unit excluding bach.. Existing residential subdivision is located to the south, large lot residential across the road to the east and to the north of the site is greenfield.

FIGURE 9: MAP SHOWING AREA 4 (BLUE) AND 12 (ORANGE)



In terms of transport, Wakari Road and Helensburgh Roads are Collector Roads under the 2GP, however the part of Wakari Road the site is located on is not classified as a Collector Road. There is public transport located approximately 1.5km from the site. The Helensburgh shops (which includes a medical centre, veterinary clinic and other shops) is located within 1km of the site.

In terms of overlay sites, there are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas or hazard areas).

TABLE 6: CHARACTERISTICS OF AREAS 4 AND 12

	Area 4	Area 12
Location	Polwarth Rd & Wakari Rd	32/45 Honeystone Street
Current Zone	Rural Residential 2	Rural
Proposed Zone	General Residential 1	General Residential 1
Size (ha)	22.40	8.94
Expected Dwelling Capacity	163	37
High Class Soil Coverage	93%	43%
HPL - 3 Coverage	-	-
HPL - 1 Coverage	-	-

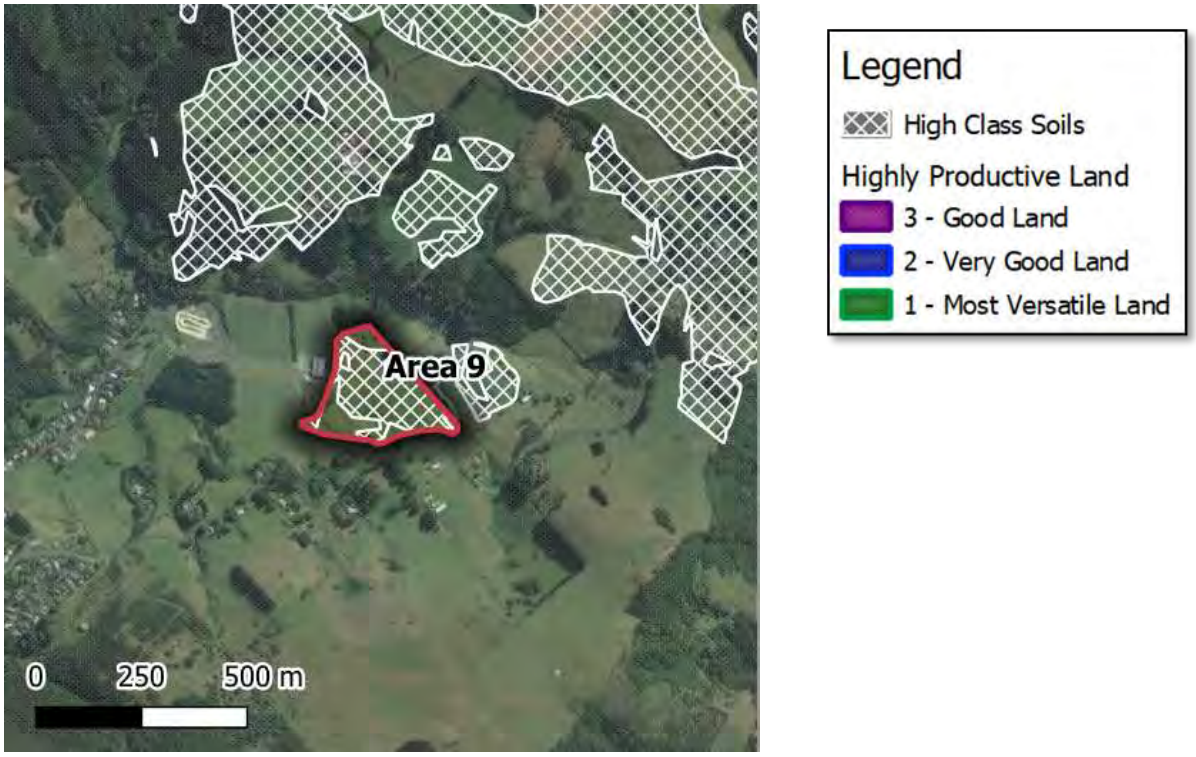
Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Provides for residential capacity with close proximity to the existing urban environment. Access to amenity, shops and limited commercial services. Material increase in land value.	**Area 4** While the majority of this area is identified as HCS the affected sites are residential or lifestyle, with only 2 fitting the size and activity criteria to meet production thresholds. This results in the reduction of 12.4 ha of productivity land with the output to 2048 equating to: $270,000 (discounted). Reverse Sensitivity Risk: Low.
Provides for residential capacity with close proximity to the existing urban environment. Access to amenity, shops and limited commercial services. Material increase in land value. Score 2.	**Area 12** With, potentially, 6ha of productive land and a 43% HCS coverage this site represents a potential impact on output to 2048 of: $85,000 (discounted). Score 1. Reverse Sensitivity Risk: Low.
Environmental	
	Due to the distance to public transport and the large capacity of the site, a potential increase in greenhouse gas emissions due to an increase in vehicle emissions. This may increase the impact of climate change.
	Reduction or loss of amenity values, including public viewpoints, arising from development

	(e.g. going from a green, open space to a developed, built environment).
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	
Social	
Provides social cohesion due to its close proximity to existing residential housing, schools and retail in Helensburgh and Wakari.	Potential loss of food production due to the potential land use of farming livestock.
Due to the capacity of the site, could potentially create more working environments and therefore the potential for communities to have better access to potential places of employment in the local area, access to goods and services, and therefore the potential to reduce commuting times between home, work and goods and services.	Potential loss of agricultural jobs or businesses due to the current land use of farming livestock.
Good recreational opportunities near the site with the nearby Bain Recreational Reserve, Balmacewen Golf Course and Ross Creek Reservoir.	The potential increase in traffic congestion and the impacts of this on neighbours as well as greenhouse gas emissions and climate change.

AREA 9

Area 9 is located at 636 North Road, Normanby. The current land use is Rural Industry: Stock Finishing. It is surrounded by Greenfield sites with Forrester Park (a recreational area) located immediately to the north.

FIGURE 10: MAP SHOWING AREA 9 (IN RED)



In terms of transport, North Road is an Arterial Road. There is public transport located approximately 1km from the site.

The site is located within the Rural Hill Slopes zone as well as the Significant Natural Landscape overlay for Flagstaff-Mt Cargill (currently subject to appeals).

TABLE 7: CHARACTERISTICS OF AREA 9

Area 9	
Location	636 North Road (Area 2: extension)
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	5.40
Expected Dwelling Capacity	48
High Class Soil Coverage	71%
HPL - 3 Coverage	-
HPL - 1 Coverage	-

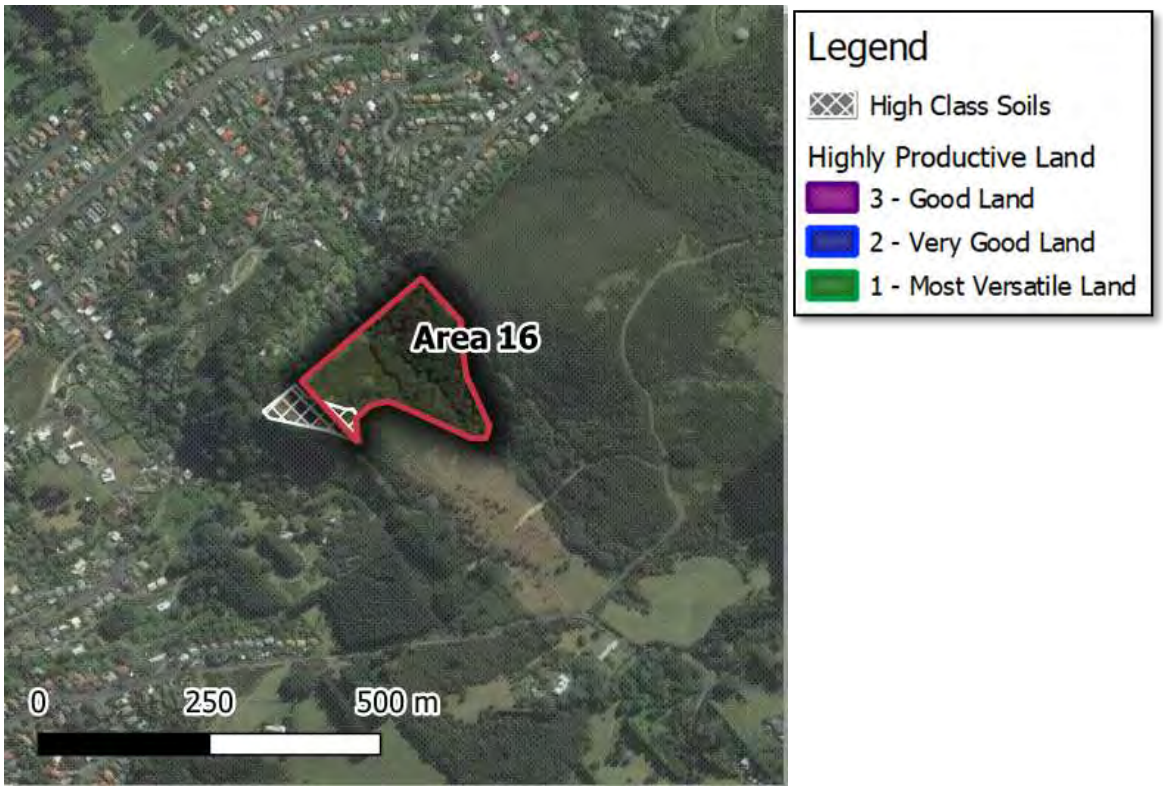
Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
While the resulting density is efficient the overall level of sites is relatively small. With limited access and current continuity with an urban environment the economic benefits are likely to be minimal. There is a high expectation that current provision for development 'bridging' the urban area will occur which has the potential to improve the economic benefit of this area for future development: (timing dependant due to lower connectivity)	The affected site is both productive and consists of a majority of HCS. As such the potential reduction in output to 2048: $100,000 (discounted). Reverse Sensitivity Risk: Medium.
Environmental	
Water quality (both ground and surface water) may improve due to the environmental effects of the current land use (stock finishing) being removed (e.g. point discharges of dairy effluent, application of fertiliser and agrichemicals, sedimentation).	Potential erosion and sedimentation effects when developing as on a hill slope.
Less demand for water (stock water and irrigation), thereby allowing surface and groundwater to replenish its allocation and quantities.	Potential hazard and land instability effects arising from the residential development.
	Due to the lack of available public transport and the large capacity of the site, may result in potential increase in greenhouse gas emissions due to an increase in vehicle emissions thereby increasing the impact of climate change.
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	

Social	
	Potential loss of agricultural jobs and businesses provided, particularly given the current land use of "stock finishing".
	Loss of food production, or potential food production in the future due to the stock finishing land use.

AREA 16

Area 16 is located at 233 Signal Hill Road, Opoho. The current land use of the site is Lifestyle: Single Unit. There is general residential located to the north and west of the site with the surrounding land undeveloped.

FIGURE 11: MAP SHOWING AREA 16



In terms of transport, Signal Hill Road is classified as a Collector Road under the 2GP. The site is part of Opoho which contains some shops, but it is also on the outskirts of Northern Dunedin which contains businesses, a supermarket and retail.

In terms of overlay sites, there are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas).

The site contains a Significant Natural Landscape overlay (Flagstaff-Mt Cargill) which is under appeal. It is located within 700m of public transport routes.

TABLE 8: CHARACTERISTICS OF AREA 16

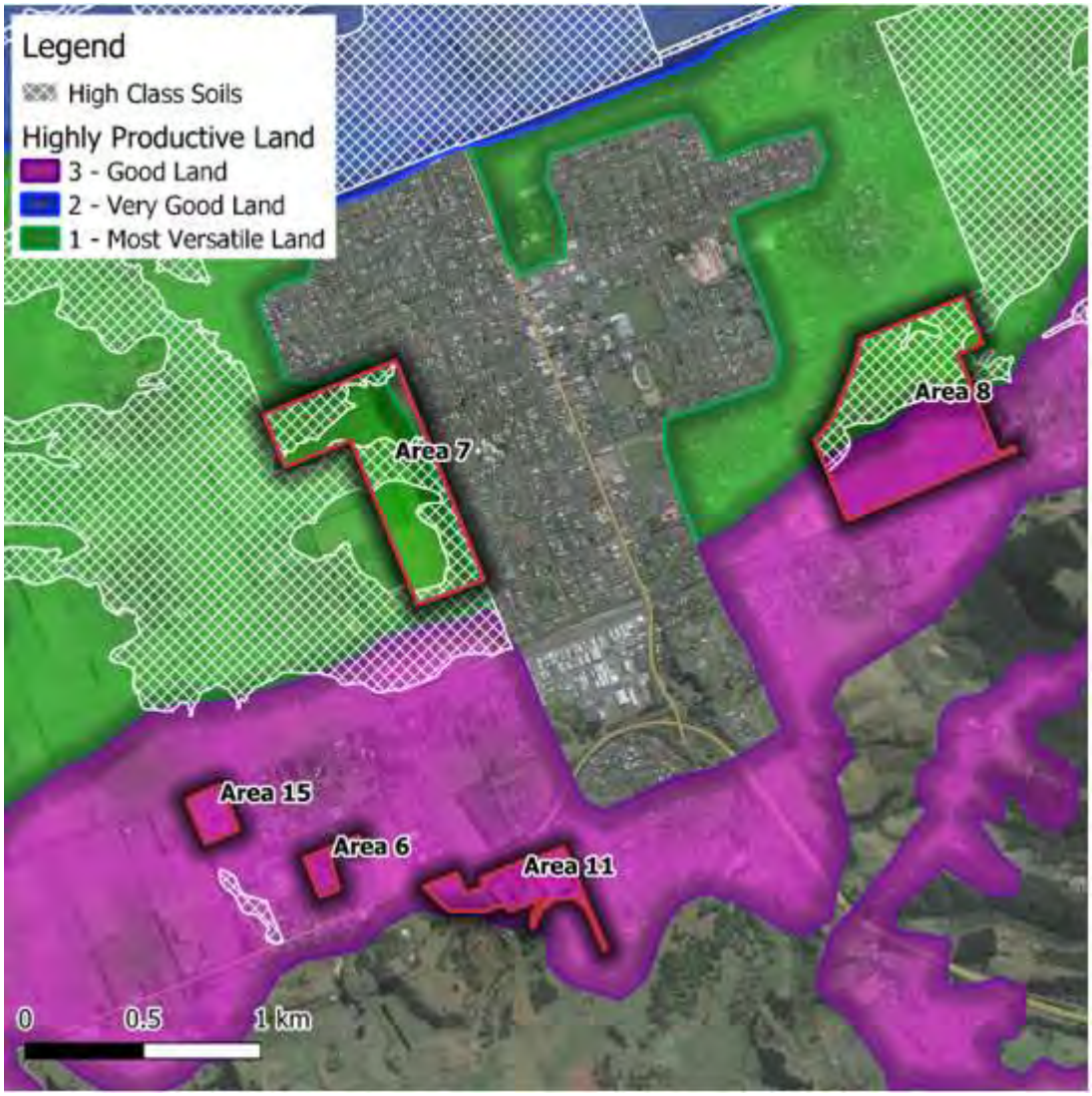
Area 16	
Location	233 Signal Hill Rd
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	3.35
Expected Dwelling Capacity	41
High Class Soil Coverage	3%
HPL - 3 Coverage	-
HPL - 1 Coverage	-

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Fits the current urban form and contributes to both economies of scale in the area, public infrastructure utilisation and likely to increase demand for local services.	With only 3% of the 3.3 ha of developable land being HCS the expected impact on HCS production to 2048 is expected to be: $27,000 (discounted). Reverse Sensitivity Risk: Low.
Environmental	
	Potential erosion and sedimentation effects when developing as the site is located on a hill slope.
	Potential hazard and land instability effects arising from the residential development located on a hill.
	Reduction or loss of amenity values, including public viewpoints, arising from development. This is particularly relevant given the site is

	located within a Significant Natural Landscape overlay (Flagstaff-Mt Cargill).
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	
Social	
The site is located near a public transport route, thereby it could improve accessibility to jobs and services via public and active transport.	
Provides social cohesion due to its close proximity to existing residential housing, and schools and retail in Opoho / North East Valley.	
Due to the capacity of the site, could potentially create more working environments and therefore the potential for communities to have better access to potential places of employment, access to goods and services, and therefore the potential to reduce commuting times between home, work and goods and services.	

5.3. MOSGIEL CATCHMENT

FIGURE 12: MOSGIEL CATCHMENT AREAS



AREA 6

Area 6 is located on Riccarton Road East in Mosgiel. The current land use is Lifestyle: Single Unit and Residential: Vacant.

The site is surrounded by developed residential subdivision. Jaffray Stream runs along the eastern boundary of the site.

FIGURE 13: MAP SHOWING AREA 6

In terms of transport, Riccarton Road East is an Arterial Road whilst Main South Road is a Strategic Road under the 2GP. There is no public transport located within 1km of the site.

In terms of overlay sites, there are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas). The site contains the Hazard 3 (alluvial fan) overlay, which is low risk. It also contains a flood hazard from the nearby Jaffray Stream.

TABLE 9: CHARACTERISTICS OF AREA 6

	Area 6
Location	49 and 55A Riccarton Rd East
Current Zone	Large Lot Residential 1
Proposed Zone	General Residential 1
Size (ha)	2.03
Expected Dwelling Capacity	14
High Class Soil Coverage	-
HPL - 3 Coverage	100%
HPL - 1 Coverage	-

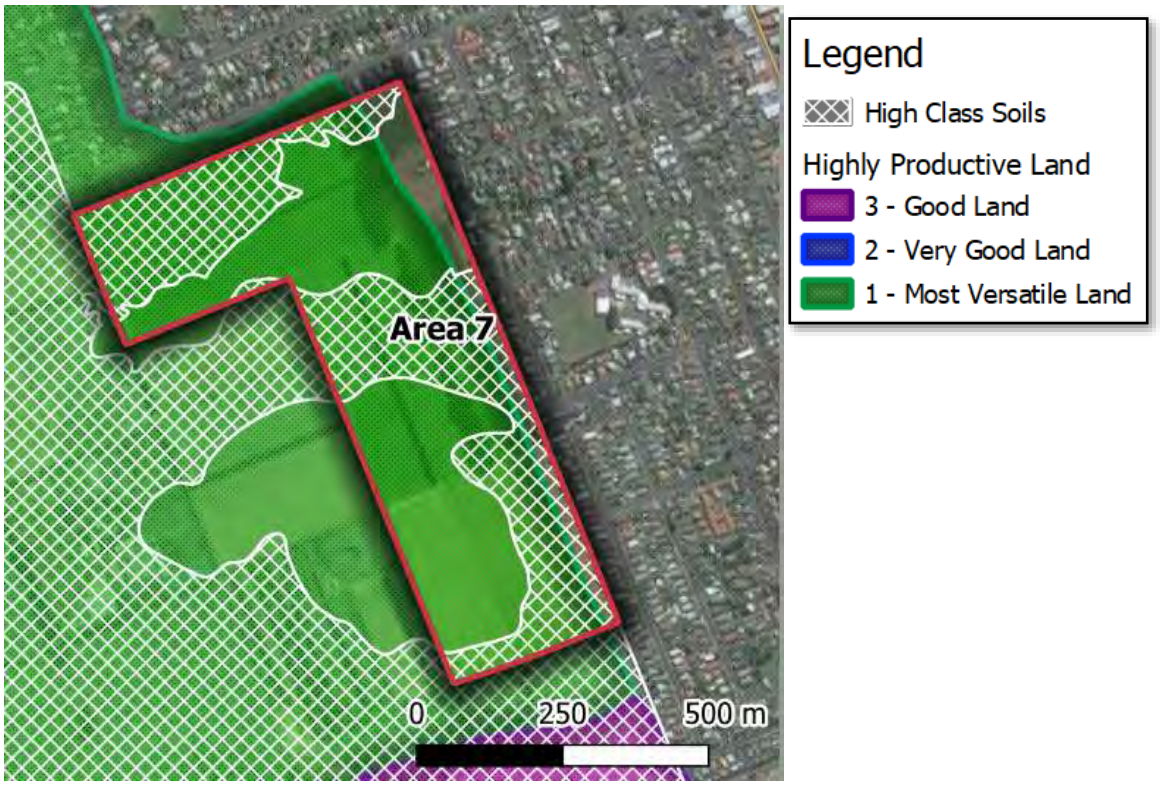
Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Fits the current urban form and contributes to both economies of scale in the area, public infrastructure utilisation and likely to increase demand for local services.	Consists of 2 small sites unlikely to be materially productive in primary output. Reverse Sensitivity Risk: Low to None.
Environmental	
	Potential decreases in water quality due to increases in stormwater discharges associated with residential development to urban streams (particularly nearby Jaffray Stream).
	Lack of nearby public transport may result in potential increase in greenhouse gas emissions due to an increase in vehicle emissions thereby increasing the impact of climate change (e.g. greenfield site developed to residential that is not well connected to public transport).
	Potential negative effects on aquatic life in Jaffray Stream due to increased soil-runoff from soil compaction (soil compaction occurs when the soil is compressed and cannot absorb water, making it drought-prone).
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	
Social	
Provides social cohesion due to its close proximity to existing residential housing, schools and retail in Mosgiel. Surrounded by residential housing.	
May provide employees for nearby Mosgiel, which contains many businesses, retail and supermarkets.	

AREA 7

Area 7 is located 27 Inglis Street and part 58 Ayr Street in Mosgiel. The current land use is Rural Industry: Arable Farming and Lifestyle: Vacant.

Residential development is located to the east with other Greenfield located to the south, west and north. Wal's Plant Land is located to the west.

FIGURE 14: MAP SHOWING AREA 7



In terms of transport, Inglis and Ayr Streets are local roads. There is public transport located within 600m of the site.

In terms of overlay sites, there is a wāhi tupuna area (ID 56. – Kokika o Te Matamata) located on part of the site. The site is also within a Hazard 3 flood overlay zone (low risk) associated with the east of the Lower Pond on Taieri.

The site is over a Groundwater Protection Mapped Area – the Lower Taieri Aquifer. There is also a designation (218) over the site which is for the East Taieri Drainage Scheme, with the requiring authority being the Otago Regional Council.

TABLE 10: CHARACTERISTICS OF AREA 7

Area 7	
Location	27 Inglis St and part 58 Ayr St, Mosgiel
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	37.15
Expected Dwelling Capacity	433
High Class Soil Coverage	50%
HPL - 3 Coverage	-
HPL - 1 Coverage	89%

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Provides for significant residential capacity with close proximity to the existing urban environment. Increased amenity and highest and best use[3].	Both affected sites have productive value as well as registering HPL 1 HCS. Combined they have the potential for primary production output to 2048 equating to: $850,000 (discounted). Reverse Sensitivity Risk: Low.
Environmental	
Water quality (both ground and surface water) may improve due to the potential adverse environmental effects associated with agriculture being removed (e.g. application of fertiliser and agrichemicals).	Potential negative effects on aquatic life due to increased soil-runoff from soil compaction (soil compaction occurs when the soil is compressed and cannot absorb water, making it drought-prone). This is particularly relevant given the excellent soils on the site (class 1).

[3] *This relates to the capital value change with resulting from the potential zone change, given the relatively low current land value (approximately $35,000/ha) and the subsequent residential value (approximately 20-fold)*

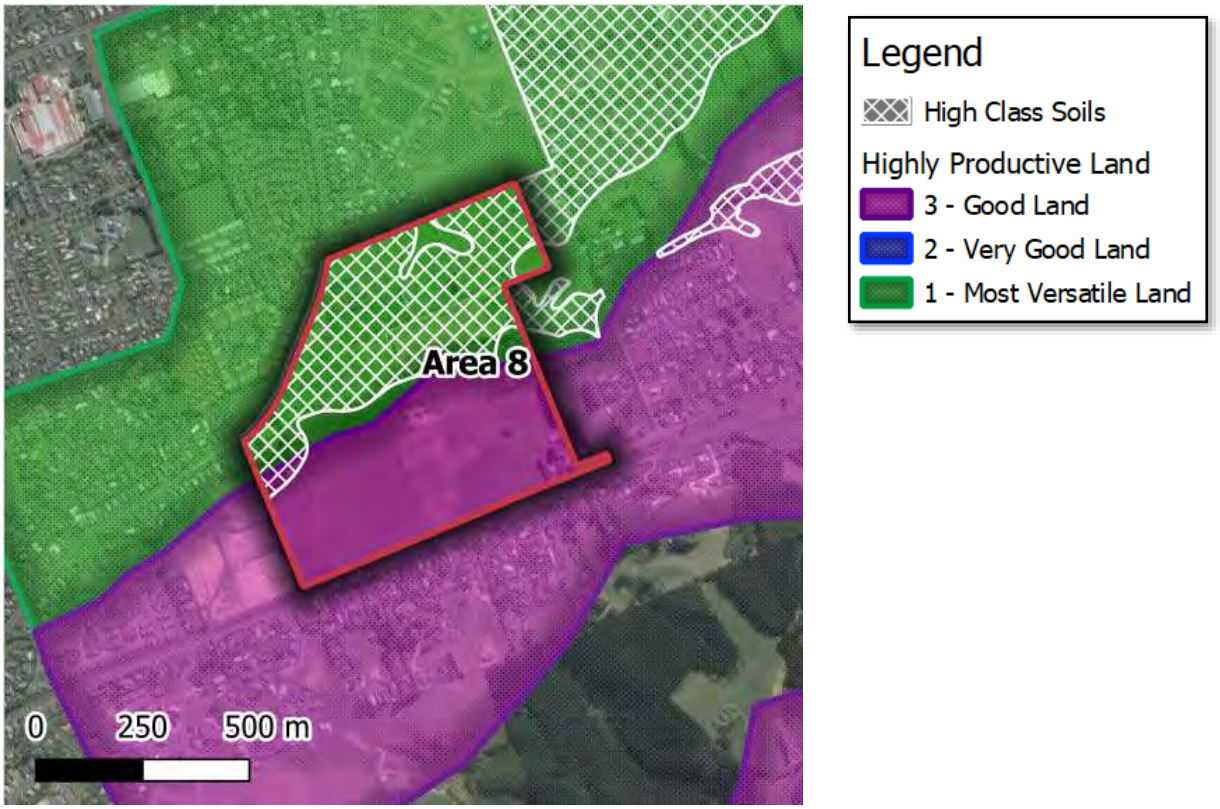
Less demand for water (irrigation), thereby allowing surface and groundwater to replenish its allocation and quantities.	Potential decreases in water quality due to increases in stormwater discharges associated with residential development to urban streams.
	Potential to exacerbate existing flooding issues given the flood overlay zone.
	Located within a Groundwater Protection Area, thereby residential development may affect this area regards to water quality and quantity.
	Loss of Class 1 soils which are the most versatile land with minimal limitations to arable use.
Cultural	
	Potential to disturb a wāhi tupuna area.
Social	
Good social cohesion due to the site being located immediately adjacent to existing residential development and Mosgiel.	Potential loss of agricultural jobs or business as the site is currently arable farming.
The site is located near a public transport route, thereby it could improve accessibility to jobs and services via public and active transport.	Potential loss of food production due to the loss of the cropping that is currently being undertaken at the site.

AREA 8

Area 8 is an area called the Taieri Plain Rural and it is bounded by Hagart-Alexander Drive, Gladstone Road North and Wingatui Road in Mosgiel.

The current land use is Greenfield (Rural Industry: Stock Finishing and Lifestyle: Vacant) as well as Lifestyle: Multi Unit and Lifestyle: Single Unit. Rural Industry: Stock Finishing. Residential development is located to the west, north, south and partially to the east.

FIGURE 15: MAP SHOWING AREA 8



In terms of transport, Hagart-Alexander Drive is an Arterial Road; Gladstone Road North is a Collector Road; and Wingatui Road is a local road. There is public transport located approximately 700 metres from the closest boundary of the site.

The site is also within a Hazard 3 flood overlay zone (low risk) associated with the east of the Lower Pond on Taieri. There is also a designation (218) over the site which is for the East Taieri Drainage Scheme, with the requiring authority being the Otago Regional Council.

TABLE 11: CHARACTERISTICS OF AREA 8

Area 8	
Location	Area zoned Taieri Plain Rural bounded by Hagart-Alexander Drive, Gladstone Rd North, Wingatui Rd
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	43.92
Expected Dwelling Capacity	378
High Class Soil Coverage	45%
HPL - 3 Coverage	49%
HPL - 1 Coverage	51%

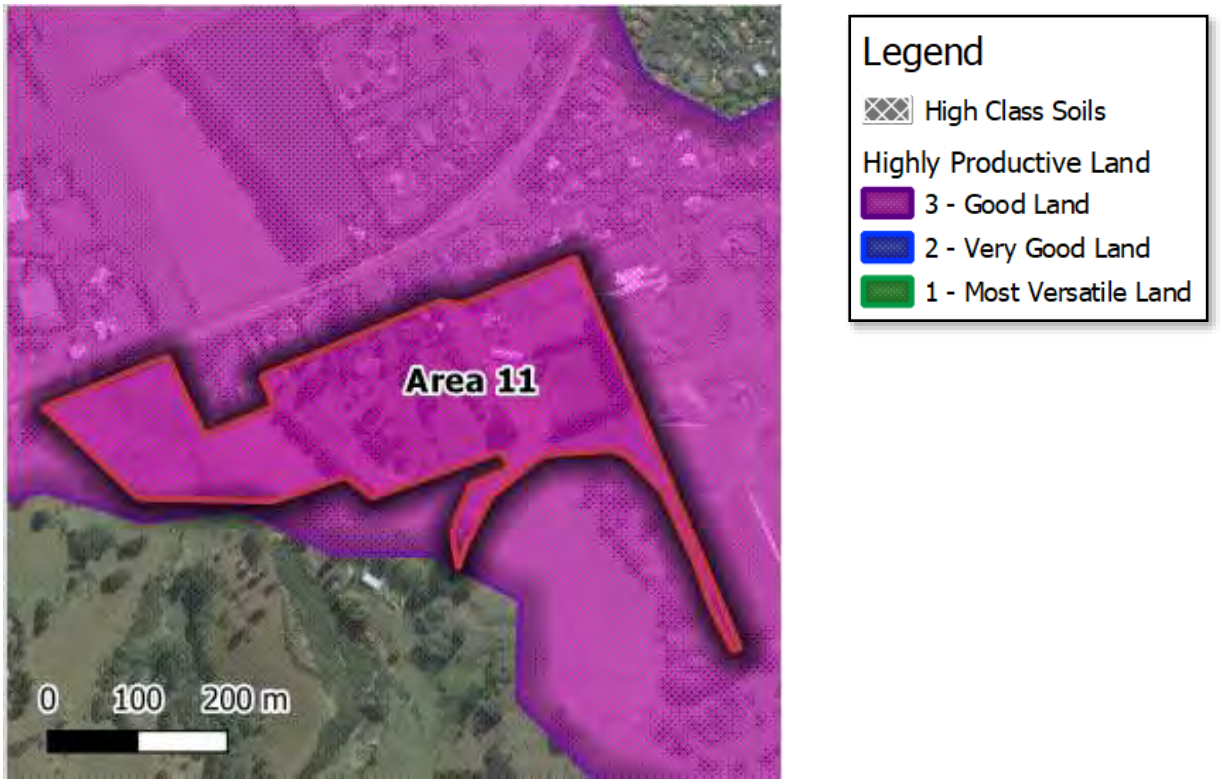
Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Provides for significant residential capacity with close proximity to the existing urban environment. Increased amenity and highest and best use.	While several sites are impacted only 11ha are likely to result in primary production. Even with a significant proportion of HCS (45%) the total expected reduction in output to 2048: $245,000 (discounted). Reverse Sensitivity Risk: Low to None
Environmental	
	Potential negative effects on aquatic life due to increased soil-runoff from soil compaction (soil compaction occurs when the soil is compressed and cannot absorb water, making it drought-prone). This is particularly relevant given the excellent soils on the site (class 1).
	Potential decreases in water quality due to increases in stormwater discharges to urban streams associated with residential development.
	Potential to exacerbate existing flooding issues given the flood overlay zone.
	Loss of Class 1 soils which are the most versatile land with minimal limitations to arable use.
	The lack of available public transport close to the site may result in potential increase in greenhouse gas emissions due to an increase in vehicle emissions thereby increasing the impact of climate change (e.g. greenfield site developed to residential that is not well connected to public transport).
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	

Social	
Good social cohesion due to the site being located immediately adjacent to existing residential development and Mosgiel.	Loss of potential food production and associated jobs / businesses in the future due to the loss of Class 1 soils.

AREA 11

Area 11 is located at 5 Main South Road, East Taieri. The Greenfield site has a current land use of Lifestyle: Vacant and Lifestyle: Single Unit. To the north of the site is State Highway and to the east, south and west is varying degrees of residential development.

FIGURE 16: MAP SHOWING AREA 11



There is public transport located within 1km of the site.

