Greater Christchurch Partnership

Te Tira Tū Tahi
One Group, Standing Together

Greater Christchurch Housing Capacity

Report 2: Housing Development Capacity – An Assessment of Plan-Enabled and Infrastructure Serviced Capacity

9 February 2018 - Draft Version 3

Contents

Executive Summary

The National Policy Statement on Urban Development Capacity (NPS-UDC) requires local authorities to carry out a housing and business development capacity assessment (Policy PB1) that estimates the demand for dwellings and the supply of development capacity to meet that demand in the short (Three years), medium (Ten years) and long (Thirty years) term. This report is the second in a series prepared by the Greater Christchurch Partnership to meet the policy requirements of the NPS-UDC, specifically Policy PB3 (a) and (b). Its purpose is to assess the capacity of land intended for housing development based on:

a) the zoning, objectives, policies, rules and overlays that apply to the land, in the relevant proposed and operative regional policy statements, regional plans and district plans; and
b) the provision of adequate development infrastructure to support the development of the land.

The first step requires an assessment of plan-enabled capacity to determine the effect this will have on opportunities for development to be taken up. This has been calculated following two approaches:

a) 'theoretical' - being what the plan enables and
b) 'modified' - being what has historically been developed within the different zones, or as determined by a spatial parcel specific analysis (as undertaken for the Selwyn and Waimakariri growth models), or through a more detailed development potential analysis (i.e. to ground truth the district plan provisions at a site and/or block level to be applied across the zoned area).

The rationale for preparing a modified, more ground-truthed, scenario, is to provide a better understanding of what may be a more realistic quantum of plan-enabled capacity and therefore what the actual opportunities are for development to be taken-up. Table 1 provides a summary of the 'theoretical' and 'modified' scenarios, which will be used as part of the housing capacity.

Table 1: Plan-enabled housing capacity – theoretical and modified scenarios

Local Authority	Theoretical	Modified
Christchurch	236,968	51,106
Selwyn[1]	12,120	9,717
Waimakariri	7,820	4,188
Greater Christchurch	256,908	65,011

For urban land to be deemed as having 'development capacity', it not only needs to be zoned for such purpose and either be serviced or planned to be serviced with development infrastructure (i.e. network infrastructure for water supply, wastewater, stormwater, and land transport). An infrastructure assessment was undertaken and concludes that of the plan-enabled capacity within the Selwyn district and Waimakariri district, development of any zoned urban land is not precluded over the short, medium or long term.

For Christchurch City, as a consequence of its recent review of its Christchurch District Plan, there has been a significant change to zone provisions, in particular those zones that apply to the existing urban area (i.e. non-greenfield areas). The result is that the now operative district plan offers significant redevelopment opportunities (through a process of intensification of land use), however current and planned infrastructure programmes have not been, nor will be, updated to provide for all plan-enabled capacity. This is neither fiscally achievable nor necessary, based on past and more recent population projections under medium and high growth scenarios. The Christchurch City Council's infrastructure programme under the 2016 Long Term Plan does provide for the servicing of all planned greenfield areas (zoned Residential New Neighbourhood) in the medium term. Further, in the short term most greenfield areas infrastructure can be developer led. It also provides substantial capacity to accommodate redevelopment opportunities across almost all of the existing urban area (excluding the Shirley and Aranui vacuum sewer catchments, approximately 3,666 households) to the extent signalled under the Land Use Recovery Plan and the Greater Christchurch Urban Development Strategy 2007.

For Selwyn District Council and Waimakariri District Council, both district plans have been operative for some time and are undergoing reviews. The plans have incorporated provisions to give effect to Chapter 6 of the CRPS and infrastructure programming and upgrades have aligned with growth. A large proportion of

[1] This data is reported off an initial iteration of the SCGM – Version 5 received on the 24th November 2017 – The results are interim pending review and sensitivity testing.

subdivision has occurred under this framework that helps determine uptake to be quantified and therefore, a relatively high degree of confidence can be placed in the modified supply estimates.

Definitions

The following table defines commonly used acronyms and abbreviations in this document.

Term	Definition
CCC	Christchurch City Council
CEDS	Christchurch Economic Development Strategy
CRPS	Canterbury Regional Policy Statement
Development Capacity	As defined in the NPS-UDC, means: in relation to housing and business land, the capacity of land intended for urban development based on: a) the zoning, objectives, policies, rules and overlays that apply to the land, in the relevant proposed and operative regional policy statements, regional plans and district plans; and b) the provision of adequate development infrastructure to support the development of the land."
Development Infrastructure	As defined in the NPS-UDC, means: network infrastructure for water supply, wastewater, stormwater, and land transport as defined in the Land Transport Management Act 2003, to the extent that it is controlled by local authorities.
GC	Greater Christchurch
GIS	Geographical Information System
HH/Ha	Households per Hectare
Infill	Is the addition of a dwelling, generally to the back of a site, whilst keeping the original dwelling.
Intensification	As defined in the CRPS, means: An increase in the residential household yield within existing areas. It includes infill and comprehensive redevelopment.
LTP	Long Term Plan
LURP	Land Use Recovery Plan
NPS-UDC	National Policy Statement on Urban Development Capacity
NZTA	NZ Transport Authority
Other Infrastructure	As defined in the NPS-UDC, means: a) open space; b) community infrastructure as defined in the Local Government Act 2002; c) land transport as defined in the Land Transport Management Act 2003, that is not controlled by local authorities; d) social infrastructure such as schools and healthcare; e) telecommunications as defined in the Telecommunications Act 2001; f) energy; and g) other infrastructure not controlled by local authorities.
UDS	Urban Development Strategy
Version	

1. Overview and Methodology

1.1 NPS-UDC requirements regarding the sufficiency of development capacity

This report is second in a series of reports prepared to meet the requirements of the National Policy Statement on Urban Development Capacity (NPS-UDC), specifically in relation to housing. It follows a housing demand assessment prepared for the Greater Christchurch area (refer to the report titled Greater Christchurch Housing Capacity: Report 1 Housing Demand Assessment, dated 6 February 2017) but focuses on the supply of housing to meet the projected demand. In accordance with the NPS-UDC, Policy PA1, it forms the first stage of the housing supply assessment required to demonstrate that at any one time there is sufficient housing development capacity over the short, medium and long term. The more specific focus of this report is to meet the NPS-UDC policy requirements of PB1 and PB3 below [our emphasis underlined].

"PB1: Local authorities shall, on at least a three-yearly basis, carry out a housing and business development capacity assessment that:

a. Estimates the demand for dwellings, including the demand for different types of dwellings, locations and price points, and the supply of development capacity to meet that demand, in the short, medium and long-terms; and

b. Estimates the demand for the different types and locations of business land and floor area for businesses, and the supply of development capacity to meet that demand, in the short, medium and long-terms; and

c. Assesses interactions between housing and business activities, and their impacts on each other.

PB3: The assessment under policy PB1 shall estimate the sufficiency of development capacity provided by the relevant local authority plans and proposed and operative regional policy statements, and Long Term Plans and Infrastructure Strategies prepared under the Local Government Act 2002, including:

a. The cumulative effect of all zoning, objectives, policies, rules and overlays and existing designations in plans, and the effect this will have on opportunities for development being taken up;

b. The actual and likely availability of development infrastructure and other infrastructure in the short, medium and long term as set out under PA1;

c. The current feasibility of development capacity;

d. The rate of take up of development capacity, observed over the past 10 years and estimated for the future; and

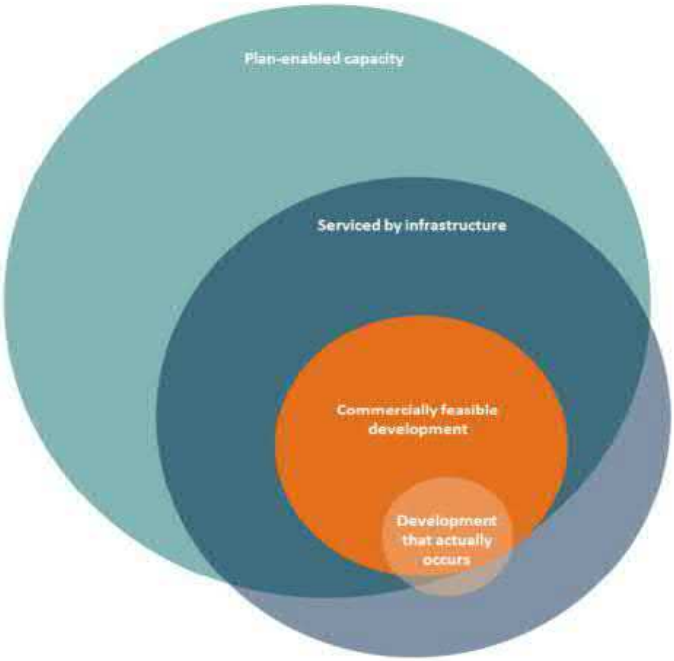
e. The market's response to planning decisions, obtained through monitoring under policies PB6 and PB7.

PB4: The assessment under policy PB1 shall estimate the additional development capacity needed if any of the factors in PB3 indicate that the supply of development capacity is not likely to meet demand in the short, medium or long term."

Whilst the report will provide a useful understanding of potential capacity within locational (geographical) sub-areas (refer to the NPS-UDC Greater Christchurch Housing Capacity Assessment Methodology, section 6.2) it will not directly address whether the plan-enabled supply meets the estimated demand for different types of dwellings (i.e. stand alone or multi-unit housing developments). The report does not assess capacity in terms of price points by location either. The test of housing sufficiency (including price points) will draw from the housing supply work undertaken to assess the feasibility of land for housing developments (refer to the GC Housing Capacity Assessment Report 3 – Development feasibility and assessment of sufficient capacity). The outputs from this report will however provide a useful benchmark to compare against the outputs from the feasibility assessment, which in turn may help to inform a planning response, for example to remove planning constraints on density and building restrictions and to enable and/or incentivise further housing supply.

1.2 Methodology

The approach to determining plan-enabled and infrastructure serviced capacity follows the direction and approaches contained within the *National Policy Statement on Urban Development Capacity: Guide to Evidence and Monitoring*. The following figure (found on pg35 of the guide) illustrates the approach. Where the supply assessment deviates or goes beyond the recommended approaches under this guide, this is documented and a rationale provided.



The stepped approach to assessing plan-enabled and infrastructure serviced capacity is set out in the supporting report titled NPS-UDC Greater Christchurch Housing Capacity Assessment Methodology, specifically sections 8 and 9. In following this methodology the results are as follows.

2. Plan Enabled Capacity

As required under NPS-UDC Policy PB3a, this section discusses and tabulates the cumulative effect of all zoning, objectives, policies, rules and overlays and existing designations in the Greater Christchurch district plans. Capacity is determined from an assessment of both vacant and built land, incorporating redevelopment and intensification potential. The assessment begins with a discussion of what land and zones or overlays are included, an outline and explanation of the density used, and then provides a total theoretical and modified capacity for Greater Christchurch. Essentially theoretical capacity is as if all land was built to the maximum potential anticipated in the zone as permitted or restricted discretionary development disregarding existing development and cadastral boundaries (i.e considering urban blocks as if it was one vacant land development parcel with one owner). For Christchurch City, the modified capacity is based on the average or realised density of existing zones, extrapolated and projected to all similarly zoned areas.

The approaches for each district are different as they have different areas of emphasis. While the approach to the greenfield capacity assessment is consistent across the three districts, the approach to assessing additional capacity within the existing urban areas reflects the different emphasis on intensification and capacity for intensification within each district. Christchurch City is focused on redevelopment or intensification of existing multiple land parcels as comprehensive development. Capacity as suburban infill in Christchurch City (i.e. subdividing the vacant rear part of an existing allotment) is limited, with most opportunities for this having already been taken-up. In terms of redevelopment opportunities in Selwyn and Waimakariri, capacity is focused more on greenfield uptake and backfill capacity in suburban zones, with less focus on comprehensive site redevelopment. This is due to a combination of a number of factors including market forces, the age of existing housing stock, past patterns of development, and the size and form of the townships. The Canterbury Regional Policy Statement (CRPS) policy direction signals that only limited infill development is anticipated in Selwyn and Waimakariri.

2.1 Land and Zones/Overlays included

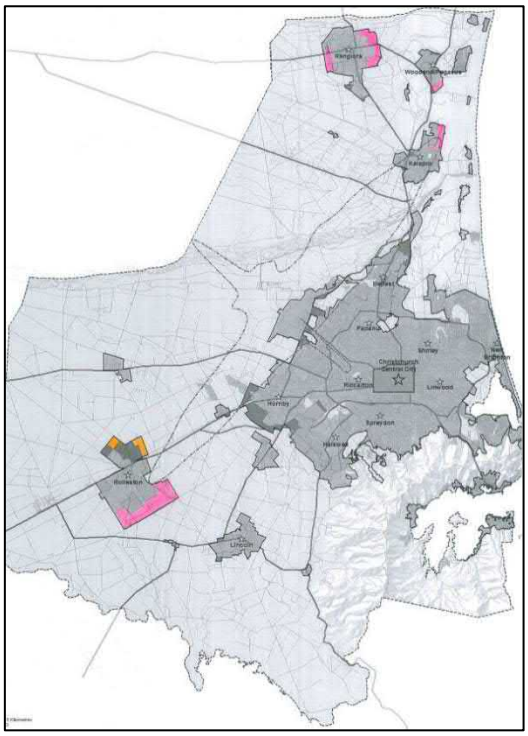
The initial step to estimating development capacity is to evaluate what land is to be included within the assessment. The NPS-UDC limits this to land intended for urban development based on zoning, objectives and policies. Land zoned for urban development is identified within each Council's district plan, including all areas identified as existing zoned or greenfield residential land for development under Chapter 6 of the CRPS, specifically Map A.

It is noted that whilst Map A (refer to Appendix 7 of this report) clearly defines housing and business greenfield priority areas, it also includes a "Projected Infrastructure Boundary" encompassing rural land beyond these greenfield priority areas in Rangiora, Woodend/Pegasus, Kaiapoi and Rolleston. The CRPS does not have a corresponding objective or policy identifying this rural land within the projected infrastructure boundary as being intended for urban development. The background to consideration of these additional areas as future potential greenfield urban areas, stems from Proposed Change 1 (PC1) to the CRPS. When the LURP took effect on 6 December 2013 it made changes to the CRPS (including the insertion of Chapter 6 - Recovery and Rebuilding of Greater Christchurch) and revoked PC1.

In developing the LURP these areas were excluded from being rezoned as their need was (at the time) assessed as being beyond the 2028 'recovery' timeframe. Given that the objective and policy framework of the CRPS seeks to avoid urban development outside of existing urban areas or greenfield priority areas (regardless of whether it is within the Projected Infrastructure Boundary), this report has not included it within the assessment of development capacity.

However, land identified in a prescribed Housing Accord Area[2] is included as essentially this supersedes the underlying rural zoning where resource consents have been issued under the Housing Accords and Special Housing Areas Act 2013. The following sections outline the process for identifying the amount of zoned land (in hectares) by zone and overlay for each council.

[2] Housing Accord Areas created through the Housing Accords and Special Housing Areas Act 2013 allow a streamline process to enhance housing affordability by facilitating an increase in land and housing supply.



2.1.1 Christchurch Zoned Land

The starting point for the assessment is the areas defined by the Christchurch District Plan as residential zones. Included as part of Appendix 6 is a map that shows the distribution of the residential zones. Roads under the District Plan are separately zoned, effectively confining the residential zones to a series of distinct urban blocks. Analysis of theoretical and modified capacity was therefore at a block-by-block level. The appropriate type code was either the zone or, if there was an overlay, the overlay. The capacity for each block was then truncated (rounded down) to the nearest whole number. Other determinants were as follows:

- Land zoned Residential Guest Accommodation was excluded as it is anticipated that this is used for hotels and not housing. Also, land within the accommodation and community facilities overlay was excluded as currently it is used for accommodation (which could provide around 600 additional households). The District Plan encourages this activity in the overlay and discourages it elsewhere. Therefore this land is excluded.
- Land within the High Flood Hazard area was not considered as having additional capacity as the District Plan seeks to avoid development within these areas due to the flood risk. Therefore this land is excluded.
- Commercial Zones (outside the Central City): The Commercial Core, Commercial Local, Commercial Banks Peninsula, and Commercial Mixed Use Zones all permit residential activity located either above or at the rear of a development site. Assessment of residential activity within these zones shows that take-up is negative (see appendix 3). Since the earthquakes, more residential units located within commercial areas have been removed than have been built. So while there is potential capacity within these areas, the recent evidence suggests it is not occurring and, therefore, is not included within this capacity assessment.
- Commercial Central City: While areas such as the 'Frame' and the Central City Mixed Use zone have been included in the assessment, the potential within the Commercial Central City Business Zone, which permits housing above the ground floor, requires more work to determine its potential capacity. Therefore this land is currently excluded.
- Papakāinga/Kāinga Nohoanga Zone: There is one Papakāinga zone located within Greater Christchurch (within Christchurch City), located in Rāpaki. The Papakāinga zone allows contiguous Māori land (identified through Te Ture Whenua Maori Act 1993) to be treated as one site and has no site density controls. This provides potential for a wide variation in density. Four residential

houses have been built since 2012. More work needs to be done to determine the potential capacity of this zone and therefore, this land is currently excluded from the capacity assessment.

2.1.2 Selwyn and Waimakariri zoned land

Within Selwyn and Waimakariri districts, zoned land is identified by township and the various Living or Residential zones contained within them. This is inclusive of the Selwyn District Plan Living 3 (Rural Residential) or Waimakariri District Plan Residential 4a and 4b zones that are located on the edge of or near existing townships and enabled through Councils adopted Rural Residential Strategies and Policy 6.3.9 of the CRPS (see Appendix 6). This evaluation excludes rural zones and Existing Development Areas/Small Settlements under both district plans that are historic lifestyle living/residential zones which are in most cases located within the rural environment in isolation of townships. The two Special Housing Accord Areas in Selwyn are included as plan enabled capacity, which include the South Faringdon and Geddes/Dryden Trust development areas[3].

Housing supply for Selwyn and Waimakariri has been reported from the Selwyn Capacity for Growth Model (SCGM) and Waimakariri Capacity for Growth Model (WCGM), both models having been prepared by Market Economics Limited. These two models assess capacity at a site specific level.

For the SCGM this estimates housing supply at a site specific level by combining geospatial data with District Plan subdivision density standards, permitted activity bulk and location rules and accounting for 'vacant' (where there are no consented buildings on the site) and 'vacant potential' (where potential exists to subdivide based on the subdivision standards) land to determine the Theoretical Capacity of each property[4]. The WCGM follows a similar approach however does not model the bulk and location rules. The SCGM is therefore a slightly more refined assessment.