TABLE 12: CHARACTERISTICS OF AREA 11

	Area 11
Location	5 Main South Road, East Taieri (non-SNL area)
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	10.11
Expected Dwelling Capacity	79
High Class Soil Coverage	-
HPL - 3 Coverage	100%
HPL - 1 Coverage	-

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
With potential capacity of nearly 80 sites and a location that provides efficiencies with the existing urban area this area adds material capacity to meet future growth requirements.	While several sites are impacted only 2 have the potential to efficiently operate primary production. In total 4.1 productive(LUC 3) hectares are impacted with a total expected reduction in output to 2048: $42,000 (discounted). Reverse Sensitivity Risk: Low to None
Environmental	
	Lack of available public transport may result in potential increase in greenhouse gas emissions due to an increase in vehicle emissions thereby increasing the impact of climate change (e.g. greenfield site developed to residential that is not well connected to public transport).
	Potential to exacerbate flooding issues given the flood overlay zone.
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	

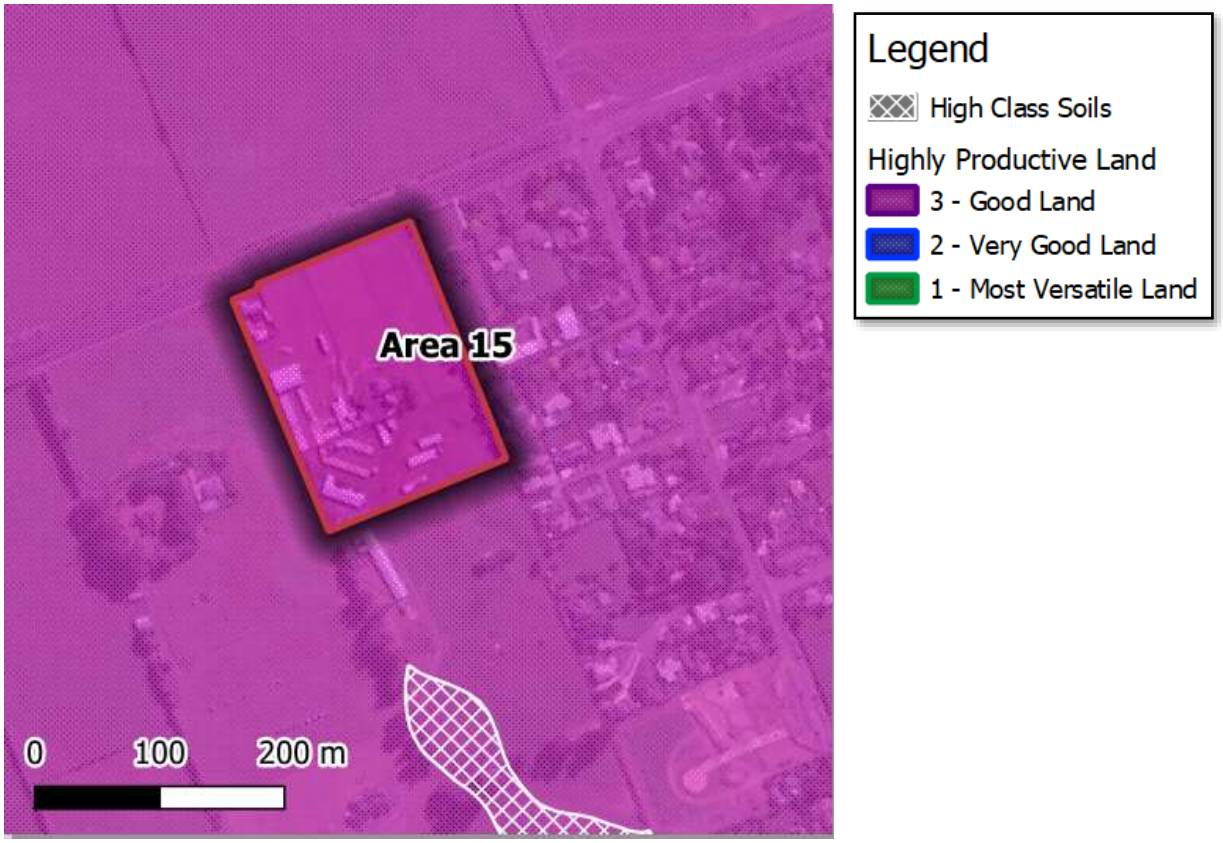
Social	
Good social cohesion due to the site being located immediately adjacent to existing residential development and Mosgiel.	

AREA 15

Area 15 is located at 201, 207 and 211 Gladstone Road South, East Taieri. The current land use of the site is Greenfield (Rural Industry: Stock Finishing) as well as Lifestyle: Single Unit and Residential: Single Unit excluding bach.

Immediately north of the site is the Main South Railway Line, with residential development to the east. To the south and west are Greenfield sites. There is no public transport located within 1km of the site.

FIGURE 17: MAP SHOWING AREA 15



In terms of transport, Gladstone Road South is classified as a Collector Road under the 2GP. The site is part of East Taieri which contains some shops, but it is also on the outskirts of Mosgiel.

In terms of overlay sites, there are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas). The site contains a hazard 3 (alluvial fan) overlay which is low risk.

TABLE 13: CHARACTERISTICS OF AREA 15

	Area 15
Location	201, 207, and 211 Gladstone Road South
Current Zone	Rural
Proposed Zone	General Residential 1
Size (ha)	3.16
Expected Dwelling Capacity	36
High Class Soil Coverage	-
HPL - 3 Coverage	100%
HPL - 1 Coverage	-

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Fits the current urban form and contributes to both economies of scale in the area, public infrastructure utilisation and likely to increase demand for local services.	Consists of 3 small sites unlikely to be materially productive in primary output. Reverse Sensitivity Risk: Low to None
Environmental	
	Lack of available public transport may result in potential increase in greenhouse gas emissions due to an increase in vehicle emissions thereby increasing the impact of climate change (e.g. greenfield site developed to residential that is not well connected to public transport).
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	
Social	
Good social cohesion due to the site being located immediately adjacent to existing	

residential development in East Taieri and Mosgiel.	

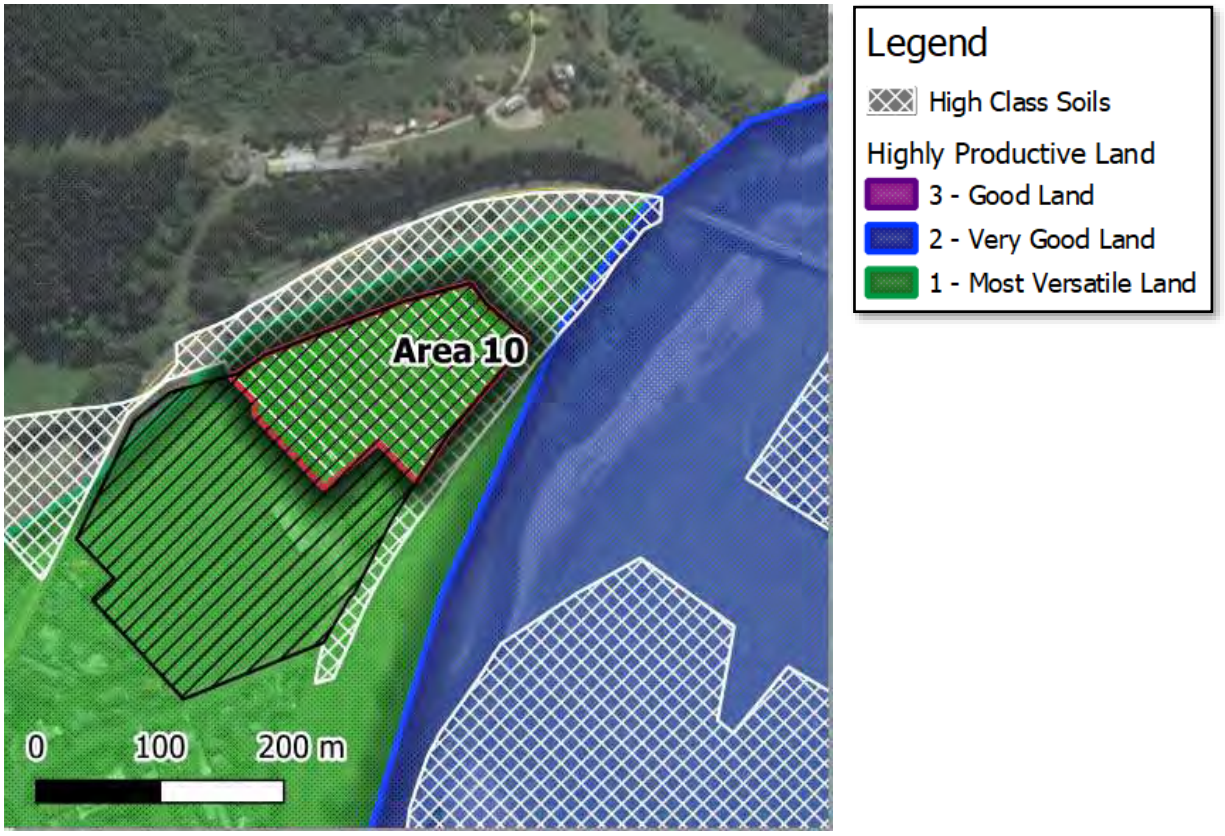
5.4. OTHER AREAS

AREA 10

Area 10 is located at 50 Franks Place, Outram. The Greenfield site has a current land use of Lifestyle: Single Unit.

To the north of the site is State Highway 87; directly to the east and south is the Taieri River; and to the west is residential land.

FIGURE 18: MAP SHOWING AREA 10 AND ASSOCIATED PARCEL



There is no nearby public transport available.

The site is located within a Hazard 2 flood overlay, with a moderate risk. The site is also located within a "no DCC reticulated wastewater mapped area".

TABLE 14: CHARACTERISTICS OF AREA 10

Area 10	
Location	50 Franks Place, Outram (Rural zoned parts)
Current Zone	Rural
Proposed Zone	Large Lot Residential 1
Size (ha)	2.16
Expected Dwelling Capacity	13
High Class Soil Coverage	100%
HPL - 3 Coverage	-
HPL - 1 Coverage	100%

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Minimal contribution to accommodating residential growth and impacts on residential prices in general.	Existing area has been subdivided for residential use as such the remaining 2 hectare block is unlikely to have significant future productive value: Reverse Sensitivity Risk: Low
Environmental	
	Potential decreases in water quality due to increases in stormwater discharges associated with residential development to urban streams, particularly given the nearby Taieri River.
	Potential for increased pressure on natural resources (e.g. such as water quality) if urban intensification is not appropriately managed in relation to potential adverse effects on the natural environment (particularly the Taieri River).

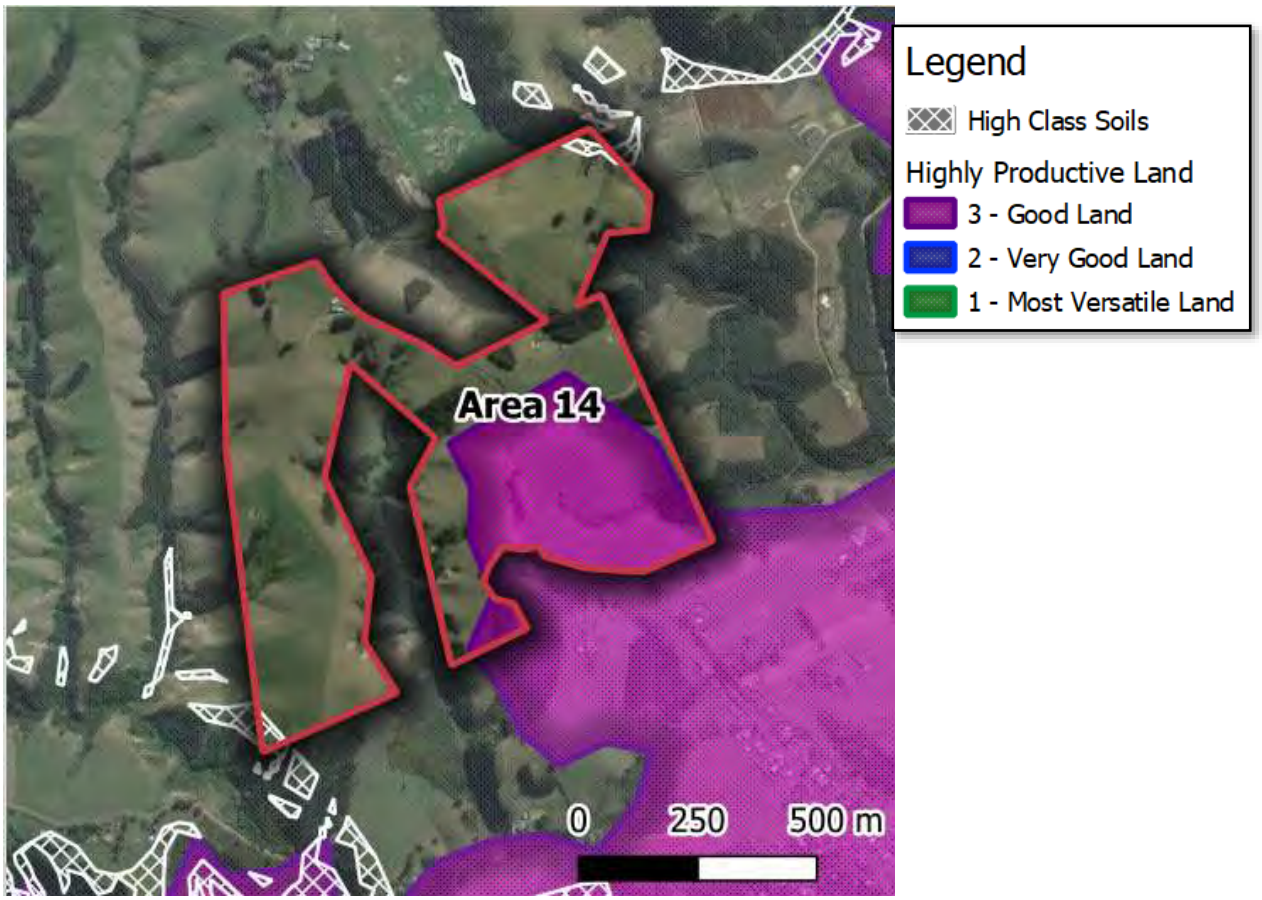
	The lack of available public transport may result in potential increase in greenhouse gas emissions due to an increase in vehicle emissions thereby increasing the impact of climate change (e.g. greenfield site developed to residential that is not well connected to public transport). This may also be exacerbated given the few working opportunities in nearby Outram and the probable need for residents to travel for work.
	Potential negative effects on aquatic life due to increased soil-runoff from soil compaction (soil compaction occurs when the soil is compressed and cannot absorb water, making it drought-prone). This is exasperated given the Class 1 soils on the site.
	Loss of excellent Class 1 soils (most versatile land with minimal limitations to arable use).
Cultural	
May increase accessibility to nearby Taieri River.	Potential loss of mahinga kai, particularly Nohoaka sites, due to the presence of the nearby Taieri River.
Social	
	Due to no public transport being available, the potential increase in traffic congestion and the impacts of this on neighbours as well as greenhouse gas emissions and climate change.
	The costs of additional infrastructure and public services given there are no Council services in this area.
	Loss of potential food production and associated jobs / businesses in the future due to the loss of Class 1 soils.

AREA 14

Area 14 is located at 155 and 252 Scroggs Hill Road, Brighton.

The current land use of the site is Rural Industry: Stock Finishing. Brighton township is located south down the hill but otherwise, the site is surrounded by Greenfield / farmland.

FIGURE 19: MAP SHOWING AREA 14 (IN RED)



In terms of transport, Scroggs Hill Road is classified as a Collector Road under the 2GP. Brighton is located approximately 3km south and contains community facilities and some shops. It is assumed the nearest available public transport is located in Brighton.

In terms of overlay sites, there are no scheduled items located on the site according to the 2GP planning maps (such as heritage items, archaeological sites or wāhi tupuna areas or hazard areas).

TABLE 15: CHARACTERISTICS OF AREA 14

Area 14	
Location	155 and 252 Scroggs Hill Road
Current Zone	Rural / Rural Residential 1
Proposed Zone	Large Lot Residential 1
Size (ha)	62.88
Expected Dwelling Capacity	45
High Class Soil Coverage	1%
HPL - 3 Coverage	24%
HPL - 1 Coverage	-

Potential Benefits of Urban Expansion occurring on highly productive land	Costs associated with the irreversible loss of highly productive land for primary production
Economic	
Provides for increased capacity within the lifestyle residential market, potentially increasing the competitive nature of this market. Limited efficiencies in terms of amenity and economies of scale.	Several factors contribute to the primary value of this area. Firstly the 2 affected sites are large and secondly only approximately 25% of the sites fall within the (LUC) HPL. Overall, this gives a output value to 2048 of: $526,000 (discounted). Reverse Sensitivity Risk: Medium
Environmental	
Less demand for water (stock water and irrigation), thereby allowing surface and groundwater to replenish its allocation and quantities.	Potential erosion and sedimentation effects when developing as the site is located on a hill slope.
Water quality (both ground and surface water) may improve due to the potential adverse environmental effects associated with agriculture being removed (e.g. point discharges of dairy effluent, application of fertiliser and agrichemicals, sedimentation).	Potential hazard and land instability effects arising from the residential development located on a hill.

	Due to the large capacity of the site and public transport being located 3km away, a potential increase in greenhouse gas emissions due to an increase in vehicle emissions thereby increasing the impact of climate change (e.g. greenfield site developed to residential that is not well connected to public transport).
	Potential reduction or loss of amenity values, including public viewpoints, arising from development due to the site being located on a hill and overlooking the coastal environment.
Cultural	
Nothing more specific than those listed in the general benefits and costs (Section 2.3 of this memorandum)	
Social	
Provides social cohesion due to its close proximity to existing residential housing, schools and shops in Brighton.	The potential increase in traffic congestion and the impacts of this on neighbours as well as greenhouse gas emissions and climate change.
Due to the capacity of the site, could potentially create more working environments and therefore the potential for communities to have better access to potential places of employment, access to goods and services, and therefore the potential to reduce commuting times between home, work and goods and services.	Potential loss of agricultural jobs and businesses provided by the highly productive land, particularly given its existing land use of stock finishing.
	Loss of food production, or potential food production in the future (i.e. meat, orchards, crops).
	The costs of additional infrastructure and public services.

6. ECONOMIC REVIEW

Table 16 below outlines the summary economic variables resulting from the process above.

A key economic cost identified through this report is, specially, the value-added cost resulting as a potential loss of productive agricultural land for residential development. This value-added loss is a representative proxy for losses in food production as well as potential impacts on flow-on benefits to the community through increased productive operations and employment provision.

Essentially this table represents the relative impact of each identified area on the Dunedin economy providing for a scenario where each area has the potential to achieve the highest value (based on localised averages) per hectare activity.

It is therefore considered pertinent to utilise the lost value by site provided for each area as an indicator of the relative economic costs of residential rezoning. Column 6 within the table below outlines this representative cost ranging from sites that are unlikely to result in lost production (due to factors such as current activities, current site sizes, HPL classifications), such as Area 15 through to areas that have significant relative potential economic costs associated with them, such as Area 14 (due in part to its productive capacity and resulting low density residential outcome.

It is important to note when considering these relative costs that their significance in terms of the wider economy are likely to be less material. As outlined above the total identified land area (for all 16 areas) equates to only 300 hectares in comparison to a District wide HPL land area of 32,000 hectares and an agricultural sector that contributes less proportionately than the national average.

TABLE 16: RELATIVE ECONOMIC AREA POSITIONS

Area	Sites	Area (Ha)	Value Added (annual)	Value Added (Total NPV)	Average Land Use	Production / Site	Reverse Sensitivity	Urban Connectivity
1	12	9.74	$0	$0	1.23	$0	low	medium
2	25	5.76	$6,633	$33,600	4.34	$1,344	low	medium
3	617	70.28	$103,443	$524,000	8.78	$849	medium	high
4	163	22.4	$53,301	$270,000	7.28	$1,656	low	medium
5	70	19.72	$28,625	$145,000	3.55	$2,071	low	medium
6	14	2.03	$0	$0	6.90	$0	low	medium
7	433	37.15	$167,799	$850,000	11.66	$1,963	low	medium
8	378	43.92	$48,366	$245,000	8.61	$648	low	medium/high
9	48	5.4	$19,741	$100,000	8.89	$2,083	medium	low
10	13	2.16	$0	$0	6.02	$0	low	low
11	79	10.11	$8,291	$42,000	7.81	$532	low	medium
12	37	8.94	$16,780	$85,000	4.14	$2,297	low	medium
13	6	1.35	$0	$0	4.44	$0	low	medium
14	45	62.88	$103,838	$526,000	0.72	$11,689	medium	low
15	36	3.16	$0	$0	11.39	$0	low	medium
16	41	3.35	$5,330	$27,000	12.24	$659	low	medium

In terms of relative economic benefits associated with the residential rezoning of these areas, three key factors (two of which are interrelated) have been considered.

The first relates to existing urban connectivity and the ability for the identified area to access amenity and facilities that would amplify the economic value attributable to residential activity in each area. Economic values (beyond such considerations as wealth, affordability and choice) generally relate to associated amenities that contribution to quality of life and accessibility (to employment, public transport, community facilities etc). In terms of the identified areas these have been summarised as connectivity, each area is therefore rated as low to high.

Additionally, reverse sensitivity has the potential to impact upon existing activities and their productivities, due to this usually coinciding with urban form individually it contributes to a lesser degree than connectivity.

Finally, the general extent to land use efficiency is considered in terms of sites per hectare. While there is value in the provision of larger lots (e.g. for 'lifestyle' choice) the uptake of more land, on average, for residential use typically reduces land use efficiencies and relates to a lower economic value (and typically a lower value per sqm). Once again, in terms of relativity, Area 14 has a low connectivity with lower land use efficiency.

Table 17 summarises the relative economic impacts associated with each site by categorising the sites into three classifications – Lowest Relative Economic Impact, Medium / Middle Relative Economic Impact, and Highest Relative Economic Impact. These classifications are relative to each other, i.e. Area 14 has High economic costs relative to Area 11.

TABLE 17: RELATIVE ECONOMIC COSTS

Lower Impact	Medium Impact	Highest Impact
1,3,6,8,11,13,15,16	2,4,5,7,10,12	14,9

Source: Property Economics

As outlined the economic costs assessed include primarily land-based production value (based on a potential average for the land type classification) as well as considering any reverse sensitivity issues. The economic benefits include the extent and location of potential residential capacity and its ability to meet future demand projections in a managed environment.

Essentially Table 17 outlines the potential production cost associated with each dwelling provided through the potential rezoning. This is 'tempered' through a ratio for reverse sensitivity (7.5% at the upper limit).

While not a full economic cost assessment (not considering such factors as infrastructure constraints and provision), this provides for a relative economic value between the identified growth locations indicating areas that display lower relative (to the full spectrum of areas) direct land costs and those which indicate higher relative costs.

Mayor's Taskforce for Housing

Housing Action Plan for Dunedin 2019-2039

April 2019

DUNEDIN CITY COUNCIL
Kaunihera-a-rohe o Otepoti

COMMUNITY HOUSING SOLUTIONS

Table of Contents

Introduction

Housing is among our nation's most critical problems and not just in our largest city, Auckland. It is becoming a critical issue for Dunedin too; from health, economic development and community well-being perspectives.

Dunedin is now classified as a medium-growth city. Demand for homes has increased with a rising population and increasing construction worker numbers. Some homes that might otherwise be rented are being turned into visitor accommodation.

Supply of housing has not kept pace with the increase in population, and house and rental prices have risen accordingly. It is difficult for lower income families to get into any home at a reasonable price.

Compounding this still is the poor quality of some of our city's older housing – particularly rental houses. Cold, damp housing continues to contribute to Dunedin hospital admissions.

The economic downside is that businesses and workers will not come to a city with nowhere adequate to live.

Upcoming major developments; the hospital re-build and several University projects, will require more out-of-town construction and related workers. This increased demand is expected to compound the large waiting lists for social housing, creating the perfect housing storm.

By working together, we can create a city which maintains sustainable growth while also providing available, affordable and quality homes, with equitable access, for the whole community.

This is why the Mayor's Taskforce for Housing was convened in April 2018. To bring forward the actions and solutions that will see our City avoid the crisis that has plagued other centres.

This report presents 16 recommended action points to ensure affordable and accessible healthy homes for our people living in Dunedin, especially for those needing social and emergency housing. The Taskforce calls upon all concerned parties to work together to address these action points.

Purpose of the Taskforce

The Mayor's Taskforce for Housing (the Taskforce) was established to provide recommendations to guide key stakeholders and the wider community in meeting the city's long-term housing needs and Community Outcomes related to housing.

It's acknowledged that a housing shortage already exists within Dunedin and that, if this issue is not addressed, it could result in a housing crisis. It is also understood that quality of housing needs improvement.

The Mayor's Taskforce for Housing is a multi-sector group with members chosen specifically for knowledge and experience of housing and strategies that can address housing needs. The Taskforce can request input from other organisations or individuals working within specific areas of the sector. Full Terms of Reference for the Mayor's Taskforce for Housing and its membership are listed Appendix 1.

Executive Summary

Dunedin City is experiencing major changes in housing affordability. There is a mix of changing demographic, economic and social factors resulting in challenges for residents to find secure, warm, safe and dry homes. Some of these factors are demographic changes such as an aging population, refugee resettlement, increasing migration from the North Island and overseas and changes to average household sizes. Estimated population growth of 1,900 people over the 2017/2018 year, and 1,800 people over the 2016/2017 year, shows two years of a sharp rise in population compared with an average of 290 new residents per year during the prior decade.

The quality of housing in Dunedin is a concern, with a relatively older housing stock that is less likely to be insulated. There is a very limited supply of units of houses that are suitable sized and designed for older persons and those with physical or sensory disabilities.

With rising rents and house prices, fewer residents are able to access a home. There are minimal options in Dunedin for suitable short-term emergency accommodation. Lack of flexibility in tenure is a complication for people with mental health issues, people with physical and sensory disabilities and older people (e.g. when moving from hospital care or supported to independent living).

The Taskforce estimates that around 440 households are experiencing high housing stress, overcrowding, and periods of homelessness. Demand is growing with both the MSD Social Housing Register and the Dunedin City Council waitlist increasing over the past year. Taskforce members providing front-line services to families and individuals in high-need and facing severe rental stress seeking an affordable rental solution, report increasing demand for their services.

Supply of new affordable homes is pressured, with only 55 new Social Housing places currently funded for Dunedin in the Ministry of Housing & Urban Development's Public Housing Plan during the next four years. There are few currently planned rental units, where the rent would be affordable to a person earning minimum wage or a benefit (estimated at $250/pw). Estimated population growth is the highest expected in at least 20 years; and it's projected the city therefore needs to build about 750 homes every year, instead of the 340 - 360 currently being built.

In Dunedin, the median household income for the year ending December 2018 was approximately $71,500, with a median house price of $408,500. Currently Dunedin is at the early stages of unaffordability – with a median house price of 5.7 times the median household income.

The Taskforce recognises the vision of Dunedin - that Dunedin is one of the world's great small cities. The recommendations and actions in this report contribute to this vision and also to the strategic priorities and principles of the Dunedin City Council Strategic Framework.

The Taskforce believes that Dunedin as a community must work together to support the city's vision. By bringing together our skills, resources and knowledge we can define and deliver a Dunedin response to the housing challenges being faced. The Taskforce proposes the following set of actions based on the information gathered

over the past year. The actions are designed to address the following priorities set out in the Terms of Reference:

- Social housing
- Emergency housing
- Affordable housing
- Healthy housing

1. Healthy Housing Recommendations: Promote Healthy Homes across all tenures.

Action 1.1 **Advocate for incentives to landlords to improve habitability and security of tenure.**

Action 1.2 **Continue investment in the Cosy Homes Charitable Trust and the Warm Dunedin Targeted Rate programme.**

Action 1.3 **That Dunedin City Council show leadership in enabling the development and delivery of more affordable rental housing in Dunedin.**

Action 1.4 **The Council becomes a member of the 'Cities for Adequate Housing' and implements housing as a human right and ends homelessness in Dunedin.**

2. Planning Recommendations: Leadership to Deliver Community Outcomes

Action 2.1 **That Dunedin City Council completes a Housing Needs Assessment.**

Action 2.2 **Utilise and encourage new technology and construction methods.**

Action 2.3 **That Council adopts a policy and develops tools to facilitate use of publicly owned land for affordable housing.**

Action 2.4 **That Council adopts a policy and develop tools to ensure new developments help meet Dunedin's social and affordable housing needs.**

Action 2.5 **That Council designate a Housing Navigator/Facilitator to assist residential developers navigating the resource and building consent processes.**

3. Delivery Recommendations – Building Homes to Meet Community Need

Action 3.1 **Scale up community housing trust provision.**

Action 3.2 **Joint procurement strategy for high quality, affordable homes.**

Action 3.3 **Prioritise the accessibility of housing to those most in need.**

Action 3.4 **That Central Government, Council and other parties explore 10 year funding and procurement plans.**

Action 3.5 **Advocate for direct Central Government capital investment.**

Action 3.6 **Income Related Rent and Accommodation Supplement review.**

Action 3.7 **That Council contribute to any reviews of the Building Act.**

The Taskforce encourages Council to adopt the report and to develop an Action Plan to implement the recommendations. The Taskforce believes the collaborative approach used to date should be continued. While Council has a central role to play, it cannot deliver everything alone.

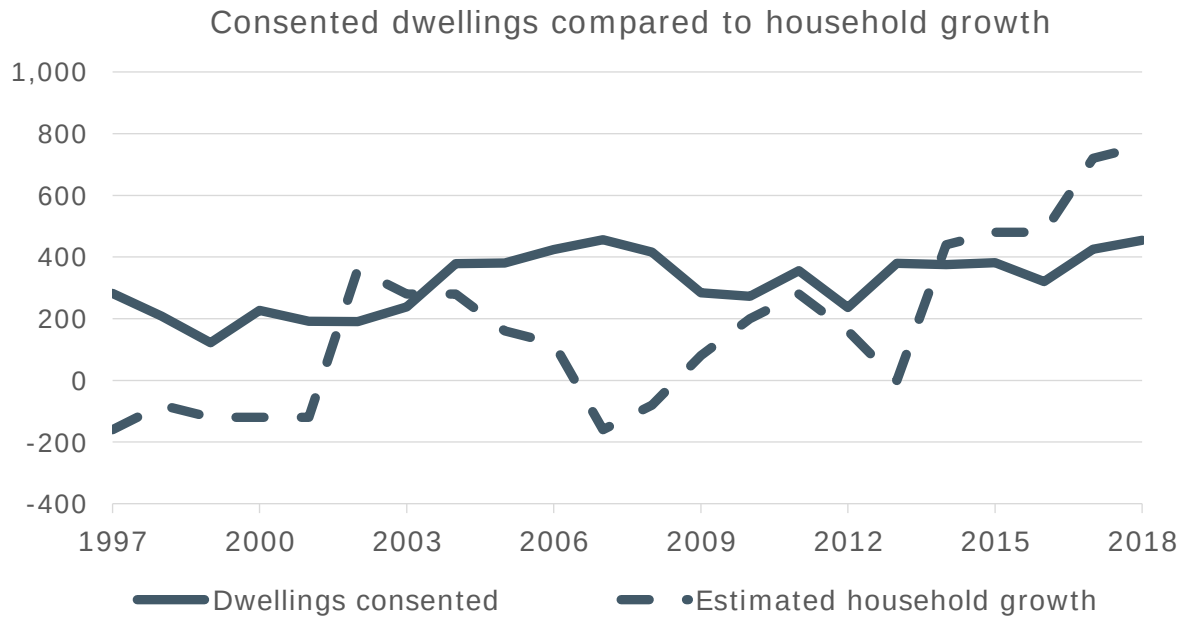
Context

Demographic Change

Forecast demographic changes such as aging population, refugee resettlement, migration from the North Island and overseas, and changes to average household sizes mean that a more diverse range of dwelling types will be needed. The significant increase in the 65+ age group will have a considerable impact on the future of housing in Dunedin.

Household Growth

Dunedin is now a considered a medium growth city[1]. Estimated population growth of 1,900 people over the 2017/2018 year, and 1,800 people over the 2016/2017 year, shows two years of a sharp rise in population compared with an average of 290 new residents per year during the prior decade. Yet during the past two years only 360 homes and 355 homes (respectively) were built. While the City has had a housing quality issue for decades, now it also has a shortage of new supply, in part responsible for declining housing affordability.



NOTE: Population growth of 1,900 people converted to 800 households (rounded). Also, data on consented dwellings differs slightly from number of homes built within an annual period.

[1] Dunedin was re-categorised as a medium growth area in November 2017 as a result of new population projections from Statistics New Zealand, This triggered **new requirements** under the National Policy Statement – Urban Development Capacity, which can be sorted into **monitoring, assessing capacity, and responding**.

Quality of Housing Stock

Dunedin has relatively older housing stock. This means it is less likely to be insulated or retrofitted to be suitable for all, and especially those with physical disabilities, the aged, as well as young families. Poor quality housing is often linked as a contributor to poor health. It may also cause financial hardships as the need for heating as well medical treatment becomes excessive.

Size of Housing

With an aging population there is predicted to be significant demand for suitably sized houses from 1-2 person households. There is also evidence that there is demand for larger homes from Māori and Pāsifiki families and some migrants.

Design, Location, and Access

There is a very limited supply of units of houses that are suitable sized and designed for older persons and those with physical or sensory disabilities. This is increasingly linked to the mismatch with Dunedin household sizes described above. Other desirable features that may be missing include location on the flat; easy access into and around the home; off-street car parking; access to public transport routes, support services and amenities such as shops.

Emergency Housing

It has been identified that there is a shortfall in the provision of Emergency Housing. There are few options in Dunedin of suitable short-term emergency accommodation. There is no provision of emergency housing for women (except those supported by Women's Refuge), youth, and few suitable options exist for transients. For people with mental health issues crisis respite services are available, however there is a lack of supported medium term accommodation.

Tenure and Eligibility Issues

Lack of flexibility in tenure is a complication for people with mental health issues, people with physical and sensory disabilities and older people (e.g. when moving from hospital care or supported to independent living). Lack of flexibility may also result from allocation policies which restrict who may access social housing options. For instance, people who fall just outside eligibility criteria such as age thresholds. Allowing more flexibility may result in more efficient and fair allocation.

Affordability and Hardship

A number of groups including older people, low-income individuals and families, those with physical and sensory disabilities, people with mental health issues and their families are facing issues of housing affordability, sustainability and supply. High rental costs and high energy costs, often associated with poor quality housing, are a significant burden for these groups.

A need for measures that incentivise new supply and improve existing stock

The Taskforce recognised that attention is needed to bring our current housing stock into better shape and to meet the current and future needs of the city's renters and first home buyers. Dunedin will thrive if a significant proportion of the new build housing stock is affordable, accessible, offers security of tenure, is in locations with good

access to services, is culturally appropriate, and performs well above the basic habitability requirements.

On housing quality, the efforts of the Cosy Homes Trust, backed by ongoing investment from Dunedin City Council, Otago Community Trust, Otago Regional Council, and central government over more than a decade has seen a percentage [32%] of the mainly owner-occupied housing stock improved with insulation and other improvements. The uptake rate for private rental housing is not known. Many landlords chose to perform the work themselves and data is not available on the number of homes previously insulated.

In February 2019, central government announced new Healthy Homes Standards[2], with regulations set for mid-2019 that all rental housing must comply with, by July 2024, with earlier dates in 2021 (private landlords) and 2023 (Housing New Zealand and Community Housing Providers) as new tenancies arise. In addition, the Residential Tenancies Act states that landlords must ensure that their rental properties have the right ceiling and underfloor insulation by 1 July 2019.

Regarding new supply requirements, the Taskforce estimates that around 440 households are experiencing high housing stress, overcrowding, and periods of homelessness. This figure is comprised from: the current social housing register (155 households); the Dunedin City Council waitlist for Council housing of 244; plus, the 41 households currently in emergency accommodation. This figure of 440 houses required is three times higher than previous estimates of need, and up to eight times higher than the known pipeline of genuinely affordable housing expected to come through existing channels.

The Taskforce wishes to highlight that those with unmet housing need will be over represented by people of Māori and Pāsifiki descent, and people with disabilities.

A different approach is needed.

The Dunedin City Council's reporting on the National Policy Statement for Urban Development Capacity (NPS-UDC), forecasts the overall demand in the coming decades along with available serviced land.

Projected Demand for new housing	**2021**	**2023**	**2028**	**2038**
Stand-alone houses	850	1,200	1,900	3,100
Attached units	450	550	950	1,550
Total	1,300	1,750	2,850	4,650
Total + buffer[1]	*1,565*	*2,125*	*3,425*	*5,490*
Zoned feasible capacity	2,175	2,175	2,400	2,550
Sufficiency	+610	+50	-1,025	-2,940

[1] Buffer is 20% over 2018-2028 and 15% over 2028-2048

These projections indicate there will be a shortfall of residential development capacity over the medium and long-term. In February, Council initiated Variation 2 to the

[2] https://www.hud.govt.nz/residential-housing/healthy-rental-homes/healthy-homes-standards/

Second Generation District Plan (2GP) to address this shortfall, and work has already started to identify options. The NPS-UDC requires that the Council considers all practicable options to enable necessary housing capacity. This could include applying residential zoning to new areas (greenfield development), amending rules or other provisions to increase the density of housing enabled in residential zones, or using statutory tools and methods available under other legislation. Once initial options are developed, consultation will start with landowners to understand the likelihood that areas would be developed if rezoned. There will also be opportunities for broader public consultation on the identified options.

The Taskforce members expressed concern about the reliance on infill in the zoned feasible capacity numbers above. The experience of members working in commercial real estate is that there has been low uptake by owners to subdivide and add additional housing.

Another change needed for Dunedin housing is to better match house sizes and design with changing demographics. The average size of a new home built in Dunedin is static at around 200m^2. This type of home is not matched with need. Based on the current make up of Dunedin's housing stock, a survey of housing preferences, and population/demographic trends, one third of new dwellings need to be attached, such as terraced units, etc. However, over the past 3 years, only 18% of consented dwellings have been attached.

Critical Housing Issues

Demand is growing

The number of applicants on the Public Housing Register for the Ministry of Social Development Southern region shows 155 individuals/families waiting for public housing as at December 2018. This is up from 144 in December 2017.

The number of public houses in the Southern region is currently 1375. Housing NZ Corporation is the main provider of these tenancies.

41 transitional housing places are currently funded, through three providers and 28 households received Emergency Housing Special Needs Grants during the quarter ending in December 2018.

Dunedin City Council wait list shows 244 in March 2019 waiting for housing, up from 185 in February 2018. The number of Elder Person Housing (Community Housing) tenancies managed by the Counicl is 940.

The Taskforce members providing front-line services to families and individuals in high-need, and facing severe rental stress seeking an affordable rental solution report increasing demand for their services.

Due to the separate wait lists and the inability to share these, the actual numbers of those in need cannot be precisely counted. Based on the numbers above the Taskforce estimate 440 people are waiting for permanent affordable accommodation.

An unknown number are not able to move from rental on a pathway to homeownership.

Supply is pressured

Only 55 new Social Housing places are currently funded for Dunedin in the MHUD Public Housing Plan during the next four years; HNZC has 14 new units planned.

The Salvation Army and Just Housing Ōtepoti are the only registered Community Housing Providers in the City; only recently have they been able to access the Income Related Rent Subsidy to support new builds.

There are few currently planned rental units, where the rent would be affordable to a person earning minimum wage or a benefit (estimated at $250/pw).

Estimated population growth is the highest seen in at least 20 years; therefore there is a need to build about 750 homes every year, instead of the 340 - 360 we are building.

While funding for emergency and transitional housing and related services has become available, the Taskforce is concerned that the lack of adequate permanently affordable

housing is being overlooked as the long-term solution. The Taskforce noted the impact of large events in the city on the availability of emergency motel accommodation. This has led to displacement of households during these events.

Measuring Affordability

The Taskforce has adopted the internationally recognised benchmark where housing is deemed affordable if the household spends less than one third of their gross household income on rent or mortgage repayments. Based on this definition, an affordable dwelling for a household with a lower quartile household income of $37,000 pa to purchase would be $249,000 or less. This is based on a 4.74% interest rate, a 30-year mortgage, and the ability to save a 20% deposit.

The maximum purchase cost for a landlord to provide an affordable rental for a household with a lower quartile household income of $37,000 pa, would be $288,000 or less, based on a rent of $240 per week and a gross rental yield of 4.32%. Investors are typically looking for a rental yield of 6.5%. In addition to the low yield issue, the median cost of a house in the city is now over $408,500, resulting in few new rental homes affordable to lower quartile households.

In practical terms, there is a need to focus efforts on delivering roughly half of the unmet demand (circa 220 of the 440 homes), prioritising households that are a sole parent with a child, able to afford around $250 per week as a rental. The other half will be a mix of larger and smaller households.

This household income-based approach has been informally referenced and the Taskforce recommends it becomes policy through the further actions set out in this Action Plan.

The “median multiple’ is a common measure of affordability at a city level, where the median house price is divided by the gross annual median household income. As noted in Dunedin, the median household income for the year ending December 2018 was approximately $71,500, with a median house price of $408,500. Currently Dunedin is at the early stages of unaffordability – with a median house price of 5.7 times the median household income. CoreLogic reported Dunedin’s property market had another strong year in 2018, with average values up by 11.2%. In the past four years, they’ve risen by 48.8% - that’s an increase of $142,683, from $292,220 to $434,903[3]. This trend is especially concerning as incomes are rising at a much slower rate.

The Taskforce is concerned that household incomes have not kept up with increases in house prices and the general cost of living. Households need more financial resources, potentially from a higher Accommodation Supplement, an increase in minimum wage or higher benefit payments. They noted the Welfare Expert Advisory Group national report is due in May and could address some of these needs.

[3] https://www.corelogic.co.nz/news/dunedin-set-remain-jewel-south-2019#.XJlETygzbIU

Strategic Context

The Taskforce recognises the vision of Dunedin, that Dunedin is one of the world's great small cities. The following recommendations and actions in this report contribute to this vision and also to the strategic priorities and principles of the Dunedin strategic framework. Most relevant are the Social Wellbeing Strategy priorities of affordable and healthy homes: that people are living in warm and healthy homes and affordable housing options are available to all. Other priorities such as Dunedin as a compelling destination with connected people, cohesive communities and quality lifestyles and a vibrant and exciting city are also relevant.

Recommendations

The Taskforce believes that Dunedin as a community must work together to achieve the vision of Dunedin is one of the world's great small cities. By bringing together our skills, resources and knowledge we can define and deliver a Dunedin response to the housing challenges we face.

As a community, we have a joint responsibility to ensure all residents are able to access adequate and affordable homes. The terms 'suitable' and 'adequate' refer to housing that is healthy (well-insulated, dry, with reasonable natural light), accessible (both external access and ease of access within housing units), well-located (to services, amenities and transport routes), of an appropriate size and fit-for-purpose (meets tenants' needs, particularly for older persons or persons with disabilities).

The Taskforce proposes the following set of actions based on the information gathered over the past year. The actions are designed to address the following priorities set out in the Terms of Reference:

- Social housing
- Emergency housing
- Affordable housing
- Healthy housing

The Taskforce recommendations are targeted to the Dunedin community, (not solely to Council,) as we all have a role to play in meeting the city's long-term housing needs and meeting Community Outcomes related to housing. The 16 actions proposed are grouped into the following themes:

- Healthy housing
- Land planning leadership
- Delivery
- Advocacy

Council is called upon to steward the parties and resources required to improve housing within the city. The Taskforce notes that there may be an additional budget

requirement for specialist skills beyond staff knowledge to implement the recommended actions.

1. Healthy Housing Recommendations: Promote Healthy Homes across all tenures.

Action 1.1 Advocate for incentives to landlords to improve habitability and security of tenure.

The Dunedin City Council and relevant stakeholders advocate to MBIE to coordinate education and enforcement to support all landlords and tenants to take responsibility to improve the habitability of their homes through the proper use of measures such as ventilation, use of curtains, and appropriate heating. Where possible, also advocate for incentives that ensure tenants can afford rents that may rise as improvements are done.

The Taskforce recommends that Dunedin City Council continues to support changes to legislation that increase the quality of homes and security of tenure.

The Taskforce calls on Dunedin City Council and other relevant stakeholders to advocate for MBIE to provide resourcing for the monitoring and enforcement of minimum rental standards in the City, recognising the age and quality of Dunedin's housing stock.

Action 1.2 Continue investment in the Cosy Homes Charitable Trust and the Warm Dunedin Targeted Rate Programme.

The Taskforce considers the improvement of the quality of housing in Dunedin to be a high priority. Housing quality affects households in all types of homes and tenures, therefore increasing quality will have broad beneficial impacts for our entire community.

A practical way to support Healthy Homes is to continue and increase investment in improving the quality and habitability of existing homes through investment in the Cosy Homes Charitable Trust and the Warm Dunedin Targeted Rates programmes. The scope of the Warm Dunedin Targeted Rates scheme should be extended beyond insulation and heating, to include investment in other improvements, such as ventilation and draught-stopping.

It is recommended that before homeowners use the Warm Dunedin Targeted Rates programme, they receive advice from a certified Home Performance Advisor to ensure they understand the best improvements for their house. The cost (if any) of the Home Performance Advisor could be added to the targeted rate. This has the benefit of people learning more about home performance (both what to fix/add to their house and how to use their house) and hopefully encouraging providers to become Home Performance Advisors (HPA). It is noted that the Eco Design Advisor based at the Council is a certified HPA and offers a free service.

Action 1.3 That Dunedin City Council show leadership in enabling the development and delivery of more affordable rental housing in Dunedin.

The Taskforce acknowledges that Council is the largest landlord for community housing in the City, through its elder persons housing portfolio. It recommends Council plans for investment in a new supply of affordable housing and prepares itself to make that investment in ways where it is a partner as well as delivering the housing itself.

It may also mean being open to serving additional cohorts of residents in addition to the core of pensioners it currently serves. All new housing supply (in which Council invests) should meet standards similar to Lifemark for accessibility. As well as an overall house performance rating tool such as HomeStar that promotes energy and water efficiency, moisture management and reduces construction waste, should also be utilised.

The Taskforce requests Council to take a lead in coordinating Central Government and other interested parties to encourage and incentivise new supply of affordable homes. Council should contribute as a partner as well as direct supplier. This may include using planning instruments, infrastructure planning, funding and support for the not-for-profit sector.

The Taskforce notes that the current settings make new builds inherently unaffordable for those in greatest need, this is why it is focusing on rentals in this instance.

Further actions below provide detail of the Taskforce's views on ways to encourage and incentivise new supply. These actions are directed to Central Government and other parties who will play critical roles in housing.

Action 1.4 That Council becomes a member of the 'Cities for Adequate Housing' and implements housing as a human right and ends homelessness in Dunedin.

The Taskforce encourages the Council to join the 'Cities for Adequate Housing' movement and endorse the Municipalist Declaration of Local Governments for the Right to Housing and the Right to the City. This Declaration commits members to implementing housing as a human right and recognising that housing is a significant community issue which will ensure well into the long-term future. The Declaration is a platform through which the city can activate its locally-led solutions, building on local and international best practice. A practical first step in implementing this approach is to end homelessness in Dunedin.

2. Planning Recommendations – Leadership to Deliver Community Outcomes

Action 2.1 That Dunedin City Council completes a Housing Needs Assessment.

The Taskforce identified the need for a detailed understanding of housing demand in our community. The lack of current data from the Census has been a frustration for the Taskforce. To address this, Council should perform or commission a Housing Needs Assessment documenting housing need across the housing affordability continuum, by household demographics and income. The Taskforce acknowledges that this may not be possible until 2018 Census data is released, but recent announcements on the accuracy of the information are a concern.

There is a need for an understanding of the demand for different housing solutions for older people, and the barriers to their being provided (supply, affordability, perceptions).

The Taskforce noted a lack of information on the need for emergency housing, particularly for women. The Housing Needs Assessment should include a specific identification of the city's population sleeping rough.

In addition to this Housing Needs Assessment, Council and identified partners should develop a centralised tool or system that allows people facing housing need to document their situation and what they think would successfully resolve their need. It is acknowledged this will require additional short and medium-term resourcing by the Council.

Action 2.2 Utilise and encourage new technology and construction methods.

The Taskforce received evidence of how new construction methods and technologies can potentially improve housing quality and lower build costs[4]. It believes Council should facilitate and encourage the local adoption of these. It can also demonstrate leadership by adopting these in its own development activities. Council should continue engaging with and learning from other local bodies that have experience of consenting new construction methods with a view to encouraging the use of new technology. Council should also continue to offer advice to potential applicants about ways to streamline the consenting process.

Action 2.3 That Council adopt a policy and develops tools to facilitate use of publicly owned land for affordable housing.

The Taskforce identified the lack of tools available to Council to more directly support the provision of affordable homes. To address this, Council can further utilise the land resources it controls. As a first step, it should include public land (in addition to private land) when assessing potential areas where residential development may be enabled. In recognition of the current pressure on housing, Council should assess and prioritise the use of its undeveloped and unencumbered land holdings for suitability for residential housing development.

[4] http://www.prefabnz.com/resources see especially the 'PrefabNZ Value Case for Prefab'

A current barrier to utilising Council land is the 'highest and best use' valuation methodology approach. Councils and Central Government both need clarity on a well-being valuation methodology that resolves disputes around 'highest and best use' of public land for affordable housing. This would provide greater flexibility to deliver housing on publicly owned land. To give effect to a new methodology, Council may need to advocate for policy and legislative barriers to be removed.

Action 2.4 That Council adopt a policy and develops tools to ensure new developments help meet Dunedin's social and affordable housing needs.

The Taskforce requests that Council explore the opportunities arising from an increased need for worker accommodation. This should be used as an opportunity to build new housing that could become affordable supply in the medium term.

The Taskforce supports the existing work being undertaken under the National Policy Statement for Urban Development Capacity to monitor and increase the supply of housing. It encourages an output from that work to clearly identify areas with infrastructure capacity for residential development. This includes an assessment of how further development capacity can be enabled in a way that meets the needs of current and future residents.

The Taskforce supports the development of an integrated community providing for a range of affordability and tenures in new development. To achieve this, the Taskforce recommends Council work with developers and community housing providers to agree appropriate incentives and requirements to ensure all new developments contribute toward meeting Dunedin's housing needs, (as identified in Action 2.1 Housing Needs Assessment). The goal is to have a portion of new housing being affordable, based on households paying no more than the proposed standard of 35% of their income toward housing costs. The resulting homes would ideally be required to be retained as permanently affordable to provide intergenerational benefits.

To progress this work on incentives, Council should assess options related to a development contributions remission framework for residential development that delivers on its goals of inner city residential development, medium density development, affordable home ownership, and/or public housing.

Action 2.5 That Council designate a Housing Navigator/Facilitator to assist residential developers navigating the resource and building consent processes.

The Taskforce heard concerns from the development community about the difficulties they encounter navigating the resource and building consent processes. Part of this concern may be beyond Council control to address (e.g. legislative and regulatory requirements and prescribed timeframes). However, the Taskforce does see the ability of Council to designate a Housing Navigator/Facilitator to assist residential developers navigating the resource and building consent processes.

This role would build upon the 'red carpet' approach Council has provided for developers. The intent is to have an identified point of contact with a broad understanding of the processes and requirements who can help keep development proposals on track. This can be done by helping applicants to problem solve ways to comply with the law when they come up against barriers. The role would also be a resource to connect applicants with the correct Council colleague early in the process to ensure correct understanding of the requirements and timeframes.

3. Delivery – Building Homes to Meet Community Need

Action 3.1 Scale up community housing trust provision.

The Taskforce believes that community housing trusts are best positioned to lead the development of new affordable homes. Only an increase in the supply of new affordable homes will meet the needs evident in Dunedin. The community housing trusts should be the delivery agents for new builds on publicly owned land enabled by Action 2.3 or other opportunities created by Action 2.4. The trusts should be required to be not for profits, to ensure any benefits received are held and recycled into affordable homes in the future.

The priority developments undertaken should respond to the types of homes and affordability levels identified in the Housing Needs Assessment. This could result in several trusts partnering in a development to respond to varying needs, with each bringing different skills and expertise. The new homes could provide social (public) housing for those on the Social Housing Register, affordable rentals for those who do not quality for social housing, and rent-to-buy or other pathways for those aspiring to affordable home ownership.

The Taskforce notes this same concept is identified in the *2011 Assessment of Future Social Housing Needs in Dunedin City* report. It asks Council to build upon that report. To achieve results, better partnerships and more effective collaboration amongst the trusts, developers and Council are required. The Taskforce sees this as an approach that will activate and build upon the capability of the current community housing providers, with the Council and commercial partners working toward an agreed outcome. The Taskforce asks Council to advocate this view and role to Central Government, so that Government participates as a supportive partner enabling locally-led solutions.

Action 3.2 Joint procurement strategy for high quality, affordable homes.

The Taskforce supports multi-sector, cross-agency procurement and standards that ask the building industry for more innovative solutions that can be delivered locally. These would be supported and enabled by Action 2.2 (Utilise and encourage new technology and construction methods). The Taskforce sees gains from a common

'planbook' for homes and accommodation that consistently deliver high performance in a cost-effective way. To achieve this, The Taskforce sees the use of innovative and standard solutions including offsite manufacture as a resource that can activate and supply more housing using the best of both local NZ regional manufacturers, as well as components from overseas where required.

The Taskforce encourages the Council to join up across the commercial providers, Community Housing Trusts, Iwi, HNZC, MBIE and MHUD through a multi-year procurement setting that meets local housing needs.

Of the currently allocated 55 new builds for Income Related Rent Subsidies the Taskforce encourages a goal to achieve a full uptake within 12 months. This will require Council, HNZC and other parties to directly support public housing development partnerships between community housing trusts, developers, and landowners. Two such developments could reasonably be identified within this time. The public housing that is developed by the community housing trusts with these government subsidies should be required to be retained in affordable housing in perpetuity.

Action 3.3 Prioritise the accessibility of housing to those most in need.

The Taskforce calls upon all housing providers and landlords (including Council and HNZC) to prioritise the accessibility of housing for those people in most need. This includes clarifying the barriers to entry both for physical access and access into the housing continuum. Existing barriers can be removed through innovation in housing programmes, ensuring affordability for the household is always achieved. Accessibility also means removing the physical barriers in housing design, in new builds as well through the refurbishment of existing stock. This will likely require further investment, and the Taskforce sees a role for Council and identified stakeholdrs in advocating for funding from any available source.

Action 3.4 That Central Government, Council and other parties explore 10 year funding and procurement plans.

The Taskforce calls upon all concerned parties to advocate for funding and policy timeframes of longer than three years. The Taskforce has documented that Dunedin is facing major developments including the hospital rebuild, university build programme and roading. We propose setting the goal of 10-year funding and procurement certainty for the provision of additional social and affordable housing to mitigate the impacts of this development. This will give the providers, developers and builders certainty for investment in land and staff. These funding and policy settings should prioritise infrastructure support for new housing meeting the identified local needs in terms of affordability and type of home. They could also provide additional incentives such as consenting and development contribution deferrals for non-profit community housing trust schemes.

Action 3.5 Advocate for direct government capital investment.

The Taskforce calls upon all concerned parties to advocate to Central Government for the allocation of direct capital investment that can flow to affordable housing development across the affordability continuum in Dunedin. The actions identified above will require capital to provide homes affordable to the lower-income households that are in greatest need. Where Council has enabled access to land, streamlined consenting and supported partnerships with community housing trusts, Central Government should commit the additional finance required to deliver permanently affordable homes.

Action 3.6 Income Related Rent and Accommodation Supplement review.

The Taskforce calls upon all concerned parties to advocate to Central Government for a comprehensive review of the Accommodation Supplement and Income Related Rent Subsidy to encourage more housing. These programmes are spending over $2 billion every year but are not delivering the housing outcomes required to meet our needs. The Taskforce calls for creation of a national, sustainable system to increase the supply of affordable homes meeting the housing needs identified by the Dunedin community.

In particular, the Taskforce believes that the Ministry for Social Development should urgently review the Accommodation Supplement limit for Dunedin and lift it above the current cap of $80 per week. The new supply actions above will take time to implement. Families currently challenged with finding an affordable home can be quickly supported by increasing Accommodation Supplement limits to offset increases in local rents.

Action 3.7 That Council contribute to any reviews of the Building Act.

The Taskforce notes the recent announcement of the Building Act Reforms and calls on Council to make a submission. Any review of the Building Act should include an update to the standards that could include better contribution to the goals of the Healthy Homes Guarantee Act, allow for regional variation to account for different weather conditions, and enable new residential builds to be more resilient in the face of a changing climate.

Implementation and Monitoring

The delivery of this report completes the Mayor's Taskforce for Housing's duties under the Terms of Reference. The Taskforce encourages Council to adopt the

report and to develop an action plan to implement the recommendations. The Taskforce believes the collaborative approach used to date should be continued. While Council has a central role to play, it cannot deliver everything alone. Only through collective action will the housing needs of Dunedin residents be met and specific roles for others need to be identified within the action plan. Leadership from within the community should be encouraged and supported by Council.

The Taskforce recommends that a monitoring and reporting framework is developed in the action plan. A representative group of stakeholders, similar to this Taskforce, should be constituted to periodically review progress. It could serve to highlight emerging trends, new potential partners and opportunities to ensure Dunedin is one of the world's great small cities.

Appendix 1 Terms of Reference Mayors Taskforce for Housing

DCC Mayor's Taskforce for Housing Terms of Reference

Name of Advisory Panel	Dunedin Mayor's Taskforce for Housing
Advisory Panel Terms of Reference (detail the purpose, powers, duties and functions of the Councillor Advisory Panel)	**Purpose** The purpose of the Mayor's Taskforce for Housing (the Taskforce) is to provide recommendations that can guide key stakeholders and the wider community in meeting the city's long-term housing needs and meeting Community Outcomes related to housing. It's acknowledged that a housing shortage already exists within Dunedin and, that if this issue is not addressed, the shortage could result in a housing crisis. It is also understood that quality of housing needs improvement. The Mayor's Taskforce for Housing is a multisector group with members chosen specifically for their knowledge and experience of housing, and strategies that can address housing need. The Taskforce will represent the full spectrum of the housing sector, and comprise of the "core members" (see below). The Taskforce can request input from other organisations or individuals working within specific areas of the sector. **Powers** The Taskforce has no regulatory or statutory powers or decision-making powers. It's role is to utilise the knowledge and expertise of members to provide advice and recommendations to Council and other key stakeholders working within the housing sector e.g. central government, social sector, property developers, landlords etc. **Duties and Functions** The Taskforce will consider the current and future housing issues (housing stock numbers and quality) within Dunedin City from 2018 through to 2038. The Taskforce will specifically consider the following areas; • Social housing • Emergency housing • Affordable housing • Healthy housing Taskforce members will contribute available data, research and information on housing and will propose options to address housing issues. The Taskforce will provide advice to Council within the agreed timeframes which suggest how the Dunedin community and key stakeholders can meet identified housing needs and achieve Community Outcomes related to housing (social, spatial and

	economic). Advice on social housing will include options for Council owned housing into the future. Agreed timeframes to report to Council and key stakeholders will be – 1. August 2018 2. October 2018 3. February 2019 Taskforce Meetings The Taskforce will meet monthly for no more than 2 hours. Secretariat support will be provided by the DCC. An Internal DCC Housing Group will support the Taskforce with research, advice and information and data collection and collation. Taskforce meetings will begin in late April 2018 and will end in April 2019.
Committee of Council that the Advisory Panel is to report to	Community and Culture
Chairperson of Advisory Panel	Aaron Hawkins
Membership of Advisory Panel (detail by position or by name)	**Internal Housing Group** • Programme Sponsor, Nicola Pinfold • Programme Office, Community Development and Events • Programme Leader, Joy Gunn **External Housing Group – Taskforce** • Dunedin Chair Advisory Panel – Councillor Aaron Hawkins, Councillor Marie Laufiso • Ministry of Social Development • Housing New Zealand Corporation • Southern District Health Boar (Public Health) • Salvation Army • Presbyterian Support Otago • Pact • Kāi Tahu representatives x 2 • Te Hau Ora Whanau Services • Property Developers x 2 • Property Management Groups x 2 • Housing Specialist • University of Otago
Support Staff (detail by positon)	Manager Events and Community Development Senior Community Advisor
General Manager (or Chief Executive) supporting Advisory Panel	Sandy Graham
Expected term of Advisory Panel (include anticipated end date)	One year from April 2018

Appendix 2: Taskforce for Housing Members

Cr Aaron Hawkins, Cr Marie Laufiso, Lisa Little (Ministry of Social Development), Louise Carr (Pact), Mark Miller (Edinburgh Realty), Elizabeth Nidd (Nidd Realty), Gillian Bremner (Presbyterian Support Otago), Ron McLachlan (Runaka representative), Scott Figenshow (Community Housing Aotearoa), Terri-Lee Nyman (Te Hou Ora Whānau Services), Susan Jack (Public Health South), Raymond Clark (Department of Corrections) and Gill Brown (Housing New Zealand), David Perry (University of Otago), David McKenzie (Salvation Army), Chris Matthews (Department of Corrections)

Also attended: Michael Parker (Presbyterian Support Otago), Julie Ashton (Ray White), Bill Sharp (Housing New Zealand), Kate Milton (Housing New Zealand),

Timeline

The taskforce met 12 times, focusing on certain aspects at each meeting. The Taskforce provided an interim report to the 26 November 2018 Dunedin City Council meeting and held the Dunedin Housing Summit on 28 February 2019. The actions and recommendations in this Housing Action Plan incorporate the learnings from each of these milestone events.

Meetings were held:

30- April 2018

5 June 2018

20 July 2018

2 August 2018

29 August 2018

24 September 2018

29 October 2018

26 November 2018

21 January 2019:

18 February 2019:

28 February 2019 – Housing Summit

18 March 2019 postponed to 4 April

15 April 2019

Appendix 3: Cities for Adequate Housing Declaration

Municipalist Declaration of Local Governments for the Right to Housing and the Right to the City

New York, 16th July 2018

#citiesforhousing

Building on the milestones of the New Urban Agenda of Habitat III (Quito, 2016) and the momentumof “The Shift”, a global initiative on the right to housing, the signatory cities below take part inthis High-Level Political Forum of the United Nations to follow up on Sustainable Development Goal 11 (SDG11: “Make cities and human settlements inclusive, safe, resilient and sustainable” by2030), with the support of UCLG (United Cities and Local Governments), the Office of the High Commissioner for Human Rights, and Leilani Farha, UN Special Rapporteur on the right to housing.

We, the local governments, are the public officials who are most sensitive to the everyday needs of our citizens. In the contemporary world, lack of national and state funding, market deregulation, growing power of global corporations, and increasing competition for scarce real estate often become a burden on our neighbourhoods, causing serious distortions in their social fabric, and putting the goal of ensuring equitable, inclusive, and just cities at risk. We, the local governments strongly believe that all people should have actual access to “adequate housing”, understood by the United Nations as the one that has the correct “affordability”, “legal security of tenure”, “habitability”, “availability of services, materials, facilities an infrastructure””accessibility”, “location” and “cultural adequacy”. Nevertheless, real estate speculation, high cost housing, inadequate regulation, socio-spatial segregation, insecurity of tenure, substandard housing, homelessness, urban sprawl or informal urban enlargements without requisite facilities or infrastructure, are growing phenomena that threaten the equity and sustainability of our cities. Given this situation, local governments cannot stay on the sidelines, and need to take a central role. For all these reasons, we call for the following actions.

01

More powers to better regulate the real estate market

We demand more legal and fiscal powers to regulate the real estate market in order to fight against speculation and guarantee the social function of the city.

More funds to improve our public housing stocks We demand more resources and commit increased investment to strengthen the public housing rental stock in all of our neighbourhoods. We, the local governments require regulatory and enforcement tools to protect our neighbourhoods from speculation. Furthermore, we need the tools to protect the use of housing as homes for people living in the cities we represent. We also require instruments to regulate the housing rental market, protecting tenants from speculative bubbles and giving them the right to greater security of tenure. Likewise,

we demand mechanisms to implement value capture from real estate operations for the common good, both in new developments and in urban renewal. Finally, we need powers to fight substandard or vacant housing.

02

More funds to improve our public housing stocks

We demand more resources and commit increased investment to strengthen the public housing rental stock in all of our neighbourhoods.

We, the local governments demand more resources and investment to strengthen our public housing stock. We must promote unique solutions that respond proportionally to the seriousness of the housing emergency and promote innovative, fairer, sustainable, more agile and economically efficient alternatives. Public housing should contribute to achieving cities where all persons have equal access to affordable housing. This should include its use, alongside adequately-funded public services and welfare systems, to prevent homelessness and to ensure no one needs to sleep rough. Furthermore, we must guarantee a balanced distribution of affordable housing in the city, in order to promote fair housing, combat socio-spatial segregation, and alleviate the tension between centres and peripheries.

03

More tools to co-produce public-private communitydriven alternative housing
We are committed to boosting mixed residential solutions, which are neither solely government-driven nor purely based on commercial gain.

Urban planning that combines adequate housing with quality, inclusive and sustainable neighbourhoods We are committed to planning mixed, compact and polycentric cities where housing benefits from a balanced context and contributes to the social, economic and environmental sustainability of the urban fabric. We, the local governments need to be able to count on the strength and talent from our cities' productive and social fabric to co-produce mixed solutions, instead of exclusively focusing on public or businessled schemes. We must prioritize subsidies and tax exemptions for the creation of affordable housing. In addition, we aim to explore, amongst others, various options adapted to each city's situation such as the cooperative or the community land trust housing models and create public-private operators to invest capital in the creation and preservation of affordable rental housing. Likewise, we must collaborate with non-governmental organisations and foster the participation, self-management and empowerment of residents, supporting good practices such as collaborative design or assisted self-construction.

04

Urban planning that combines adequate housing with quality, inclusive and sustainable neighbourhoods

We are committed to planning mixed, compact and polycentric cities where housing benefits from a balanced context and contributes to the social, economic and environmental sustainability of the urban fabric.

We, the local governments must promote the compactness of urban fabrics to combat urban sprawl. We need urban planning practices that avoid the dependence on the private vehicle and return to the model of accessible, walkable and bikable cities that are provided with efficient public transport networks. We must boost existing urban fabrics and promote mixed uses in all of our neighbourhoods. We must promote fair housing and integrated neighbourhoods. We should also provide alternatives to the expansion of new informal settlements by focusing on the causes that lead to them and not on their victims.