For both the SCGM and WCGM the following assumptions have been applied:

- 'Undevelopable' lots have been removed, including roads and railways, hydrological features, vested roads and reserves and designated sites;
- Dwelling typology is assumed to be what the District Plans enable;
- Estimates are rounded down to the nearest whole number;
- Amalgamation of parcels is not accounted for;
- Intensification is only assumed where the zone density rules enable five or more dwellings to be accommodated on the parcel;
- That 25% of land area is set aside for infrastructure;
- That no commercial buildings will be constructed in residential zones[5].

This parcel specific information has been aggregated up to the zone level for each township for reporting the theoretical capacity in table 2.3.1.

2.2 Density and yield for capacity analysis

For Greater Christchurch, two approaches to estimating plan enabled capacity were used; theoretical capacity, and modified capacity. Theoretical capacity is the maximum plan enabled capacity derived from what is permitted, controlled or restricted discretionary residential activity within the relevant district plans and applies the densities as set in the CRPS (see Appendix 7). It essentially provides an estimate or upper ceiling of plan-enabled capacity that is close to the maximum capacity allowable under the rules of the District Plans. For Christchurch City the specific approach to calculating density and yield disregards current development and existing property boundaries and calculates the maximum capacity enabled. The approach taken under the SCGM and WCGM applies a parcel specific evaluation. For Selwyn this has included the use of GIS modelling of bulk and location rules under the district plan.

Modified capacity calculations differ between Christchurch City and the Selwyn and Waimakariri Models. This is because the policy direction for intensification in Christchurch is focused more on comprehensive development rather than, as in Selwyn and Waimakariri, providing for infill capacity. For Christchurch, the

[3] Uptake monitoring data on the Rolleston Special Housing Areas is available on Selwyn District Council's Website - http://www.selwyn.govt.nz/services/planning/special-housing-areas/selwyn-district-council-monitoring-report

[4] Refer to the SCGM and WCGM Technical Reports respectively and note that the Theoretical capacity is defined as 'Theoretical Plan Enabled Capacity' in the Growth Models

[5] Home office/small business can cohabitate within residential dwellings

modified capacity is based on the average density of past development in each residential zone or an assessment of the average of previously realised density for intensification development in higher density zones. For Selwyn and Waimakariri, as part of their respective growth models, a spatial analysis of capacity for infill in the existing urban area was conducted to establish the modified capacity to determine what densities and level of uptake has been realised in each zone.

2.2.1 Christchurch

The Christchurch District Plan introduced several overlays that either constrain or enable development. For the calculation of an area that was identified within an overlay, the density calculation ignored the zone density and used an overlay figure; in other words the overlay figure included the total households per hectare not just the addition or reduction of the zone figure. The density used for each zone and overlay and District Plan reference is set out in Appendix 1 or discussed below.

Non-residential activities in residential zones: Currently 2.7% of residential sites are occupied by non-residential activities, including halls, education and community facilities. This adjusts the theoretical capacity by 2%, while the modified capacity incorporates non-residential activities in the household per hectare calculation[6].

Residential Medium Density Zone: The Theoretical capacity applied is based on modelling of the zone standards, as found in Appendix 8. The modelling shows that a density of 120hh/ha is possible. The Modified density applied is based on the study of achieved density that occurred for redevelopment sites in the Riccarton area since 1995[7]. This showed that over 2/3 of all medium-density development achieved in excess of 30 hh/ha. More recent developments (since 2000) have generally achieved higher densities, about 40% of developments above 40 hh/ha, as well as 30% of developments between 35-40 hh/ha. The modified density of 40hh/ha represents this trend towards greater density.

Residential Central City Zone: This provides for high density housing, with a higher height limit than the Medium Density Zone resulting in a theoretical potential yield of 100 hh/ha. The 100hh/ha theoretical yield is based on the range of housing typologies (and thus densities) set out in the guide '*Exploring New Housing Choices*'. This guide provides examples of five storey courts (typology 11) reaching 124 hh/ha and a walk-up corner (typology 9) reaching 80 hh/ha[8]. The guide acknowledges that *"…In some cases this approach highlights typologies which are acknowledged as not complying with current District Plan rules (at the time of writing in August 2010)"* - refer to page 28 of the '*Exploring New Housing Choices*', document. Since 2010 the District Plan has been changed, first to give effect to the Central City Recovery Plan and further through the recent review of the Christchurch District Plan. Key changes include changes to and removal of site density and increased height standards. Therefore, the guide is relevant in that it provides a modelled assessment about what is possible on typical sites within Central City and a range of typologies that can be achieved broadly within the District Plan. Modified density is based on the current average density.

Commercial Mixed Use Zone and East Frame: The District Plan recently permitted residential and commercial activities within the Mixed Use Zone. CCC recently undertook a land use survey within part of the Mixed Use zone to determine the proportional split of ground floor activities. This survey indicates that housing occupies approximately five percent of ground floor activity. This equates to about five hectares of residential capacity. The East Frame is consented for development of 900 houses.

Residential Suburban Density Transition Zone: Within the Christchurch District Plan there is approximately 781 hectares zoned RSDT. This zone is generally located between the medium density surrounding the city centre and the suburban zone or near Key Activity Centres (identified in the CRPS). The zone allows for either suburban development on smaller sites or comprehensive development of multi-unit complexes of up to four units. The provision for multi-unit development in the zone has only been operative since 2015. Therefore there is very limited data with which a theoretical or modified density could be determined. Notwithstanding this, as part of the Christchurch City Council's evidence under the District Plan Review, a comparative modelling

[6] CCC Monitoring and Research information using valuation rating data

[7] http://www.chchplan.ihp.govt.nz/wp-content/uploads/2016/04/CCC-Rebuttal-evidence-Sarah-Oliver-22-06-16.pdf Pg13. Also, this study area was an area with a 2 storey height limit and could be an underestimation of potential capacity.

[8] https://www.ccc.govt.nz/assets/Documents/The-Council/Plans-Strategies-Policies-Bylaws/Urban-Design/Exploring-New-Housing-Choices.pdf

analysis was undertaken of the potential for the Residential Suburban, Residential Suburban Transition Density, and Residential Medium Density zones to facilitate multi-unit development. A summary overview of this analysis is provided in Appendix 8 of this report[9] . Further, the RSDT site size analysis shows that there are approximately 171ha of sites that are vacant and/or larger than 1000m^2. There are 404ha of sites between 600m^2 and 1000m^2. Based on this information, for theoretical capacity, the assumption is that it will yield 60hh/ha (5 dwellings on an 809m^2 site). For modified density, the average existing density is used, therefore does not take account of the potential uptake of multi-unit development available through the new District Plan provisions. Under the theoretical capacity assessment, intensification within the RSDT zone therefore provides for an additional 15,525 multi-unit households above the 18,975 calculated based on single unit density.

Minor Residential Units, Retirement Villages within all Residential Zones: Within the Christchurch District Plan minor residential units are permitted activities within the Residential Suburban Zone. This allows for small, independent units to be built on sites greater than 450m^2. As such for all Residential Suburban zoned sites greater than 450m^2 there is capacity for an additional unit. The provision for Minor Residential Units is new in the District Plan[10]. Consequently it is not possible to accurately make an assessment of the likely update of Minor Residential Units in the Christchurch City 'Modified' capacity. Additionally, retirement villages are permitted activities throughout the Residential Suburban Zone and could also increase the total theoretical capacity, however more detailed analysis work is required to understand and identify future potential retirement village locations and significance on capacity. Therefore, retirement villages are currently excluded from the capacity assessment density calculation.

Enhanced Development Mechanism (EDM): The EDM allows for comprehensive development if it meets certain criteria. This again could provide for greater housing densities and overall capacity; however likely development or uptake is limited. This additional potential yield has therefore been excluded from the capacity calculation.

2.2.2 Selwyn and Waimakariri

The Selwyn and Waimakariri growth models utilise parcel based information to determine the modified capacity[11]. This adjusts the theoretical capacity in recognition that the market rarely provides for housing to the densities and typologies enabled by District Plan subdivision standards and land use rules. It also accounts for the reality that there will be a range of lot sizes as a consequence of natural features, demand profiles and infrastructure needs.

The modified capacity is an estimate of the contemporary level of development that is being produced by the market within sample areas using spatial data to determine the extent to which the realised subdivision density is consistent with the underlying zones. The modified capacity outputs outlined in Table 2.3.2 have been aggregated up to the township level for the purposes of reporting.

2.3 Plan Enabled Capacity – Results of analysis

This section tabulates the theoretical (refer to Table 2.3.1) and modified (refer to Table 2.3.2) plan enabled capacity for each council and across the sub-areas. For Christchurch City this entails a simple calculation based on zoned land, identified in Section 2.1, multiplied by density (households per hectare), identified in Section 2.2. Capacity is grouped by sub-areas and then zone (see Appendix 5), for comparison.

Capacity is reported as additional to the households currently there. Current households is based on address points (not on vacant land) which indicates (broadly) what the current land use is (i.e. whether there is an existing dwelling) to provide a calculation for net capacity (i.e. additional capacity).Address points are sourced from Land Information New Zealand's official national record (used for electoral purposes), which is required (through legislation) to be updated by TA's and meet a national standard. This is the best record of the number of current households. Net capacity is, therefore, the additional housing capacity over and above what already exists.

[9] Full analysis can be sourced at http://www.chchplan.ihp.govt.nz/wp-content/uploads/2016/04/CCC-RMD-hearing-Sarah-Oliver-Appendices-G-H-9-6-16.pdf

[10] The superseded Christchurch City Plan contained provision for family flats. This provision had a similar development outcome to Minor Residential Units, however a family flat was restricted to specific tenure. The provisions are therefore not directly comparable.

[11] Refer to the SCGM and WCGM Technical Reports respectively and note that modified capacity in the SCGM is referred to as 'Modified Development Potential'.

Table 2.3.1 – Summary of Theoretical Plan Enabled Capacity

Sub-areas	Zone(s)	Net Capacity	
ChCh North West	*Residential Suburban*	*17,263*	
	Residential Suburban Density Transition	*554*	
	Residential Medium Density	*5,432*	
	Community Housing Redevelopment Mechanism	*4,579*	
	Residential New Neighbourhood	*4,672*	
	Total	32,500	
ChCh North East	*Residential Suburban*	*13,763*	
	Residential Suburban Density Transition	*1,379*	
	Residential Medium Density	*4,452*	
	Community Housing Redevelopment Mechanism	*5,216*	
	Residential New Neighbourhood	*4,103*	
	Residential Small Settlement	*436*	
	Total	29,349	
ChCh South East	*Residential Suburban*	*5,882*	
	Residential Suburban Density Transition	*1,923*	
	Residential Medium Density	*2,840*	
	Community Housing Redevelopment Mechanism	*849*	
	Residential Hills	*565*	
	Total	12,059	
ChCh South West	*Residential Suburban*	*14,808*	
	Residential Suburban Density Transition	*4,007*	
	Residential Medium Density	*7,126*	
	Community Housing Redevelopment Mechanism	*2,561*	
	Residential New Neighbourhood	*8,309*	
	Residential Hills	*22*	
	Residential Large Lots	*44*	
	Total	36,877	
ChCh City & Inner Suburbs	*Residential Suburban*	*1,027*	
	Residential Suburban Density Transition	*1,763*	
	Residential Medium Density	*28,254*	
	Residential Central City	*5,437*	
	The Frame (East and North)	*900*	
	Commercial Central City Mixed Use	*500*	
	Total	37,881	
ChCh Port Hills	*Residential Suburban*	*2,275*	
	Residential Suburban Density Transition	*141*	
	Residential Medium Density	*528*	
	Residential Hills	*9,123*	
	Residential Large Lots	*821*	
	Total	12,888	
ChCh Lyttelton Harbour	*Residential Banks Peninsula*	*4,097*	
	Residential Large Lots	*732*	
	Residential Small Settlements	*24*	
	Total	4,853	
TOTAL CHRISTCHURCH	*RSDT Intensification*	*15,525*	
	Minus 2% uptake of non-residential activities	*-3,964*	
	Minor Residential Units	*59,000*	
	Total combined Christchurch		236,968
Selwyn GCP Settlements[12]	*Rolleston*	*6,862*	
	Lincoln	*3,891*	
	Prebbleton	*914*	
	West Melton	*391*	
	Tai Tapu	*62*	
	Total		12,120
Waimakariri GCP	*Kaiapoi*	*1,590*	
	Rangiora	*1,403*	
	Woodend/Ravenswood	*3,467*	
	Pegasus	*1,043*	
	Existing Zoned Land – Small Settlements	*317*	
	Total		7,820
GRAND TOTAL		**256,908 households**	

[12] This data is reported off an initial iteration of the SCGM – Version 5 received on the 24th November 2017 – The results are interim pending review and sensitivity testing

Table 2.3.2 – Summary of Modified Plan Enabled Capacity

Sub-areas	Zone(s)	Net Capacity	
ChCh North West	*Residential Suburban*	*904*	
	Residential Suburban Density Transition	*34*	
	Residential Medium Density	*1,983*	
	Community Housing Redevelopment Mechanism	*4,579*	
	Residential New Neighbourhood	*4,672*	
	Total	12,172	
ChCh North East	*Residential Suburban*	*689*	
	Residential Suburban Density Transition	*54*	
	Residential Medium Density	*1,949*	
	Community Housing Redevelopment Mechanism	*5,216*	
	Residential New Neighbourhood	*4,103*	
	Residential Small Settlement	*34*	
	Total	12,045	
ChCh South East	*Residential Suburban*	*424*	
	Residential Suburban Density Transition	*57*	
	Residential Medium Density	*915*	
	Community Housing Redevelopment Mechanism	*849*	
	Residential Hills	*43*	
	Total	2,288	
ChCh South West	*Residential Suburban*	*1,487*	
	Residential Suburban Density Transition	*55*	
	Residential Medium Density	*2,153*	
	Community Housing Redevelopment Mechanism	*2,561*	
	Residential New Neighbourhood	*8,309*	
	Residential Hills	*1*	
	Residential Large Lots	*0*	
	Total	14,566	
ChCh City & Inner Suburbs	*Residential Suburban*	*196*	
	Residential Suburban Density Transition	*29*	
	Residential Medium Density	*5,053*	
	Residential Central City	*92*	
	The Frame	*900*	
	Total	6,270	
ChCh Port Hills	*Residential Suburban*	*306*	
	Residential Suburban Density Transition	*0*	
	Residential Medium Density	*116*	
	Residential Hills	*2,035*	
	Residential Large Lots	*137*	
	Total	2,594	
ChCh Lyttelton Harbour	*Residential Banks Peninsula*	*806*	
	Residential Large Lots	*24*	
	Residential Small Settlements	*341*	
	Total	1,171	
TOTAL CHRISTCHURCH	**Total combined Christchurch**		51,106
Selwyn GCP Settlements[13]	*Rolleston*	*5,728*	
	Lincoln	*3,020*	
	Prebbleton	*761*	
	West Melton	*146*	
	Tai Tapu	*62*	
	Total		9,717
Waimakariri UDS	*Kaiapoi*	*488*	
	Rangiora	*1,251*	
	Woodend/Ravenswood	*1,658*	
	Pegasus	*474*	
	Existing Zoned Land – Small Settlements	*317*	
	Total		4,188
GRAND TOTAL		**65,011 households**	

[13] This data is reported off an initial iteration of the SCGM received on the 13th October 2017 – The results are interim pending review and sensitivity testing

Summary

The total theoretical capacity within Greater Christchurch is 236,968 households and modified capacity is 65,458 households, being a difference of some 171,510 households. This is largely due to the difference in theoretical and modified density counts for Christchurch and the spatial analysis for Selwyn and Waimakariri. In Christchurch, the largest difference is in the Residential Medium Density, Residential Central City, Residential Suburban Density Transition and Residential Suburban zones, as what is enabled is significantly more than what densities have historically and are currently being achieved through redevelopment. For the RSDT zone, this difference is primarily the result of the recent enabling (through the Christchurch District Plan review) of multi-unit development (up to four units) as a permitted activity.

While this difference is significant, the important test under the NPS-UDC requirements will be whether the development capacity is feasible, and finally whether the feasible development capacity meets housing demand in the short, medium and long term.

3. Availability of Infrastructure

This section summarises the actual and likely availability of development infrastructure and other infrastructure in the short, medium and long term, as required under Policy PB3 (b) of the NPS-UDC, to support the development of residential land. The infrastructure assessment considered whether any area currently zoned for residential activity is: serviced or not by infrastructure necessary for development, or; is to be serviced through a council Long Term Plan (LTP) funding, or; identified within a council infrastructure strategy, and; whether the infrastructure has a specified constraint on development. The definitions of development capacity, development infrastructure and other infrastructure outlined in the NPS-UDC, and stated at the beginning of the report, specify what is required. The explicit capacity of development infrastructure is difficult to do as infrastructure models are designed to meet household projections. The current LTP timeframe for each TA is 2015 to 2025, however these LTP's will be reviewed in 2018 (every three years). This may change whether infrastructure is available in the medium term, to 2028.

3.1.1 Methodology

The approach to identifying the availability of infrastructure was to determine any areas where a lack of development infrastructure or other infrastructure would impede or prohibit the potential development of a site or sites for housing. Areas that require additional development costs, such as on-site stormwater storage capacity, were identified but not excluded from the capacity as these do not impede development directly (but do add costs). These additional costs of development will be quantified, and the impacts considered, within the housing feasibility assessment. Selwyn and Waimakariri's evaluations are prioritised to the Living/Residential zones that have remaining 'greenfield' development capacity, which includes both undeveloped or partially developed outline development plan areas and zoned land.

3.1.2 Summary of development infrastructure constrained land

Generally, no zoned land is prohibited or impeded in such a way that would make development or intensification impossible. This is principally because land identified within the CRPS (through Chapter 6, which was inserted by LURP with a timeline of 2028) required infrastructure and therefore was programmed for servicing. There are no identified infrastructure constraints for the balance of the Living/Residential Zones that would preclude intensification to the densities prescribed in either the Selwyn or Waimakariri District Plan. The following summarises potential infrastructure concerns for Greater Christchurch (see Appendix 2 for more detail).

The following table shows what capacity is currently constrained:

Area	Short Term	Medium Term	Long Term
Christchurch	6,566	3,666	0
Selwyn	0	0	0
Waimakariri	0	0	0
Total	6,566	3,666	0

Of the land zoned within Christchurch, additional household capacity of 6,566 is constrained in the short term while 3,666 is constrained in the medium term. This equates to 13% of Christchurch's modified capacity in the short term and 7% in the medium term.

Christchurch

Within some spatial areas in Christchurch there are wastewater capacity constraints that limit the additional household capacity in the short and medium term. These areas include the Shirley and Aranui vacuum sewer catchment areas and three greenfield areas. However, in all other areas development infrastructure is in place or is programmed to be as part of upgrades under the current LTP. Further, other areas where development infrastructure is planned, there is potential for it to be developer led, therefore aside from commercial feasibility factors, are not considered to be constrained.