05

Municipalist cooperation in residential strategies

We want to enhance cooperation and solidarity within city networks that defend affordable housing and equitable, just, and inclusive cities by boosting long-term strategies on a metropolitan scale.

We, the local governments are committed towards cooperation and the exchange of knowledge and practice in urban and residential policies. We also propose joining forces to call for more resources and powers from both national and international supra-municipal bodies. We need the principle of subsidiarity to be applied to housing and urban policies of city and central governments. Furthermore, we call upon the cities to form a joint front when negotiating with global actors or digital platforms. In addition, we commit ourselves towards practising metropolitan solidarity so as to overcome competitive localisms, centre-peripheral tensions and territorial imbalances. Finally, we commit ourselves to reaching city agreements that transcend governmental terms of office and guarantee the coherence and continuity of long-term strategies.

Endorsed cities

Amsterdam

Barcelona

Berlin

Durban

Lisbon

London

Montevideo

Montreal

New York

Paris

Seoul

Stantec

Memo

To:	Dunedin City Council	From:	Edward Guerreiro
		Review:	Lee Paterson
File:	Hazard Assess V2 2GP	Date:	October 28, 2020

Reference: Re-zoning – Additional Sites Hazards

SUMMARY

The purpose of this letter is to transmit our assessment of the requested additional sites for hazards. The additional sites are the following:

- 133-137 Kaikorai Valley Road
- 30 Mercer Street
- 16 Hare Road
- 33 Emerson Street, Concord
- 3-5 Brick Hill Road and 18 Noyna Road, Sawyers Bay
- 234/290 Malvern Street, Leith Valley

We have summarized our findings using a "traffic light" system.

"Green" indicates no significant hazards are present and that the site does not require any specific engineering for development (e.g. elevated areas with shallow slopes and competent underlying geology).

"Yellow" indicates that there are hazards identified on part or all of the site that will require some specific engineering design to mitigate and enable higher density development (e.g. within low risk flood and overland flow susceptible areas, liquefaction susceptible geology, moderately steep terrain, or potentially unstable geology).

"Red" indicates that there are significant hazards on part or all of the site that will require significant specific engineering design or further investigation to enable development (e.g. steep slopes, high risk flood hazards, low strength or known unstable geology, and existing known instability).

Table 1 summarizes our assessment of the additional sites.

Table 1 – Additional Sites Hazard Summary

Site	Proposed Zone	Hazards Category
133-137 Kaikorai Valley Road	General Residential 2	High
30 Mercer Street	General Residential 2	Medium
16 Hare Road	General Residential 1	Low
33 Emerson Street, Concord	General Residential 1	Medium
3-5 Brick Hill Road and 18 Noyna Road, Sawyers Bay	General Residential 1	Low
234/290 Malvern Street, Leith Valley	General Residential 1	Low to Medium

Note that while some of the sites are medium or high hazard levels based on the original proposed rezoning area, there may be smaller areas within the sites that are lower risk and suitable for development. These are indicatively outlined on the areas provided.

A detailed assessment of each site is presented below.

133-137 KAIKORAI VALLEY ROAD

Site Summary

The proposed site is indicated in Figure 1.

Figure 1 – 133-137 Kaikorai Valley Road (yellow area indicates locations on the site sloping by less than 20 degrees)

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of second main eruptive phase volcanics. The site within the yellow outline area is typically sloping by up to 20 degrees. The remaining areas outside the yellow boundary are typically 20 to 35 degrees.

The underlying lithology is generally globally stable at moderately steep slope angles (<20°), unless over-excavated or subject to weathering / ground water. Instability is generally limited to the overlying superficial deposits (loess).

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11581: Flood – Waterway (Kaikorai Stream Floodplain)

This hazard is associated with a small corner of land adjacent to the existing commercial operations to the north.

- Hazard ID 10616: Land Stability – Subsidence (Un-engineered Fill/Uncontrolled Fill)

This hazard is along the eastern boundary but doesn't impact a significant portion of the site

- Hazard ID 10360: Unknown
- Hazard ID 11504: Land Stability – Land Movement (Landslide Slip ID=5)

There is a mapped landslide on the south-western boundary of the site. It is noted that this slip ran toward Kaikorai Valley Road and inundated local businesses (Holsum Bakery) in a storm event. Approx. 28 truck loads of debris was removed that came from the steep head slopes of between 26-35 degrees).

Recommendations/ Specific Engineering Requirements

We consider that this site is a **high level hazard**. This decision is based on the following summary of information:

- There are **high level hazards** associated with slope instability on the site
    - The proposed area contains steep land over 20 degrees.
    - There is previous history of noted land instability with some historic landslides inundating local businesses at the base of the slope.
    - The trigger for land instability was uncontrolled stormwater within the same geology and slope angles that are considered within the proposed area.

It is possible that the site is developable, however careful geotechnical assessment of the site is required to quantify or at least identify the possibility of instability on the site. Assessments would include geotechnical investigations and recommendations or design of possible earthworks to limit instability or confirm that the site is stable and will not cause instability on the site or affect adjacent lots.

Development may be subject to severe restrictions on drainage/earthworks along with ongoing long-term maintenance of these systems to permit development.

It is possible that the area highlighted in yellow is more readily developable, however any excavations or vegetation removal in these areas may destabilize the uphill slopes. As such, no developments are "easy" at this site, and all require extensive geotechnical assessment.

30 MERCER STREET

Site Summary

The proposed site is indicated in Figure 2.

Figure 2 – 30 Mercer Street

Existing Information

There is some existing information from 1992 suggesting "further study of subdivision files does not indicate significant land stability issues".

Geology and Slopes

The geology of the site consists of Caversham Sandstone typically sloping by up to 15 degrees. There are steeper 1st phase volcanics up to 26 degrees to the south-eastern corner of the site.

Caversham Sandstone is known for its susceptibility to groundwater and earthworks. This instability typically becomes hazardous at slopes of over 15 degrees.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11689: Land Stability – Land Movement (unknown)

It is noted on the hazard information that there has been an investigation at some point in the past and there are noted colluvial soil depths of up to 2m over Caversham Sandstone. It is noted that there appears to be no significant land stability issues.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium hazards level**. This decision is based on the following summary of information:

- There are **medium level hazards** associated with slope instability on the adjacent land:
    - Global stability of steeper parts of the site appears to be governed by weak geological formations and stormwater management. Excavations and changing stormwater management may affect stability.
    - Geotechnical advice will be required prior to subdivision of this area to confirm the extents of any instabilities and ensure it will not affect any lots. This may also identify any offsets that might be required from unstable slopes (such as in the south east corner.

Provided the site is found to be globally stable, requirements for earthworks consent would be normal for most lots within this area (sloping by less than 15 degrees). Geotechnical assessments will be required to confirm the stability of the first main eruptive volcanic hillside to the east and Caversham Sandstone slopes within the main body of the site.

16 HARE ROAD

Site Summary

The proposed site is indicated in Figure 3.

Figure 3 – 16 Hare Road Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site is raised river terrace deposits between Otago Schist hills. The site is typically sloping by less than 12 degrees then steeply sloping towards the boundaries with slopes of up to 35 degrees.

Although not directly a hazard, the underlying soils are relatively young, and as a result may be loose / lower strength. This will affect foundation design.

The steep schist slopes along the northern boundary are heavily vegetated and unlikely to present a slope stability hazard if left untouched. Excavation into the toe of this slope will require geotechnical input.

Existing Hazards and Effects

There are no hazards within the proposed area, however we have identified the following hazard directly adjacent to this lot:

- Hazard ID 11965: Land Stability – Land Movement

  Activity: Unknown, Sensitivity: Medium, Certainty: Likely, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

The land stability hazard affects the land towards the northern boundary of the proposed area and is not considered a hazard for the whole site.

- Hazard ID 10116: Land Stability – Land Movement (Landslides from Forsyth)
- Hazard ID 11407: Seismic – Liquefaction (Domain B)
- Hazard ID 10106: Land Stability – Land Movement (Alluvial Fans – Active Floodwater dominated)

All the hazards relating to liquefaction and alluvial material are associated with weak floodplain alluvium. This is no different than many other locations along Hare Rd and is controlled using engineering design for foundations.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low hazards level**. This decision is based on the following summary of information:

- There are **low level hazards** associated with slope instability within the slope angles and geology of the site

The proposed area is predominantly developable with minor geotechnical input required. However, some general geotechnical assessments may be beneficial to confirm the extents of developability adjacent to the steep schist slopes to the north. This may also include some information regarding stormwater management, offsets from the slope, and vegetation retention to prevent erosion.

33 EMERSON STREET, CONCORD

Site Summary

The proposed site is indicated in Figure 4.

Figure 4 – 33 Emerson Street Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of Caversham Sandstone typically sloping by between 12 and 15 degrees. There are steeper areas of up to 20 degrees towards Emerson St and a steep vegetated slope on the south-eastern boundary up to 26 degrees.

Caversham Sandstone is known for its susceptibility to groundwater and earthworks. This instability typically becomes hazardous at slopes of over 15 degrees.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11965: Land Stability – Land Movement

  Activity: Unknown, Sensitivity: Medium, Certainty: Possible, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

  "May be gullied colluvium instead of landslide"

This land stability hazard is noting a possible slip downhill of the site to the south-eastern boundary of the proposed area. There are no other mapped hazards on the site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium hazards level**. This decision is based on the following summary of information:

- There are **medium level hazards** associated with slope instability on steeper portions of the land:
  - Global stability of steeper parts of the site appears to be governed by weak geological formations and stormwater management. Excavations and changing stormwater management may affect stability.
  - Geotechnical advice will be required prior to subdivision of this area to confirm the extents of any instabilities on steep slopes and ensure it will not affect any lots. This may also identify any offsets that might be required from unstable slopes (such as in the south east boundary.

Provided the site is found to be globally stable, requirements for earthworks consent would be normal for most lots within this area (sloping by less than 15 degrees). Geotechnical assessments will be required to confirm the stability of the Caversham Sandstone slopes over 15 degrees within the site.

3-5 BRICK HILL ROAD AND 18 NOYNA ROAD, SAWYERS BAY

Site Summary

The proposed site is indicated in Figure 5.

Figure 5 – 3-5 Brick Hill Road and 18 Noyna Road, Sawyers Bay Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of alluvial deposits to the east of the site and first main eruptive volcanics to the west. The site is generally low angle with some depressions associated with ephemeral flow paths.

Although not directly a hazard, the underlying soils are relatively young, and as a result may be loose / lower strength. This will affect foundation design.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10106: Land Stability - Land Movement (Alluvial Fans – Active Composite)

This hazard relates to weak floodplain alluvium. This is no different than many other nearby residential lots and is controlled using engineering design for foundations.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low hazards level**. This decision is based on the following summary of information:

- There are **low level hazards** associated with alluvial materials on the site
    - Active alluvial materials are typically mitigated with engineering design. This is typically a building control issue that is not a limiting factor for subdivision of the lots
- There are **low level hazards** associated with flood hazard/stormwater flow on the site:
    - Although there are no mapped hazards associated with stormwater, it should be noted that some stormwater design and management may be required to develop the site.

Typical engineering design can be applied to the proposed area with some consideration to stormwater flow paths. Lots k areas across the site. Consent requirements for lots within this area would be normal for most lots within this area.

234/290 MALVERN STREET, LEITH VALLEY

Site Summary

The proposed site is indicated in Figure 6.

Figure 6 – 234/290 Malvern Street, Leith Valley Sites (yellow outline indicates slopes of less than 20 degrees)

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site is third main eruptive phase volcanics (various basalts). The site is typically sloping by up to 15 degrees within the yellow highlighted area. The site is heavily vegetated on the steeper slopes which are up to 35 degrees. This vegetation is likely stabilizing erosional land stability.

The underlying lithology is generally globally stable at moderately steep slope angles (<20°), unless over-excavated or subject to weathering / ground water. Instability is generally limited to the overlying superficial deposits (loess). In this case, there are no slope stability hazards associated with the geology or sloping terrain.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11965: Land Stability – Land Movement

  Activity: Unknown, Sensitivity: Low, Certainty: Likely, Type: Rotational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

- Hazard ID 11965: Land Stability – Land Movement

  Activity: Unknown, Sensitivity: Medium, Certainty: Likely, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

- Hazard ID 10106: Land Stability – Land Movement (alluvial fans – active floodwater dominated)
- Hazard ID 11581: Flood – Waterway (Upper Leith Floodplain)

The flood and alluvial hazards are associated with the Upper Leith flood area at the toe of the proposed area. This is not a hazard for the main site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low to medium level hazard**. This decision is based on the following summary of information:

- There are **low level hazards** associated with slope instability on the site within the yellow highlighted area:
  - Global stability of the yellow area is within typical stability limits.
  - Geotechnical advice will be required prior to subdivision of this site to confirm the extents of instability in the adjacent slopes and ensure it will not affect any development. This may also identify any offsets that might be required from the active slopes.
- There are **medium level hazards** associated with slope instability across the proposed area:
  - Stability of steeper parts of the site appear to be governed by stormwater management and vegetation and may be affected by development.

Geotechnical advice will be required prior to subdivision of this site to confirm the extents of any instabilities and ensure it will not affect any lots. This may also identify any offsets that might be required from unstable slopes

Stantec

Memo

To:	Dunedin City Council	From:	Edward Guerreiro
		Review:	Lee Paterson
File:	Hazard Assess V2 2GP	Date:	September 3, 2020

Reference: Re-zoning - Group 2 Hazards

SUMMARY

The purpose of this letter is to transmit our assessment of Group 2 for hazards. The sites contained within Group 2 are the following:

- 233 Signal Hill Rd
- 235 Signal Hill Rd
- 32/45 Honeystone Street
- 33-49 Dalziel Road / 473 Taieri Road
- 127a Main Road Fairfield
- Area bounded by Seaton Highcliff Rd and Portobello
- 19 Main South Rd. Concord
- 155 and 252 Scroggs Hill Road
- 336 and 336A Portobello Road
- 201, 207, and 211 Gladstone Road South
- 105 St Leonards Drive

We have summarized our findings using a "traffic light" system.

"Green" indicates no significant hazards are present and that the site does not require any specific engineering for development (e.g. elevated areas with shallow slopes and competent underlying geology).

"Yellow" indicates that there are hazards identified on part or all of the site that will require some specific engineering design to mitigate and enable higher density development (e.g. within low risk flood and overland flow susceptible areas, liquefaction susceptible geology, moderately steep terrain, or potentially unstable geology).

"Red" indicates that there are significant hazards on part or all of the site that will require significant specific engineering design or further investigation to enable development (e.g. steep slopes, high risk flood hazards, low strength or known unstable geology, and existing known instability).

Table 1 summarizes our assessment of the sites contained within "Group 2".

Table 1 - Group 2 Hazard Summary

Site	Group	Current Zone	Proposed Zone	Hazards Category
233 Signal Hill Rd	2	Rural	General Residential 1	Low - Medium
235 Signal Hill Rd	2	Rural	General Residential 1	Low - Medium
32/45 Honeystone Street	2	Rural	General Residential 1	Low
33-49 Dalziel Road / 473 Taieri Road	2	Large Lot Residential 1	General Residential 1	Low
127a Main Road Fairfield	2	Rural	General Residential 1	Low - Medium
Area bounded by Seaton Highcliff Rd and Portobello	2	Rural Residential 2	Large Lot Residential 1	Medium
19 Main South Rd. Concord	2	Rural	General Residential 1 and 2	Low
155 and 252 Scroggs Hill Road	2	Rural / Rural Residential 1	Large Lot Residential 1	Medium
336 and 336A Portobello Road	2	Rural Residential 2	Township and Settlement	Medium
201, 207, and 211 Gladstone Road South	2	Rural	General Residential 1	Low
105 St Leonards Drive	2	Rural Residential 1	Large Lot Residential 1	Low - Medium

Note that while some of the sites are medium hazard levels based on the original proposed rezoning area, there may be smaller areas within the sites that are lower risk and suitable for development. These are indicatively outlined on the areas provided.

A detailed assessment of each site is presented below.

233 SIGNAL HILL ROAD

Site Summary

The proposed site is indicated in Figure 1. The proposed site area follows around the base of the steep slopes around Signal Hill.

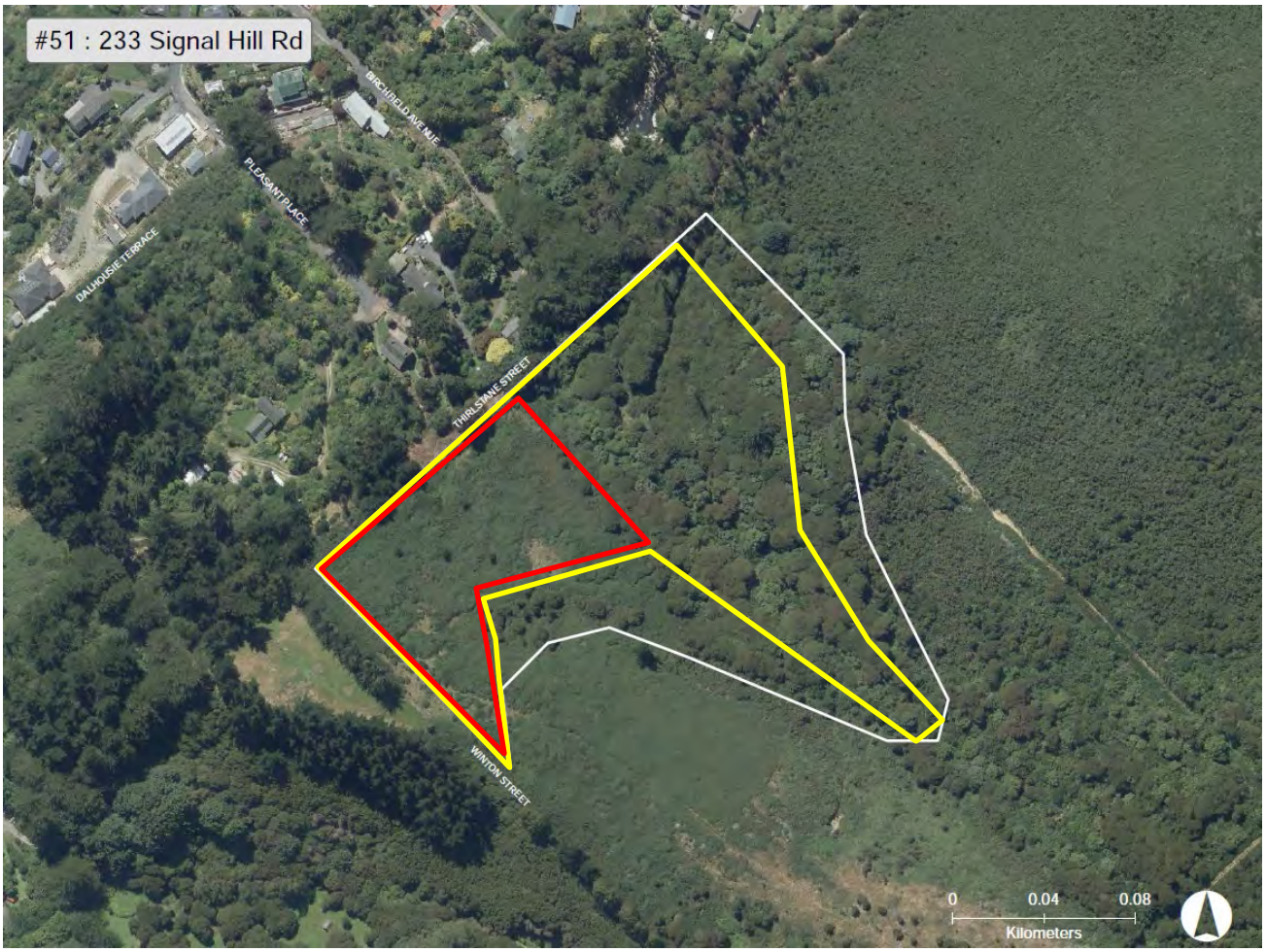


Figure 1 – 233 Signal Hill Road Site (yellow area indicates terrain under 20 degrees, red indicated likely easily developable land)

Existing Information

The site has a complicated history with consents. A recent Geolink report is also provided for both 233 and 235 Signal Hill Road. The recent geotechnical report is not relating to the proposed area.

Geology and Slopes

The geology of the site consists of second main eruptive phase volcanics. The site is very steeply sloping in some areas by up to 35 degrees.

The underlying lithology is generally globally stable at moderately steep slope angles (<20°), unless over-excavated or subject to weathering / ground water. Instability is generally limited to the overlying superficial deposits (loess).

The outlined area in yellow consists of ground that is sloping by up to 20 degrees (or just slightly over) which would be more readily developable.

Existing Hazards and Effects

There are no hazards on this site or adjacent land that may affect this site within the hazards register.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low-to-medium hazard level**. This decision is based on the following summary of information:

- There are **low hazards** associated with slope instability within the red highlighted area, however excavation into the toe of the steep slopes may exacerbate slope instability.
- There are **medium level hazards** associated with slope instability within the wider area:
    - There are possibly sensitive slopes of up to 35 degrees within the proposed area that may become unstable with excavation and improper stormwater management.
- There are **medium level hazards** associated with stormwater within the wider area:
    - There is a well defined watercourse running through the proposed area, particularly through the main “flat” section of the site. Although the land in the gully is less steep, there are other hazards associated with stormwater management and associated erosion and land stability.

There is readily developable land within the proposed area, however geotechnical investigation and assessments of the adjacent slopes is required to confirm the extents of the readily developable land. The area indicated in red appears to be more readily suited to further development.

It is possible that excavation into the steeper slopes within the proposed area may cause instability uphill, or within the watercourse.

235 SIGNAL HILL ROAD

Site Summary

The proposed site is indicated in Figure 2. The proposed site area follows around the base of the steep slopes around Signal Hill.

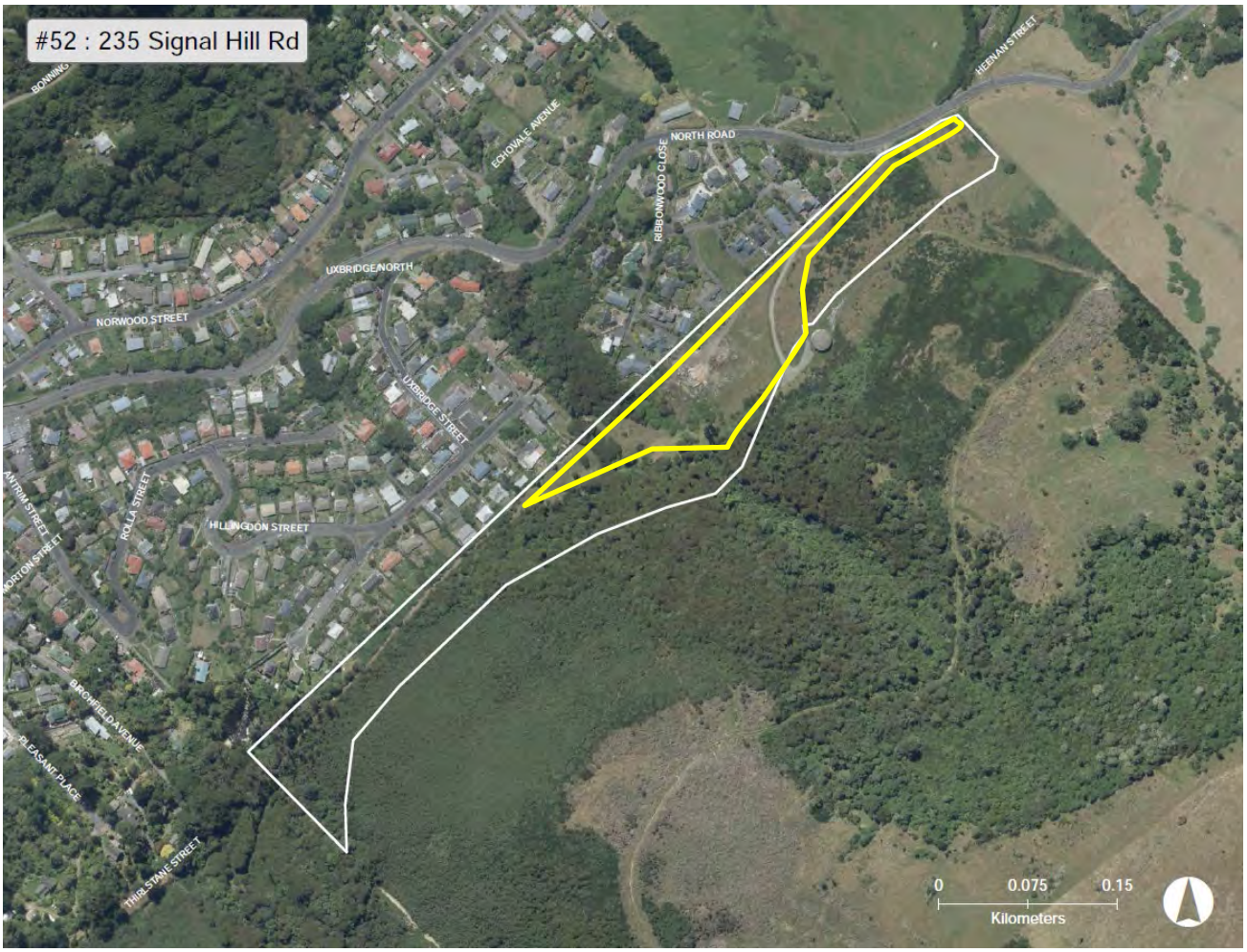


Figure 2 – 235 Signal Hill Road Site (yellow area indicates land sloping by less than 20 degrees)

Existing Information

The site has a complicated history with consents. A recent Geolink report is also provided for both 233 and 235 Signal Hill Road. The recent geotechnical report is not relating to the proposed area.

Geology and Slopes

The geology of the site consists of second main eruptive phase volcanics. The site is very steeply sloping in some areas by up to 35 degrees.

The underlying lithology is generally globally stable at moderately steep slope angles (<20°), unless over-excavated or subject to weathering / ground water. Instability is generally limited to the overlying superficial deposits (loess).

The outlined area in yellow consists of ground that is sloping by up to 20 degrees which would be more readily developable.

Existing Hazards and Effects

There are no hazards on this site or adjacent land that may affect this site within the hazards register.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low-to-medium hazard level**. This decision is based on the following summary of information:

- There are **low hazards** associated with slope instability within the yellow highlighted area, however excavation into the toe of the steep slopes may exacerbate slope instability.
- There are **medium level hazards** associated with slope instability within the wider area:
    - There are possibly sensitive slopes of up to 35 degrees within the proposed area that may become unstable with excavation and improper stormwater management.

There is readily developable land within the proposed area, however geotechnical investigation and assessments of the adjacent slopes is required to confirm the extents of the readily developable land. It is possible that excavation into the steeper slopes within the proposed area may cause instability uphill.

32/45 HONEYSTONE STREET

Site Summary

The proposed site is indicated in Figure 3. The site is located within a volcanic formation on relatively mellow slopes.

Figure 3 – 32/45 Honeystone Street site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site is third main eruptive phase volcanics (various basalts). The site is typically sloping by less than 12 degrees with some localized slopes of up to 35 degrees. There are some steep slopes up to 35 degrees in close proximity to the watercourse on the site.

The underlying lithology is generally globally stable at moderately steep slope angles (<20°), unless over-excavated or subject to weathering / ground water. Instability is generally limited to the overlying superficial deposits (loess). In this case, there are no slope stability hazards associated with the geology or sloping terrain.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11965: Land Stability – Land Movement

  Activity: Unknown, Sensitivity: Medium, Certainty: Likely, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

The land stability hazard only affects the top right hand corner of the proposed area and is not considered a hazard for the whole site. There are no other hazards on adjacent land that may affect this site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low hazards level**. This decision is based on the following summary of information:

- There are **low level hazards** associated with slope instability within the slope angles and geology of the site
- There are **medium level hazards** associated with slope instability within the wider area:
  - There are possibly sensitive slopes of up to 35 degrees within the wider area that may become unstable with excavation and improper stormwater management.
- There are no other listed natural hazards on the site which would affect development

The proposed area is predominantly developable with minor geotechnical input required. However, some "big picture" geotechnical assessments are required to confirm the extents of developability within the proposed area. This may include some restrictions like offsets to the watercourse or from the mapped landside feature to the north.

33-49 DALZIEL ROAD/473 TAIERI ROAD

Site Summary

The proposed site is indicated in Figure 4. The site is located within a volcanic formation on relatively mellow slopes.

Figure 4 – 33-49 Dalziel Road/473 Taieri Road Site

Existing Information

There is a reference to the possibility of a prehistoric land slide within a SUB-2012-92/A in ECM. There are several existing dwellings already located within this hazard area which is considered to be low risk.

Geology and Slopes

The geology of the site consists of older floodplain conglomerate with bedded tuffs and shale.

The site is predominately sloping by less than 12 degrees, though falls off to up to 26 degrees beyond the proposed area to the eastern watercourse.

The underlying geology on the site is known for its susceptibility to groundwater and earthworks. The material can typically become unstable at slopes of over 15 degrees. Excavation of the toe of these slopes can cause global instability uphill of the excavation.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11965: Land Stability – Land Movement (multiple)

  Activity: Unknown, Sensitivity: Medium, Certainty: Possible, Type: Complex,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

There are no other stability hazards within the neighboring lots within the hazard register.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low hazards level**. This decision is based on the following summary of information:

- There are **low level hazards** associated with slope instability within the slope angles and geology of the site
- There are no other listed natural hazards on the site which would affect development

The proposed area is predominantly developable with minor geotechnical inputs required. Geotechnical assessment may be required to identify offsets from the steeper slopes to the east of the proposed area.

127A MAIN ROAD FAIRFIELD

Site Summary

The proposed site is indicated in Figure 5. The site is located within undulating volcanic terrain.

Figure 5 – 127a Main Road Fairfield Site

Existing Information

There is no preexisting hazard information found within histoic ECM files.

Geology and Slopes

The geology of the site is Otago Schist and inactive Alluvial deposits. The site is typically sloping by less than 12 degrees up to 26 degrees towards the Motorway.

The underlying lithology is generally globally stable at steep slope angles (<26°), however is subject to weakness under certain conditions and slope angles. Excavation within lower schist slopes can

destabilize uphill land. Though instability is generally limited to the overlying superficial deposits (loess). In this case, there is dense vegetation covering the site.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10106: Land Stability – Land Movement (Alluvial Fans – Inactive Floodwater Dominated)

There are no other hazards within the proposed area or adjacent areas.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low-to-medium hazard level**. This decision is based on the following summary of information:

- There are **low hazards** associated with slope instability across most of the site
- There are **medium hazards** associated with slope instability in the steeper parts of the proposed area

The proposed area is predominantly developable with minor geotechnical inputs required. Geotechnical assessment may be required to identify the stability of the underlying schist and effects of excavation within the steeper slopes within the proposed area.

AREA BOUNDED BY SEATON HIGHCLIFF RD AND PORTOBELLO

Site Summary

The proposed site is indicated in Figure 6. The site is located within the "Peninsula Landslide" area.

Figure 6 – Area Bounded By Seaton Highcliff Rd And Portobello Sites

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of "flows and tuffs" volcanic material.

The site is typically sloping by up to 20 degrees and rolling off to over 26 degrees towards the west and east of the site. There are slopes over 35 degrees adjacent to the eastern boundary of the proposed area.

The underlying lithology is highly variable and varies from very strong to very weak and unstable slopes. Instability can range from shallow to large scale failures.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Class 3)
- Hazard ID 11965: Land Stability – Land Movement (Unknown)
- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Cass 2)
- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Cass 1)
- Hazard ID 10127: Land Stability – Land Movement (Alluvial Fans – Active Debris Dominated)

The site consists of various levels of land stability hazards from the Peninsula Landslide Complex. Generally, most of the site is within Class 2 and slopes of 20 degrees or less.

This does not exclude this site from development, but engineering assessments of these steep areas is definitely required to permit development of the proposed site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium level hazard**. This decision is based on the following summary of information:

- There are **medium level hazards** associated with slope instability on the site
    - Global stability of steeper parts of the site appears to be governed by variable geological conditions and stormwater management and may be affected by development.
    - Geotechnical advice will be required prior to subdivision of this site to confirm the extents of any instabilities and ensure it will not affect any lots. This may also identify any offsets that might be required from unstable slopes

Geotechnical assessment will be required to confirm the stability of some parts of the proposed area. Provided the site is found to be globally stable, regular earthworks requirements would be applicable for most lots on the site.

Some parts of the site (such as within landslide class 1-2 and sloping less than 15 degrees) are free of any significant hazards.

Extensive geotechnical assessments are required to substantiate the applicability of earthworks or higher density development in this area. Specific assessment and design would be required to confirm the global stability of the site, and identify weaker geologies. It is possible that much of this area is not developable without earthworks that may destabilize weaker material.

19 MAIN SOUTH ROAD CONCORD

Site Summary

The proposed site is indicated in Figure 7.

Figure 7 – 19 Main South Road Concord Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of Caversham Sandstone with steep 1st phase volcanics to the east of the site. The site is typically sloping by less than 12 degrees.

Caversham Sandstone is known for its susceptibility to groundwater and earthworks. This instability typically becomes hazardous at slopes of over 15 degrees.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11965: Land Stability – Land Movement (unknown)

  Activity: Recent, Sensitivity: Medium, Certainty: Definite, Type: Surficial,

  Initiation Time: Probably Prehistoric, Last Movement: 3-4 June 2015

The following hazard is not within the site but is directly adjacent to the site.

- Hazard ID 11965: Land Stability – Land Movement (unknown)

  Activity: Unknown, Sensitivity: Medium, Certainty: Likely, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

  Comments: Extensively modified by construction of Concord offramp

- Hazard ID 10106: Land Stability – Land Movement (Alluvial Fans – Active floodwater dominated)

The above two landslides are mapped on the same slip on a volcanic slope to the east of the site. The runout of the landslide of the steeper slopes crosses the boundary to the proposed site. The primary hazard to the site is runout debris as opposed to land stability. The Concord offramp also intersects the slip runout path and will possibly limit the risk to the proposed site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low hazards level**. This decision is based on the following summary of information:

- There are **low level hazards** associated with slope instability on the site
  - Global stability of the site itself is within typical stability limits.
  - Geotechnical advice will be required prior to subdivision of this site to confirm the extents of instability in the adjacent slope and ensure it will not affect any lots. This may also identify any offsets that might be required from the active slopes to the east.

Geotechnical assessment will be required to confirm the stability of the hillside to the east. Provided the site is found to be globally stable, requirements for consent would be normal for most lots within this area.

155 AND 252 SCROGGS HILL ROAD

Site Summary

The proposed site is indicated in Figure 8. The site is located within undulating Otago Schist hills above Brighton.

Figure 8 – 155 and 252 Scroggs Hill Road Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of Otago Schist and Taratu Coal Measures (Quartz conglomerate).

The site is typically sloping by less than 12 degrees on the ridge tops and up to 35 degrees within numerous gullies within the area.

The underlying lithology is generally globally stable at steep slope angles (<26°), however is subject to weakness under certain conditions and slope angles. Excavation within lower schist slopes can destabilize uphill land. Though instability is generally limited to the overlying superficial deposits (loess). In this case, there is dense vegetation covering the steeper parts of the site.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11965: Land Stability – Land Movement (unknown)

  Activity: Unknown, Sensitivity: Low, Certainty: Likely, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

- Hazard ID 11504: Land Stability – Land Movement (Landslide Slip ID=135 and 136)

  Landslides triggered by 17-19 March 1994 rainstorm

The site consists of multiple mapped landslides from unknown movement to certain historic activity. These are all occurring within the gullies and zones of steep terrain.

A mapped historic landslip has occurred at the site within the steeper terrain to the east. The trigger for this site was related to stormwater and mapped landslip extents are within the proposed site.

This does not exclude this site from development, but engineering assessments of these steep areas is definitely required to permit development and confirm the extents of the proposed site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium level hazard**. This decision is based on the following summary of information:

- There are **medium level hazards** associated with slope instability on the site
  - Global stability of steeper parts of the site appears to be governed by stormwater management and steepness/aspect of the slopes.
  - Geotechnical advice will be required prior to subdivision of this site to confirm the extents of instability and ensure it will not affect any potential lots. This may also identify any offsets that might be required from unstable areas.

Geotechnical assessment will be required to confirm the stability of any proposed lots. Provided the site is found to be globally stable, some specific earthworks and stormwater management requirements would be applicable for lots on the site. It is likely that removal of trees from the gully areas will exacerbate instability.

The ridgelines and flatter areas appear to be suitable for building platforms.

336 AND 336A PORTOBELLO ROAD

Site Summary

The proposed site is indicated in Figure 9. The site is located on the sedimentary foothills of a volcanic formation.

Figure 9 – 336 and 336A Portobello Road Site

Existing Information

There is preexisting hazard information found within historic CST100 files regarding land instability from stormwater on Lot 3 DP4349. The hazard information is regarding Hazard ID 10749 described in the hazards section of this proposed area.

Geology and Slopes

The geology of the site consists of second main eruptive phase volcanics. The site is typically sloping by 20 - 26 degrees and rolling off to up to 35 degrees towards the western gully.

The underlying lithology is generally globally stable at moderately steep slope angles (<20°), unless over-excavated or subject to weathering / ground water. Instability is generally limited to the overlying superficial deposits (loess).

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Class 3)
- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Class 4)
- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Cass 2)
- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Cass 1)
- Hazard ID 10127: Land Stability – Land Movement (Alluvial Fans – Active Debris Dominated)
- Hazard ID 10749: Land Stability – Land Movement

  "the proposed subdivision area is within a gully containing relatively thin colluvium over volcanic bedrock. Shallow seated slumping is likely upslope from the building platform. A small stream runs down the centre of the site with a culvert used to control its flow next to the existing building platform on proposed lot 2, which might result in other potential land stability issues to the building platform. A suitably qualified person is recommended for the foundation design, please refer to CST100 files in ECM for more details"

The site consists of various levels of land stability hazards from the Peninsula Landslide Complex. Generally, most of the site is within Class 3 and slopes of 26 degrees or less.

This does not exclude this site from development, but engineering assessments of these steep areas is definitely required to permit development of the proposed site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium level hazard**. This decision is based on the following summary of information:

- There are **medium level hazards** associated with slope instability on the site
    - Global stability of steeper parts of the site appears to be governed by variable geological conditions and stormwater management and may be affected by development.
    - Geotechnical advice will be required prior to subdivision of this site to confirm the extents of any instabilities and ensure it will not affect any lots. This may also identify any offsets that might be required from unstable slopes

Geotechnical assessment will be required to confirm the stability of the entire proposed area. Provided the site is found to be globally stable, specific earthworks requirements and specific engineering design will still be required for most lots on the site.

Engineering assessment will need to identify the areas of land instability (or otherwise) prior to any subdivision of the site. There is precedent for development in the area on similar slopes, however further development must be subject to thorough geotechnical testing and assessment.

201, 207, AND 211 GLADSTONE ROAD SOUTH

Site Summary

The proposed site is indicated in Figure 10. The site is located on the South Mosgiel plains.

Figure 10 – 336 and 336A Portobello Road Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of alluvial deposits of south Mosgiel. The site is flat.

Although not directly a hazard, the underlying soils are relatively young, and as a result may be loose / lower strength. This will affect foundation design.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10106: Land Stability - Land Movement (Alluvial Fans – Inactive Floodwater Dominated)
- Hazard ID 11407: Seismic – Liquefaction (Domain B)
- Hazard ID 11407: Seismic – Liquefaction (Domain C)

  Domain B/C - The ground is predominantly underlain by poorly consolidated marine or estuarine sediments with a shallow groundwater table. There is considered to be a moderate to high likelihood of liquefaction-susceptible materials being present in some parts of the areas classified as Domain C.

- Hazard ID 11582: Flood – Overland Flow Path (Flood Hazard Area 22)
- Hazard ID 11582: Flood – Overland Flow Path (Flood Hazard Area 23)

All the hazards are relating to flood and liquefaction associated with weak floodplain alluvium. This is no different than many other locations within Mosgiel and is controlled using engineering design for foundations and guidelines for minimum floor levels.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low hazards level**. This decision is based on the following summary of information:

- There are **low level hazards** associated with seismic instability on the site
  - Liquefaction is typically mitigated with geotechnical investigation followed by site specific design. This is typically a building control issue that is not a limiting factor for subdivision of the lots
- There are **low level hazards** associated with flood hazard on the site:
  - The site lies within flood hazard overlays that are typically mitigated through minimum floor levels implemented at the time of subdivision

Geotechnical assessments will be required for liquefaction assessments which can be recommended at the time of subdivision.

Minimum floor levels will be required to be set for any subdivision within the proposed area.

Specific engineering design or exclusion of liquefaction risk will still be required for all lots within liquefaction risk areas across the site.

105 ST LEONARDS DRIVE

Site Summary

The proposed site is indicated in Figure 11. The site is located on first phase volcanic terrain.

Figure 11 – 105 St Leonards Drive (the yellow area indicates an area of low hazards)

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of first main eruptive phase volcanics and is typically sloping by less than 20 degrees, but up to 26 degrees towards the southern and eastern aspects of the site. There are slopes of up to 35 degrees adjacent to the south of the site.

The underlying lithology is well known for its sensitivity to over excavation and ground water. This susceptibility may become hazardous at slopes of over 15 degrees. (however there is already a dwelling located on the site within slopes of up to 20 degrees)

Existing Hazards and Effects

There are no hazards identified within the hazards register for this site or any adjacent sites.

There are hazards associated with the existing slopes on the site and underlying geology. The steeper slopes to the south of the site may become unstable if subject to excavation or stormwater.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low-to-medium hazard level**. This decision is based on the following summary of information:

- There are **low hazards** associated with slope instability within the yellow highlighted area, however excavation into the toe of the steep slopes may exacerbate slope instability.
- There are **medium level hazards** associated with slope instability within the wider area:
    - There are possibly sensitive slopes of up to 35 degrees to the south of the proposed area that may become unstable with excavation and improper stormwater management.

There is readily developable land within the proposed area, however geotechnical investigation and assessments of the adjacent slopes is required to confirm the extents of the readily developable land. It is possible that excavation into the steeper slopes within the proposed area may cause instability uphill.

Stantec

Memo

To:	Dunedin City Council	From:	Edward Guerreiro
		Review:	Lee Paterson
File:	Hazard Assess V2 2GP	Date:	August 26, 2020

Reference: Re-zoning - Group 1 Hazards

SUMMARY

The purpose of this letter is to transmit our assessment of Group 1 for hazards. The sites contained within Group 1 are the following:

- Waldronville Golf Course
- Allen Rd (Green Island)
- Freeman Cl, Lambert St, Abbotsford
- Polwarth Rd & Wakari Rd
- Main South Road, Fairfield
- Emerson St
- Highcliff Road
- Brighton Rd, Allen Rd (Green Island)

We have summarized our findings using a "traffic light" system.

"Green" indicates no significant hazards are present and that the site does not require any specific engineering for development (e.g. elevated areas with shallow slopes and competent underlying geology).

"Yellow" indicates that there are hazards identified on part or all of the site that will require some specific engineering design to mitigate and enable higher density development (e.g. within low risk flood and overland flow susceptible areas, liquefaction susceptible geology, moderately steep terrain, or potentially unstable geology).

"Red" indicates that there are significant hazards on part or all of the site that will require significant specific engineering design or further investigation to enable development (e.g. steep slopes, high risk flood hazards, low strength or known unstable geology, and existing known instability).

Table 1 summarizes our assessment of the sites contained within "Group 1".

Table 1 - Group 1 Hazard Summary

Site	Group	Current Zone	Proposed Zone	Hazards Category
Waldronville Golf Course	1	Rural	General Residential 1	Low-Medium
Allen Rd (Green Island)	1	Rural	General Residential 1	Medium
Freeman Cl, Lambert St, Abbotsford	1	Rural	General Residential 1	Medium-High
Polwarth Rd & Wakari Rd	1	Rural Residential 2	General Residential 1	Low
Main South Road, Fairfield	1	Rural Residential 2	General Residential 1	High
Emerson St	1	Rural	General Residential 1	Medium
Highcliff Road	1	Rural Residential 2	General Residential 1	Medium
Brighton Rd, Allen Rd (Green Island)	1	Rural	General Residential 1	Medium

Note that while some of the sites are medium or high hazard levels based on the original proposed rezoning area, there may be smaller areas within the sites that are lower risk and suitable for development. These are indicatively outlined on the areas provided.

A detailed assessment of each site is presented below.

WALDRONVILLE GOLF COURSE

Site Summary

The proposed site is indicated in Figure 1. The shape of the proposed area appears to follow the Kaikorai Valley overland flow path hazard boundary.

Figure 1 - Waldronville Golf Course Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site is partially alluvial towards Kaikorai Stream and Abbotsford Mudstone east of this. The site is all sloping by less than 12 degrees.

Although not directly a hazard, the underlying alluvial soils are relatively young, and as a result may be loose / lower strength

Abbotsford Mudstone is known for its susceptibility to groundwater and earthworks. This instability becomes hazardous at slopes of over 15 degrees – so is not a hazard in this case.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11407: Seismic – Liquefaction - Domain C

  The ground is predominantly underlain by poorly consolidated marine or estuarine sediments with a shallow groundwater table. There is considered to be a moderate to high likelihood of liquefaction-susceptible materials being present in areas classified as Domain C.

- Hazard ID 11581: Flood – Waterway - Kaikorai Stream Floodplain

  The site is in close proximity to a waterway which has the potential to impact the site.

- Hazard ID 12074: Flood – Overland Flow Path – Kaikorai Valley Flood Level Including 500mm Freeboard

  The site is subject to overland flow from adjacent properties.

There are no other hazards on adjacent land that may affect this site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low-to-medium hazard level**. This decision is based on the following summary of information:

- There are **no hazards** associated with slope instability
- There are **medium level hazards** associated with geology:
  - Potentially liquefiable soil (mitigated by geotechnical investigation and specific foundation design)
- There are **medium level hazards** associated with stormwater:
  - Flood (mitigated by minimum floor levels and local scale design)
- There are some **high level hazards** associated with overland flow paths directly adjacent to the proposed area. Although the proposed area (**Figure 1**) appears to avoid the overland flow hazard, a stormwater assessment is required to identify the extents of the overland flow hazard, and thus the extents of the developable area.

Although we consider the site is a medium hazard level, it is directly adjacent to a high level hazard, and this interface must be appraised.

ALLEN ROAD (GREEN ISLAND)

Site Summary

The proposed site is indicated in Figure 2. The site is located on the sedimentary foothills of a volcanic formation.

Figure 2 – Allen Road Site – yellow boundary indicates lower risk potentially developable sites

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site is Green Island loose sand to the west of the site and Burnside Mudstone underlying most of the site. Caversham Sandstone is mapped along the eastern boundary and projects further east uphill.

The site is typically sloping by less than 12-15 degrees with some localized depressions of up to 26 degrees.

Burnside Mudstone is known for its susceptibility to groundwater and earthworks. This instability becomes hazardous at slopes of over 15 degrees.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10116: Land Stability – Land Movement (Landslides from Forsyth)

  Activity: Unknown, Sensitivity: Low, Certainty: Definite, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

- Hazard ID 11965: Land Stability – Land Movement (unknown)

  Activity: Unknown, Sensitivity: Low, Certainty: Definite, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

There are other land stability hazards on nearby slopes and within similar geology that have failed within the past 15 years (a mapped landslide). There are also readily identifiable features of land movement on the slopes uphill of the site. These are all located on Caversham Sandstone and on slopes steeper than 15 degrees.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium level hazard**. This decision is based on the following summary of information:

- There are **medium level hazards** associated with slope instability on the site and **high level hazards** associated with slope stability on adjacent land.
  - Global stability of the site itself is unlikely to be affected by development, however local instabilities and earthworks around gullies will require engineering design.
  - Large scale excavations, especially in the eastern-most corner of the site could disrupt the toe support and further destabilize the adjacent uphill slopes. Global stability of adjacent uphill land may be affected.

Geotechnical assessment and specific engineering design may be required to confirm the stability of the hillside. The requirements for specific design would be dependent on the extent of proposed earthworks at each site.

FREEMAN CL, LAMBERT ST, ABBOTSFORD

Site Summary

The proposed site is indicated in Figure 3. The site is located North and West of historic Abbotsford landslides.

Figure 3 – Freeman Cl, Lambert St, Abbotsford Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of most of the site is Abbotsford Mudstone with some conglomerate and alluvial sediment towards the north-western creek.

The site is predominately sloping by less than 12 degrees, though has some large areas of up to 15 degrees and gullies of 35 degrees.

Abbotsford Mudstone is known for its susceptibility to groundwater and earthworks and historic large-scale instabilities. The material can typically become unstable at slopes of over 15 degrees, however there have been several cases of instabilities within slopes of less than 12 degrees. An example of this is the historic Abbotsford motorway landslide within the same geology (although slightly different geological circumstances). Excavation of the toe of the slope caused a global landslip within land sloping by less than 12 degrees.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10358: Unknown (possibly related to "slippage, slope stability, erosion"

  Noted hazard with comments relating to land stability and erosion
- Hazard ID 10710: Unknown (possible related to land stability)

  Noted hazard with no data
- Hazard ID 10105: Flood – Waterway (Abbots Creek)

  Possible indicative area of flooding from Abbots Creek
- Hazard ID 10106: Land Stability – Land Movement (Alluival Fans – Active Floodwater Dominated)

  Possible transport of sediment from flooding within this area
- Hazard ID 11965: Land Stability – Land Movement (multiple)

  Activity: Unknown, Sensitivity: Low, Certainty: Likely, Type: Complex,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown
- Hazard ID 10116: Land Stability – Land Movement (Landslides from Forsyth)

  This hazard area represents the limits of this mapped hazard
- Hazard ID 11498: Land Stability – Subsidence (Mine)

  This hazard area represents maximum limits of mine workings
- Hazard ID 10632: Land Stability – Subsidence (Mine)

  This hazard area represents possible extents of coal mine workings. "Fill ex brickworks '93"
- Hazard ID 10633: Land Stability – Subsidence (Mine)

  This hazard area represents possible extents of coal mine workings. "Fill ex brickworks '93"

There are other land stability hazards on nearby slopes and within similar geology that have historically failed (Abbotsford Motorway Slide, East Abbotsford Landslide. There are also readily identifiable features of land movement and disturbance in the area.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium** to **high level hazard** site. This decision is based on the following summary of information:

- There are several **high level hazards** associated with slope instability and precedent for land instability within similar geology and slope angles nearby.
    - Global stability of the site could be affected by development, especially from earthworks and/or groundwater changes. Any global instabilities would be large to massive in scale and affect multiple potential lots.
    - The site is located within the same geology and slope angles as other large historic landslides nearby.
    - Mine site hazards require further investigation to confirm the affects on developability of the site
    - Geological investigations are required to determine the suitability of the site. Investigations may require deep drilling
- There are also several **medium level hazards** associated with stormwater
    - Alluvial sediment transport within the flood hazard area
    - Flooding within the flood hazard area

Extensive geotechnical assessments are required to identify suitability (or not) of the site for higher density development. The specific assessments would be required to confirm the extents and impacts of historic mine works, and global stability of the site. It is possible that extensive hazard mitigation design and conditions would be required for development in much of this area.

POLWARTH ROAD & WAKARI ROAD

Site Summary

The proposed site is indicated in Figure 4. The site is located within undulating volcanic terrain.

Figure 4 – Polwarth Road & Wakari Road Site

Existing Information

There have historically been earthworks consents and contamination sites within this proposed area.

There is no preexisting hazard information found within histoic ECM files.

Geology and Slopes

The geology of the site is third main eruptive phase volcanics (various basalts). The site is typically sloping by less than 12 degrees with some thin depressions/gullies.

The underlying lithology is generally globally stable at moderately steep slope angles (<20°), unless over-excavated or subject to weathering / ground water. Instability is generally limited to the overlying superficial deposits (loess). In this case, there are no slope stability hazards associated with the geology or sloping terrain.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11965: Land Stability – Land Movement

  Activity: Unknown, Sensitivity: Medium, Certainty: Likely, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

- Hazard ID 11550: Contaminated Land – Pesticide Bulk Storage

The land stability hazard only affects a minute corner of the proposed area and is not considered a hazard for the site. There are no other hazards on adjacent land that may affect this site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **low hazards level**. This decision is based on the following summary of information:

- There are **no hazards** associated with slope instability
- There are no other listed natural hazards on the site which would affect development

MAIN SOUTH ROAD, FAIRFIELD

Site Summary

The proposed site is indicated in Figure 5. The site is located west of the historic Abbotsford landslides.

Figure 5 – Main South Road Site - yellow boundary indicates lower risk potentially developable sites

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of most of the site is Abbotsford Mudstone sloping towards alluvial gravels south of the site.

The site is predominately sloping by less than 12 degrees, though has many areas of up to 20 degrees and localized slopes of up to 26 degrees.

The steepest part of the site is located within the vegetated embankment with consistent slopes of 20-26 degrees. Earthworks within this area may cause significant large scale instability within the uphill lots off Severn St and Tate Cres.

Abbotsford Mudstone is known for its susceptibility to groundwater and earthworks and historic large-scale instabilities. The material typically become unstable at slopes of over 15 degrees, however there have been several cases of instabilities within slopes of less than 12 degrees. An example of this is the historic Abbotsford motorway landslide within the same geology. Excavation of the toe of the slope caused a global landslip within land sloping by less than 12 degrees.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10106: Land Stability – Land Movement (Alluvial Fans – Inactive Floodwater)

  Most of the northern half of the area contains this non-hazard.

- Hazard ID 11807: Land Stability – Land Movement (Landslide)

  It is noted that an area within the eastern wing of the site has this landslide hazard. There is a "swampy area" and possible recent land instability in this area.

- Hazard ID 11965: Land Stability – Land Movement (Miller Street Landslide)

  Adjacent to the previous hazard, there is an area within the eastern half of the site containing this mapped pre-historic landslide.

There are other land stability hazards on nearby slopes and within similar geology that have historically failed (Abbotsford Motorway Slide, East Abbotsford Landslide. There are also mapped hazards and recent commentary on land instability within the proposed area.

There is also a large quarry still active directly adjacent to the west of the proposed site, and was previously active within the lower slopes and terraces to the southwest.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **high level hazard** site. This decision is based on the following summary of information:

- There are several **high level hazards** associated with slope instability and precedent for land instability within similar geology and slope angles nearby.
  - Global stability of the site could be affected by development, especially from earthworks and/or groundwater changes. Any global instabilities would be large to massive in scale and affect multiple potential lots.
  - The site is located within the same geology and slope angles as other large historic landslides nearby.

- Geological investigations are required to determine the suitability of the site. Investigations may require deep drilling.

Extensive geotechnical assessments are required to substantiate the applicability of earthworks or higher density development in this area. Specific assessment and design would be required to confirm the global stability of the site. It is possible that much of this area is not developable without earthworks that may destabilize a large slip.

There is precedent for development of the Grand Vista Subdivision adjacent to the site which underwent intensive geotechnical investigation to identify land instability and no build zones. At least one site within this area is subject to section 72 of the Building Act.

EMERSON STREET

Site Summary

The proposed site is indicated in Figure 6.

Figure 6 – Emerson Street Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of Caversham Sandstone and is adjacent to other first main eruptive phase volcanics.

The site is typically sloping by 12-20 degrees with some very steep and unstable slopes directly adjacent to the site sloping by up to 35 degrees.

Caversham Sandstone is known for its susceptibility to groundwater and earthworks. This instability typically becomes hazardous at slopes of over 15 degrees.

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 11965: Land Stability – Land Movement (unknown)

  Activity: Unknown, Sensitivity: Medium, Certainty: Possible, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

The following hazard is not within the site but is directly adjacent to the site.

- Hazard ID 11965: Land Stability – Land Movement (unknown)

  Activity: Unknown, Sensitivity: Medium, Certainty: Likely, Type: Translational Slide,

  Initiation Time: Probably Prehistoric, Last Movement: Unknown

The above two landslides are mapped on either side of the hill. The eastern landslide is uncertain and may be gullied colluvium instead of bedrock instability. The landslide to the west of the site is mapped as a prehistoric slip, however it is readily evident that there is ongoing erosion and instability within the very steep bank. This does not exclude this site from development, but engineering assessments of these steep areas may be required to permit development of the proposed site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium level hazard**. This decision is based on the following summary of information:

- There are **medium level hazards** associated with slope instability on the site
  - Global stability of the site itself is unlikely to be affected by development, however local instabilities and earthworks may require engineering design.
  - Geotechnical advice will be required prior to subdivision of this site to confirm the extents of instability in the adjacent slope and ensure it will not affect any lots. This may also identify any offsets that might be required from actively fretting slopes.

Geotechnical assessment will be required to confirm the stability of the hillside. Provided the site is found to be globally stable, requirements for specific foundation design would likely be required for most lots within this area.

HIGHCLIFF ROAD

Site Summary

The proposed site is indicated in Figure 7. The site is located within the "Peninsula Landslides Area".

Figure 7 – Highcliff Road Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The geology of the site consists of second main eruptive volcanics.

The site is typically sloping by 15-20 degrees and rolling off to over 26 degrees towards the north of the site.

The underlying lithology is generally globally stable at moderately steep slope angles (<20°), unless over-excavated or subject to weathering / ground water. Instability is generally limited to the overlying superficial deposits (loess)

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Class 4)
- Hazard ID 10106: Land Stability – Land Movement (Alluival Fans Active Debris)
- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Cass 2)
- Hazard ID 10127: Land Stability – Land Movement (Peninsula Landslides Cass 1)
- Hazard ID 10127: Land Stability – Land Movement (Landslide Slip ID=51)

The site consists of various levels of land stability hazards from the Peninsula Landslide Complex. Generally, most of the site is within Class 2 and slopes of 20 degrees or less.

A mapped historic landslip has occurred at the site within the steeper terrain to the north. The trigger for this site was related to stormwater and mapped landslip extents is also located within Class 4 terrain.

This does not exclude this site from development, but engineering assessments of these steep areas is definitely required to permit development of the proposed site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium level hazard**. This decision is based on the following summary of information:

- There are **medium level hazards** associated with slope instability on the site
    - Global stability of steeper parts of the site appears to be governed by stormwater management and may be affected by development.
    - Geotechnical advice will be required prior to subdivision of this site to confirm the extents of instability and ensure it will not affect any lots. This may also identify any offsets that might be required from unstable slopes

Geotechnical assessment will be required to confirm the stability of some parts of the proposed area. Provided the site is found to be globally stable, regular earthworks requirements would be applicable for lots on the site.

Some parts of the site (such as within landslide class 2 and sloping less than 20 degrees) are free of any significant hazards.

BRIGHTON ROAD, ALLEN ROAD (GREEN ISLAND)

Site Summary

The proposed site is indicated in Figure 8. The site is located on the sedimentary foothills of a volcanic formation.

Figure 8 – Allen Road Site

Existing Information

There is no preexisting hazard information found within historic ECM files.

Geology and Slopes

The underlying geology of the site is Green Island loose sand and is situated on the slope above Abbotsford Mudstone.

The site is typically sloping by less than 12 degrees, rising to Allen Road by up to 20 degrees.

Green Island loose sand is known for its susceptibility to groundwater and earthworks. This instability becomes hazardous at slopes of over 15 degrees.

There have been historic events within the same geology on steeper slopes (West Abbotsford landslide). This site does not have some of the defining features of these historic landslides (such as steeper downslope features).

Existing Hazards and Effects

We have identified the following hazards within the Hazards Register that are applicable for this lot:

- Hazard ID 10372: Land Stability – Erosion

  There is an obvious drainage depression running through the site from Allen Road. This hazard also affects adjacent nearby properties

- Hazard ID 11407: Seismic – Liquefaction Domain C

  The ground is predominantly underlain by poorly consolidated marine or estuarine sediments with a shallow groundwater table. There is considered to be a moderate to high likelihood of liquefaction-susceptible materials being present in areas classified as Domain C.

- Hazard ID 12074: Flood – Overland Flow Path (Kaikorai Valley Flood Level inc. 500mm Freeboard

  The site is subject to overland flow from adjacent properties which can be clearly seen from Allen Road through the site.

Recommendations/ Specific Engineering Requirements

We consider that this site is a **medium level hazard**. This decision is based on the following summary of information:

- There are also several **medium level hazards** associated with stormwater
  - Alluvial sediment transport within the flood hazard area
  - Flooding within the flood hazard area (mitigated by minimum floor levels and local scale stormwater design)
- There are **medium level hazards** associated with slope instability on the site.
  - Global stability of the site itself is unlikely to be affected by any residential development, however local instabilities toward Allen Road and earthworks around gullies may require engineering design.
- There are **medium level hazards** associated with geology:
  - Potentially liquefiable soil (mitigated by geotechnical investigation and specific foundation design)

Site specific stormwater assessment and design may be required to mitigate the underlying flood and alluvial sediment hazards, and to manage the existing overland flow paths and erosion through the site. The site should be readily developable following this.

Planning for Housing Survey Report Dunedin City

February 2020

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City Development

Dunedin City Council

Executive Summary

The Planning for Housing Survey, conducted by the Dunedin City Council in October 2019, provided the wider community an opportunity to share their views on the provision of housing capacity in Dunedin. The results are to inform ongoing work by Council on housing-related initiatives, including changes to the Second Generation District Plan (2GP) and development of wider, housing-related strategic policy.

Results from 252 individual respondents demonstrated general alignment with the strategic approach to providing housing capacity in the 2GP, especially the focus on intensification in the existing urban area of Dunedin, while also offering greenfield development opportunities to provide people a range of housing choices.

Areas where participants generally supported greenfield rezoning included areas adjacent to the main urban area of Dunedin, especially those closest to the central city. More contentious areas included the Mosgiel/Taieri area, Halfway Bush and the Otago Peninsula, with notable support and opposition received. Greenfield rezoning was generally opposed in areas of productive rural land, natural hazards, green space and natural landscapes.

Widespread support was received for enabling intensification within the existing urban area, with 90% of participants supporting some form of intensification. Areas considered most appropriate for intensification included the inner city, inner suburbs (from Maryhill to Maori Hill), and suburbs in the north of the city (North Dunedin, North East Valley and the Pine Hill area). Areas considered the least appropriate for intensification included the Town Belt green space, Halfway Bush and areas subject to natural hazards. Areas that received both support and opposition included South Dunedin, Otago Peninsula, Mosgiel and areas with heritage buildings. The need to manage the design of new buildings in the existing urban area to ensure the effects on existing neighbourhood character are acceptable was also contentious.

Participants also provided suggestions on various ways housing development could be better enabled, and its effects managed. Planning-related suggestions included enabling infill development on larger suburban sections and changes to the density performance standards to enable various types of two-unit development across the city, such as duplexes. Other suggestions covered a wide range of topics managed by other Council departments. These included better integration of infrastructure planning with urban planning, improved consenting processes, and financial incentives to encourage preferred types of housing development.

The results suggest that, in addition to planning responses such as changes to the 2GP, there are opportunities across Council to consider initiatives that will cumulatively better enable the expectations of the community in relation to housing to be met.

Contents

Figures

1.0 Introduction

1.1 Context

Dunedin's population has recently grown at rates not seen in over twenty years. While this unexpected growth is a positive boost for the city, it is also putting further pressure on Dunedin's housing-related issues, such as the increase in demand for housing and an increase in house prices.

In April 2018, the Mayor's Taskforce for Housing was convened to address issues around housing supply, affordability, quality and access in Dunedin, culminating in the *Housing Action Plan for Dunedin 2019-2039*[1]. This proposed a set of social and affordable housing-related actions that focussed on healthy housing, land planning leadership, delivery and advocacy.

Extra housing capacity was recently added in Dunedin through the 2GP as newly zoned residential land and new medium density zoning. However, as shown in the *Housing Capacity Assessment for Dunedin City*[2], there is still a shortfall in capacity over the medium to long term. The city is categorised as a medium-growth urban area under the National Policy Statement on Urban Development Capacity (NPS-UDC). As such, the city is required to ensure there is sufficient feasible, zoned capacity for residential development over at least the short (3 years) and medium (10 years) terms in the District Plan. Capacity for the long term is required to be identified in a Council plan or strategy.

Dunedin City Council (DCC) is working on identifying appropriate options to address medium and long-term capacity requirements. A wide range of factors will be considered in deciding where to enable capacity for residential housing development. These include central government policy, 2GP policies, the availability of public services and the results of public consultation.

1.2 Purpose of the Survey

The DCC conducted an online 'Planning for Housing Survey' in October 2019, to provide the wider Dunedin community an opportunity to share their views on how planning for housing in Dunedin should be approached. This included questions on which areas of the city should be rezoned for new houses (greenfield development) and where more homes, such as apartments and townhouses, could be built in existing urban areas (intensification). A copy of the survey questionnaire is included in **Appendix A**. Results from the Planning for Housing Survey will contribute to the approach Council takes in responding to housing-related issues, including through Variation 2 to the 2GP and future plan-changes and policy development.

2.0 Method

The survey was undertaken in late-October 2019 via a page on the DCC website. This presented two options for people to provide their opinions. The first option was in a traditional questionnaire format and the second was a social-media-styled interactive mapping tool (Social Pinpoint). Participants could choose to use either or both options for providing feedback. This section provides further detail on

[1] Dunedin City Council and Community Housing Solutions (2019). *Housing Action Plan for Dunedin 2019-2039.* Retrieved from https://infocouncil.dunedin.govt.nz/Open/2019/05/CNL_20190506_AGN_1166_AT_WEB.htm.

[2] Stocker, N. (2019). *Housing Capacity Assessment for Dunedin City*. Retrieved from https://www.dunedin.govt.nz/__data/assets/pdf_file/0010/704962/Housing-capacity-assessment-for-Dunedin-City.pdf.

each method, how the survey was advertised to potential participants, how the data was analysed, and limitations.

2.1 Online Survey Questionnaire

The online survey was available from 9am on Monday, 14 October 2019 to 9pm on Sunday, 3 November 2019, for anyone to submit a response. Responses could be provided anonymously or with name and contact details, with all participants made aware that the information they provided would be publicly available. 252 unique responses were received, after accounting for multiple responses by individual participants.