Area	Short Term	Medium Term	Long Term
Greenfield	2,900		
Intensification	3,666	3,666	

Wastewater - There are no major wastewater constraints to residential development of most areas within Christchurch over the long term. There are however some areas across the city where capacity is limited (as shown in Appendix 2), namely the vacuum sewer catchment areas of Shirley and Aranui. These areas currently have no additional capacity until a solution is developed and could constrain development capacity by an estimated 3666 additional households. There are some other constrained areas, (as shown in Appendix 2) that require alternative solutions for connections and therefore impact upon development costs (and so feasibility) but do not preclude development capacity. Alternative solutions allow development without exacerbating overflow issues and further compromising Council's ability to meet is consented overflow conditions. All wastewater capacity constraints will be resolved by 2028 following the completion of planned upgrades under the current LTP. Prior to 2028, there are three greenfield areas (SE Halswell, Highfield and Hawthornden) providing for approximately 2,900 household sites, that require either the planned upgrades to be completed, or alternatively the required infrastructure is developer led (such to advance land development prior to 2028).

Water Supply - There are no water supply constraints to development within the Christchurch area, as all required major upgrades have either been undertaken in recent years or are planned to be undertaken within the next seven to ten years in the current LTP. In greenfield areas (RNN Zone), water supply can be developer led or is programmed for upgrades by 2028.

Stormwater - Throughout Christchurch, stormwater capacity is not identified as a significant restraint to residential development, as sites have the ability to mitigate effects on site. Land development is therefore not precluded, rather for certain sites there will be an increased development cost associated with providing on-site mitigation infrastructure.

Transport - Throughout Christchurch, all existing and planned urban areas have access to core transport links, corridors and public transport. Identified areas of future growth (RNN) have led to upgrades to transport links to be programmed. These upgrades include Cashmere Rd, Lincoln Rd and Whiteleigh Ave, public transport and cycleway improvements. Areas of intensification around the city are supported through various transport programmes, notably improvements to the public transport and cycling network, which become more viable through intensification.

However, growth is also likely to lead to reductions in the level of service and capacity on the transport network, which will result in increasing delays and congestion. This could have a constraining impact on economic growth. The Future Development Strategy will consider this.

Selwyn

Wastewater - The East Selwyn Sewer Scheme has capacity, with additional upgrades planned and undertaken when population thresholds are met or where developers need to extend sewer mains and install lateral connections at the time of subdivision. Further, master planning and supporting Development Contribution policies are in place in the 2015-25 LTP.

Water Supply - Generally, bulk water infrastructure is planned and will be constructed as required, with developers needing to extend water mains and install lateral connections to the primary network at the time of subdivision. Further, master planning and supporting Development Contribution policies in place in the 2015-25 LTP. Some development areas in Lincoln, Rolleston, and Prebbleton require water supply and utility upgrades, which are programmed for upgrades by 2028. Developers have an option to progress these upgrades privately within a shorter timeframe in response to the timing and sequencing of development.

Stormwater - Generally, stormwater capacity is available or possible for all sites that have been zoned for development with an Integrated Stormwater Management System established in Lincoln.

Transport - Urban areas have access to transport links, including the Main Trunk and Midland Lines and State Highway 1, 73 and 75. The Southern Motorway extension and Four-Laning State Highway 1 to Rolleston is under construction as a Road of National Significance. Future growth are enabled through progressive upgrades to transport links, which have been either undertaken or are programmed to ensure there is sufficient capacity within the strategic transport network to accommodate growth needs over time.

Waimakariri

Wastewater - Generally, there is wastewater capacity across the urban areas. Several rural-residential areas require upgrade and ongoing work to increase capacity is either underway or programmed for works.

Water Supply - Generally, there is water supply capacity. Several rural-residential areas require upgrade and ongoing work to increase capacity is either underway or programmed for works.

Stormwater - Generally, there are no stormwater constraints. Areas, such as East Rangiora and Ravenswood will require Stormwater Management Plans for development.

Transport - Generally, throughout Waimakariri, urban areas have access to transport links, including the Main Trunk (State Highway 1 and 71). The Northern and Western Corridor improvements is under construction as part of the Roads of National Significance improvements. Identified areas of future growth are aligned to upgrades to transport links, which have been either undertaken or programmed to integrate development in the strategic transport network.

4. Future Work

The following areas have been identified throughout the report as requiring additional work for the next housing capacity assessment in three years. These are:

- Consolidating each TA monitoring and information management systems to ensure consistency
- Investigation of the potential for a GC growth model
- Monitoring the location, density and uptake of multi-unit development within the RSDT zone.
- Monitoring the uptake of minor residential units to estimate the potential of these units to provide for capacity
- Refine the vacant land available by mapping the intentions of vacant sites. Monitor the uptake and density of Commercial Central City land for housing capacity.
- Spatially assess large subdividable RS zoned land for backfill capacity, looking at the likelihood of access.
- Monitor the location and uptake of retirement villages throughout Christchurch.
- Monitor the use and density achieved through the EDM.
- Assess potential capacity for Rāpaki Papakāinga Zone.
- Additional analysis of the impact of AirBnB, Bookabach and other sites offering short term rentals on overall capacity.

This work will continue to help refine the housing capacity and better understand the choice and range of housing available.

5. Alternative approaches

This section discusses what alternative approaches could have been used in determining plan-enabled capacity. For Christchurch City an alternate approach could be to start at the site level and assess the potential additional capacity. This would require the mapping of potential built form bulk and location and an assessment of the viability of each site's housing typology. However, this alternative "infill" approach does not consider the potential of site amalgamation and comprehensive residential development (which is occurring in redevelopment areas). Further work would be required to identify adjoining vacant land that could be amalgamated to provide additional infill. This could lead to capacity being underestimated. Further this alternative approach could be done with a three-dimensional element included, taking into account the recession plane and height limitations. This alternative approach is not possible for this first assessment due to time constraints to develop a tool to assess each site and map the bulk and location.

A. Appendices

A.1 Density Table

Christchurch

The modified density count is the average existing density, based on past development, unless stated.

Zone / Overlay	Theoretical (hh/ha)	Modified (hh/ha)	Reason
Zones			
Residential Suburban	25	15.9	Theoretical - 400m^2 minimum lot size – DPR 14.4.1.3 RD1
Residential Suburban Density Transition	60	20.6	Theoretical - Potential from RSDT and RMD modelling, see Appendix 8
Residential Medium Density	120	40	Theoretical - Potential from RSDT and RMD modelling, see Appendix 8 Modified - Potential from Riccarton evidence (discussed above)
Residential New Neighbourhood	15	15	Theoretical and Modified - Residential Policy – 14.2.1.1 a. iv.
Residential Central City	100	37.5	Theoretical - 200m^2 minimum lot size – DPR 14.6.2.11, however comprehensive development possible
Residential Hills	17	9.6	Theoretical - 585m^2 minimum lot size – DPR 14.7.1.3 RD1
Residential Large Lot	7	2.8	Theoretical - 1350m^2 minimum lot size – DPR 14.9.1.3 RD2
Residential Banks Peninsula	25	11.9	Theoretical - 400m^2 minimum lot size – DPR 14.8.2.1 a. i.
Residential Small Settlement	10	6.6	Theoretical - 1000m^2 minimum lot size – DPR 14.10.2.1 a. i.
Overlays			
Community Housing Redevelopment Mechanism	40	40	Based on density achieved by Housing NZ
East Frame	900 households	900 households	Based on consent data for housing units and the master plan
RS - Existing Rural Hamlet Overlay	5	5.7	2000m^2 minimum lot size – DPR 14.4.3.2.1 b. ii.
RS - Peat Ground Condition Constraint	5	5.1	2000m^2 minimum lot size – DPR 14.4.3.2.1 b. ii.
RS - Stormwater Capacity Constraint Overlay	52 households	52 households	Existing allotments at June 1995 – DPR 14.4.3.2.1 b. ii.
RMD - Medium Density (Higher Height Limit and Individual Site Density) Overlay	120	40	Theoretical - Potential from RSDT and RMD modelling, see Appendix 8 Modified - Potential from Riccarton evidence (discussed above)
RMD - Residential Medium Density Lower Height Limit Overlay	120	40	Theoretical - Potential from RSDT and RMD modelling, see Appendix 8 Modified - Potential from Riccarton evidence (discussed above)
RH - Residential Hills Density Overlay	13	3.7	Theoretical - 765m^2 minimum lot size – DPR 14.7.1.3 RD1
RH - Residential Mixed Density Overlay – 86 Bridle Path Rd	9 households	9 households	Stated households – DPR 14.7.2.1 a. iv.
RH - Residential Mixed Density Overlay – Redmund Spur	400 households	400 households	Stated households – DPR 14.7.2.1 a. iii.

RLL - Residential Large Lot Density Overlay	3	1.9	Theoretical - 2700m^2 minimum lot size – DPR 14.9.1.3 RD2
RLL - Residential Large Lot Density Overlay Allandale	24 households	24 households	Lots identified on ODP – 8.10.13
RLL - Residential Large Lot Density Overlay Samarang Bay	8 households	8 households	Lots identified on ODP – 8.10.12
RBP - Diamond Harbour Density Overlay	16	7.4	Theoretical - 600m^2 minimum lot size – DPR 14.8.2.1 a. ii.
RSS - Kainga Overlay 1 and 2	22	8.2	Theoretical - 450m^2 minimum lot size – DPR 14.10.2.1 a. v.

Selwyn[14]

Town	Zone	Infrastructure %	Theoretical	Theoretical HH/Ha	Modified Lot	Modified HH/Ha
Rolleston	Living Z	0.25	500	15.00	630	11.90
	Living Z Deferred	0.25	500	15.00	600	12.50
	Living 1	0.25	750	10.00	765	9.80
	Living 1A	0.25	300	25.00	360	20.83
	Living 1B	0.25	1,200	6.25	1,200	6.25
	Living 1C	0.25	2,000	3.75	2,000	3.75
	Living 2	0.25	5,000	1.50	5,000	1.50
	Living 3	0.25	5,000	1.50	5,000	1.50
	Living 2A	0.25	10,000	0.75	10,000	0.75
Lincoln	Living Z	0.25	500	15.00	680	11.03
	Living 1A3	0.25	500	15.00	600	12.50
	Living 1	0.25	650	11.54	780	9.62
	Living 1A2	0.25	650	11.54	780	9.62
	Living 1A1	0.25	650	11.54	780	9.62
	Living 1A	0.25	850	8.82	1,020	7.35
	Living 1A4	0.25	1,500	5.00	1,500	5.00

[14] These results have been compiled by SDC officer's using reporting outputs from ME's SCGM applying the following methodological basis: 1. Theoretical is plan enabled and reflect the minimum average allotment sizes for a Restricted Discretionary subdivision consent under SDP Rule 12.1 Table C12.1 - http://eplan.selwyn.govt.nz/#!Rules/0/32/1/0+. For Living Z where this has medium densities a middle point has been taken between the Low density and medium density enabled by the plan; 2. It is assumed that 25% of the developable land is lost to infrastructure; 3. Given 2. above that leaves 7,500m^2 available per hectare for residential development, and; 4. The 7,500m^2 available for development has been divided by the lot size to find the households/hectare number for both Theoretical and Modified

	Living X	0.25	2,000	3.75	2,000	3.75
	Living 2	0.25	3,000	2.50	3,000	2.50
	Living 3	0.25	5,000	1.50	5,000	1.50
Prebbleton	Living Z	0.25	500	15.00	713	10.52
	Living 1A6	0.25	600	12.50	720	10.42
	Living X	0.25	800	9.38	960	7.81
	Living 1A1	0.25	800	9.38	960	7.81
	Living 1	0.25	800	9.38	960	7.81
	Living 1A4	0.25	800	9.38	960	7.81
	Living 1A2	0.25	800	9.38	960	7.81
	Living 1A3	0.25	800	9.38	960	7.81
	Living 1A5	0.25	800	9.38	960	7.81
	Living 1A	0.25	1,000	7.50	1,000	7.50
	Living 2A	0.25	5,000	1.50	5,000	1.50
	Living 2A (Blakes Road)	0.25	20,000	0.38	2,0000	0.38
	Living 3	0.25	5,000	1.50	5,000	1.50
West Melton	Living WM	0.25	3,000	2.50	1,625	4.62
	Living 1	0.25	1,000	7.50	1,000	7.50
	Living 1B	0.25	2,800	2.68	2,800	2.68
	Living 2	0.25	5,000	1.50	5,000	1.50
	Living 2A	0.25	10,000	0.75	10,000	0.75
Springston	Living 1	0.25	800	9.38	960	7.81
	Living 1A	0.25	800	9.38	886	8.47
Tai Tapu	Living 1A	0.25	800	9.38	800	9.38
	Living 2A	0.25	5,000	1.50	5,000	1.50
	Living 3	0.25	5,000	1.50	5,000	1.50

Waimakariri

To add

A.2 Infrastructure Summary

Wastewater and Water Supply

Geographic Area		Short Term (Serviced)		Medium Term (in LTP)		Long Term (In Strategy)	
Address Point	**Hectares**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**
Christchurch City Council							
Shirley vacuum sewer catchment area		N	No spare capacity until solution found	N	No spare capacity until solution found	Y	
Aranui vacuum sewer catchment area		N	No spare capacity until solution found	N	No spare capacity until solution found	Y	
SW Greenfield (except SE Halswell)		Y	Potential for infrastructure to be developer led	Y	Upgrade works programmed by 2028	Y	
SE Halswell		N		Y	Upgrade works programmed by 2028		
Belfast Greenfield		Y	Potential for infrastructure to be developer led	Y	Upgrade works programmed by 2028	Y	
Highfield		N		Y	Upgrade works programmed by 2028	Y	
Hawthornden		N		Y	Upgrade works programmed by 2028	Y	
South-West Hornby (Appendix 16.8.1)		Y	Wastewater not to exceed 0.09l/s/ha	Y	Wastewater not to exceed 0.09l/s/ha	Y	Potential upgrade possible
Waimakariri District Council							
Ravenswood		Y	WS – Additional source capacity required for bulk of development (alternative source) WW – Will require a dedicated rising main through to the treatment plant				
Freeman		Y	WS – Some network upgrades required				

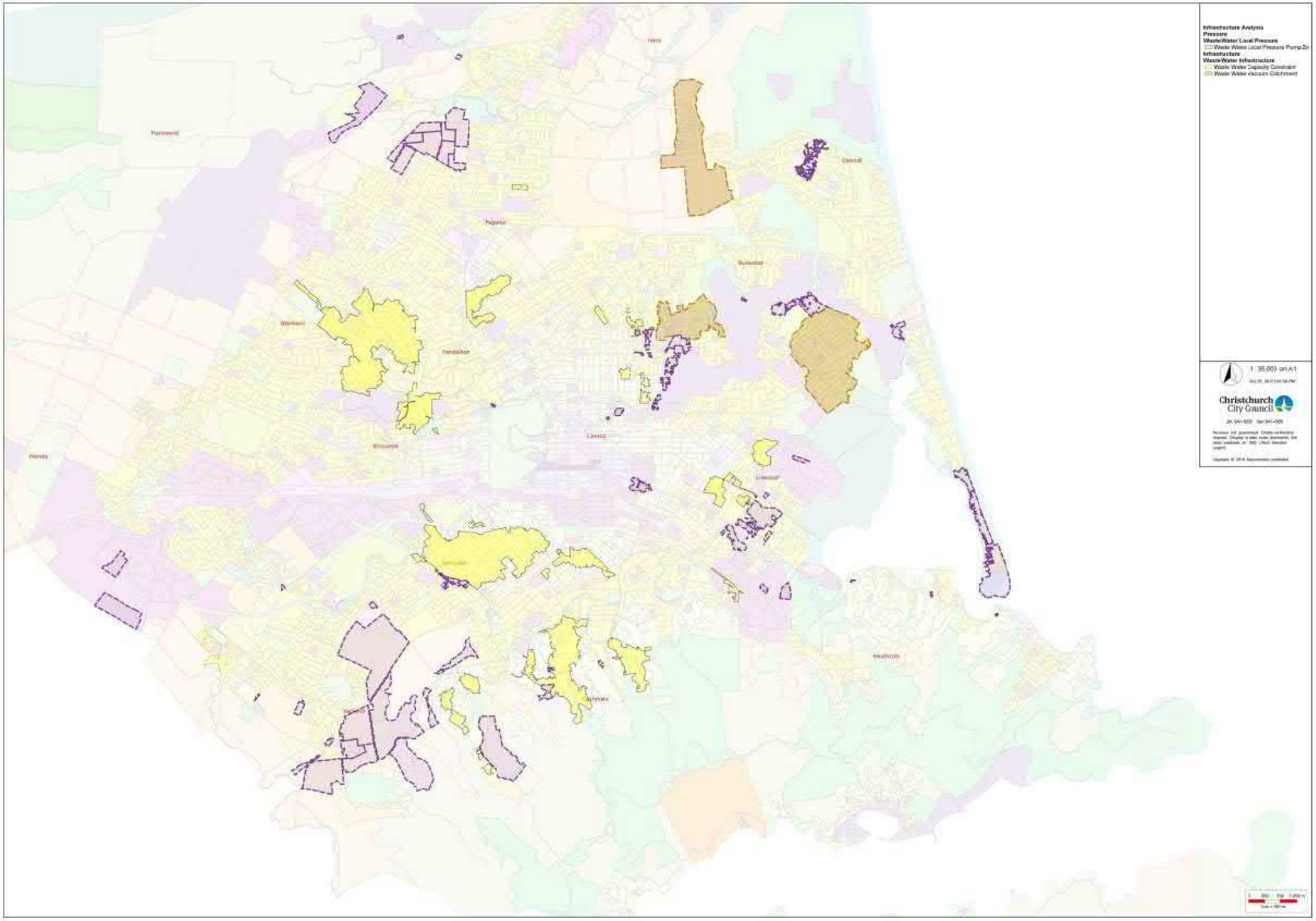
Geographic Area		Short Term (Serviced)		Medium Term (in LTP)		Long Term (In Strategy)	
Address Point	**Hectares**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**
			WW – Some network / pump station upgrades required				
East Woodend		Y	WS – Some network upgrades required WW – Some network / pump station upgrades required				
Scouts Land Williams Street		Y	WW – Some network / pump station upgrades required				
Silverstream		Y	WS – Some network upgrades required				
Waikuku		Y	WS – Some capacity issues. Scheme source capacity being increased				
Waikuku Beach		Y	WS – Some capacity issues. Scheme source capacity being increased				
Woodend Beach		Y	WS – Would require extension of Woodend scheme along Woodend Beach Road				
River Road Res 4B Rangiora		Y	WS – Some network upgrades required WW – Some network upgrades required for connection				
NW Kaiapoi Res 4B		Y	WS – Some network upgrades required WW – No sewer. Current means of disposal is onsite septic tank				
Res 4A NW Rangiora		Y	WW – May need a pump station. May need additional capacity high density				
West Eyreton Res 4B		Y	WW – No sewer. Current means of disposal is onsite septic tank				
Fernside Res 4B		Y	WW – Only partially served by sewer. Other properties means of disposal is onsite septic tank. Alternatively scheme would need to connect to Rangiora in order to be extended				

Geographic Area		Short Term (Serviced)		Medium Term (in LTP)		Long Term (In Strategy)	
Address Point	**Hectares**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**
Waikuku Res 4A		Y	WS – Some capacity issues. Scheme source capacity being increased.				
Waikuku Res 4B		Y	WS – Requires extension to Waikuku Beach or Pegasus WW – No sewer. Current means of disposal is onsite septic tank. Requires extension to Waikuku Beach or Pegasus				
Waiora lane Res 4B		Y	WS – No water, current means supply likely to be private bore WW – No sewer. Current means of disposal is onsite septic tank				
Fernside RRDP Evansvale		Y	WS – Requires connection to Mandeville, underway WW – Requires scheme to be connected to Rangiora in order to be extended				
South East Kaiapoi RRDP		Y	WS – Will require extension of Kaiapoi WW – Private lateral will need to be upgraded and changed to a public main				
Waikuku RRDP		Y	WS – Requires extension to Waikuku Beach or Pegasus WW – Requires extension to Waikuku Beach or Pegasus				
SE Rangiora RRDP		Y	WS – Network upgrades required WW – Additional pump station/s require to connect to treatment plant				
Selwyn District Council							
General		Y	Bulk water capacity planned and constructed as required. ESS wastewater capacity planned and constructed as required.	Y	Master planning and supporting Development Contribution policy in place and being updated for 2018-28 LTP.	Y	Area covered in 30Yr

Geographic Area		Short Term (Serviced)		Medium Term (in LTP)		Long Term (In Strategy)	
Address Point	**Hectares**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**
			Master planning and supporting Development Contribution policy in place for 2015-25 LTP.				Infrastructure Strategy
Lincoln – ODP 3 Rosmerryn & Flemington (includes vacant neighbourhood centre)	160	Y	Final stage of ODP will require WW extension through to ODP 2				
Lincoln – ODP 5	12.5	Y	WS –Water main extension required WW – Pump Station and pumping main required (DC as part of 2018-28 LTP). Connection to trunk main available				
Lincoln – ODP 8	11	Y	WS –Water main extension required through ODP 5. WW – Pump Station and pumping main required as part of ODP 5 (DC as part of 2018-28 LTP)				
Rolleston – ODP 4	11	Y	WS –Water main extension required. WW - Sewer extension required.				
Rolleston - ODP 9	24.5	Y	WW - Sewer extension required (in part) currently underway.				
Rolleston - ODP 10	28	Y	WS – Water main extension required, budgeted 2017/18.				
Rolleston – ODP 12	56	Y	WS – Water main extension required, budgeted 2017/18.				
Rolleston – SHA – Chelsea Green (includes neighbourhood centre)	90	Y	WS –Water main extension required. Connection to trunk main available.				
Rolleston RR - Holmes	91	Y	WS –Water main extension required. Restricted water supply.				