The survey was set up with four multichoice and six free-form questions, the first question being the only mandatory-answer question, a setting required for security reasons. All free-form questions were assigned a word limit of 50 words, except the final 'any other comments' question which had a word limit of 200 words. These word limits were selected to encourage people to be succinct in expressing their views, to enable the results to be more efficiently analysed. The length of the survey was also managed to ensure it was quick to fill out, to encourage participation. However, a facility was also made available for participants to upload up to two files of up to 10MB each in size to provide further information if they wished. Only four people used this facility.

2.2 Online Social Pinpoint Interactive Mapping

Access to the interactive mapping tool was available for the same duration as the questionnaire form. This platform provided access to a copy of the Google Maps aerial photography for Dunedin, allowing people to zoom in and out to areas of interest. Participants could place a 'marker' at the location they wished to comment about, with markers available for comments on greenfield development or intensification. Other participants could respond to these comments by starting a discussion in a similar format to social media. Participants could also like or dislike a comment. Therefore, due to the nature of the platform, participants could provide multiple responses.

Overall, 134 comments were received from 58 people. Of these, 63 comments were on intensification and 71 were on greenfield development. **Appendix B** shows an example of a comment received on the map, and a resulting discussion with other participants.

2.3 Communications & Advertising

Various methods were employed to communicate and advertise the consultation with the public of Dunedin. These included the following:

- Press release to media on 14 October 2019 announcing the start of the consultation. Consequently, an article was published in the ODT on 16 October 2019;
- Email to members of the 'People's Panel', which consists of approximately 1,200 people who have self-selected to receive surveys on issues that the Council and city are facing, on 15 October 2019;
- A post on the DCC Facebook page on 16 October 2019, directing people to the consultation webpage. Comments on this post were also collected as data for analysis;
- Article in 'City Development News', an emailed newsletter sent to people self-selected to receive updates on activity within the DCC City Development department on 21 October 2019;
- DCC Intranet article encouraging staff to participate (as individuals, rather than as staff members);
- A link to the consultation webpage on the 2GP page of the DCC website;
- Advertising on the online edition of the ODT for the duration of the survey.

2.4 Coding Responses

All results received from the questionnaire and interactive mapping (along with comments from the DCC Facebook post) were collated into a centralised system for sorting. A 'tagging' system was devised whereby each submission for the questionnaire was read and 'tagged' according to the topics it

addressed. In total, 130 different topic tags were applied, which enabled refined quantitative analysis of the data collected in 'freeform' answers. It is acknowledged that different people's ideas of where suburban boundaries lie can vary between individuals. In the interest of consistency and unambiguity, responses that referred to specific suburban areas were therefore tagged according to a set of pre-determined boundaries for all suburbs.

Topic tagging was not undertaken for the interactive mapping comments because of the way individuals could make multiple comments on the same topic. Tagging these comments and including them with the results for the questionnaire for quantitative analysis, would potential skew the results. Analysis and presentation of the results for the interactive mapping comments is yet to be undertaken.

2.5 Limitations

The main limitation of this consultation is the representativeness of the sample compared to the current and future population of Dunedin. The participants are self-selected through the communication and advertising methods listed above. Many of those methods are likely to have reached only a subset of the population and are particularly likely to have limited the participation of people outside of Dunedin who may move here in the future. The administration of the consultation solely by computerised means is also likely to have affected the recruitment of participants, as would have the three-week timeframe for feedback.

Another limitation is that the nature of the Social Pinpoint data has meant that it cannot easily be combined with the results for the questionnaire, so it has not been considered further in this report. As mentioned above, this is mainly because participants could make multiple submissions in the maps which are difficult to combine into a single submission. While this data has not been fully analysed yet, preliminary analysis shows that 18 of the 58 unique participants in the Social Pinpoint mapping also submitted a questionnaire response, so those people's opinions have been included to an extent.

Other limitations relating specifically to individual survey questions or results are discussed separately in the relevant sections of the results below.

3.0 Results & Discussion

This section presents and discusses the results in four topic groups. They are:

- Section 3.1 Greenfield rezoning, which analyses views on where greenfield rezoning should or should not occur;
- Section 3.2 Intensification of existing urban areas, which analyses views on where intensification should or should not occur, how many units should be permitted per site, and whether design permission should be required for second residential units on a site;
- Section 3.3 The balance of greenfield and intensification, which analyses overall views on how these types of housing capacity should be provided compared to one another; and
- Section 3.4 Other methods suggested, which addresses methods participants suggested to encourage or manage the effects of housing development.

3.1 Greenfield Rezoning

This section presents survey respondents' opinions in relation to greenfield rezoning. Respondents provided information on where they thought greenfield rezoning would and would not be appropriate, by naming locations or describing environmental features. Some respondents provided a reason for their views, and some did not. These results are presented below, followed by a discussion of the findings.

3.1.1 Views on Specified Locations

Figure 1 below provides a representation of the most frequently mentioned locations in relation to greenfield rezoning, and whether respondents supported or opposed greenfield rezoning there. A

break-down of responses according to the various geographical areas follows, with responses regarding environmental features addressed after that.

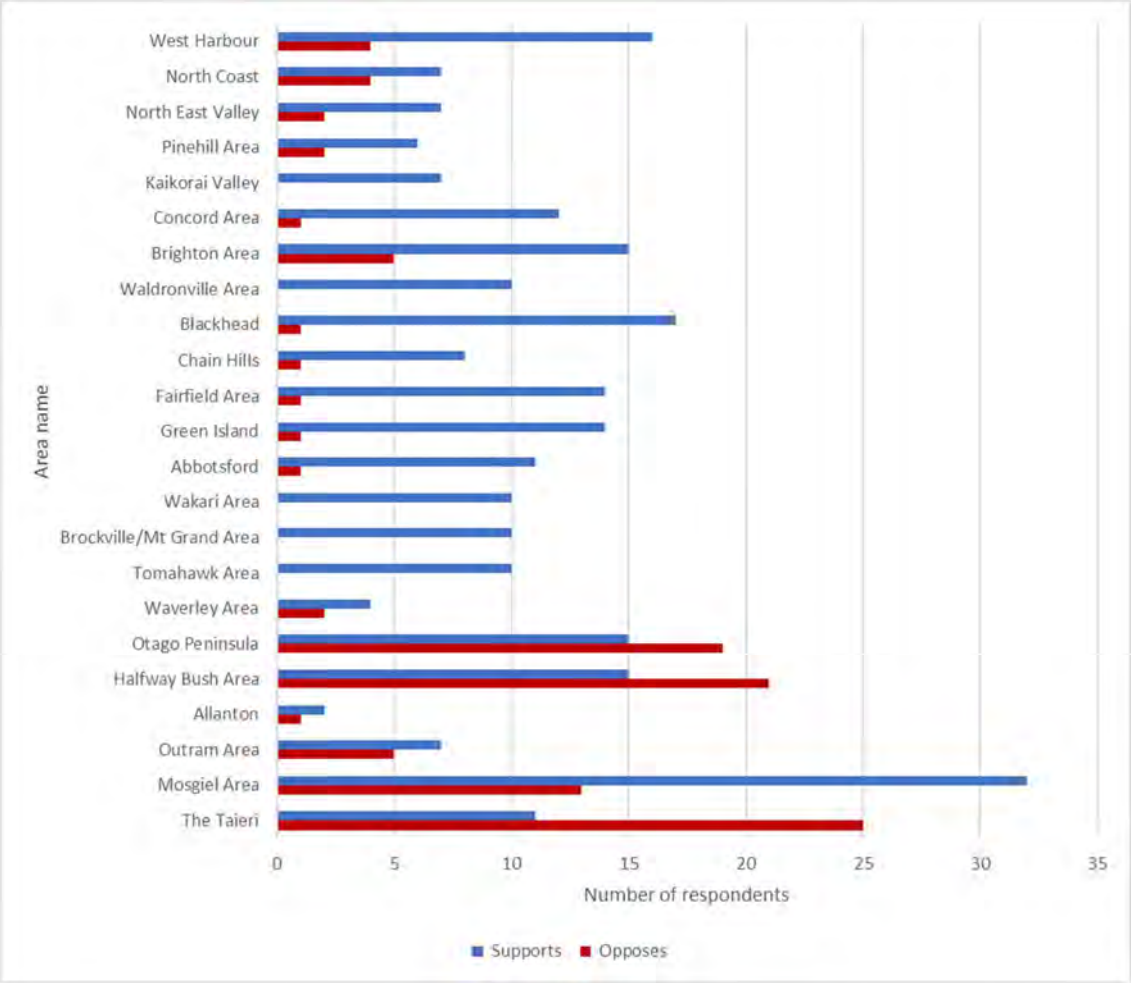


Figure 1: Views on the suitability of specified locations for greenfield rezoning

3.1.1.1 *The Taieri, Mosgiel, Outram and Allanton*

Results for each of the areas in this section are considered together, as there is overlap due to the different scales at which respondents considered the questions. As shown in **Figure 1** above, Mosgiel and The Taieri received a high number of responses compared to other areas around the city. For Mosgiel, there was stronger support for greenfield rezoning than opposition. However, the reverse was true for 'The Taieri'. This pattern of responses indicates that the Mosgiel and Taieri area is of significant interest to people concerning greenfield rezoning and that additional greenfield rezoning is contentious.

Key reasons given for opposition to greenfield rezoning in these areas were flood hazards, the need to protect productive land for future food production, the need to protect biodiversity, and that it may lead to inappropriate sprawl, car dependency and pressure on the road network.

Respondents who were in favour of greenfield rezoning in this area generally did not provide reasons for their views. However, some did qualify their response by saying floodable areas should be avoided.

A small number of responses were received which specifically mentioned Outram or Allanton. Similar reasons were given as for Mosgiel and The Taieri, and one person highlighted that Outram should not be rezoned without an appropriate sewerage system.

3.1.1.2 *Halfway Bush*

As seen in **Figure 1** above, Halfway Bush was another area that received a high response rate in the questionnaire, with slightly more opposition than support. This reflects the high level of local interest in proposals for residential rezoning and development in the area over the last few years. This was further demonstrated by a residents' group canvassing of the neighbourhood through mailers and a Facebook page, encouraging participation in the survey and providing suggested responses. It is noted that this may have resulted in an overrepresentation of views on the Halfway Bush area in the survey, compared to other areas of the city.

Participants who were in opposition to greenfield rezoning in Halfway Bush gave many reasons for their opposition, including a desire to preserve lifestyle, historic values, plant and birdlife, and a peaceful environment. The quote below was replicated in several submissions:

> *It should not occur in the Dalziel Road, Three Mile Hill Road, Taieri Road and Ashmore Street areas or any land that is currently zoned Rural or Rural Residential in Halfway Bush. The existing lifestyle for current residents, established trees, birdlife, pony club, historic stone walls, view, open spaces, peace and quiet environment, place to have grazing animals etc all need to be protected (Respondent 743783).*

Overall, most of the respondents opposing greenfield development in Halfway Bush are residents of that area. **Figure 2** below depicts the results sorted by whether the respondent was a local resident of the area or not.

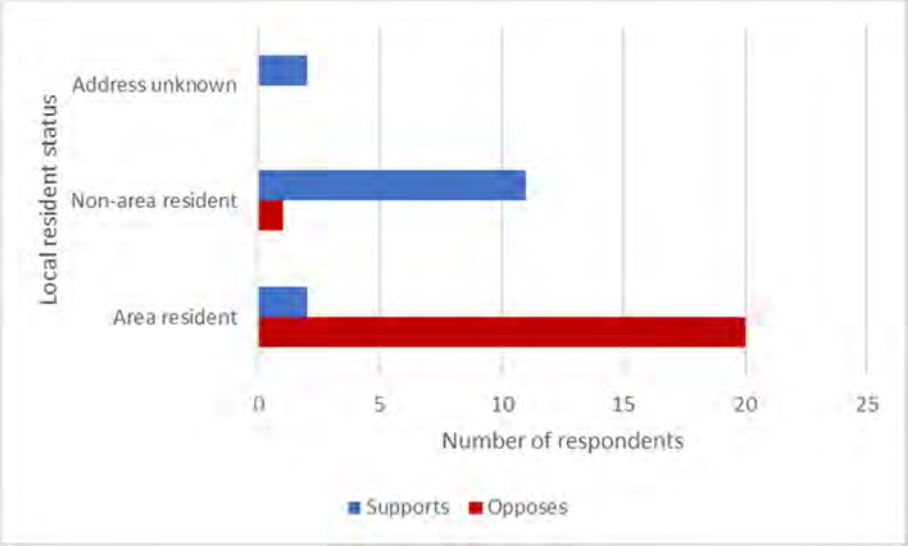


Figure 2: Halfway Bush views on greenfield rezoning by local resident status

The people who were in support of greenfield rezoning in Halfway Bush either did not give a reason or expressed a need for land to be made available to build new housing stock in Dunedin, naming the Halfway Bush area as suitable for that purpose. One participant submitted the following when asked where greenfield rezoning should occur:

> *Where ever there is suitable land and appropriate infrastructure available, Half Way Bush Three Mile Hill Road and Tairei Road Waikari Concorde Saddle Hill (Respondent 743935).*

3.1.1.3 *Otago Peninsula*

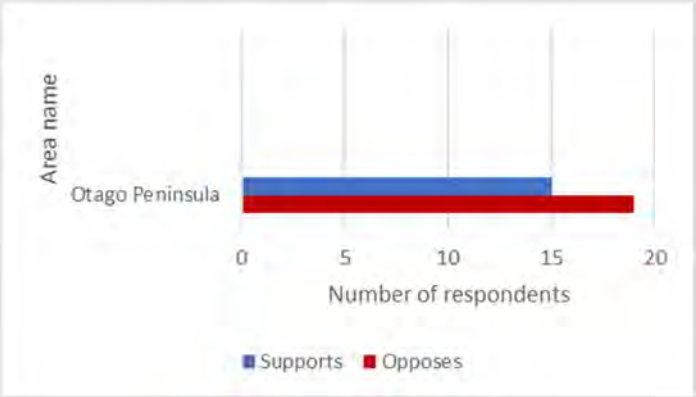


Figure 3: Views on greenfield rezoning on the Peninsula, Waverley and Tomahawk

A relatively high number of responses were also received concerning the Otago Peninsula, with slightly more participants in opposition to greenfield rezoning that in support. Those in opposition advocated for guardianship of Dunedin's biodiversity and green spaces for future generations, prevention of sprawl and car dependency, whereas those in support either did not give reasons or stated they were looking for, or already owned, property in the area.

3.1.1.4 *Other Areas*

As shown in **Figure 1** above, most other areas mentioned in relation to greenfield rezoning around the city received significantly more support than opposition, with several areas receiving no opposition at all.

Areas that did receive some opposition tended to be those located further from the central city, including around Brighton, the townships and rural areas to the north of the city ('North Coast'), and the areas around the townships along the west of Otago Harbour ('West Harbour'). Participants who opposed rezoning in these areas gave reasons including the protection of green space and the prevention of urban sprawl.

Areas that received a good level of support, with no or very little opposition, included the Brockville and Wakari areas to the west of the central city (including Helensburgh and Balmacewen), Blackhead and Concord to the south, and Abbotsford, Green Island, and Fairfield (often collectively referred to as 'the area between the city and Mosgiel').

Most reasons that were given for supporting the rezoning of these areas for residential use related to the availability of existing infrastructure and services and proximity to the city, such as in this response:

> *I live in blackhead, Green island Bush Road. We are 10 minutes from the center of the city, it is rural but if there is* [no] *better place to expand the city this has to be a viable option. We have a great tourist attraction, a bus service close by that is easily extendable with the new roundabout, also plenty of people that have land and are willing to subdivide. There is also a water tower close by and other services I'm sure can be sorted. The city is growing it needs to go somewhere (Respondent 739931).*

3.1.2 Views on the Features of Areas

In considering where greenfield rezoning should or should not be pursued, some participants described the features of areas that should be prioritised or avoided, instead of, or as well as, naming specific

locations around the city. This section presents results on the features mentioned and should be considered in addition to the previous sections on specific locations.

Figure 4 below provides an overview of how often different features were mentioned, and whether people supported or opposed greenfield rezoning where these features are present. A break-down of the results for different features follows.

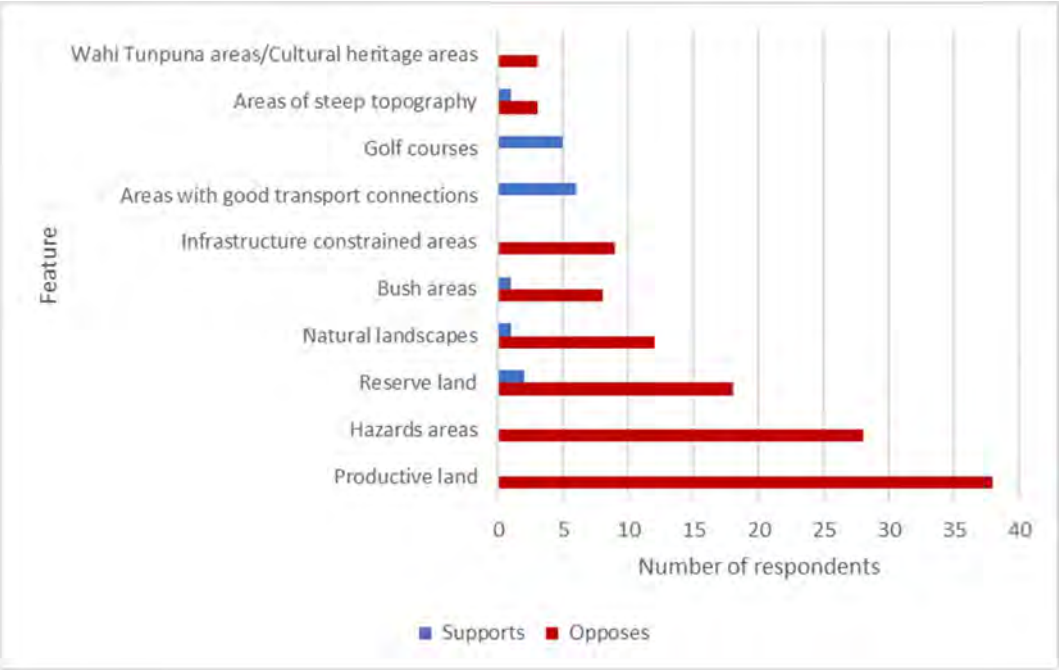


Figure 4: Opinions on features mentioned in relation to greenfield rezoning

3.1.2.1 *Productive land*

Productive land was the feature most often mentioned as one to avoid when considering greenfield rezoning, with 38 participants mentioning this. Productive farmland on The Taieri was especially mentioned in this regard. The following is one example of responses received to the question, 'Where should greenfield rezoning not occur?':

> *On valuable food production land on all of the Taieri. No more subdivisions should be permitted on the Taieri as this land is going to be needed for food production in the long term (Respondent 740166).*

3.1.2.2 *Hazards*

Twenty-eight submitters, whether in support of greenfield rezoning or not, stated that greenfield rezoning should not occur in areas subject to natural hazards. Amongst these submissions, flooding was the natural hazard mentioned most often, with some submitters specifically focusing on the increase in flood risk from sea level rise and climate change. Land stability and liquefaction were also referred to.

3.1.2.3 *Reserve land, recreational land and golf courses*

Eighteen people mentioned reserve land and recreational areas as places they did not wish to see greenfield rezoning of. Only two people suggested the use of parks for housing development, while five were in favour of rezoning golf courses for residential use.

> *…there MUST be a balance that ensures natural + social spaces are still plentiful, as these are essential elements of community building and the wellbeing of residents (Respondent 740926).*

3.1.2.4 *Bush areas, natural landscapes and cultural heritage/Wāhi Tūpuna*

One opinion shared by several submitters was that natural landscapes with scenic, character-contributing or cultural relevance should be protected from greenfield rezoning. Eight submitters specifically mentioned that greenfield rezoning should not occur in areas with high biodiversity values. To those people, wildlife habitats and wildlife corridors need to be safeguarded.

3.1.2.5 *Infrastructure constrained areas/ Transport connections*

Nine submitters were concerned that greenfield rezoning should not occur in areas where the appropriate infrastructure is not already available, and not in areas where water and sewerage infrastructure is already near or at capacity. Seven submitters also felt that greenfield rezoning should only occur in areas where public transport or cycleways are already available or easily extendable.

> *We have to be conscious of the costs of providing roading, water, transport, drainage and power services. Existing residential areas need to be filled up before permitting residential development in rural or rural-residential areas (Respondent 743685).*

3.1.3 Discussion of Greenfield Rezoning Results

3.1.3.1 *Summary of Results for Greenfield Rezoning*

Overall, the results show general support for greenfield rezoning around the urban fringes of Dunedin, especially closer to the central city and where connection to existing or upgraded infrastructure is easiest (3-Waters and transport). The main exception is at Halfway Bush, a proportion of the local community is opposed to urban growth proposals, leading to some divergence in the results for this area.

Areas around Mosgiel and The Taieri attracted support, but equally, opposition. Opposition is linked to the presence of highly productive land and flooding hazards, along with concerns over urban sprawl. A similar trend is seen concerning the Otago Peninsula, but concerns are more in relation to the protection of green spaces and biodiversity, as well as avoiding urban sprawl and car dependency.

3.1.3.2 *Alignment of views with current 2GP provisions*

Most of the reasons provided in the survey for opposition to greenfield rezoning align with strategic directions in the 2GP. Policy 2.6.2.1 (subject to appeal) is the key policy guiding the assessment of greenfield rezoning areas (see **Appendix C** for a copy of the policy). In line with the reasons given by participants, it seeks to ensure that:

- the potential risk from natural hazards is no more than low, including consideration of climate change (Policy 2.6.2.1.viii);
- productive rural land is protected from less productive competing uses (Policy 2.6.2.1.d.ii);
- green spaces, important natural landscapes, and natural coastal areas are maintained (Policy 2.6.2.1.d.i, iv, v, and vii);
- important biodiversity is protected, enhanced and restored (Policy 2.6.2.1.iii);
- urban sprawl and car dependency is managed by the rezoning of the most appropriate areas, when required, by prioritising areas close to existing development and in locations where frequent bus routes exist or can be developed (Policy 2.6.2.1.c, d.vii.6 and d.xi); and
- the efficiency and costs of 3-Waters and transport infrastructure are managed (Policy 2.6.2.1.b, ix, and x).

3.2 Intensification of Existing Urban Areas

This section presents survey respondents' opinions in relation to residential intensification of existing urban areas. Respondents provided information on where they thought intensification would and would not be appropriate, by naming locations or describing environmental features in free-text

answers. In addition, a multi-choice question asked participants to identify where intensification was appropriate by presenting various options describing various environmental features.

Two other topics were canvassed concerning intensification in two additional multi-choice questions and a free-text question. The first focussed on how many residential units should be permitted on a single site in standard suburban areas, and the second asked whether resource consent for the design of a second unit on a site should be required to manage the effects on neighbourhood character. The free-text question asked participants to explain their answers.

The following sections present the results on all the above subjects, followed by a discussion of the findings.

3.2.1 Views on Specified Locations

Figure 5 below presents the locations most frequently mentioned regarding intensification, and whether respondents supported or opposed intensification. A break-down of responses according to geographical areas follows, focussing on those with the highest number of responses, with responses regarding environmental features addressed after that.

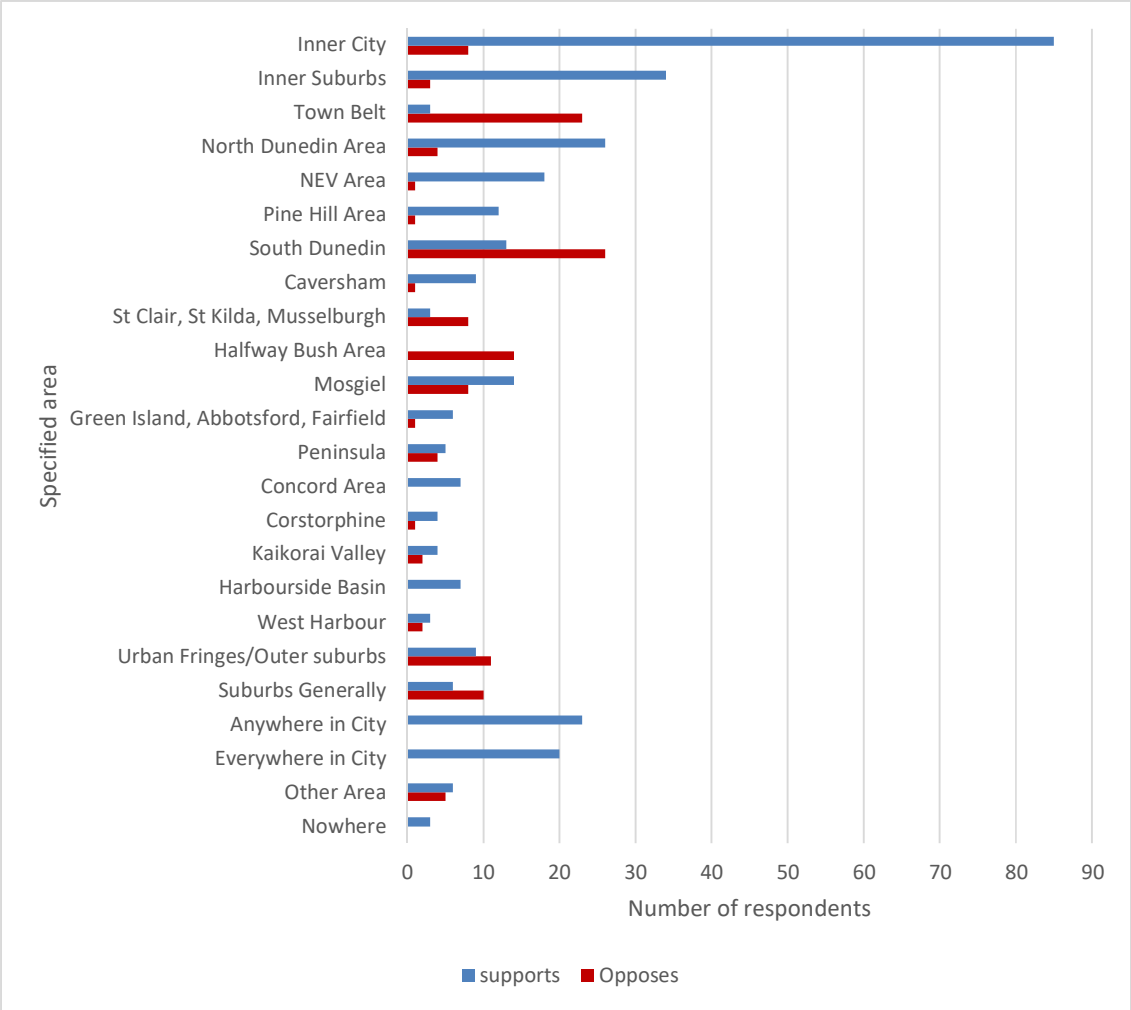


Figure 5: Views on the suitability of specified locations for intensification

3.2.1.1 *Inner City, Inner Suburbs and Town Belt*

As shown in **Figure 5** above, wide support was received for intensification in the inner-city area (considered to be the area below the Town Belt, including City Rise and the CBD), with 85 participants in support of intensification in that area. This was significantly ahead of the next most-mentioned

area, being the inner suburbs (which, for this report, include the hill suburbs Maori Hill, Roslyn, Belleknowes, Mornington, and Mary Hill). Comparatively little opposition to intensification was received for either of these areas, although some participants explained that limits should be put in place. For example, in response to the question 'Where should intensification be allowed?', one participant answered:

> *In the city centre, from the town belt down- but not to the extent that it blocks the views of the existing home owners who have lived there for years (Respondent 740997).*

Opinions received concerning the Town Belt were in stark contrast, with 23 people specifically expressing their opposition to residential development there, with only 3 people supporting it.

3.2.1.2 *North Dunedin, North East Valley, and Pine Hill Areas*

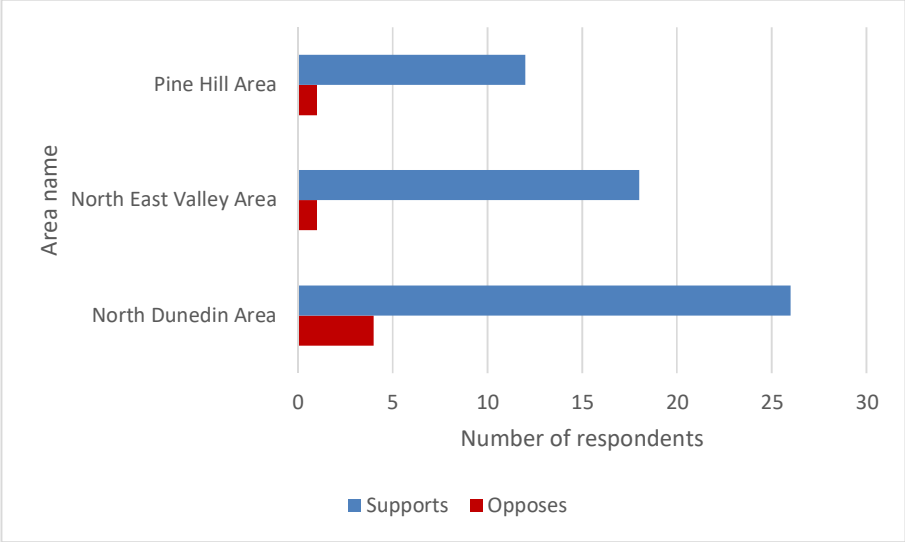


Figure 6: Views on intensification in North Dunedin, North East Valley and Pine Hill

Intensification in the northern areas of the city was supported, with little opposition. Those supporting intensification in the North Dunedin area (which encompasses North Dunedin, Woodhaugh, and the Tertiary precinct for this report) expressed opinions that this area of land would have potential for more residential capacity if old and run-down flats were replaced with more modern, purpose-built structures.

It is noted that, for this report, the North East Valley area includes comments relating to Opoho, Signal Hill and Normanby; and that the Pine Hill area includes comments relating to Liberton and Dalmore.

3.2.1.3 *South Dunedin, Caversham, St Clair, St Kilda, Musselburgh*

South Dunedin was the area that received the most opposition to intensification, but it also had some support. Twice as many people opposed intensification in South Dunedin as supported it (see **Figure 7**).

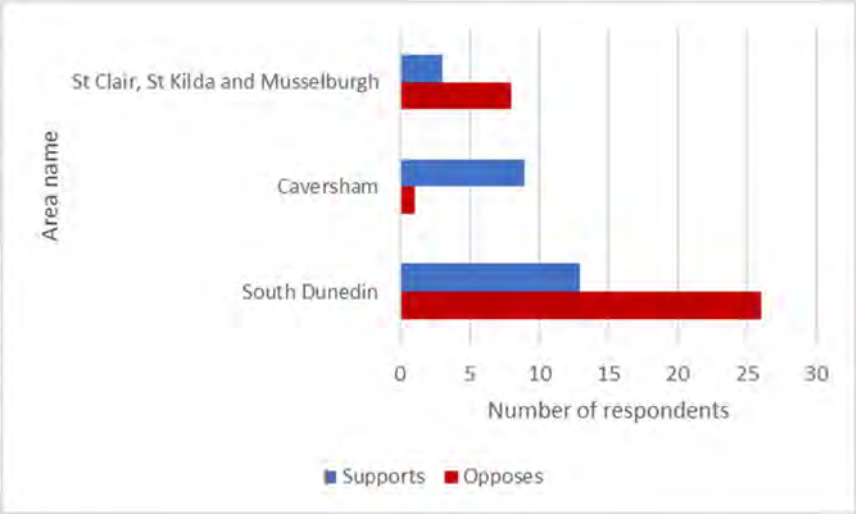


Figure 7: Views on intensification in South Dunedin, Caversham, St Clair, St Kilda and Musselburgh

Of the 26 people opposed to intensification in South Dunedin, the most common reason given was the risk of rising sea levels, with two participants emphasising the need for a planned retreat from the area. Of the 13 people in support, some believed that existing residential areas need to be 'filled up' before expanding residential areas further afield. Some supporters suggested that intensification should be subject to certain conditions, such as the area being assessed by geotechnical surveys or investment in community facilities in the area.

St Clair, St Kilda and Musselburgh did not feature strongly in people's responses regarding appropriate locations for intensification. Many people may consider St Clair and St Kilda to form part of a wider 'South Dunedin' area. The responses that did specifically mention these areas tended to oppose intensification.

Caversham was the topic of some responses, with those mostly supporting intensification in the area.

3.2.1.4 *Halfway Bush*

In a similar vein to responses relating to greenfield rezoning in Halfway Bush, there were Fourteen responses opposing intensification, and none in support. It is noted that this area may more generally be seen as undeveloped and not an area for intensification, but rather for greenfield rezoning (which may explain the lack of responses relating to intensification in the area, other than those from current residents in opposition to residential development).

Most responses received contained wording similar to the following quote in response to Question 5 ("Where should intensification not be allowed?"):

> *It should not occur in the Dalziel Road, Three Mile Hill Road, Taieri Road and Ashmore Street areas or any land that is currently zoned Rural or Rural Residential in Halfway Bush (Respondent 743783)*

Refer above to the section on greenfield rezoning for a discussion on limitations of the results regarding Halfway Bush.