Geographic Area		Short Term (Serviced)		Medium Term (in LTP)		Long Term (In Strategy)	
Address Point	**Hectares**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**	**Yes/No**	**Capacity**
			WW – Wastewater main extension required. Low pressure sewer.				
Rolleston RR - Skellerup	72	Y	WS –Water main extension required. Restricted water supply. WW – Wastewater main extension required. Low pressure sewer.				
Prebbleton – ODP 4	25.5	Y	WS –Water main extension required. WW – Wastewater main extension required along with other network upgrades.				
Prebbleton RR- Conifer Grove	12	Y	WS –Water main extension required. Restricted water supply. WW – Wastewater main extension required. Low pressure sewer.				
Prebbleton RR - Stratford	16	Y	WS –Water main extension required. Restricted water supply. WW – Wastewater main extension required. Low pressure sewer.				
Prebbleton RR – Trents/Shands Rd	9	Y	WS –Water main extension required. Restricted water supply. WW – Wastewater main extension required. Low pressure sewer.				
Tai Tapu – Living 2A (vacant land)		Y	WS - Restricted water supply. WW – Low pressure sewer.				
Tai Tapu RR – Hauschilds Road		Y	WS - Restricted water supply.				

Christchurch Wastewater constraints



Stormwater

Geographic Area	Short Term (Serviced)		Medium Term (in LTP)		Long Term (In Strategy)	
	Yes/No	Capacity	Yes/No	Capacity	Yes/No	Capacity
Christchurch City Council						
General	Stormwater capacity not identified as a significant restraint as sites have the ability to self-mitigate.					
Hill land	Required to provide controlled discharge without the use of large detention basins					
Flood hazard areas	Compensatory flood storage needed for displacement of flood waters					
Waimakariri District Council						
East Rangiora	Y	Inch may need own SMA as may not be able to discharge into Horncastle SMA.				
Ravenswood	Y	Requires extended detention to prevent downstream flooding. Requires realignment of Taranaki Stream				
Freeman	Y	Requires own SMA				
Scouts Land Williams Street	Y	Likely to require own SMA before discharge to Kaikanui Stream				
Beach Grove	Y	Some challenges with current system and later stages.				
Selwyn District Council						
General	Stormwater discharge to a mixture of ground and surface water.					

Other Infrastructure

Open Space
The provision of open space is through the collection of development contributions. Greenfield Outline Development Plans identify generally the location of parks that are defined through the subdivision process. Intensification development is rarely of the scale to provide a new park within the development so the contributions collected goes towards the general open space programme of acquiring new parks.
Community Infrastructure
Through the Area Plan work, the location of new facilities was considered. Generally community infrastructure follows development and is not prohibitive to development. Other community infrastructure, such as public toilets, are directed through the Public Toilets Policy, locating them in malls and parks.
Telecommunications
The Broadband network improvements are continuing and will be completed near the end of 2030. This will provide ultrafast broadband to most of the county though currently not programmed to cover the red zone. The mobile network covers all urban areas.
Energy
Ongoing work is continuing to strengthen and expand the network.

A.3 Residential Activity within Business Zones

Since the earthquakes, residential units within commercial zones are generally not being replaced. The rate of take-up is negative. However, there are a few examples of new mixed-use buildings within local centres (see below).

Zone	2012	2013	2014	2015	2016	2017	Total
Commercial Banks Peninsula	0	0	-1	1	0	0	**0**
Commercial Core	-5	-6	-2	-6	6	0	**-13**
Commercial Local	-1	-5	0	9	7	-1	**9**
Commercial Mixed-Use	-1	-3	0	0	0	0	**-4**
Commercial Office	0	0	0	0	0	0	**0**
Commercial Retail Park	-2	-3	-1	0	-1	0	**-7**
Industrial General	-6	-12	-14	-9	5	-5	**-41**
Industrial Heavy	-4	-1	-2	1	3	2	**-1**
Industrial Park	0	0	0	0	0	1	**1**
Total	**-19**	**-30**	**-20**	**-4**	**20**	**-3**	**-56**

Table: *Building Consents showing Net New Housing within the Commercial Zones*

Note: Negative numbers mean a residential unit has been removed and not replaced

Figure: *Mixed-Use building with retail on ground floor and apartment living above - http://naiharcourts.co.nz/HHC3917*

A.4 Central City Potential

The Commercial Central City Business and Commercial Central City Mixed Use Zones permit residential activity[15]. The Commercially zoned area of the Central City is approximately 56 hectares, while the Mixed Use Zone is approximately 96ha. However, since the earthquakes, the number of residential building consents across all of the Central City commercial zones has been minimal. This leaves a large amount of high density capacity without enough evidence to project additional capacity.

In the last few years that there has been a positive growth in housing, seen in the table below.

Zone	2012	2013	2014	2015	2016	2017	Total
Central City Business	0	-4	-3	-6	12	52	**51**
Central City Mixed Use	-3	-6	-4	-4	100	0	**83**
Central City South Frame	0	0	0	0	-1	-1	**-2**
Total	**-3**	**-10**	**-7**	**-10**	**111**	**51**	**132**

Table: *Building Consents showing Net New Housing within the Central City Commercial Zones*

Note: Negative numbers mean a residential unit has been removed and not replaced

For the Central City Mixed Use Zone, recent survey work shows around 5% of mixed use zone having residential on the ground floor. This also helps reconcile the housing and business assessments.

ADD REFERENCE TO BUSINESS ASSESSMENT

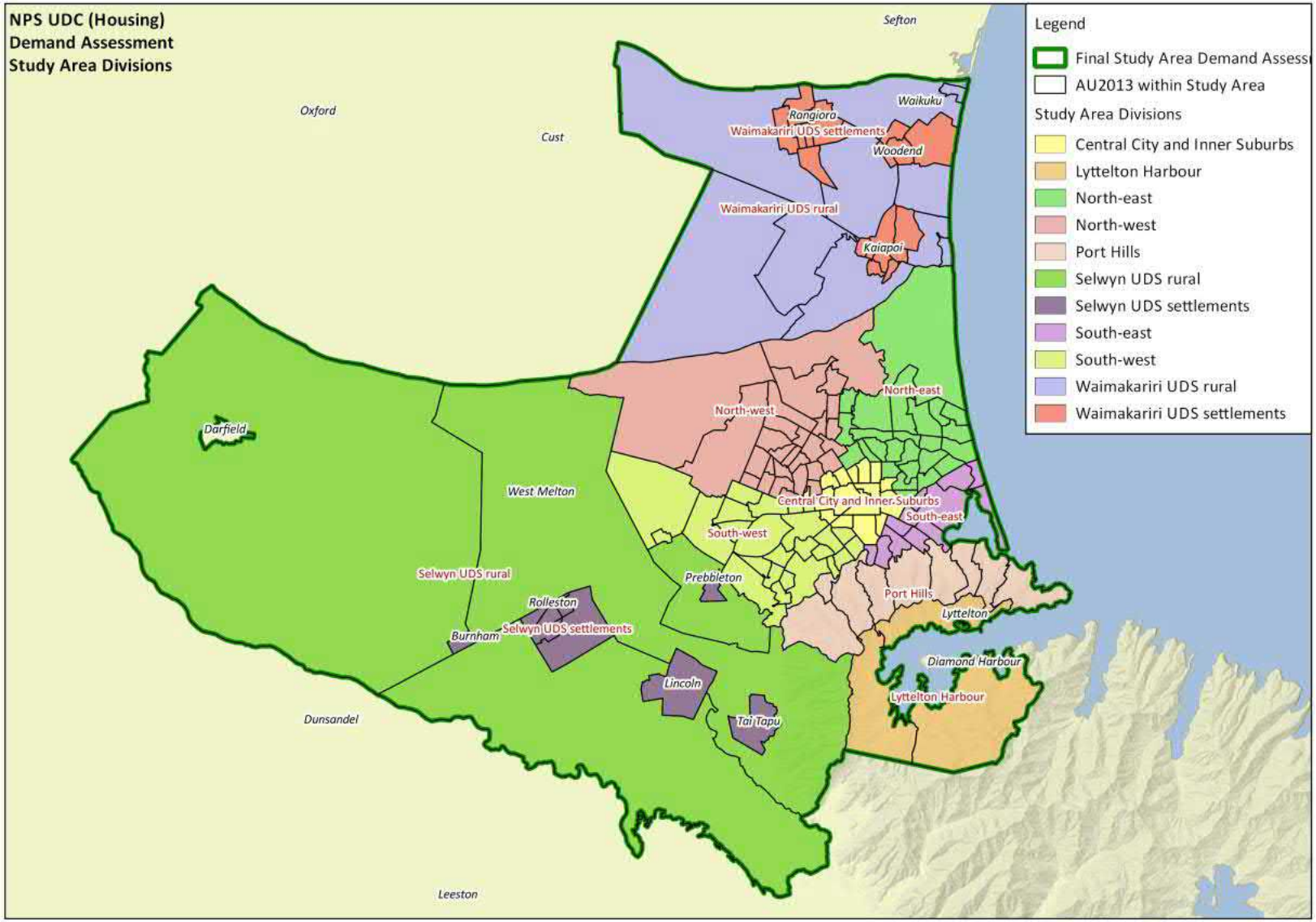
The provision of residential units varies. A few sites offer a ground floor commercial space with several levels of residential living above (example pictured below), while others offer one unit on top of a small scale commercial building. This requires ongoing spatial monitoring to provide a better understanding of the expected density.

Figure: *Apartment building - http://www.dgmgroup.co.nz/west-kilmore/*

[15] CCCMU Zone permits residential activity at ground floor level. The CCCB Zone permits residential activity predominately at upper levels.

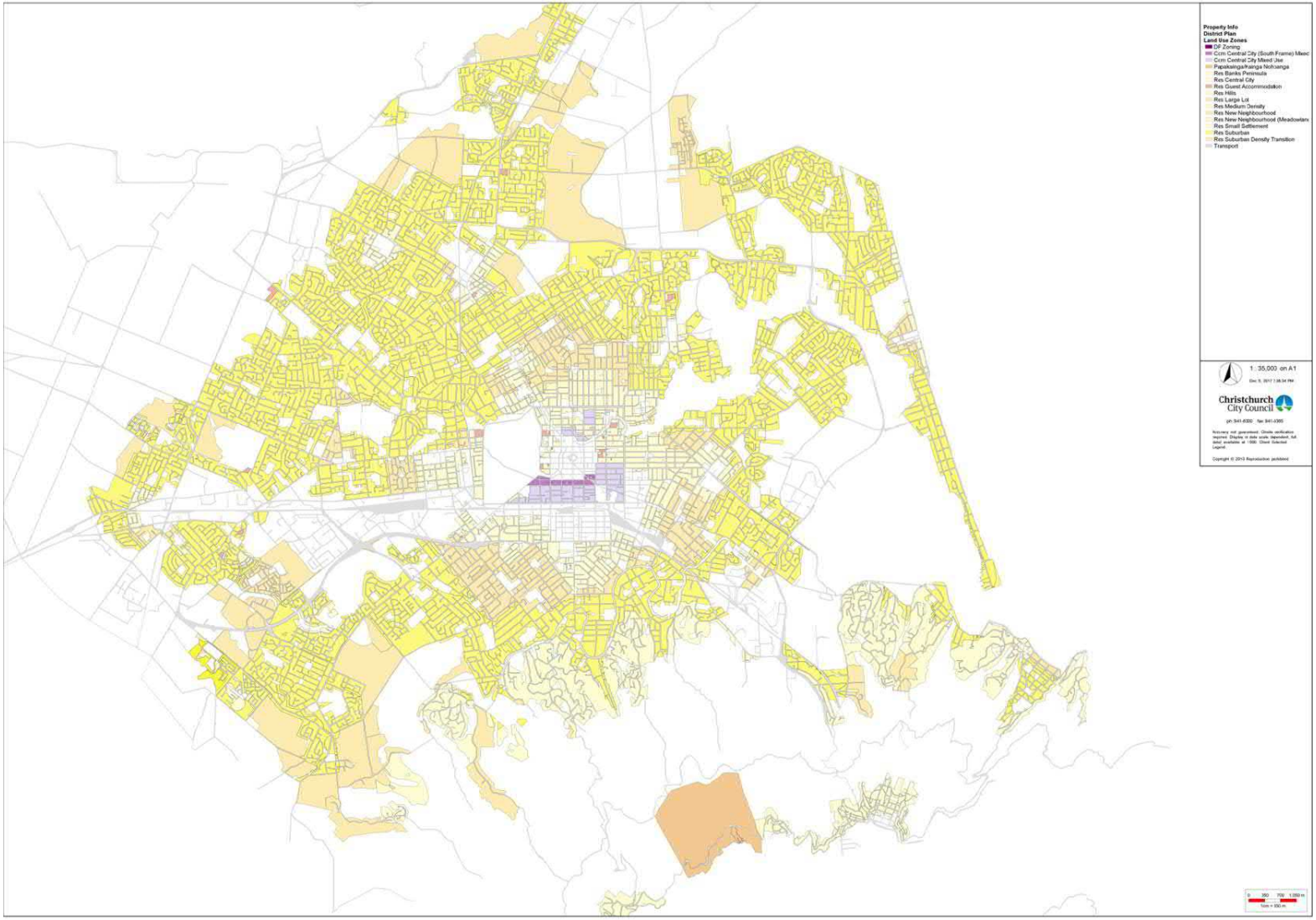
A.5 Map of Sub-Areas

This map shows the sub-areas or sub-areas of Greater Christchurch identified for comparison.



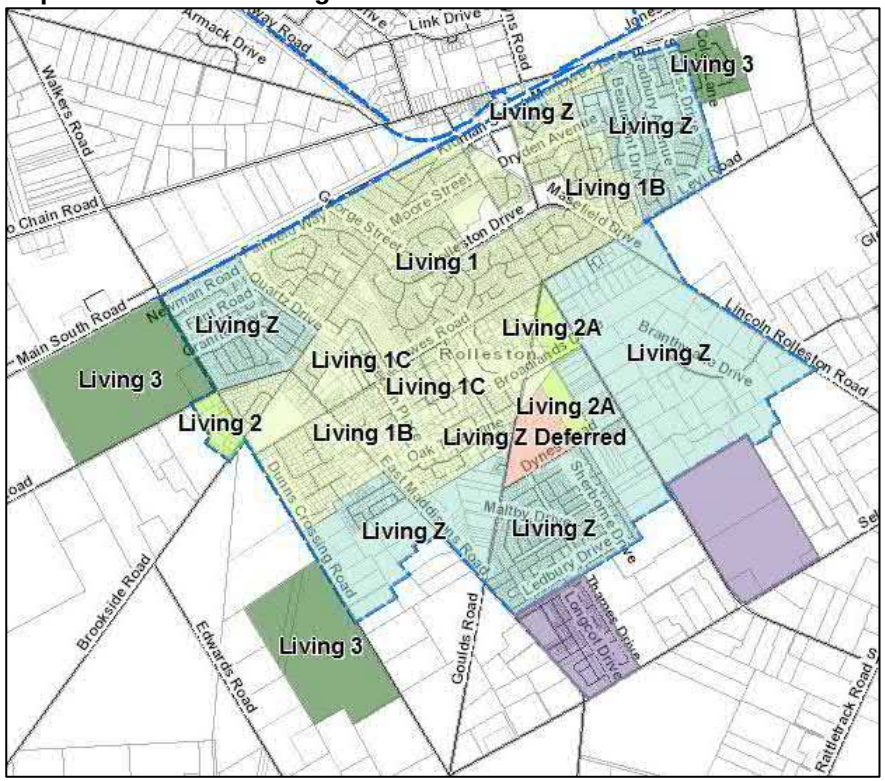
A.6 Map of Residential Zoned Land

Christchurch

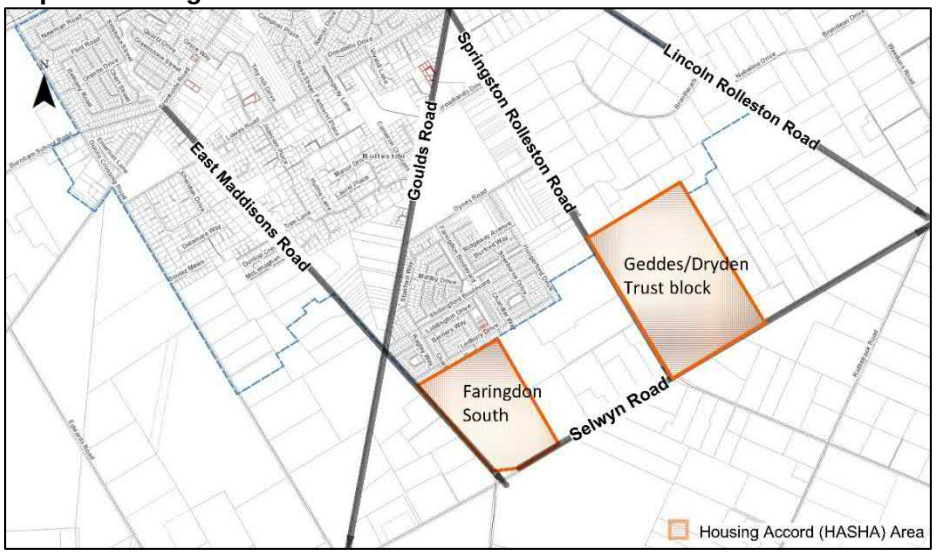


Selwyn

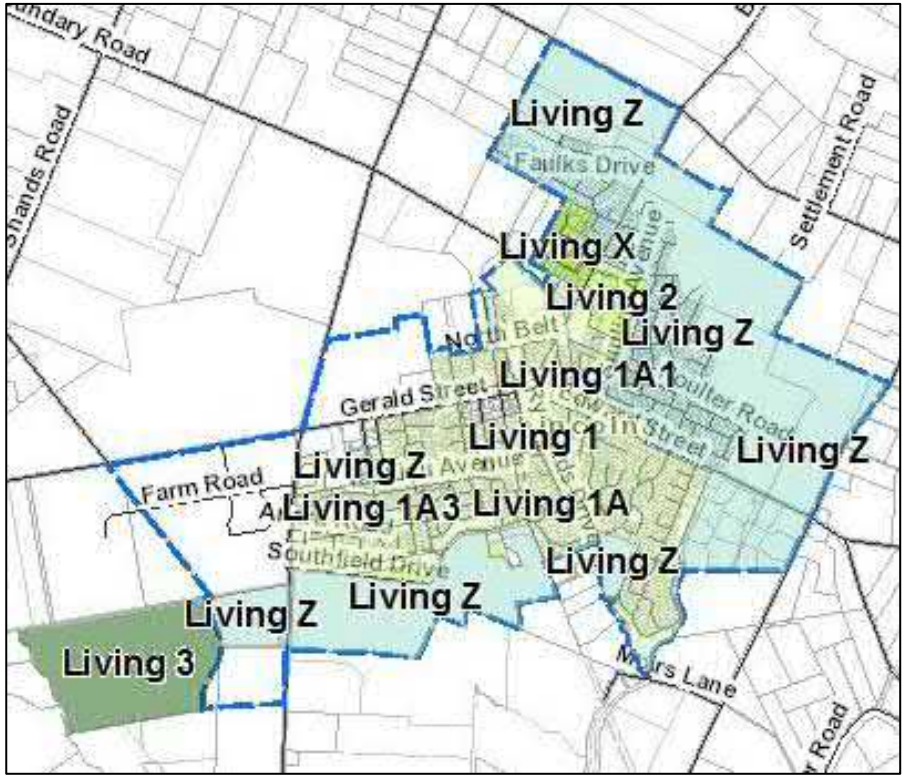
Map 1: Rolleston Housing Land



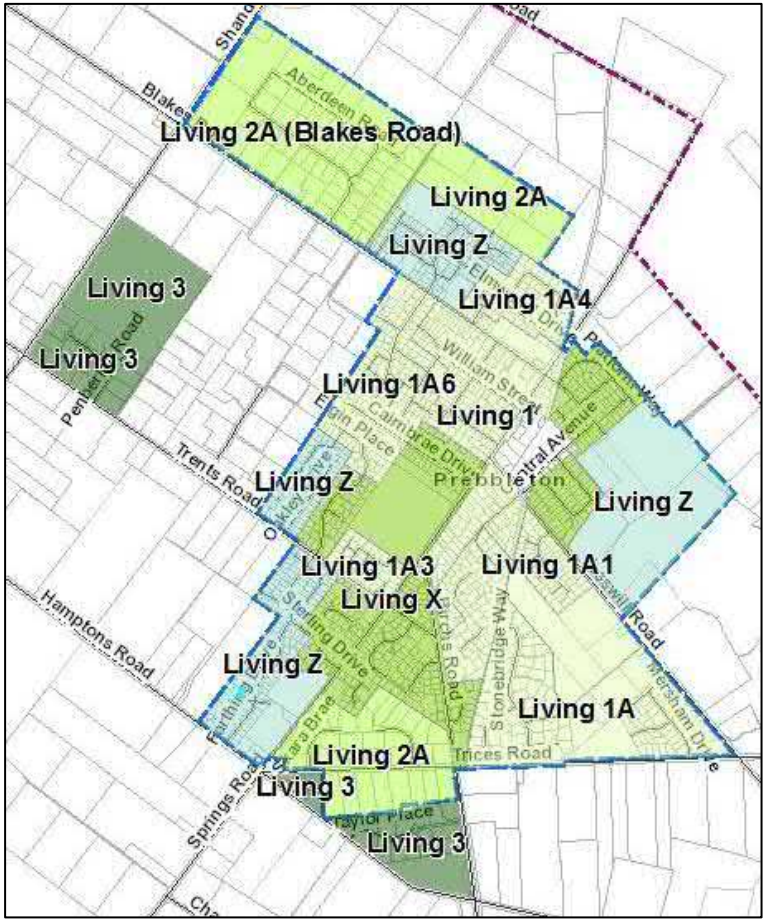
Map of Housing Accord Areas



Map 2: Lincoln Housing Land



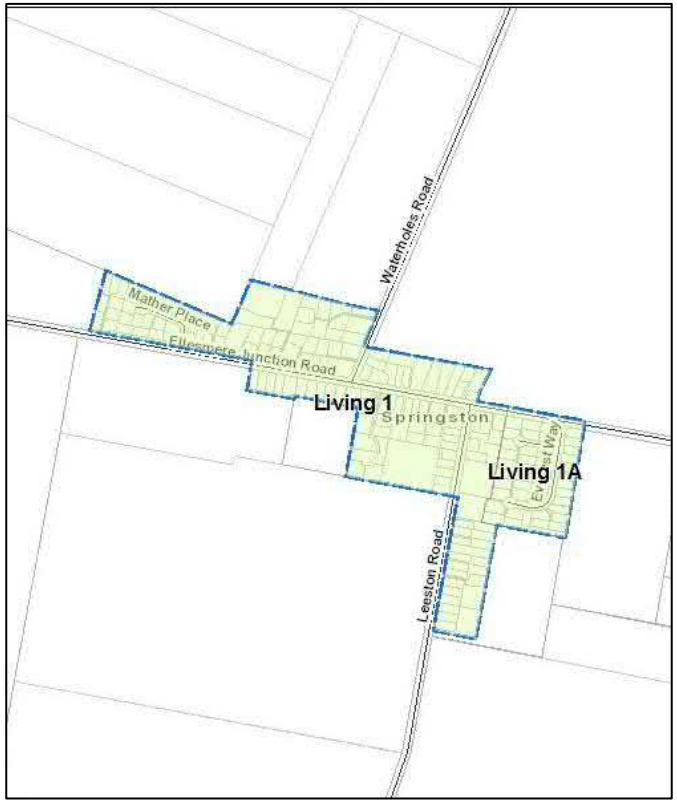
Map 3: Prebbleton Housing Land



Map 4: West Melton Housing Land

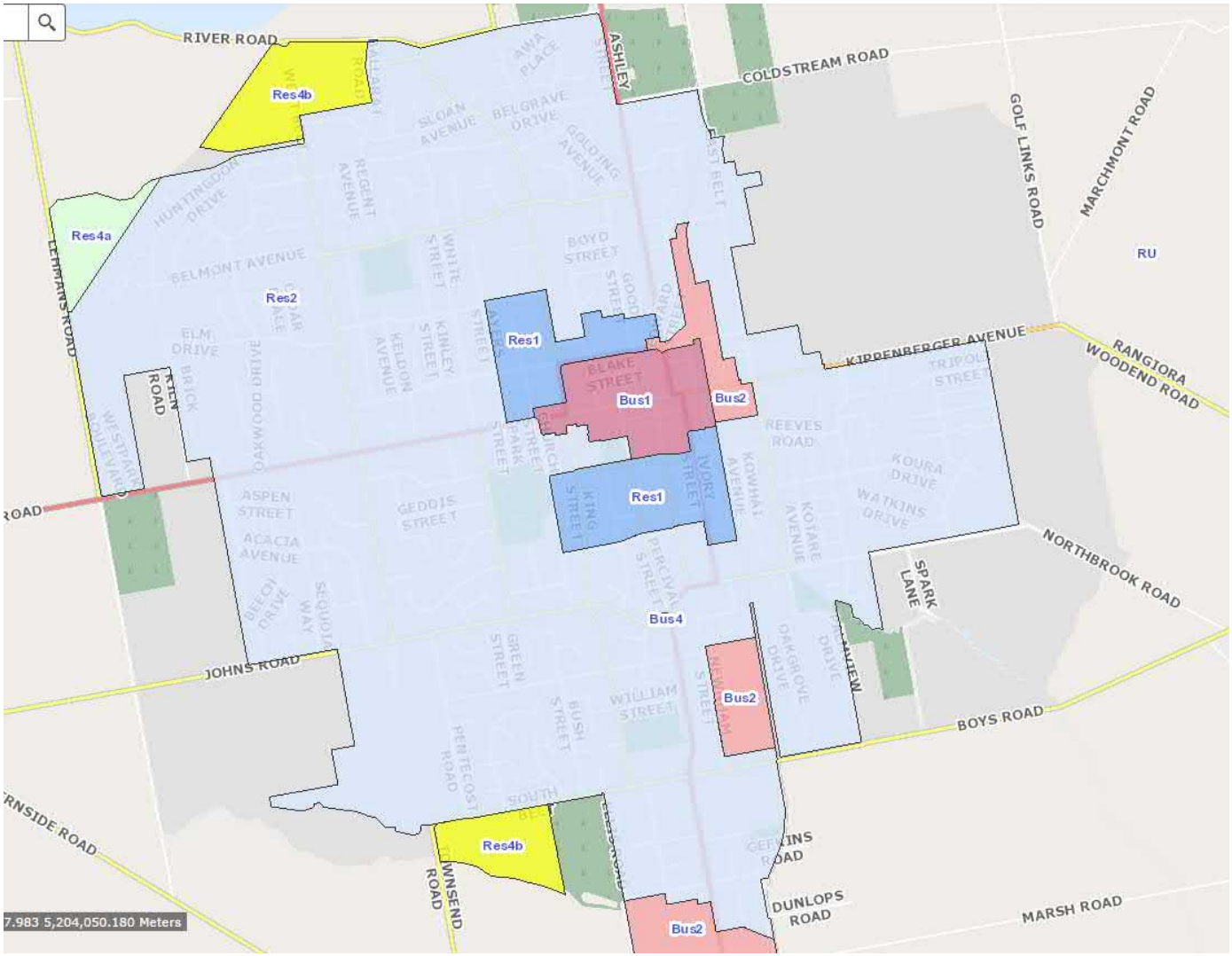
Map 5: Tai Tapu Housing Land

Map 6: Springston Housing Land

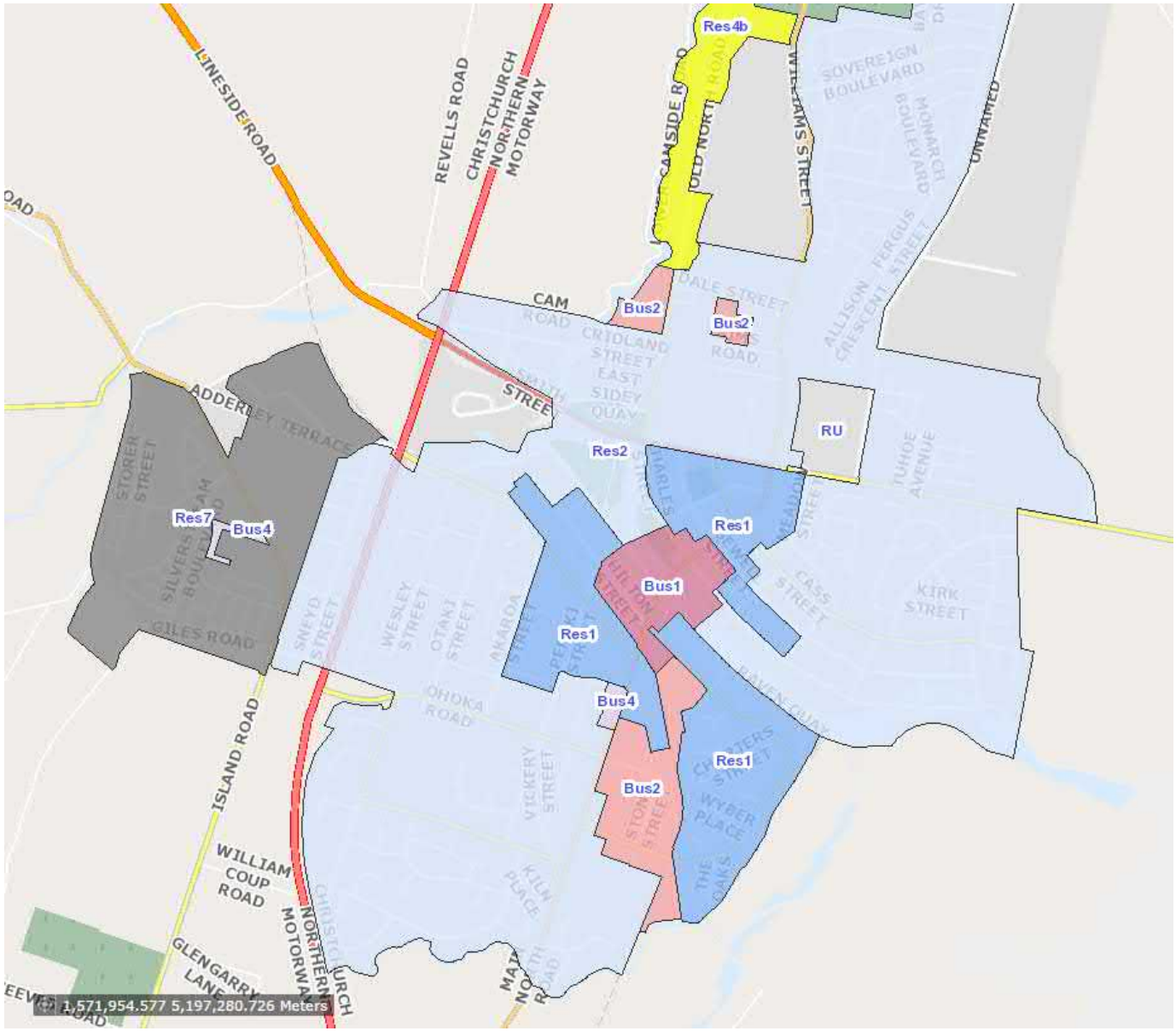


Waimakariri

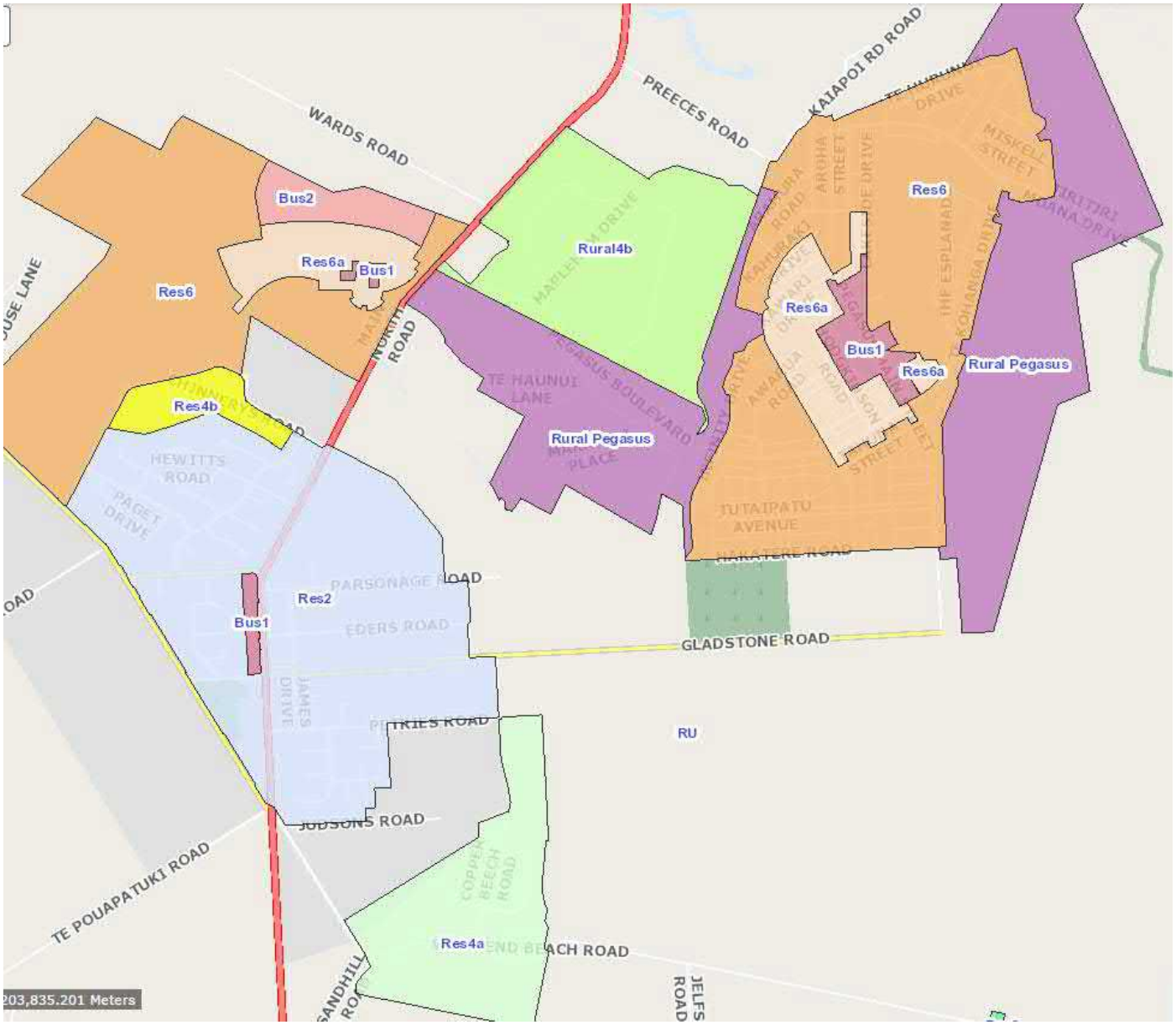
Rangiora



Kaiapoi


LINESIDE ROAD
REVELLS ROAD
CHRISTCHURCH NORTHERN MOTORWAY
Res4b
WILLIAMS STREET
SOVEREIGN BOULEVARD
MONARCH BOULEVARD
UNNAMED
CAM ROAD
Bus2
Bus2
ADDERLEY TERRACE
RU
Res2
Res7
Bus4
Res1
Bus1
Res1
Bus4
Res1
Bus2
ISLAND ROAD
WILLIAM COUP ROAD
GILES ROAD
OHOKA ROAD
GLENGARRY LANE
1,571,954.577 5,197,280.726 Meters