3.2.1.5 *Mosgiel*

A moderate number of responses were received concerning intensification in Mosgiel, of which almost two-thirds were in support. Those in support opined that Mosgiel is suitable due to its flat topography and location away from the coast. People in opposition were concerned about flooding, including the effects of climate change, and lack of services in the area.

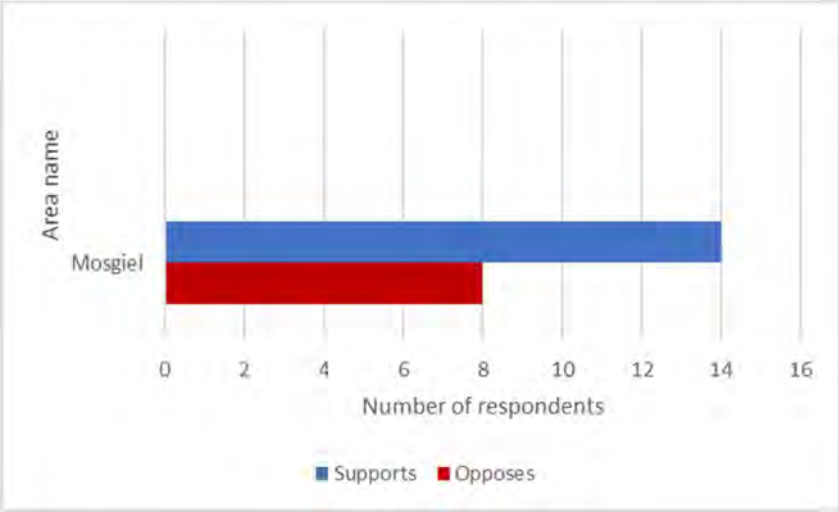


Figure 8: Opinions on intensification in Mosgiel

3.2.1.6 *Other Specified Locations*

A range of other specified locations were given in responses regarding intensification, as shown in **Figure 5** above: Green Island, Abbotsford, Fairfield, Otago Peninsula, Concord, Corstorphine, Kaikorai Valley, Harbourside Basin, and West Harbour. These submissions tended to be in support of intensification in for the locations they concerned, with slightly higher levels of opposition observed for locations on The Otago Peninsula.

3.2.1.7 *Unspecified locations*

A substantial number of respondents answered the questions on where intensification should or should not be allowed with general comments, rather than identifying specific locations. These included comments that intensification should be allowed 'everywhere', 'anywhere in the city' or 'nowhere'. Other comments related to intensification generally in 'suburban areas'.

A relatively high number of respondents supported intensification either 'everywhere' or 'anywhere in the city' (43 people), while only 3 people did not support any intensification by answering 'nowhere'.

General comments relating to 'suburban areas' showed a stronger level of opposition than support for intensification, although over one-third of comments were in support. Overall, the oppositional comments relating to the 'suburban areas' were still substantially less than the comments in support of intensification 'everywhere' or 'anywhere in the city'.

3.2.2 Opinions on the Features of Areas

In considering where intensification should or should not be pursued, some participants described the features of areas that should be prioritised or avoided, instead of, or as well as, naming specific locations around the city. Multichoice question six also asked for people's opinions on the types of areas that would be best for intensification. This section presents results on the features mentioned and should be considered in addition to the previous sections on specific locations.

Figure 9 below provides an overview of how often different features were mentioned in the free-text responses, and whether people supported or opposed intensification where these features are present. A break-down of the results for different features follows.

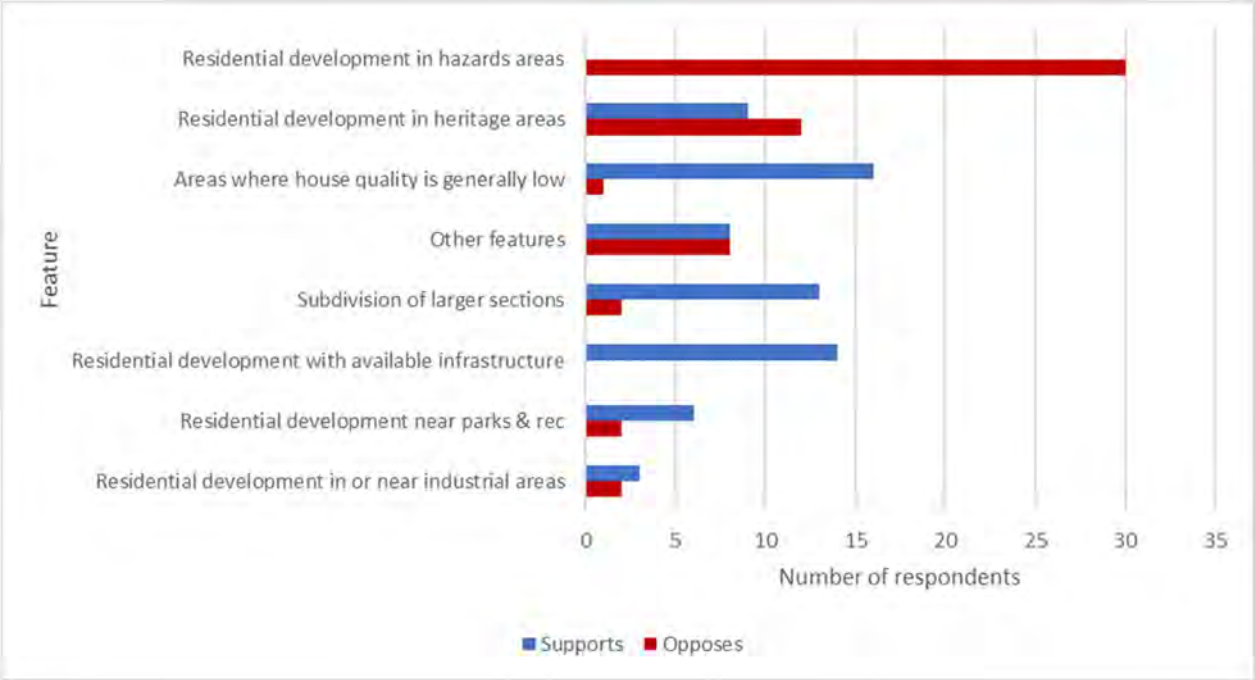


Figure 9: Opinions on features mentioned regarding intensification

3.2.2.1 *Intensification in hazards areas*

Opposition to allowing intensification in areas that may be subject to natural hazards was regularly noted by survey participants. Flooding and sea level rise were the most frequently mentioned hazards and, concerning those hazards, South Dunedin and Mosgiel/Taieri were the most frequently noted vulnerable areas. Areas of unstable geology, slips, coastal erosion and sinking reclaimed land were also highlighted by submitters. For example, in answering 'Where should intensification not be allowed?', one participant responded:

> *Any land at risk of coastal erosion or sea level rise, issues such as the reclaimed land already built on sinking also needs to be taken into consideration (Respondent 740591).*

3.2.2.2 *Intensification in heritage areas*

Submitters who shared their opinions on intensification in heritage areas were largely referring to Dunedin's built heritage. As depicted in **Figure 9**, this was a topic that attracted strongly opposing views from submitters. Some submitters were clear that heritage areas should be excluded from intensification. Others wanted heritage values to be protected but acknowledged that intensification could be done in a sympathetic manner. A minority felt that intensification should be prioritised over heritage. The following quotes show the range of opinions offered on intensification in relation to heritage.

> *Dunedin is a city of stunning, world-class architectural heritage - that should be treasured and protected as part of any intensification. Recource consent process is needed to ensure building doesn't become a shoddy free-for-all (Respondent 740104).*

> *Given Dunedin's special character, it's important that heritage advocates and design professionals both have seats at the table (Respondent 741039).*

> *Stop believing the houses around cbd are good looking, high street is a disgrace[ful] looking bunch of run down houses. Allow demolition and rebuild (Respondent 740972).*

3.2.2.3 *Low quality of existing housing*

Survey participants regularly expressed concern over the low quality of residential housing in Dunedin, with many supporting intensification and redevelopment in areas where existing housing stock is in poor condition. Such comments were often linked to heritage comments, with some submitters advocating for the renovation of historical buildings for residential use, while others preferred to see them replaced with new builds (see previous section).

The following two quotes illustrate these different viewpoints.

> *Make it easier and cheaper to bulldoze old houses... so many of our houses are so cold and damp they just need to be bowled and replaced (Respondent 740703).*

> *Love the idea of creating more apartments in inner city, especially as part of earthquake strengthening process-Heritage plus intensification works well in older cities-Dunedin has Melbourne's gold rush age and buildings; worked well there (Respondent 740978).*

3.2.2.4 *Large sections*

Thirteen people used free-text fields to indicate their support for the subdivision of, or intensification on, larger sections in the existing urban area. Only two people noted their opposition to this idea. When asked where intensification should be allowed, some participants responded:

> *On sections greater than 800sqm (Respondent 740296).*

> *in the outer suburbs where the sections tend to be larger (Respondent 740287).*

3.2.2.5 *Infrastructure available*

It was important to several respondents that intensification is only allowed in areas where appropriate and adequate infrastructure is available. Fourteen people specifically mentioned this in their submissions, independent of where they thought intensification would be appropriate. Water and sewerage services were the most frequently mentioned type of infrastructure, but public transport was also referred to.

> *Access to frequent and regular public transport is essential. There is no point adding more housing if a vehicle is a necessity to live in those houses. Reticulation of water and sewage is essential (this seems so obvious, but I want to mention it anyway) (Respondent 740963).*

3.2.2.6 *Other features mentioned*

Many other features were mentioned in respondent's discussions of where intensification should be allowed or avoided, but these views are not repeated as they have already been discussed in this section.

Some respondents opposed intensification near major facilities, in areas where existing views will be blocked, and in already-dense areas. Other comments supported residential intensification near parks, in areas next to those already zoned for intensification, and in unused shops and commercial areas. Mixed opinions were given on residential development on or near industrial areas.

3.2.2.7 *Multichoice Question 6 responses*

In addition to the free-text responses on the features of places where people thought intensification should or should not occur, the sixth question was multi-choice and asked people to select from various options to express their opinions. The question was:

In general, what types of areas would be the best places to allow intensification?

Available options to choose from:

1. *Areas where there is no consistent housing character (i.e. areas of mixed house types, sizes and ages)*
2. *Areas close to the city centre*
3. *Areas close to suburban shops*
4. *Areas with access to frequent public transport*
5. *Allow all existing suburban areas to be intensified*
6. *Existing suburban areas should stay as they are*

Respondents could select as many options as they wished from the list of options. The question was answered by 232 people. A graph showing results is given in **Figure 10** below.

The majority of those who answered this question agreed that intensification should be provided for near existing services (in line with existing 2GP policy for medium density zoning). That is, 83% agreed that intensification should occur in areas close to the city centre, 78% thought that intensification should occur in areas with access to frequent public transport, and 65% indicated areas close to suburban shops as appropriate.

The other feature considered in this question is the character of existing housing. Just over half (56%) of respondents agreed that intensification should occur in areas where there is no consistent housing character. This infers that the other half (44%) either do not see the consistency of housing character as being a consideration relevant to intensification, or they do not agree with intensification at all. Responses relating to effects on existing residential character are explored in greater detail in **Section 3.2.5**.

Figure 10: Preferred areas for intensification

The remaining options provided an opportunity for people to express views on allowing intensification everywhere or nowhere. This is related to results given above in **Section 3.2.1.7** on free-text answers regarding intensification 'everywhere', 'anywhere in the city' and 'nowhere'.

Of significance, 37% of respondents indicated that intensification should be allowed in all existing suburban areas. In contrast, only 10% of respondents thought that existing suburban areas should

stay as they are. This shows that 90% of respondents are supportive of some form of intensification in suburban areas.

3.2.3 Types of Intensification and Housing

The questionnaire asked one multi-choice question on the types of intensification people might support, which asked how many and what types of houses should be allowed on a standard suburban site. In addition, some participants provided comments in the free-text boxes about specific types of housing they thought should be provided. Results from both sources are presented in this section.

3.2.3.1 *Multichoice Question 7 responses*

This question asked the following:

How many houses, attached or detached, do you think should be allowed on a standard suburban residential site while still meeting normal plan rules for height, setbacks from boundaries etc.?

Available options to choose from:

1. *One house per site plus a flat with a maximum 60m^2 floor area that only family members can live in (current rule)*
2. *Dividing an existing house into multiple flats*
3. *Two houses of any type per site*
4. *Two semi-detached houses on same site*
5. *One house per site plus a flat with a maximum 60m^2 floor area that anyone can live in*
6. *More than two houses of any type per site*

As noted in the question, the first option represents the existing 2GP rule for the General Residential 1 Zone. All the other options represent an increase in the permitted density for this zone, of varying degrees. This question was answered by 223 people and people could choose as many options as they liked. Responses to Question 7 are presented in **Figure 11** below.

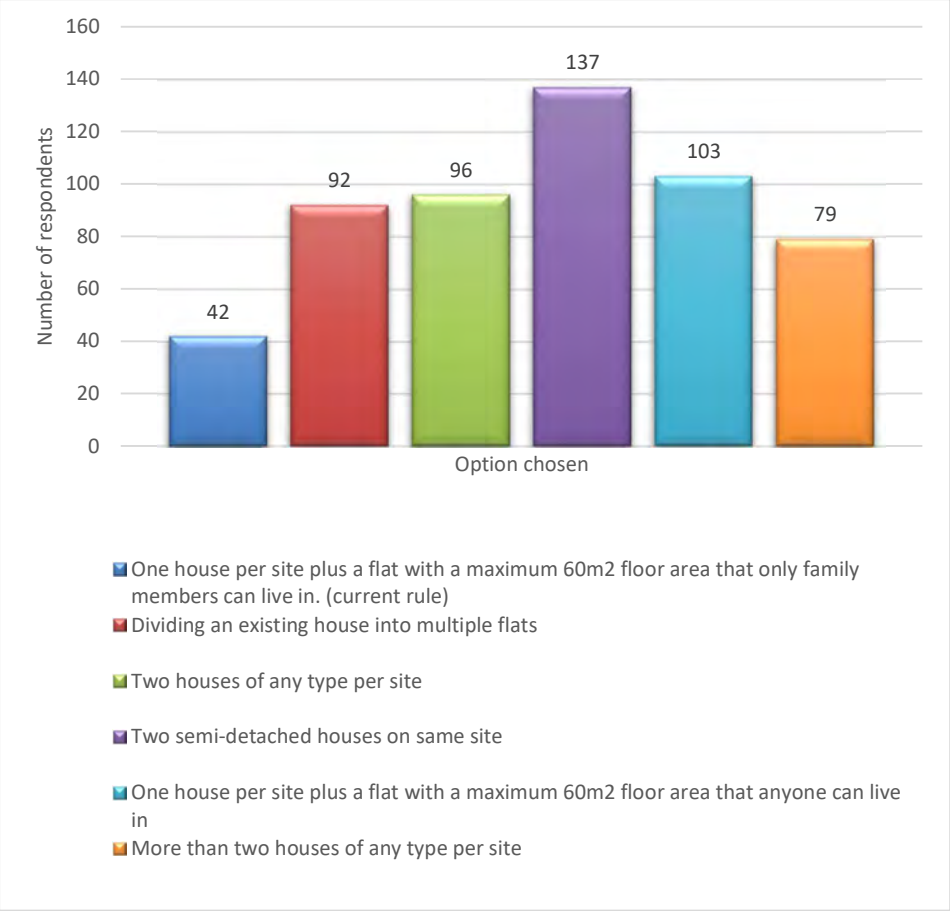


Figure 11: Representing how many houses respondents think should be allowed on a standard residential site

Significantly, the least preferred option was the current rule, with only 19% of respondents selecting this option.

Of the options providing for increased density, 61% agreed that two semi-detached houses on the same site should be allowed (i.e. duplexes). The next three most popular options scored similarly, with 'one house per site plus a flat that anyone can live in' at 46%, 'two houses of any type per site' on 43%, and 'dividing an existing house into multiple flats' on 41%. One third (35%) considered that more than two houses of any type per site would be appropriate.

3.2.3.2 *Free-text comments on types of housing*

Of those participants that commented on the types of housing that should be better provided for in Dunedin, most supported apartments (16, with only 1 in opposition), followed by social housing (12 in support) and smaller houses, including tiny homes (11 in support). Ten respondents highlighted the need for more affordable housing. Other participants recommended more alternative housing arrangements, such as co-housing, more housing for the elderly, and terraced housing.

Example responses are:

> *Almost all the pensioner/social housing council flats need knocking down and replacing with nicer, larger ones. And double/triple the number are needed urgently as increasing number of elderly and increasing poverty (Respondent 740260).*

Need to somehow incentivise developers to build low cost housing rather than larger designer homes. Need to encourage socially minded organisations to consider new housing developments (Respondent 743010).

3.2.4 Opinions on design permission requirements

One consideration for intensification of residential development that was canvassed in the survey was the effects of new, denser development on the existing character of neighbourhoods. This was addressed in a multi-choice question where participants were asked whether a resource consent for design (to consider effects on neighbourhood character) should be required if more than one house was allowed on a site. A further question asked why people responded in the way they did, with many comments received. This section outlines the results from these two questions.

3.2.4.1 *Multichoice Question 8 responses*

The multichoice question on whether to require design permission was asked as follows, with the results shown in **Figure 12**. This was not mandatory, yet it was responded to by 229 participants.

If more than one house was allowed on a site, do you think it should require design permission, through a resource consent process, to ensure it fits with the character of the neighbourhood as much as possible?

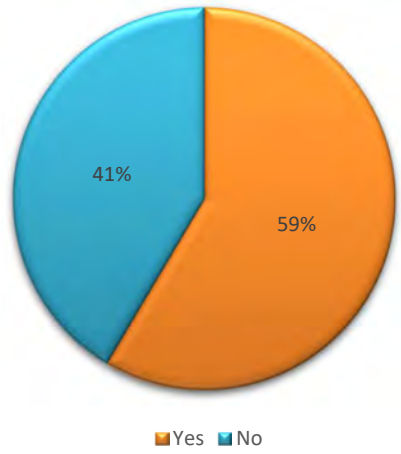


Figure 12: Shows the proportion of respondents who support or oppose design permission regulations on developments with more than one house per site

The reader should refer to a note in **Section 3.2.4.4** on limitations of the results on design permission, which may have resulted in these answers being skewed in favour of 'yes' answers.

Participants then were asked to explain their answers, with most doing so. Their reasons are explored in the following sections.

3.2.4.2 *Reasons why people answered 'no'*

As shown in **Figure 13** below, the main reason why people opposed requiring resource consent for design in relation to neighbourhood character was that it would add delay and uncertainty to the process of building new housing. This was also connected with comments on the additional costs and overall effect of discouraging development. For example:

Too much process and time to get consent is holding up building when there is a massive shortage (Respondent 739911)

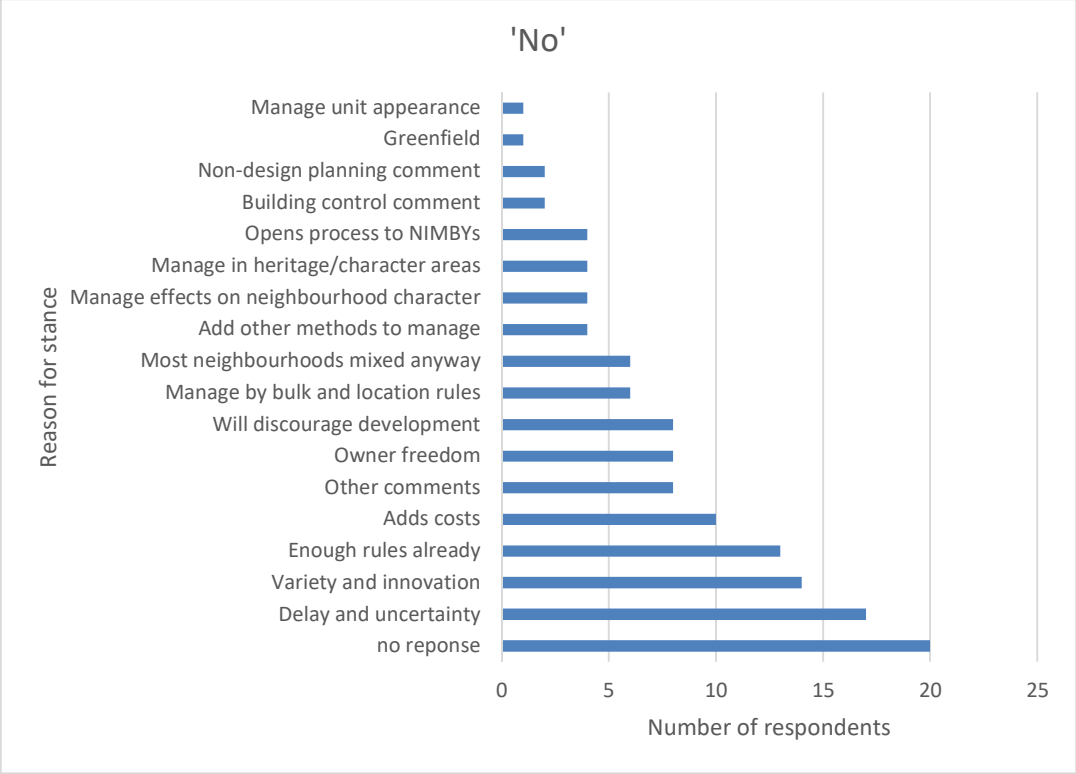


Figure 13: Reasons why people answered 'no' to Question 8 on design permission

Another key reason was that people thought variety should be encouraged in terms of neighbourhood character, with participants suggesting that consistent character is visually uninteresting, or that encouraging consistency would stifle innovation and use of new and efficient building technologies. Several people also suggested that the existing character was already mixed. For example:

> *I love eclectic variety - Dunedin suburbs are already interesting and don't have overall character. Something modern thrown in amongst villas and bungalows sounds great! (Respondent 741754)*

More general comments were those suggesting there are enough rules already, including bulk and location rules, which manage the physical form of new buildings. Some believed effects on character should simply not be managed. Other comments suggested that other methods should be used to manage the effects on neighbourhood character, including additional design standards in the district plan. Others again suggested that design permission should be restricted to areas where there is a special or distinctive character. For example:

> *No – a trojan horse for NIMBYism. Nothing will ever be built if there's too much weighting on this. HOWEVER.. if the neighbourhood in question is a historic heritage neighbourhood this could be useful in ensuring that its heritage values are respected (Respondent 740286)*

It is noted that some participants misinterpreted the intention of the question and responded with comments relating to matters of building control, rather than planning, or matters on other planning matters such as car parking or building height, which are managed by other rules in the district plan.

3.2.4.3 *Reasons why people answered 'yes'*

As illustrated in **Figure 14**, people who answered 'yes' to Question 8 tended to be more concerned with the potential effects of new builds on neighbourhood character than those who answered 'no', especially concerning maintaining consistency. Different participants considered the question at different scales, with some considering effects on individuals (such as neighbours), some considering

effects on the neighbourhood, and some considering the cumulative effect on the city's character and how this might influence people's decisions to visit or live in Dunedin.

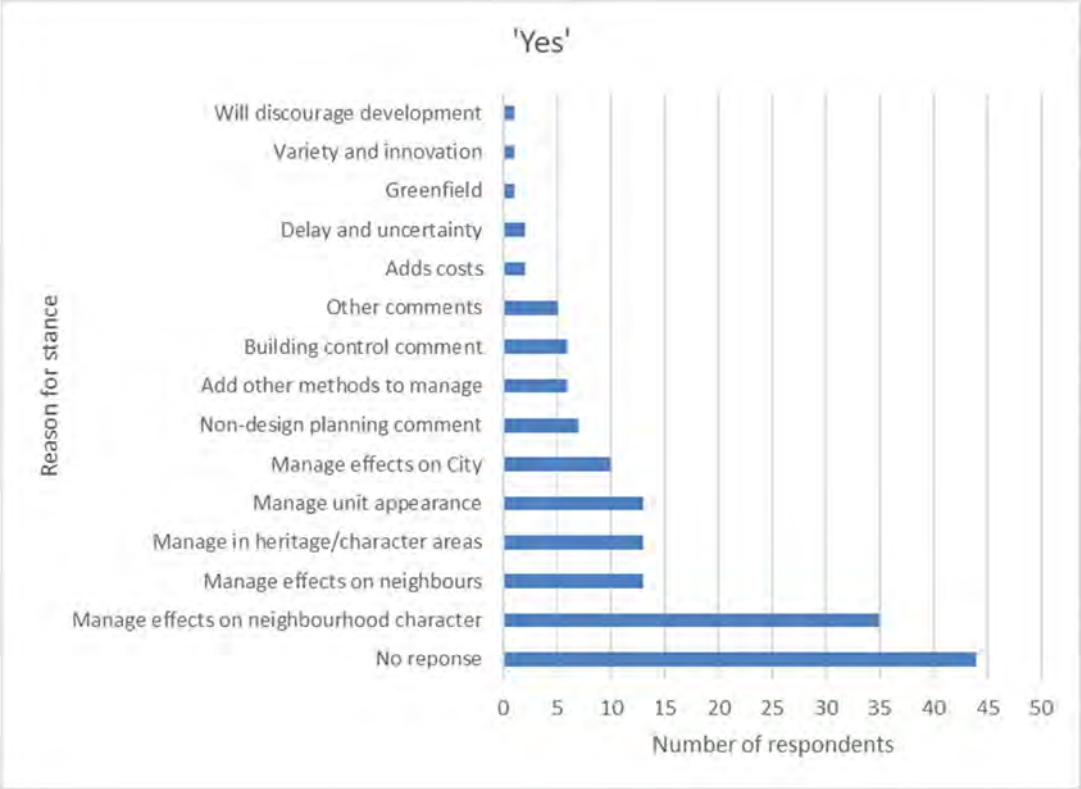


Figure 14: Reasons why people answered 'yes' to Question 8 on design permission

Similar to some of those who answered 'no' to Question 8, several participants who answered 'yes' suggested that resource consent requirements should only apply in areas of truly unique character. Some also noted the same limitations as those who answered 'no'. Some also made comments that were of less relevance to design and its effects on neighbourhood character, as for the 'no' answers.

Some people were concerned with the management of unit appearance to prevent 'ugly' development, with concerns especially regarding infill development undertaken by developers rather than future residents. Examples are:

> *We do not want shoddy, ugly or poorly thought out intensification, but we do need intensification. It should be done in a tasteful and intelligent way (Respondent 740702).*

> *If not, then there will be some visually awful, minimum specification, low rent appearance housing built to maximise the builder/owners returns. Would result in a detriment to the surroundings. Dunedin should still place a premium on it being a great place to live and to visit (Respondent 739855).*

3.2.4.4 *Limitation of results on design permission*

As noted above, some of the participants that thought design permission should be required for sites with more than one house, provided reasons which were not related to the management of effects on neighbourhood character. For example, it was evident that some people confused the meaning of 'design permission' with 'building consent', and that some used the space provided in Question 9 to address other planning matters than neighbourhood character. As such, it is plausible that the results for Question 8 are more strongly in favour of requiring design permission than is the case. In other

words, if participants had restricted their consideration to the effects on neighbourhood character alone when answering Question 8, it is possible that fewer respondents would have answered 'Yes'.

3.2.5 Discussion of Intensification Results

3.2.5.1 *Summary of results for intensification*

Overall, the results show widespread support (90%) for some form of intensification to be provided for in Dunedin, with 37% of respondents indicating that intensification should be allowed in all existing suburban areas, compared to only 10% that seek suburban areas to stay as they are.

Intensification was most supported in the inner city, and in the inner and northern suburbs (including the hill suburbs from Maryhill to Maori Hill, North Dunedin, North East Valley and Pine Hill). Intensification was also supported on larger sections (including those over 800m^2), where existing housing stock is old and of poor quality, and where infrastructure is available. Widespread support was expressed for a change in the density provisions for standard suburban areas, with a preference to permit duplexes and to provide for options other than the current approach (one unit plus a family flat per site).

Contentious topics (with both support and opposition) were intensification in South Dunedin, Mosgiel and heritage areas, and whether resource consent should be required for the design of more than one unit on a site to help manage effects on existing neighbourhood character.

Intensification was most strongly opposed in the Town Belt and Halfway Bush (although it is noted that these areas are technically greenfield areas), and in areas subject to natural hazards.

3.2.5.2 *Alignment of views with current 2GP provisions*

The results above show general alignment with the current 2GP approach to providing for intensification, particularly using medium density residential zoning. All of the areas where intensification is generally supported by respondents have received new areas of medium density zoning through the recent 2GP decisions (either General Residential 2 Zone or Inner City Residential Zone). In addition, residential development has been provided for within the Commercial and Mixed Use Zones, including the Central Business District. These relatively newly zoned areas will continue to provide opportunities for intensification into the future. Expanding or adding to these areas of medium density zoning may also be worthy of investigation, given the above results.

Strategic policy Policy 2.6.2.3), which outlines the criteria for rezoning an area to a medium density zone, already includes the age of housing stock and availability of infrastructure as relevant considerations in providing for intensification.

Infill development on larger sections in existing suburban areas is currently controlled through density performance standards for land use and minimum site size rules for subdivision, primarily for the zones which apply over most suburban properties (General Residential 1 Zone and Township and Settlement Zone). The 2GP, and the preceding district plan, provide for a minimum site size of 500m^2 and one dwelling per site. This has limited opportunities for infill development of larger suburban sites in the range of 800m^2-1000m^2. The results of this consultation indicate that there is some appetite to reconsider these limits. Similarly, there is an appetite to enable development of duplexes and other configurations enabling a second residential unit of some description per site.

The concerns regarding intensification in South Dunedin and Mosgiel is largely linked to risks of natural hazards, being coastal hazards and flooding, including those associated with climate change. The 2GP recognises this by the presence of mapped hazard overlays in these areas, which link to rules to manage the risk to residential development. In addition, hazards are a consideration when determining areas of all new residential rezoning, (Policies 2.6.1.4, 2.6.2.1, and 2.6.2.3). The results show that taking into account hazard risk is important to the community when considering intensification in these areas.

Concerns over intensification in heritage areas were extensively traversed through the 2GP hearings and decisions. Heritage rules only affect residential areas which are in a heritage precinct and/or for buildings listed in the heritage schedule of the 2GP. Most heritage precincts occur in areas already zoned for medium density development, although heritage controls may limit the uptake of development opportunities. Heritage rules must continue to strike a balance between preservation of important heritage and enabling development to ensure the community's views are actioned.

Residential development in the Town Belt is not provided for in the 2GP, as it is zoned Recreation. It is also noted that this area has reserve status and the protection and enhancement of important green spaces is promoted in the strategic policy for new residential zoning (Policy 2.6.2.1).

3.3 The Balance of Greenfield and Intensification

This section presents results from Question 1 which sought participants' opinions on how housing capacity should be split between greenfield and intensification opportunities. It asked:

Which approach to planning for more housing do you think is best?

Available options to choose from:

1. *Put more emphasis on greenfield rezoning*
2. *Put more emphasis on intensification*
3. *Have an even split between greenfield rezoning and intensification*
4. *None of the above*

In response to feedback from one participant, the option 'None of the above' was added to the first question on the fifth day of the survey. This was principally to accommodate the views of those participants who did not think Dunedin should grow at all. This option was also selected by many participants from the Halfway Bush area, reflecting their overall opposition to all residential development (greenfield and intensification) in that area.

This was a compulsory-answer question, and only one option could be selected. The results are presented in **Figure 15** below.

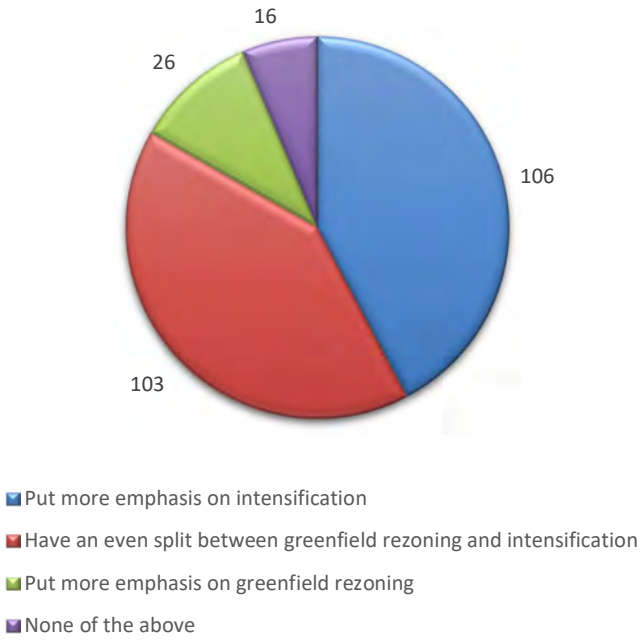


Figure 15: Opinions on the split of new housing capacity between intensification and greenfield

As shown in **Figure 15**, near equal numbers selected 'put more emphasis on intensification' (42%) and 'have an even split between greenfield rezoning and intensification' (41%). Only 10% selected 'put more emphasis on greenfield rezoning', and 6% selected 'none of the above'.

3.3.1.1 *Discussion on the balance between greenfield and intensification*

The results from Question 1 show that once again there was significant overall support for intensification among the participants of this survey. While there was support for greenfield rezoning, most of those in support also considered that it should be balanced with intensification opportunities.