Woodend / Pegasus / Ravenswood

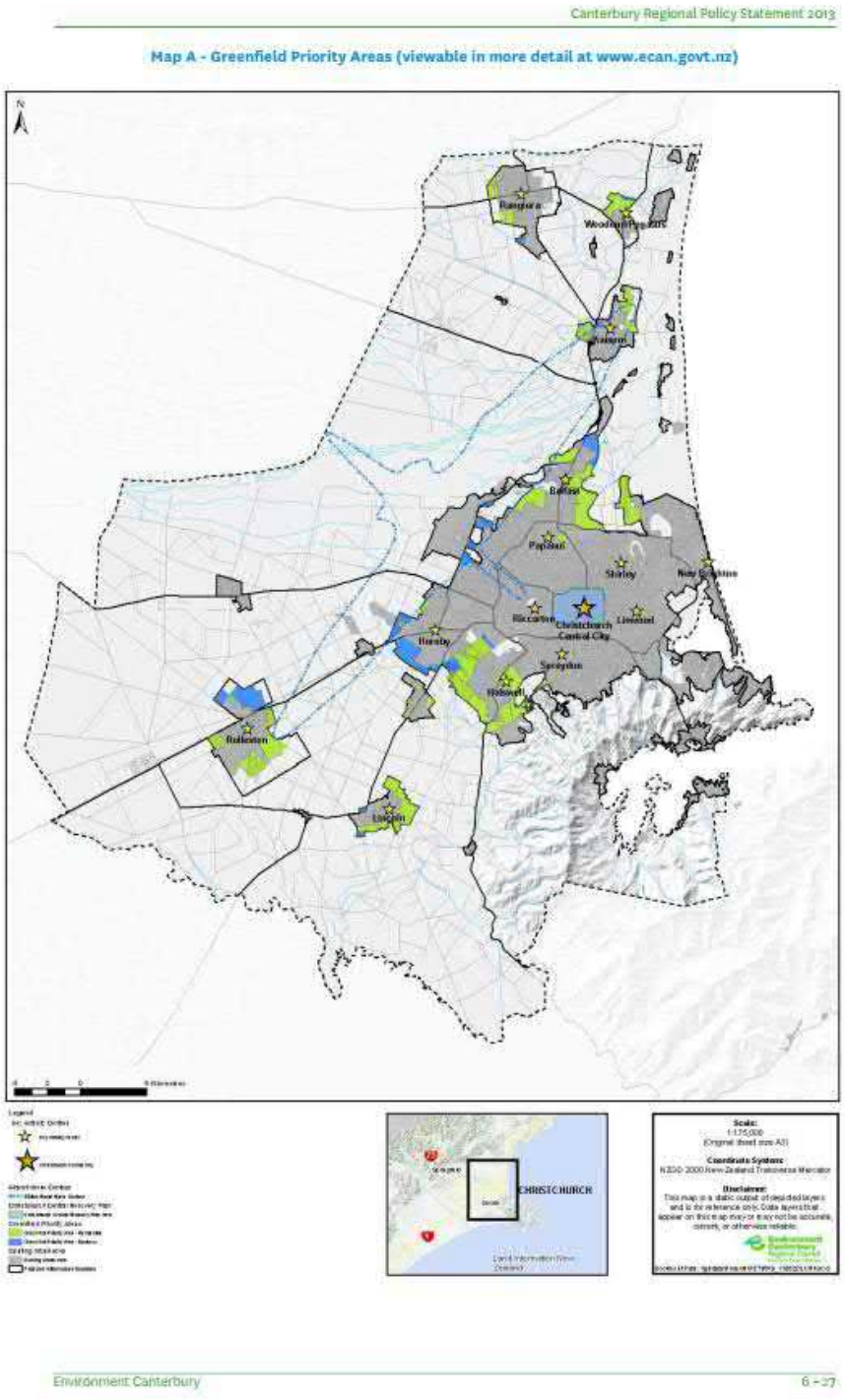


A.7 Canterbury Regional Policy Statement Densities and Chapter 6 Map A

Canterbury Regional Policy Statement Densities

Policy 6.3.7 – Residential location, yield and intensification outlines densities in relation to Greater Christchurch as:

3. …shall achieve at least the following residential net densities:
   (a) 10 household units per hectare in greenfield areas in Selwyn and Waimakariri District; and
   (b) 15 household units per hectare in greenfield areas in Christchurch City;
4. Intensification development within Christchurch City to achieve an average of:
   (a) 50 household units per hectare for intensification development within the Central City;
   (b) 30 household units per hectare for intensification development elsewhere.



A.8 RSDT Model overview

Below is a summary of different typologies possible in the RSDT zone of the Christchurch District Plan zoned provisions and potential capacity for multi-unit development within the Residential Suburban, Residential Suburban Density Transition and Residential Medium Density Zones.

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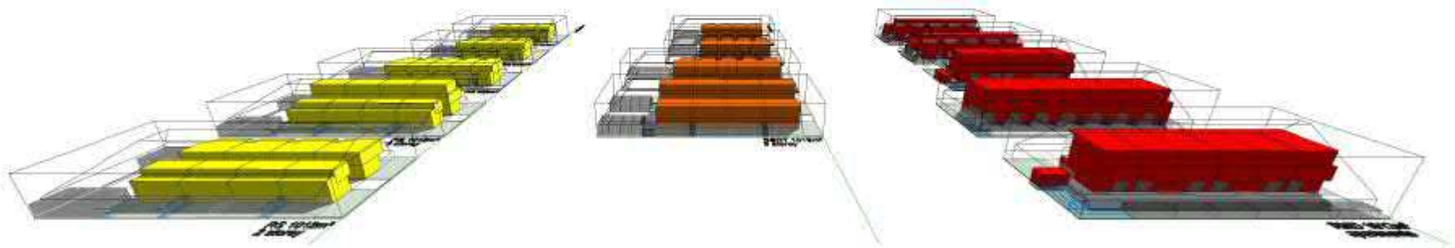
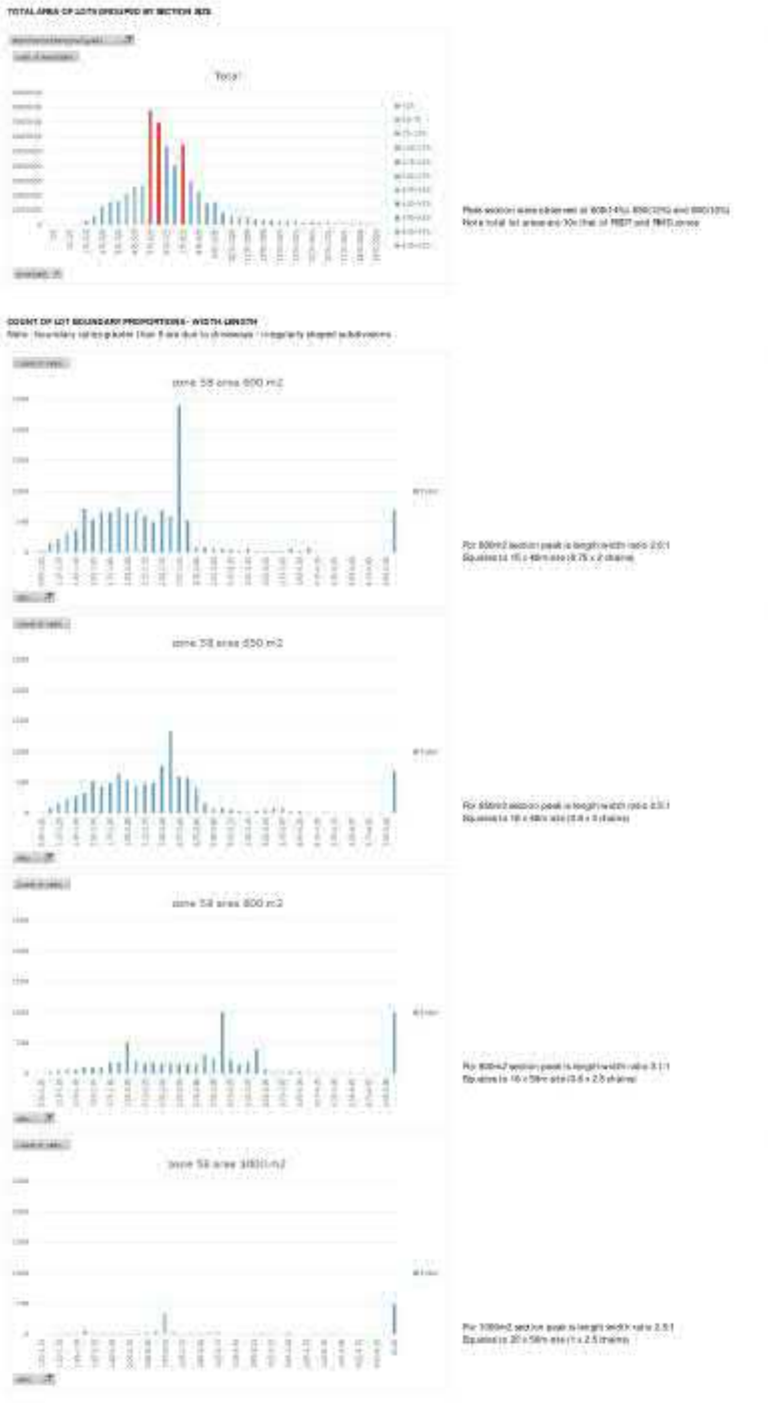
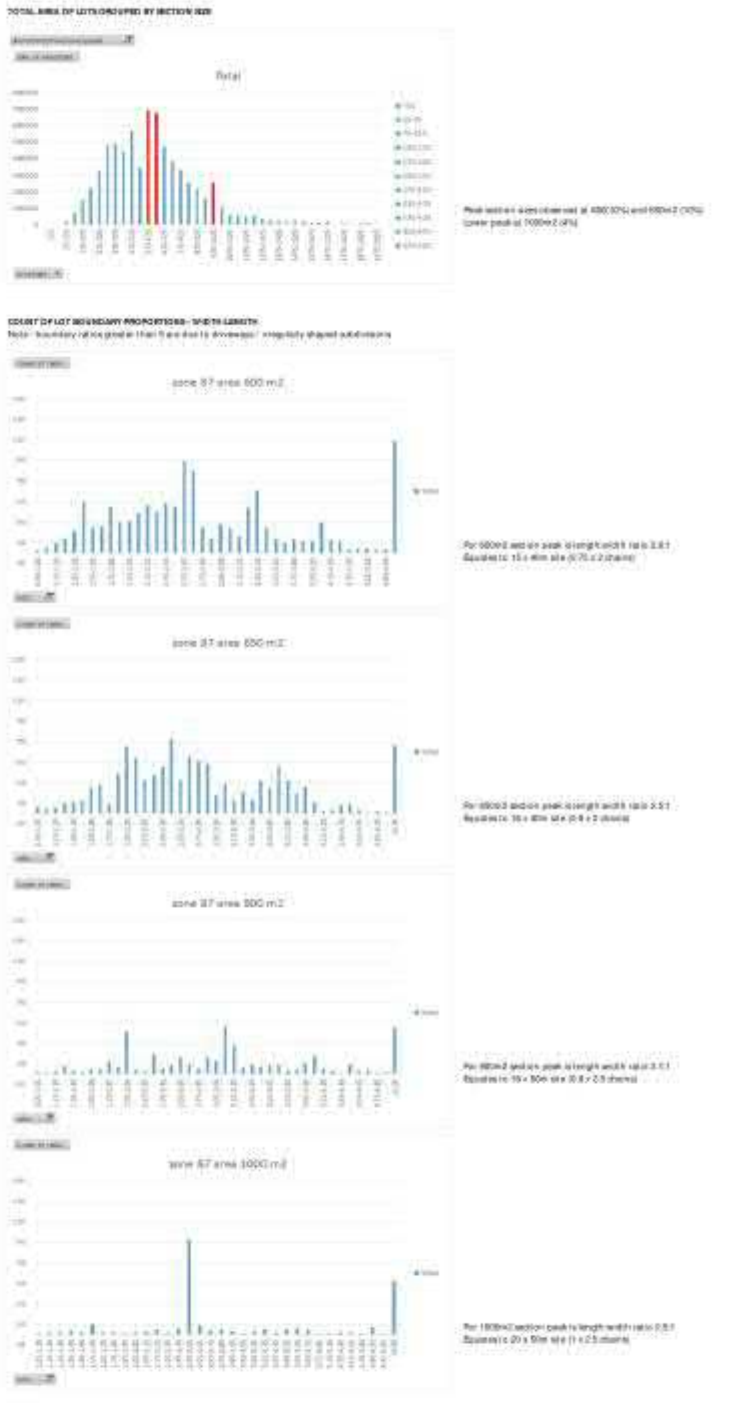


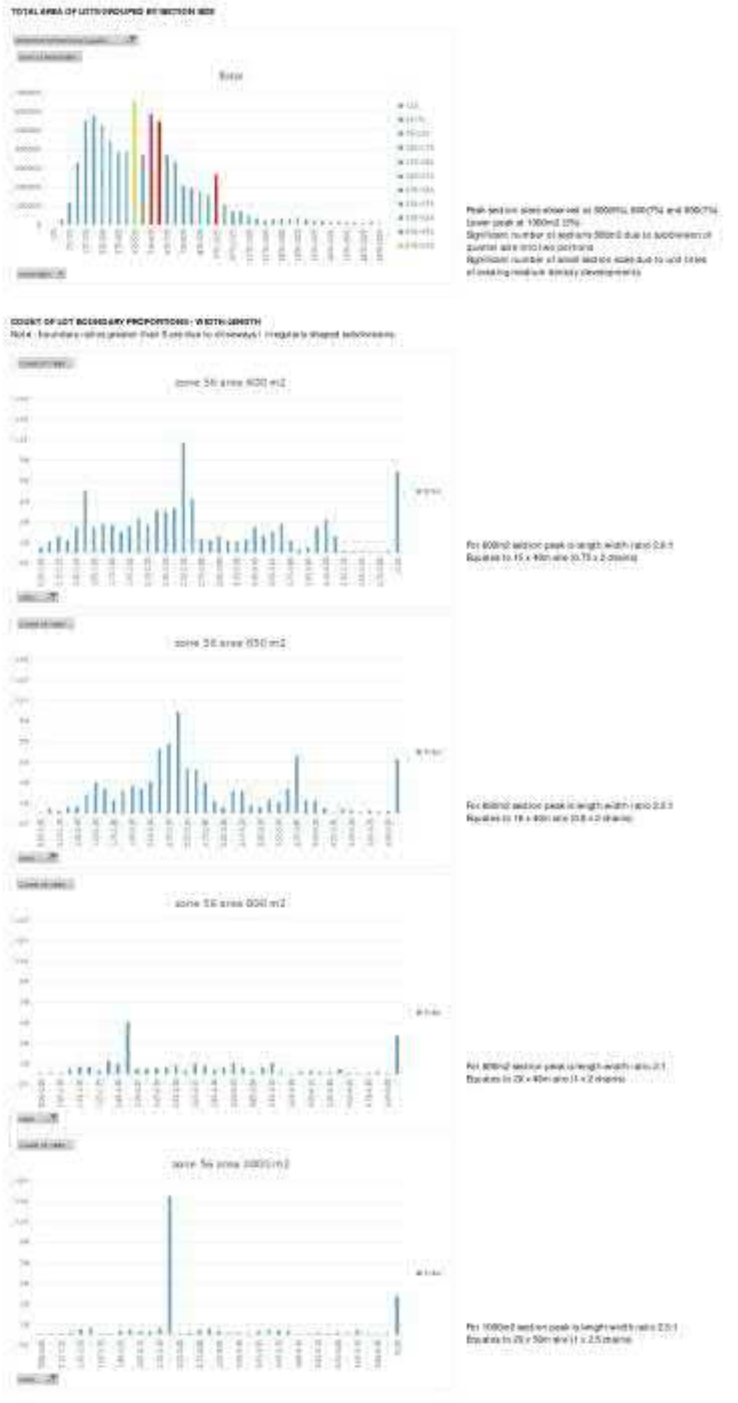
RESIDENTIAL ZONE
ZONE 58



RESIDENTIAL SUBURBAN DENSITY TRANSITION ZONE
ZONE 87



RESIDENTIAL MEDIUM DENSITY
ZONE 56



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RESIDENTIAL SECTION ANALYSIS BY ZONE
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DISTRICT PLAN MODELLING
RESIDENTIAL ZONE BUILT FORM STANDARD COMPARISONS

Rule summary - as considered for typical multi-unit residential development
Social housing / EPH / Character areas etc rules are excluded as these are a specific location not
Factors not affecting site / space planning for feasibility studies are excluded for simplicity (ie number of trees /form & proximity of existing buildings adjacent etc)
Rules are for predominant generic situations, not specific site configurations - an overview pertaining to multi-unit residential bulk and location constraints