The overall results align with provisions already included in the 2GP, which seek to prioritise intensification over urban expansion (Objective 2.2.4 and Policy 2.2.4.1), while also seeking to provide a range of housing choices, including greenfield development opportunities as part of an appropriate mix of options (Objective 2.6.1 and Policy 2.6.1.1 – subject to appeal).

3.4 Other Methods Suggested

The survey offered participants the opportunity to provide additional comments on planning for housing in Dunedin. Many took the opportunity to suggest methods (both planning and non-planning related) that could be used to encourage and provide for housing development, or to better manage its effects. This section presents these results.

3.4.1 Planning methods suggested

Figure 16 below shows the wide range of planning-related suggestions received regarding enabling housing development in Dunedin.

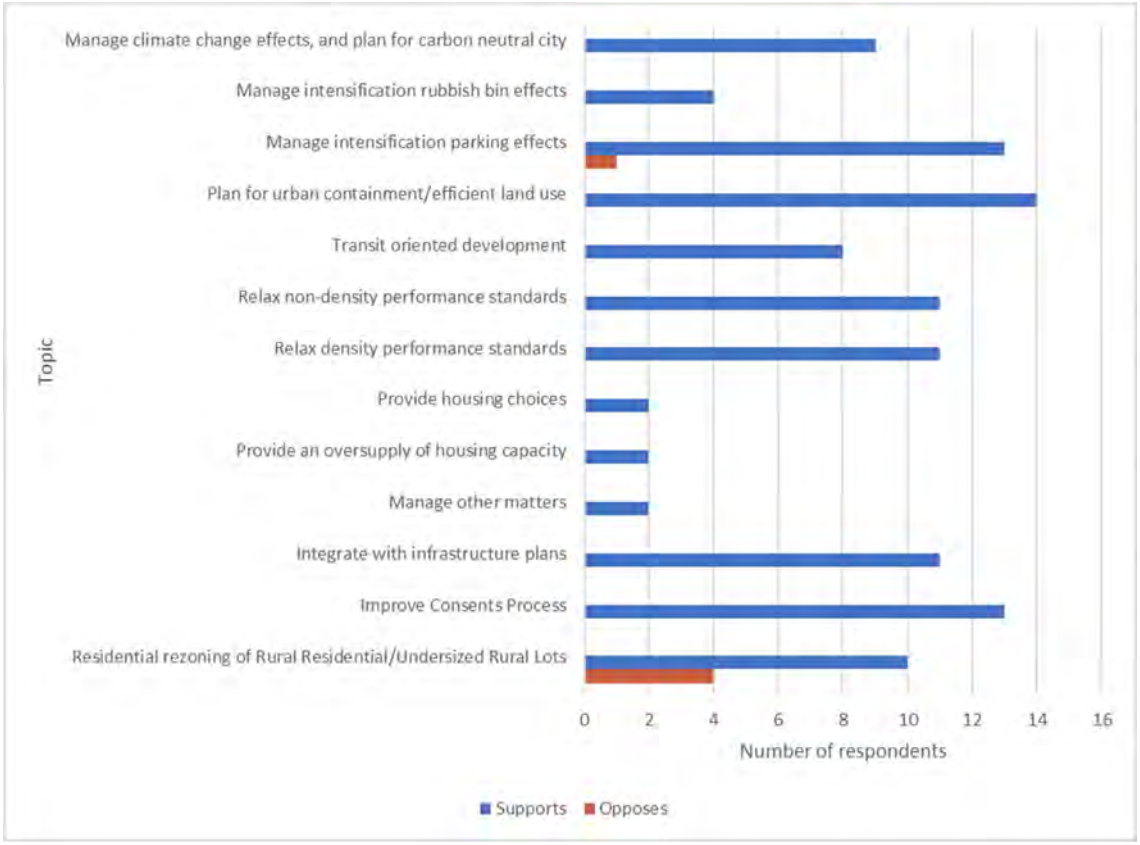


Figure 16: Suggested planning methods to encourage and manage the effects of housing development

3.4.1.1 *Methods to encourage development*

A number of participants seeking to encourage housing development supported simplification and speeding up of the resource consent process, the relaxation of performance standards for density and other matters, and the provision of an oversupply of housing capacity to give developers options, as demonstrated in a selection of quotes below.

> *Resource consent process needs to be faster. Neighbours should have no say unless the building process actually interferes with their physical property and as long as the building meets code, meets district plan, and there are utilities services available for the development. On larger properties rules should be flexible regarding number of dwellings and height of dwellings (Respondent 739647).*

> *I suspect the single biggest difference we can make to urban capacity would be to reduce or remove the 1 per 500m2 density restriction in our main residential zone (Respondent 740550).*

> *…mass (deferred) zone land, to be made available sequentially as the infrastructure is extended/installed. Make more land available than is needed (Respondent 739855).*

Provision of more lifestyle development options (by way of Rural Residential zoning or allowing residential development on undersized Rural lots) was also supported by several submitters, with some in opposition. For example:

> *Our property is 40 acres along with neighbouring properties. Undersized for farming but too big for lifestyle. Rezoning to Rural Residential would see the land used practically, provide more housing opportunity in a growing area but still retain the rural landscape (Respondent 739942).*

> *There's no one right or wrong answer to how the mix works, but turning the Taieri into lifestyle blocks is not the answer (Respondent 740849).*

3.4.1.2 *Methods to manage the effects of development*

Participants seeking better management of the effects of urban development supported methods such as urban containment and the efficient use of land, transit-oriented development and the integration of infrastructure planning with planning for housing.

> *I want to indicate general support for the current policy of limiting greenfield development. Everyone, and I mean everyone, from all walks of life notes, when Dunedin is brought up, how great its compactness is (Respondent 740184).*

> *Consider using a proven framework, like Livable Communities, which supports development and redevelopment that links housing, jobs and services while demonstrating efficient and cost-effective use of land and infrastructure. Emphasise transit-oriented development (Respondent 743668).*

> *Need to upgrade the infrastructure to cope long term with the increased demand. A holistic over view is needed to see where we are headed long term (Respondent 740587).*

In relation to intensification, several participants addressed parking effects, with some suggesting that intensification should be associated with additional car-parking provision. Others suggested intensification close to services would reduce the demand for parking. Some submitters also raised issues regarding waste and recycling management in areas of intensified development, with suggestions for centralised waste management to avoid amenity and safety issues arising from increased numbers of kerbside bins.

Vehicle parking should be isolated from housing in the inner city instead of incorporated into new design. Devoting land to garaging or parking is a waste of valuable infrastructure-serviced space in the inner city (Respondent 740282).

Another consideration for multi-unit dwellings of four [or] more units the provision of an onsite safe and sanitary communal storage area for the collection of waste and recycling. This would require service vehicles to enter the property to empty bins. In turn this will lesson impact of having an increasing number of waste and recycling bins presented at kerbside causing obstruction (Respondent 740869).

A big-picture issue noted by several participants was that of climate change, including comments on Dunedin's carbon neutral target. These participants suggested that both climate change mitigation and adaptation should be integral considerations as urban development is considered.

Dunedin needs to be able to house more people than ever before while adapting to a post-fossil fuel future. In no uncertain terms, if Dunedin is to become a carbon neutral city, we will need to stop suburban sprawl and greenfield rezoning - which can only be supported by cars. Dunedin needs smart intensification along public transport corridors, close to shops, and safe from sea-level rise. So that people can easily move around this city (Respondent 743947).

3.4.2 Non-planning methods suggested

Figure 17 below shows the range of non-planning-related suggestions received regarding enabling housing development in Dunedin.

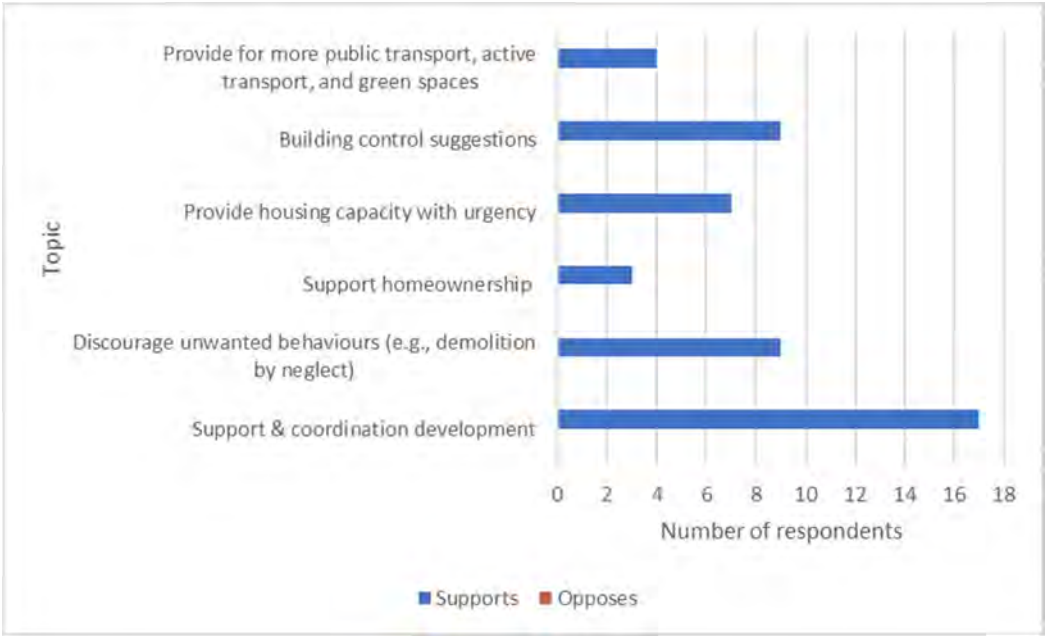


Figure 17: Suggested non-planning methods to encourage and manage the effects of housing development

Several different non-planning methods were suggested by submitters to support and encourage housing development and homeownership. These included suggestions for ways in which Council could support or coordinate housing development or support people into homeownership.

I think that the DCC should have an advisor to identify properties that could be developed and assist with the processes involved (Respondent 739922).

free up/sell council land that is not being used (Respondent 739936).

Assist and support people who own land which is subdividable I.e. with interest bearing loans to help them complete the division/development and repay said loan (Respondent 739939).

Incentivise development of apartment buildings, so people don't have to flat in substandard houses (Respondent 740128).

Help for first home buyers who build new homes (Respondent 740271).

Other participants thought Council could support housing development by discouraging behaviours that limit or generate uncertainty for development opportunities. These included measures to limit land banking, demolition by neglect, absentee landowners, NIMBY behaviour and Air BnB-type activity.

Manage and discourage 'land banking' by adjusting and co-ordinating the rating system such that vacant residentially zoned land, (ie with no permit and no start to construction), suffers financial penalty at least equal to its annual increase in value. Ie, a modified 'use it or (financially) lose it' situation. There must be some successful examples out there in the world (Respondent 739855).

Stop allowing one or two people to completely obstruct something that will benefit the city as a whole. I am speaking particularly about my own area…We need housing stock in Dunedin City. End of story. (Respondent 740694).

A disincentive (e.g. impact fee) for investors who rent out entire homes on short-term accommodation sites (e.g. AirBNB) (Respondent 743651).

Other participants also suggested changes to the way building control matters are managed, or simply reinforced the urgency with which housing problems should be addressed.

Dunedin urgently needs more land for development and or ablity [to] build up in the inner city. please fix this (Respondent 743409).

3.4.3 Discussion on Other Methods Suggested

Participants suggested a wide range of methods to help encourage housing development and manage its effects. Some of these methods are already being undertaken by Council, such as a 'compact city' approach to urban development, consideration of accessibility by public transport when land is rezoned for new or intensified residential use, and creation of a 'development facilitator' role to assist developers and homeowners to navigate the planning and building consents processes. However, there are many other suggestions which could be explored further by Council as a part of its work on housing provision.

Future projects by Council could investigate many suggestions, except those which extend beyond Council's statutory powers and functions. This could include review of district plan provisions on subdivision site sizes and housing densities, whether additional non-notification rules could be added to provide greater certainty for developers, whether short-term accommodation rental of houses needs to be more closely managed, and whether any additional measures are needed to manage parking and waste disposal effects in areas of intensified development. The overall approach to the level of housing capacity provided could also be reviewed. Some of these suggestions are already being assessed as part of Variation 2 to the 2GP.

Other suggestions Council could investigate sit outside the functions of City Planning, such as those relating to building control and financial incentives. Council could investigate these, including ways to

modify the application of rates and development contributions to encourage preferred types of development. Overall, supporting housing development is likely to require ongoing initiatives across a wide range of Council's departments.

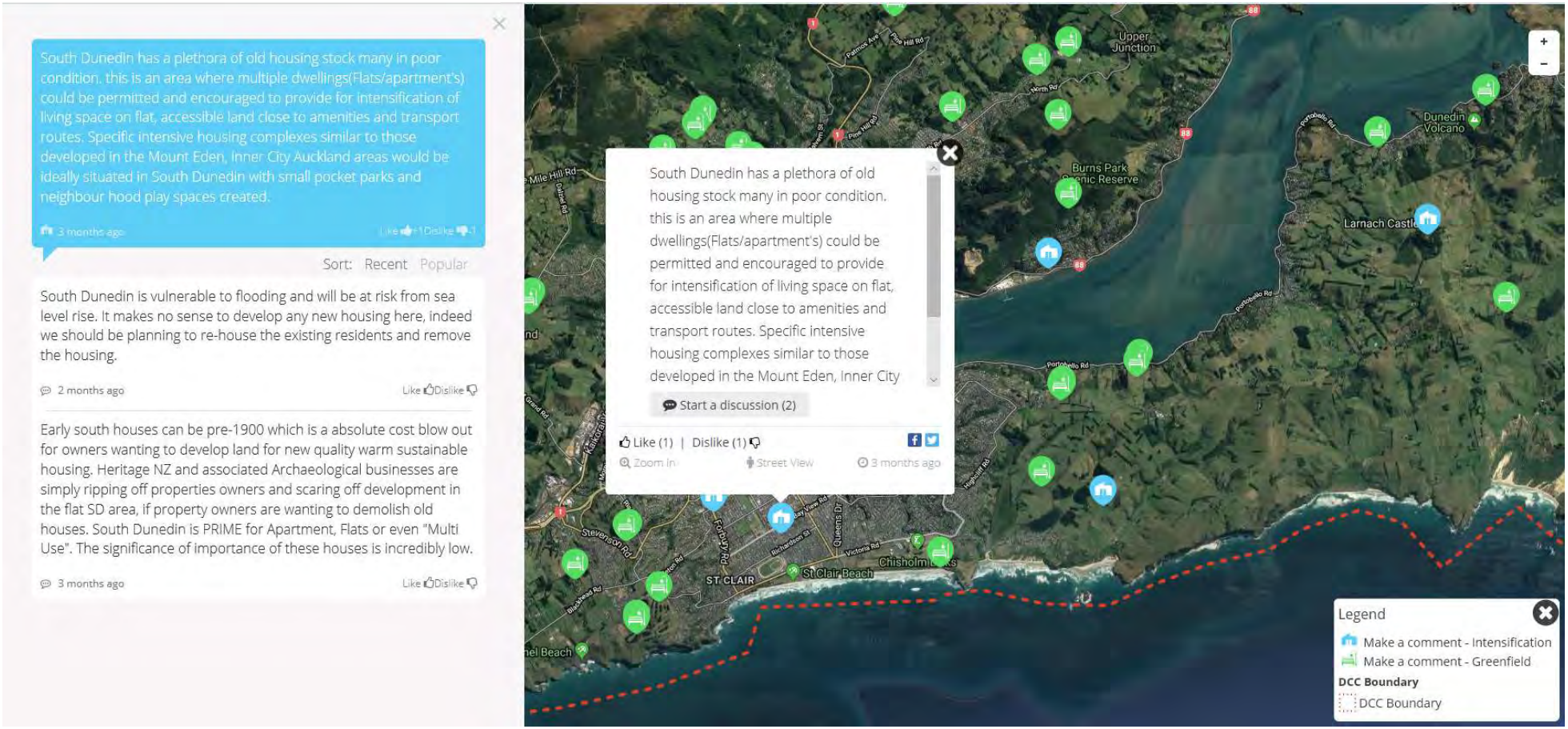
4.0 Conclusion

The results of the Planning for Housing survey show that the views of many participants on how housing capacity should be provided in Dunedin generally align with the current strategic approach of the 2GP. However, the results also reveal an appetite to reconsider some of the details to better encourage and enable housing development and manage the effects of a growing city. Measures which should be explored include additional greenfield rezoning (especially at the urban edge in areas closest to the central city), additional medium density zoning (especially along the hill suburbs and in northern areas of Dunedin), changes to the density and other performance standards for residential activity to encourage intensification, addition of non-notification rules to provide greater certainty, and other measures to make the consenting process easier. Moving into the future, greater consideration of the effects on and of climate change is expected by some participants as an integral part of urban planning.

Opinions expressed by participants do not solely address the resource management planning functions of Council, but extend to matters across most of Council's departments, including 3-Waters, transport, parks and recreation, property, community development, corporate policy, waste and environment, and building services. Overall, this indicates a need for Council to consider an integrated, Council-wide approach to addressing matters relating to housing provision to ensure community expectations are met effectively and efficiently.

Appendix A – Survey Questionnaire

Appendix B – Interactive Mapping Example



Appendix C – Relevant Objectives and Policies referred to in report discussion (2GP Decisions Version)

Objective 2.2.4: Compact and accessible city	
Dunedin stays a compact and accessible city with resilient townships based on sustainably managed urban expansion. Urban expansion only occurs if required and in the most appropriate form and locations.	
Policy 2.2.4.1	Prioritise the efficient use of existing urban land over urban expansion by: a. identifying existing areas of urban land in a range of locations that could be used more efficiently to provide for medium density housing in accordance with Policy 2.6.2.3; and b. ensuring that land is used efficiently and zoned at a standard or medium density (General Residential 1, General Residential 2, Inner City Residential, Low Density, or Township and Settlement), except if: hazards; slope; the need for on-site stormwater storage; the need to protect important biodiversity, water bodies, landscape or natural character values; or other factors make a standard density of residential development inappropriate; in which case, a large lot zoning or a structure plan mapped area should be used as appropriate.
Policy 2.2.4.2	Encourage new residential housing development in the central city and larger centres, through rules that: a. provide for residential development in the central city and centres; and b. enable adaptive re-use of heritage buildings for apartments, including by exempting scheduled heritage buildings from minimum parking requirements.
Policy 2.2.4.3	Ensure expansion of urban areas occurs in the most appropriate locations and only when required by: a. use of transition overlay zones to identify areas to provide for future residential, commercial and industrial needs; and appropriate criteria for the release of land based on: i. public infrastructure provision; and ii. for residential and commercial and mixed use zoned land, a shortage of capacity. b. encouraging applications for any subdivision that fundamentally changes rural land to residential land to be processed as a plan change; and c. requiring any alternative development areas suggested via a plan change process to demonstrate that the proposed zoning is the most appropriate in terms of the objectives and policies contained within these strategic directions, and including that for residential zoning, the proposal is appropriate in terms of the criteria contained in Policy 2.6.2.1.
Policy 2.2.4.4	Avoid subdivision that provides for residential activity of a fundamentally different type than provided for in the various zones, through: a. rules that prevent rural residential or urban-scale residential living in rural zones; b. rules that prevent urban-scale residential living in a rural residential zone;

Objective 2.2.4: Compact and accessible city	
Dunedin stays a compact and accessible city with resilient townships based on sustainably managed urban expansion. Urban expansion only occurs if required and in the most appropriate form and locations.	
	c. rules in urban environments that require the density of residential activity to reflect the existing or intended future character of the residential area; and d. rules that do not provide for family flats to be converted into primary residential units through subdivision or other means.
Policy 2.2.4.5	Limit areas where water supply, wastewater and/or stormwater network connections are allowed to zones where network connections are anticipated (including residential and other urban zones) in order to avoid future pressure for changes to the type or density of development provided for in rural or rural residential zones adjacent to areas where water supply, wastewater and/or stormwater infrastructure may pass through.

Objective 2.6.1: Housing choices	
There is a range of housing choices in Dunedin that provides for the community's needs and supports social well-being.	
Policy 2.6.1.1	Provide for housing development necessary to meet the future housing needs of Dunedin, through zones and rules that provide for an appropriate mix of development opportunities, including: infill development, redevelopment, and greenfield development; and that support Objective 2.2.4. Identify housing needs based on population projections and analysis of housing types required.
Policy 2.6.1.2	Encourage more residential housing suitable for our ageing population and growing number of one and two person households, through: a. zoning of areas that provide for medium density housing to enable transition to lower maintenance housing in existing neighbourhoods ('ageing in place'); and b. rules that enable family flats, other than in General Residential 2 and Inner City Residential zones and areas subject to natural hazards.
Policy 2.6.1.3	Apply rural residential zoning to clusters of sites in separate land tenure already developed or mostly developed for rural residential activity before 7 November 2018, and that meet the criteria in Policy 2.6.1.5, as follows: a. where the cluster comprises sites already subdivided, or which have consent to subdivide, to an average density of greater than 2ha and less than 4ha, and are either already being used for rural residential activity or there is a high degree of likelihood they will be developed for rural residential activity in the short term, Rural Residential 1 zoning is appropriate; and b. where the cluster comprises sites each under 15ha with an average site size of generally between 4ha and 10ha, Rural Residential 2 zoning is appropriate.
Policy 2.6.1.4	Apply new rural residential zoning only where:

Objective 2.6.1: Housing choices	
There is a range of housing choices in Dunedin that provides for the community's needs and supports social well-being.	
	a. there is a demonstrated shortage of rural residential land for lifestyle farming or hobby farming; b. the amount of land zoned rural residential appropriately balances providing some land resource for lifestyle farming or hobby farming with the overall Plan objectives that: i. Dunedin stays a compact and accessible city with resilient townships based on sustainably managed urban expansion. Urban expansion only occurs if required and in the most appropriate form and locations (Objective 2.2.4); ii. public infrastructure networks operate efficiently and effectively and have the least possible long term cost burden to the public (Objective 2.7.1); and iii. the multi-modal land transport network, including connections between land, air and sea transport networks, operates safely and efficiently for all road users (Objective 2.7.2); c. the proposed zoning meets the criteria contained in Policy 2.6.1.5; and d. the plan change proposal: i. considers first rezoning of Rural Residential 2 to Rural Residential 1 land to increase capacity; ii. considers next rezoning of any remaining clusters of sites below the minimum site sizes in the rural zones; and iii. only after the options in clause i and ii are assessed as inappropriate and/or unfeasible, considers the conversion of other rural sites to rural residential land.
Policy 2.6.1.5	Identify areas for new rural residential zoning in accordance with Policy 2.6.1.4 based on the following criteria: a. the land is unlikely to be suitable for future residential zoning in line with Policy 2.6.2.1; b. rezoning is unlikely to lead to pressure for unfunded public infrastructure upgrades including road sealing, unless an agreement between the infrastructure provider and the developer on the method, timing, and funding of any necessary public infrastructure provision is in place; and c. considering the zoning, rules, and potential level of development provided for, the zoning is the most appropriate in terms of the objectives of the Plan, in particular: i. the character and visual amenity of Dunedin's rural environment is maintained or enhanced (Objective 2.4.6); ii. land and facilities that are important for economic productivity and social well-being, which include industrial areas, major facilities, key transportation routes, network utilities and productive rural land are: 1. protected from less productive competing uses or incompatible uses, including activities that may give rise to reverse sensitivity; and 2. in the case of facilities, able to operate efficiently and effectively (Objective 2.3.1). Achieving this includes generally avoiding areas that are highly

Objective 2.6.1: Housing choices	
There is a range of housing choices in Dunedin that provides for the community's needs and supports social well-being.	
	productive land or may create conflict with rural water resource requirements; iii. Dunedin's outstanding and significant natural landscapes and natural features are protected (Objective 2.4.4). Achieving this includes generally avoiding the application of new rural residential zoning in ONF, ONL and SNL overlay zones; iv. the natural character of the coastal environment is preserved or enhanced (Objective 2.4.5). Achieving this includes generally avoiding the application of new rural residential zoning in ONCC, HNCC and NCC overlay zones; v. Dunedin's significant indigenous biodiversity is protected or enhanced, and restored; and other indigenous biodiversity is maintained or enhanced, and restored; with all indigenous biodiversity having improved connections and improved resilience (Objective 2.2.3). Achieving this includes generally avoiding the application of new rural residential zoning in ASBV and UBMA; vi. the biodiversity values and natural character of the coast and riparian margins are maintained and enhanced (Objective 10.2.2); vii. subdivision and development activities maintain and enhance access to coastlines, water bodies and other parts of the natural environment, including for the purposes of gathering of food and mahika kai (Objective 10.2.4); viii. the elements of the environment that contribute to residents' and visitors' aesthetic appreciation for and enjoyment of the city are protected or enhanced. These include: 1. important green and other open spaces including green breaks between coastal settlements; 2. trees that make a significant contribution to the visual landscape and history of neighbourhoods; 3. built heritage, including nationally recognised built heritage; 4. important visual landscapes and vistas; 5. the amenity and aesthetic coherence of different environments; and 6. the compact and accessible form of Dunedin (Objective 2.4.1); and ix. the potential risk from natural hazards, including climate change, is no more than low, in the short to long term (Objective 11.2.1).
Policy 2.6.1.6	Require new urban residential areas to be designed to support social connectedness and well-being through rules that require subdivisions to be designed in accordance with best practice urban design principles, including: a. designing suburbs to encourage walking; and b. providing adequate and appropriately located land for neighbourhood centres, public open spaces, and community

Objective 2.6.1: Housing choices	
There is a range of housing choices in Dunedin that provides for the community's needs and supports social well-being.	
	facilities, where not already adequately serviced by nearby areas/facilities.
Policy 2.6.1.7	Require structure plans for large subdivisions to ensure Policy 2.6.1.6 and Policy 2.2.2.5 are achieved.

Objective 2.6.2: Adequate urban land supply	
Dunedin provides sufficient, feasible, development capacity (as intensification opportunities and zoned urban land) in the most appropriate locations to meet the demand over the medium term (up to 10 years), while sustainably managing urban expansion in a way that maintains a compact city with resilient townships as outlined in Objective 2.2.4 and policies 2.2.4.1 to 2.2.4.3.	
Policy 2.6.2.1	Identify areas for new residential zoning based on the following criteria: a. rezoning is necessary to meet a shortage of residential capacity (including capacity available through releasing a Residential Transition overlay zone), either: i. in the short term (up to 5 years); or ii. in the medium term (up to 10 years), in which case a Residential Transition overlay zone is applied to the rezoned area; and b. rezoning is unlikely to lead to pressure for unfunded public infrastructure upgrades, unless either an agreement between the infrastructure provider and the developer on the method, timing, and funding of any necessary public infrastructure provision is in place, or a Residential Transition overlay zone is applied and a future agreement is considered feasible; and c. the area is suitable for residential development by having all or a majority of the following characteristics: i. a topography that is not too steep; ii. being close to the main urban area or townships that have a shortage of capacity; iii. currently serviced, or likely to be easily serviced, by frequent public transport services; iv. close to centres; and v. close to other existing community facilities such as schools, public green space and recreational facilities, health services, and libraries or other community centres; d. considering the zoning, rules, and potential level of development provided for, the zoning is the most appropriate in terms of the objectives of the Plan, in particular: i. the character and visual amenity of Dunedin's rural environment is maintained or enhanced (Objective 2.4.6); ii. land and facilities that are important for economic productivity and social well-being, which include

Objective 2.6.2: Adequate urban land supply	
Dunedin provides sufficient, feasible, development capacity (as intensification opportunities and zoned urban land) in the most appropriate locations to meet the demand over the medium term (up to 10 years), while sustainably managing urban expansion in a way that maintains a compact city with resilient townships as outlined in Objective 2.2.4 and policies 2.2.4.1 to 2.2.4.3.	
	industrial areas, major facilities, key transportation routes, network utilities and productive rural land are: 1. protected from less productive competing uses or incompatible uses, including activities that may give rise to reverse sensitivity; and 2. in the case of facilities, able to operate efficiently and effectively (Objective 2.3.1). Achieving this includes generally avoiding areas that are highly productive land or may create conflict with rural water resource requirements; iii. Dunedin's significant indigenous biodiversity is protected or enhanced, and restored; and other indigenous biodiversity is maintained or enhanced, and restored; with all indigenous biodiversity having improved connections and improved resilience (Objective 2.2.3). Achieving this includes generally avoiding the application of new residential zoning in ASBV and UBMA; iv. Dunedin's outstanding and significant natural landscapes and natural features are protected (Objective 2.4.4). Achieving this includes generally avoiding the application of new residential zoning in ONF, ONL and SNL overlay zones; v. the natural character of the coastal environment is, preserved or enhanced (Objective 2.4.5). Achieving this includes generally avoiding the application of new residential zoning in ONCC, HNCC and NCC overlay zones; vi. subdivision and development activities maintain and enhance access to coastlines, water bodies and other parts of the natural environment, including for the purposes of gathering of food and mahika kai (Objective 10.2.4); vii. the elements of the environment that contribute to residents' and visitors' aesthetic appreciation for and enjoyment of the city are protected or enhanced. These include: 1. important green and other open spaces, including green breaks between coastal settlements; 2. trees that make a significant contribution to the visual landscape and history of neighbourhoods; 3. built heritage, including nationally recognised built heritage; 4. important visual landscapes and vistas; 5. the amenity and aesthetic coherence of different environments; and 6. the compact and accessible form of Dunedin (Objective 2.4.1); viii. the potential risk from natural hazards, including climate change, is no more than low, in the short to long term (Objective 11.2.1);

Objective 2.6.2: Adequate urban land supply	
Dunedin provides sufficient, feasible, development capacity (as intensification opportunities and zoned urban land) in the most appropriate locations to meet the demand over the medium term (up to 10 years), while sustainably managing urban expansion in a way that maintains a compact city with resilient townships as outlined in Objective 2.2.4 and policies 2.2.4.1 to 2.2.4.3.	
	ix. public infrastructure networks operate efficiently and effectively and have the least possible long term cost burden on the public (Objective 2.7.1); x. the multi-modal land transport network, including connections between land air and sea transport networks, operates safely and efficiently for all road users (Objective 2.7.2); and xi. Dunedin stays a compact and accessible city with resilient townships based on sustainably managed urban expansion. Urban expansion only occurs if required and in the most appropriate form and locations (Objective 2.2.4).
Policy 2.6.2.2	Manage subdivision, new buildings and site design in transition overlay zones to ensure that these activities do not restrict the future use of the land for urban development.
Policy 2.6.2.3	Identify areas for new medium density zoning based on the following criteria: a. alignment with Policy 2.6.2.1; and b. rezoning is unlikely to lead to pressure for unfunded public infrastructure upgrades, unless either an agreement between the infrastructure provider and the developer on the method, timing, and funding of any necessary public infrastructure provision is in place, or an infrastructure constraint mapped area is applied; and c. considering the zoning, rules, and potential level of development provided for, the zoning is the most appropriate in terms of the objectives of the Plan, in particular: i. there is a range of housing choices in Dunedin that provides for the community's needs and supports social well-being (Objective 2.6.1); ii. Dunedin reduces its reliance on non-renewable energy sources and is well equipped to manage and adapt to changing or disrupted energy supply by having reduced reliance on private motor cars for transportation (Objective 2.2.2), including through one or more of the following: 1. being currently serviced, or likely to be easily serviced, by frequent public transport services; and 2. being close (good walking access) to existing centres, community facilities such as schools, public green spaces recreational facilities, health services, and libraries or other community centres; and iii. the elements of the environment that contribute to residents' and visitors' aesthetic appreciation for and enjoyment of the city are protected or enhanced. These include: 1. important green and other open spaces, including green breaks between coastal settlements; 2. trees that make a significant contribution to the visual landscape and history of neighbourhoods;

Objective 2.6.2: Adequate urban land supply	
Dunedin provides sufficient, feasible, development capacity (as intensification opportunities and zoned urban land) in the most appropriate locations to meet the demand over the medium term (up to 10 years), while sustainably managing urban expansion in a way that maintains a compact city with resilient townships as outlined in Objective 2.2.4 and policies 2.2.4.1 to 2.2.4.3.	
	3. built heritage, including nationally recognised built heritage; 4. important visual landscapes and vistas; 5. the amenity and aesthetic coherence of different environments; 6. the compact and accessible form of Dunedin (Objective 2.4.1); and iv. the potential risk from natural hazards, including climate change, is no more than low, in the short to long term (Objective 11.2.1); and b. the area is suitable for medium density housing by having all or a majority of the following characteristics: i. lower quality housing stock more likely to be able to be redeveloped; ii. locations with a topography that is not too steep; iii. locations that will receive reasonable levels of sunlight; and iv. market desirability, particularly for one and two person households.
Policy 2.6.2.4	Identify areas for new commercial and mixed use zoning based on the following criteria: a. rezoning is necessary to meet a medium term (up to 10 year) shortage of capacity to meet demand in the intended customer catchment; and b. the new area will not detract from, and preferably support, Objective 2.4.3 (Vibrant CBD and centres).
Policy 2.6.2.5	Encourage any proposal for the creation or expansion of a centre to be considered through a plan change process unless it represents a minor extension to a centre in accordance with Policy 15.2.1.5.