# RULE	RESIDENTIAL SUBURBAN	RESIDENTIAL SUBURBAN - DENSITY TRANSITION differences to RS2 only shown	RESIDENTIAL MEDIUM DENSITY	RESIDENTIAL MEDIUM DENSITY - LOWER HEIGHT LIMIT OVERLAY differences to RMD2 only shown
1 site density	14.2.3.1 450m2 Each unit to be contained within its own separate site No minimum for multi-unit residential complexes	14.2.3.1 300m2 Each unit to be contained within its own separate site No minimum for multi-unit residential complexes	14.3.3.1 0m2 No site density standard	
2 tree and garden planting	14.2.3.2 Min 20% of site for landscaping		14.3.3.2 Min 20% of site for landscaping	
3 building height	14.2.3.3 8m generally 5.5m minor dwelling units (single storey only)		14.3.3.3 11m max 3 stories	14.3.3.3 8m RMD - lower height limit overlay (note other higher limits to specific overlays)
4 site coverage	14.2.3.4 maximum net site area covered by buildings includes balconies above ground where >5m2 for one site 35% generally 40% multi-unit residential complexes		14.3.3.4 maximum net site area covered by buildings 50% generally for multi unit calculate over entire complex	
5 outdoor living space	14.2.3.5 a each unit to provide outdoor living space in a continuous area 90m2 min area 30m2 min - multi unit residential 6m min dim 4m min dim - multi unit residential b min area to be readily accessible from living area c may be occupied by accessory building <8m2	14.2.3.5 a 50m2 min area 30m2 min - multi unit residential 4m min dimension 4m min dim - multi unit residential	14.3.3.5 a two or more bedrooms - provide for each unit 30m2 min total area 16m2 min private area 4m min dim private area at GFL 1.5m min dim private balcony at least one private OLS accessible from a living area in each unit 4m min dim communal space 50% min OLS at GFL on the site b one bedroom unit at GFL - each unit 16m2 min private area 4m min dim private area at GFL c one bedroom unit at upper level - can be mix of private & communal either level 16m2 min private area 6m2 min area private balcony 1.5m min dim private balcony	
6 daylight recession planes	14.2.3.6 a buildings shall not project beyond envelope formed by recession planes from 2.3m above internal boundaries by 14.14.2 diagram A 55° north boundary 35° east & west 26° south	14.2.3.6 a buildings shall not project beyond envelope formed by recession planes from 2.3m above internal boundaries by 14.14.2 diagram B 55° north boundary 45° east & west 35° south	14.3.3.6 a buildings shall not project beyond envelope formed by recession planes from 2.3m above internal boundaries by 14.14.2 diagram C 55° north boundary 50° east & west 35° south	d in the RMD - lower height limit overlay the recession plane is 14.14.2 diagram B (ie that of RSDT2) 55° north boundary 45° east & west 35° south
7 minimum building setbacks from internal boundaries	14.2.3.7 minimum building setback from internal boundaries are to be 1.1m generally (not listed below) 2 0m accessory building <10.1m length within 1m of boundary 3 0m dwlk at or below GFL 4 0m buildings that share a common wall along an internal boundary 5 1m buildings where internal boundary adjoins access 6 4m sites adjacent railway lines, buildings, balconies and decks		14.3.3.7 minimum building setback from internal boundaries are to be 1.1m generally (not listed below) 2 1.8m (adj) where building adj site has DF window or habitable space within 1m of boundary 3 0m accessory building <10.1m length within 1m of boundary 4 0m buildings that share a common wall along an internal boundary 5 1m buildings where internal boundary adjoins access 6 4m sites adjacent railway lines, buildings, balconies and decks	
8 min setback - living area windows/ balconies facing internal boundaries	14.2.3.8 a 4m min setback from int boundary for living area windows / balconies at FL+ b 1.4m from int boundary, any living space windows at FL+ to be permanently obscured		14.3.3.8 a 4m min setback from int boundary for living area windows / balconies at FL+ b 1.4m from int boundary, any living space windows at FL+ to be permanently obscured	
9 road boundary building setback	14.2.3.9 the road boundary building setback shall be 4.5m all buildings except garages and character areas) 5.5m where a garage has a vehicle door that faces a road or shared access except where a garage side wall parallel to road <6.5m length wall facing road has window min dim 0.6m access via side boundary with landscape strip 0.6m wide to boundary 2m landscaping to road boundary b garage in single garage width door facing road accessed from local road width max 3.6m (width limitation on door type)		14.3.3.9 a the min road boundary garage and building setback shall be 2m for all buildings not listed below 4.5m garage door facing road - does not tilt or swing outward 5.5m garage door facing road - tilts or swings out 7m garage door facing shared access way - does not tilt or swing outward 4m garage door facing shared access way - tilts or swings out b habitable space front façade 1.2m garages / accessory buildings facing road to be set back further than front façade of GF habitable space	
10 street scene amenity & safety - fences	14.2.3.10 a 1.8m maximum height of fence within setback from road boundary b does not apply to internal boundaries		14.3.3.10 1 maximum height of any fence in the setback from a local road boundary a 1.8m where >50% of structure is transparent 1m where less than 50% of structure is transparent b 1.8m from any collector or arterial road c does not apply to internal boundaries d parking areas to be separated from road / conservation / open space / residential sites by fencing meeting a above	
11 building overhangs	NO RULE		14.3.3.11 no internal floor area is project more than 600mm beyond gross floor at GFL	
12 minimum unit size	NO RULE		14.3.3.12 a minimum net floor area (incl WC, excl garage / balcony) for residential unit 35m2 studio 45m2 1 bedroom 60m2 2 bedroom 90m2 3 or more bedrooms	
13 ground floor habitable space	(effectively required by 14.2.3.5.b above)		14.3.3.13 a where permitted height is 11m or less i res unit facing road to have habitable space at GFL ii 50% of res units in development to have habitable space at GFL b each GF habitable space to be internally accessible and shall have 12m2 min area 3m min internal dimension c where permitted height >11m, min of 50% GFA occupied by habitable spaces or indoor communal living space (not access to lifts / stairs etc)	
14 service storage & waste management	14.2.3.12 a for multi unit residential / social housing complexes 2.25m2 GFL waste / recycling space 1.5m min dim 3m2 GFL washing line space 1.5m min dim can be aggregated for communal provision		14.2.3.14 a for multi unit residential / social housing complexes 2.25m2 waste / recycling space 1.5m min dim 3m2 outdoor service space 1.5m min dim 4m3 single indoor storage space 1m min dim b 1.5m screen height to waste management space c waste management space can be aggregated for communal provision min outdoor service space still 3m2 d communal waste management to be sized / accessible / fit for purpose	

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BUILT FORM STANDARD COMPARISONS
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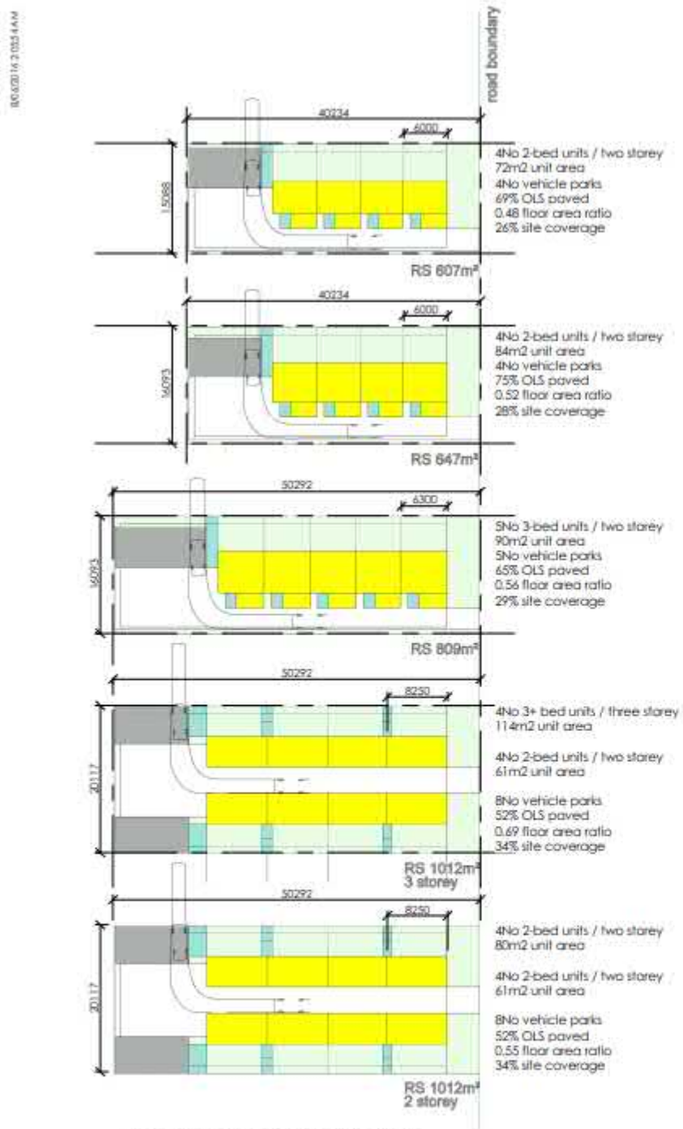
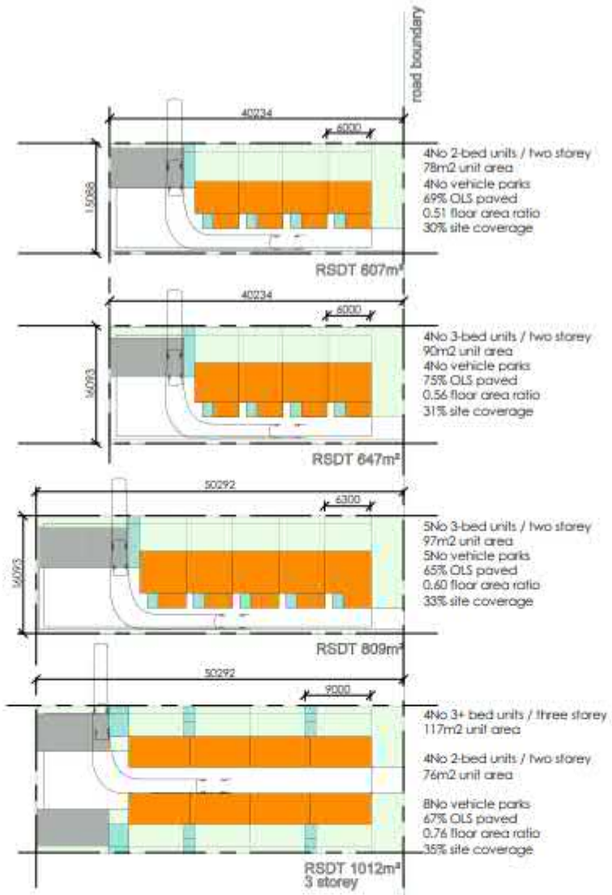


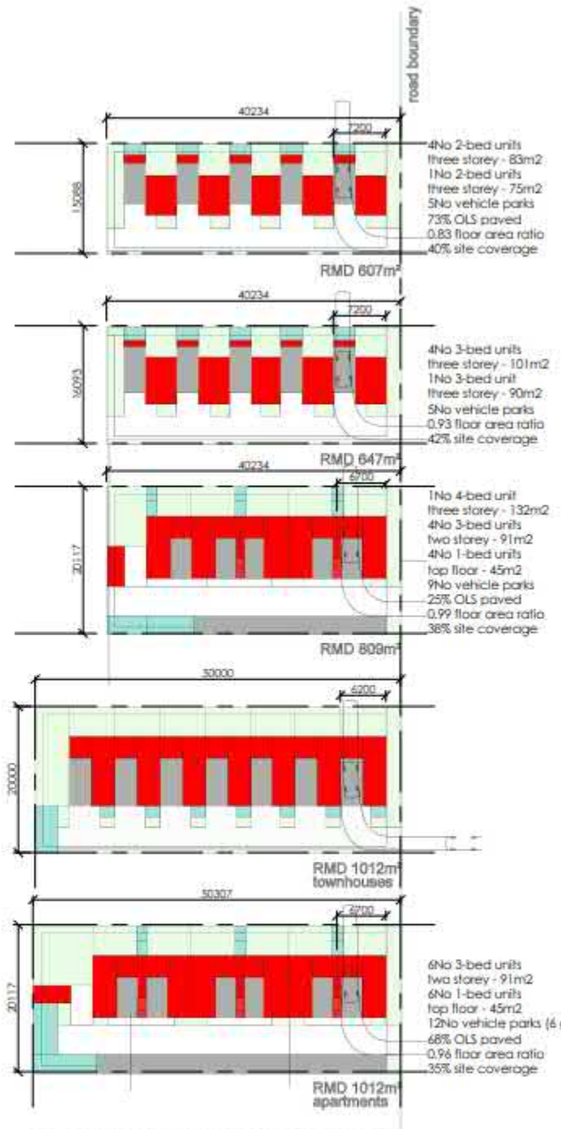
RESIDENTIAL SUBURBAN ZONE

Multi unit development under Rule 14.2.2.4 D6 is a discretionary activity. Matters of site and building design can be further considered, current conditions imposed, and resource consents declined.



RESIDENTIAL SUBURBAN DENSITY TRANSITION ZONE

Multi unit development under Rule 14.2.2.1 P4 is a permitted activity up to and including four residential units.
Activity standards apply in relation to bedroom size and habitable spaces at ground level.



RESIDENTIAL MEDIUM DENSITY ZONE

Multi unit development under Rule 14.2.2.3 RD1 is a restricted discretionary activity for three or more units.
The matters of discretion are :
a. residential design principles 14.13.1
b. minimum unit size and unit mix 14.13.4
Consent conditions can be imposed and resource consent declined.

Christchurch City Council

DEVELOPMENT COMPARISONS
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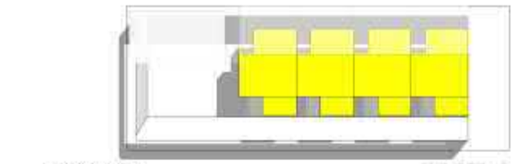

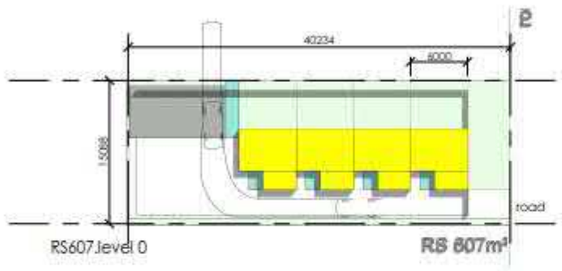

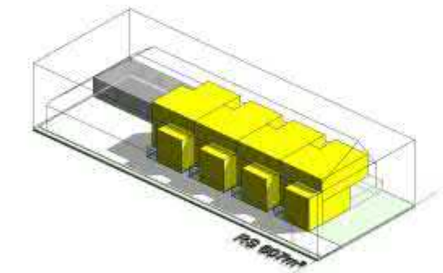

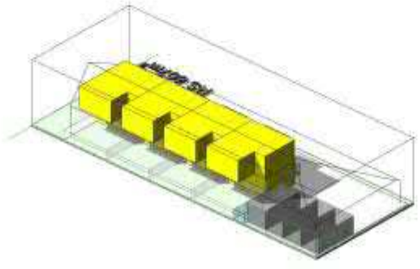

RESIDENTIAL SUBURBAN ZONE - 607m2

DESIGN RESPONSE

4No 2-bed units / two storey
72m2 unit area
4No vehicle parks
69% OLS paved
0.48 floor area ratio
26% site coverage

Form determined predominantly by parking requirements
Lot width 15m
Driveway formation 3.6m
Garage setback to shared access 5.5m
If attached garage provided to each unit then 5.9m long garage hard against north boundary required to achieve driveway width / shared access setback rules

Turning circle (at depth) loses 2.5m of width of each GF unit adjacent shared access
Garaging needs to be wider where recessed deep in plan cw aggregated parking / carport
Distribution of garaging over length of complex (rather than aggregating) means first floor areas extend through recession plane at end of site, reducing number of units (4.5m recession plane FF setback)

Minimise parking numbers, as each vehicle takes up 37-44m2 of vehicle parking / manouvering excluding shared access (depending on garaging / carport / parking)
Therefore, create larger units (2-3beds) in lieu of smaller units (studio/1bed) to maximise floor area ratios

Provide aggregated carparking at rear of site where recession planes are low and thus restrict 2 storey development
Build two storey, as wide as possible between rear carparking and front boundary setback, and as close to north boundary as outdoor living space area requirements allow

Mass: Type	Level	Floor Area	% site area
car parking	Level 0	55.0 m²	9.1
landscaping	Level 0	84.1 m²	13.9
outdoor living	Level 0	122.1 m²	20.1
paving	Level 0	191.3 m²	31.5
service+waste	Level 0	21.0 m²	3.5
		473.4 m²	78.0
res-sub.yellow	Level 1	133.6 m²	22.0
		133.6 m²	22.0
res-sub.yellow	Level 2	155.4 m²	25.6
		155.4 m²	25.6
RS607		762.4 m²	125.6

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RESIDENTIAL SUBURBAN 607m2
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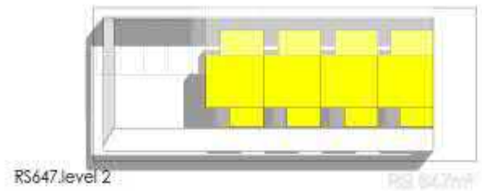

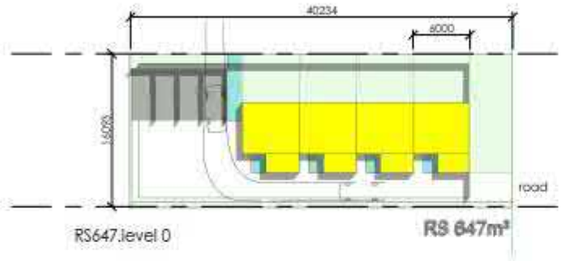

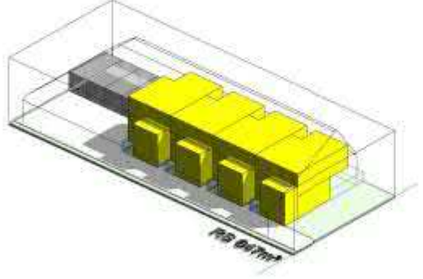

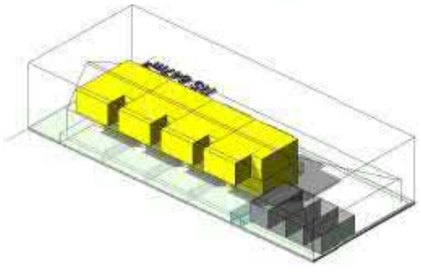

RESIDENTIAL SUBURBAN ZONE - 647m2

DESIGN RESPONSE

4No 2-bed units / two storey
84m2 unit area
4No vehicle parks
75% OLS paved
0.52 floor area ratio
28% site coverage

As per 607m2 Residential suburban design
Depth of unit increased to generate additional floor area
Outdoor Living Space maintained at minimum

Mass Type	Level	Floor Area	% site area
car parking	Level 0	55.0 m²	8.5
landscaping	Level 0	98.9 m²	15.3
outdoor living	Level 0	122.2 m²	18.9
paving	Level 0	191.3 m²	29.6
service+waste	Level 0	22.5 m²	3.5
		489.9 m²	75.7
res-sub.yellow	Level 1	157.6 m²	24.4
		157.6 m²	24.4
res-sub.yellow	Level 2	179.4 m²	27.7
		179.4 m²	27.7
RS647		826.9 m²	127.8

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RESIDENTIAL SUBURBAN 647m2
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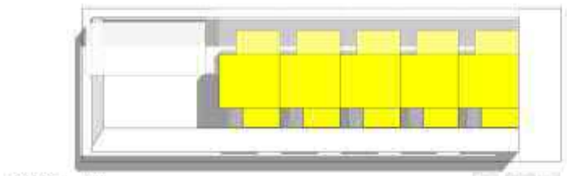
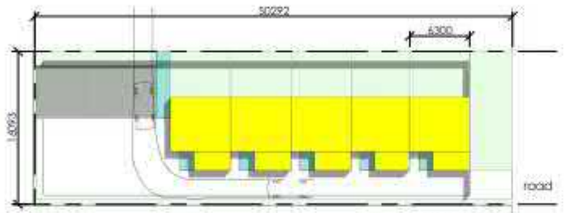


RS809.level 2



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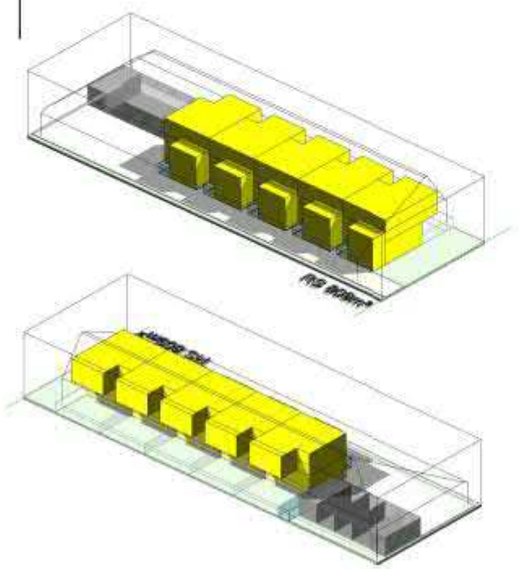

RESIDENTIAL SUBURBAN ZONE - 809m2

DESIGN RESPONSE

5No 3-bed units / two storey
90m2 unit area
5No vehicle parks
65% OLS paved
0.56 floor area ratio
29% site coverage

As per 647m2 Residential suburban design
Additional unit added due to additional site depth
Outdoor Living Space maintained at minimum

Mass: Type	Level	Floor Area	% site area
car parking	Level 0	68.8 m²	8.5
landscaping	Level 0	109.6 m²	13.5
outdoor living	Level 0	151.0 m²	18.7
paving	Level 0	237.0 m²	29.3
service+waste	Level 0	25.5 m²	3.1
		591.8 m²	73.1
res-sub.yellow	Level 1	217.6 m²	26.9
		217.6 m²	26.9
res-sub.yellow	Level 2	233.6 m²	28.9
		233.6 m²	28.9
RS809		1042.9 m²	128.9

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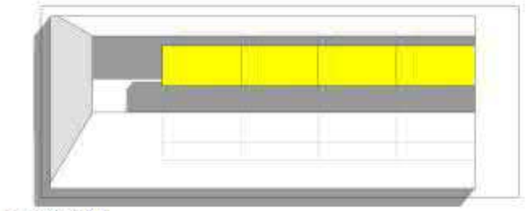
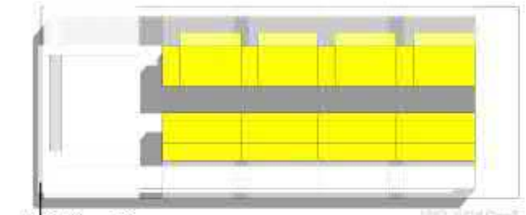
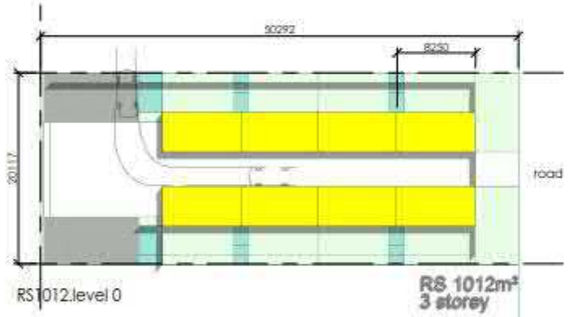
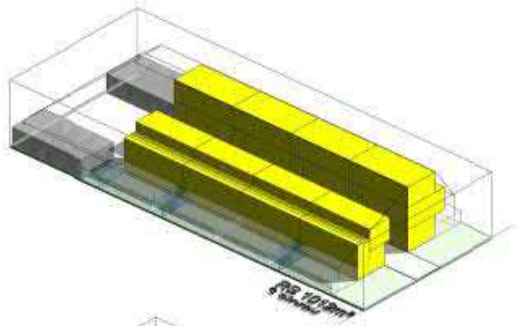
RESIDENTIAL SUBURBAN 809m2
built form standard modelling
16.0607
scale 1 : 500 a3

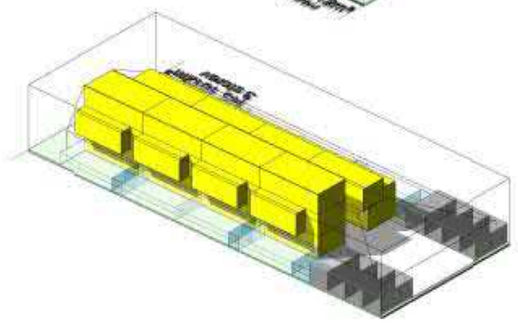
p 06











RESIDENTIAL SUBURBAN ZONE - 1012m2

DESIGN RESPONSE

4No 3+ bed units / three storey
114m2 unit area

4No 2-bed units / two storey
61m2 unit area

8No vehicle parks
52% OLS paved
0.69 floor area ratio
34% site coverage

Form determined predominantly by parking requirements
Lot width 20m
Driveway formation 3.6m
Garage setback to shared access 5.5m
If attached garage provided to each unit then 5.9m long garage hard against north boundary required to achieve driveway width / shared access setback rules

Turning circle (at depth) loses 2.5m of width of each GF unit adjacent shared access
Garaging needs to be wider where recessed deep in plan cw aggregated parking / carport
Distribution of garaging over length of complex (rather than aggregating) means first floor areas extend through recession plane at end of site, reducing number of units (4.5m recession plane FF setback)

Keep the number of units to 8 or less to prevent shared vehicle access width of 5.0m requirement (loss of 70m2 of developable space)
Lot width of 20m allows shared manouvering space between 2 opposing bays of parking, so long as shared access is central to allow one manouver into parking space

Therefore, create 8No larger units (2-3beds) in lieu of smaller units (studio/1bed) to maximise floor area ratios

Provide aggregated carparking at rear of site where recession planes are low and thus restrict 2 storey development
Build two - three storey, as wide as possible between rear carparking and front boundary setback, and as close to north boundary as outdoor living space area requirements allow

20m width allows three storey construction if top storey stud height is reduced to 2.3m to allow 100mm crossfall on "flat" roof (assuming 250mm interstorey structural depth per storey / GF slab on grade)

Mass: Type	Level	Floor Area	% site area
car parking	Level 0	101.2 m²	12.5
landscaping	Level 0	85.2 m²	10.5
outdoor living	Level 0	243.5 m²	30.1
paving	Level 0	260.0 m²	32.1
service+waste	Level 0	44.6 m²	5.5
		734.5 m²	90.8
res-sub.yellow	Level 1	277.2 m²	34.3
		277.2 m²	34.3
res-sub.yellow	Level 2	282.9 m²	35.0
		282.9 m²	35.0
res-sub.yellow	Level 3	138.6 m²	17.1
		138.6 m²	17.1
RS1012		1433.2 m²	177.1

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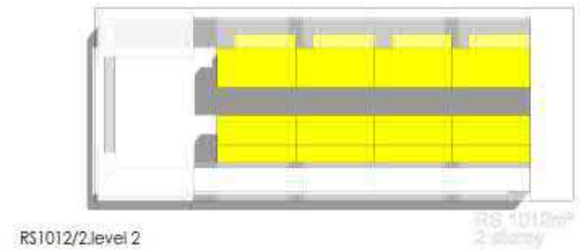
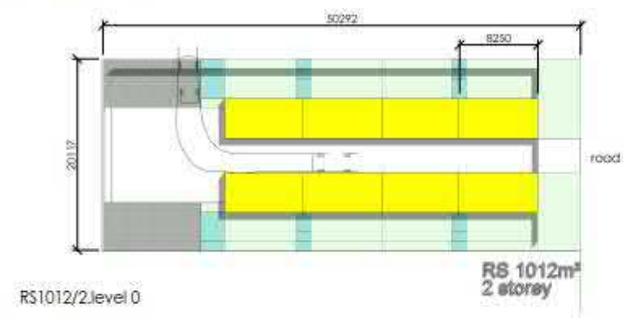
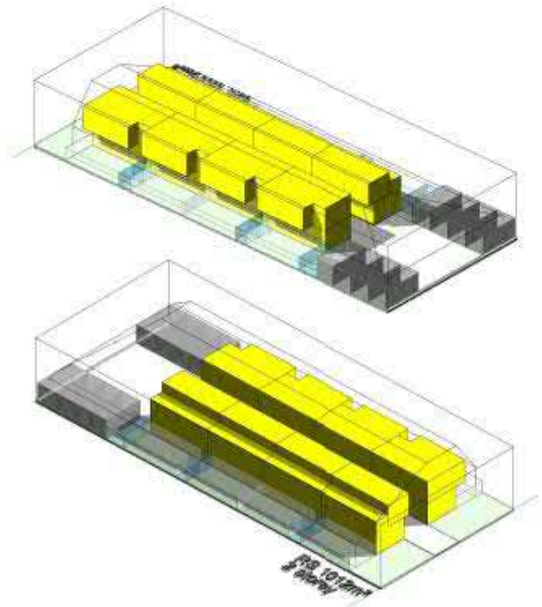
RESIDENTIAL SUBURBAN 1012m2
built form standard modelling
16.0607
scale 1 : 500 a3

p 07







RESIDENTIAL SUBURBAN ZONE - 1012m2 / TWO STOREY

DESIGN RESPONSE

4No 2-bed units / two storey
80m2 unit area

4No 2-bed units / two storey
61m2 unit area

8No vehicle parks
52% OLS paved
0.55 floor area ratio
34% site coverage

Two storey version of 1012m2 Residential Suburban development for comparison

Mass Type	Level	Floor Area	% site area
car parking	Level 0	101.2 m²	12.5
landscaping	Level 0	85.2 m²	10.5
outdoor living	Level 0	243.5 m²	30.1
paving	Level 0	260.0 m²	32.1
service+waste	Level 0	44.6 m²	5.5
		734.5 m²	90.8
res-sub.yellow	Level 1	277.2 m²	34.3
		277.2 m²	34.3
res-sub.yellow	Level 2	282.9 m²	35.0
		282.9 m²	35.0
RS1012/2		1294.6 m²	160.0

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RESIDENTIAL SUBURBAN 1012m2 - TWO STOREY
built form standard modelling
16.0607
scale 1 : 500 a3

p 08

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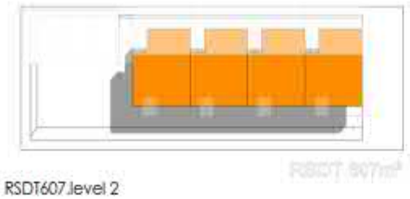
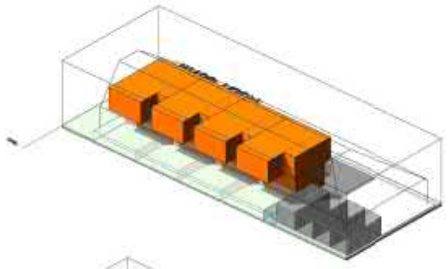
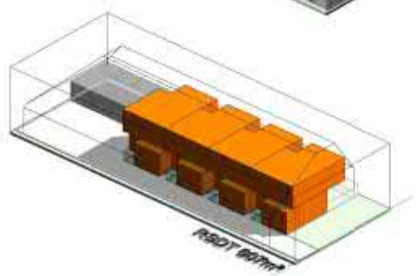


RSDT607.level 2

RSDT607.level 0





RESIDENTIAL SUBURBAN DENSITY TRANSITION ZONE - 607m2

DESIGN RESPONSE

4No 2-bed units / two storey
78m2 unit area
4No vehicle parks
69% OLS paved
0.51 floor area ratio
30% site coverage

As per 607m2 Residential suburban design
Depth of unit increased at first floor level due to steeper recession planes, generating additional floor area
Outdoor Living Space maintained at minimum

Mark	Mass: Type	Level	Floor Area	% site area
RSDT607	car parking	Level 0	55.0 m²	9.1
RSDT607	landscaping	Level 0	84.1 m²	13.9
RSDT607	outdoor living	Level 0	122.1 m²	20.1
RSDT607	paving	Level 0	191.3 m²	31.5
RSDT607	service+waste	Level 0	21.0 m²	3.5
			473.4 m²	78.0
RSDT607	res-trans.orange	Level 1	133.6 m²	22.0
			133.6 m²	22.0
RSDT607	res-trans.orange	Level 2	179.4 m²	29.6
			179.4 m²	29.6
RSDT607			786.4 m²	129.6

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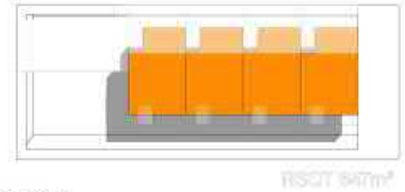
RESIDENTIAL SUBURBAN DENSITY TRANSITION 607m2
built form standard modelling
16.0607
scale 1 : 500 a3

p 09



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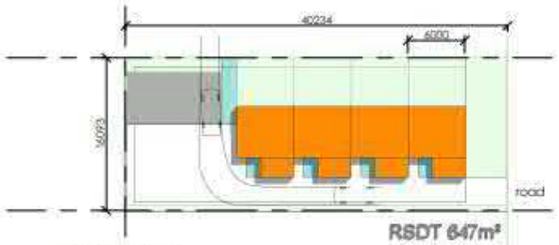

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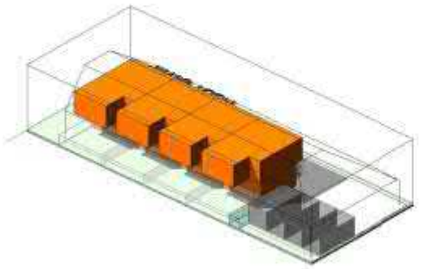

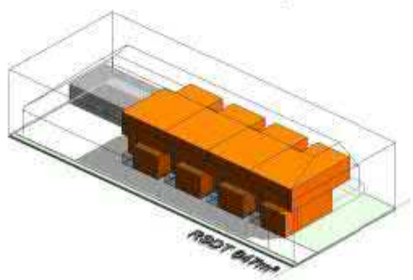

RESIDENTIAL SUBURBAN DENSITY TRANSITION ZONE - 647m2

DESIGN RESPONSE

4No 3-bed units / two storey
90m2 unit area
4No vehicle parks
75% OLS paved
0.56 floor area ratio
31% site coverage

As per 647m2 Residential suburban design
Depth of unit increased at first floor level due to steeper recession planes, generating additional floor area
Outdoor Living Space maintained at minimum

Mark	Mass: Type	Level	Floor Area	% site area
RSDT647	car parking	Level 0	55.0 m²	8.5
RSDT647	landscaping	Level 0	98.9 m²	15.3
RSDT647	outdoor living	Level 0	122.2 m²	18.9
RSDT647	paving	Level 0	191.3 m²	29.6
RSDT647	service+waste	Level 0	22.5 m²	3.5
			489.9 m²	75.7
RSDT647	res-trans.orange	Level 1	157.6 m²	24.4
			157.6 m²	24.4
RSDT647	res-trans.orange	Level 2	203.1 m²	31.4
			203.1 m²	31.4
RSDT647			850.6 m²	131.5

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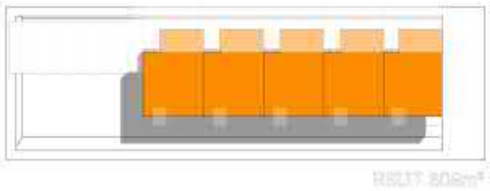
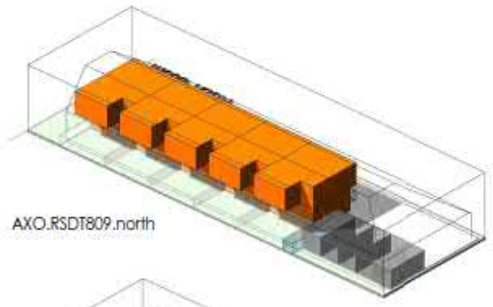
RESIDENTIAL SUBURBAN DENSITY TRANSITION 647m2
built form standard modelling
16.0607
scale 1 : 500 a3

p 10

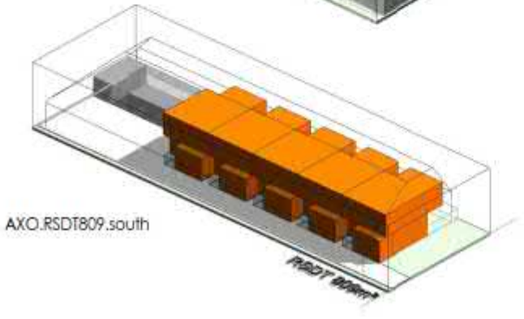


RSDT809.level 2

RSDT809.level 0



AXO.RSDT809.north



AXO.RSDT809.south

RESIDENTIAL SUBURBAN DENSITY TRANSITION ZONE - 809m2

DESIGN RESPONSE

5No 3-bed units / two storey
97m2 unit area
5No vehicle parks
65% OLS paved
0.60 floor area ratio
33% site coverage (41% if garaging provided)

As per 809m2 Residential suburban design
Depth of unit increased at first floor level due to steeper recession planes, generating additional floor area
Outdoor Living Space maintained at minimum

Mark	Mass: Type	Level	Floor Area	% site area
RSDT809	car parking	Level 0	68.8 m²	8.5
RSDT809	landscaping	Level 0	109.6 m²	13.5
RSDT809	outdoor living	Level 0	151.0 m²	18.7
RSDT809	paving	Level 0	237.0 m²	29.3
RSDT809	service+waste	Level 0	25.5 m²	3.1
			591.8 m²	73.1
RSDT809	res-trans.orange	Level 1	217.6 m²	26.9
			217.6 m²	26.9
RSDT809	res-trans.orange	Level 2	265.1 m²	32.8
			265.1 m²	32.8
RSDT809			1074.4 m²	132.8

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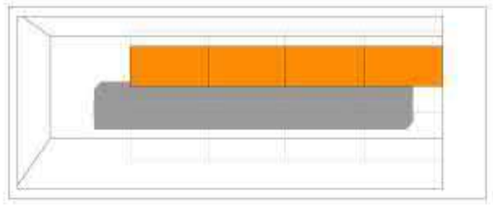
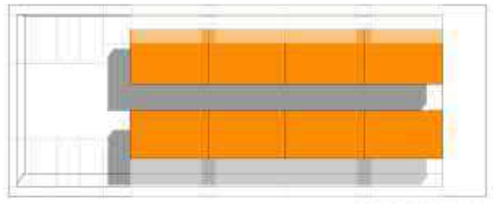
RESIDENTIAL SUBURBAN DENSITY TRANSITION 809m2
built form standard modelling
16.0607
scale 1 : 500 a3

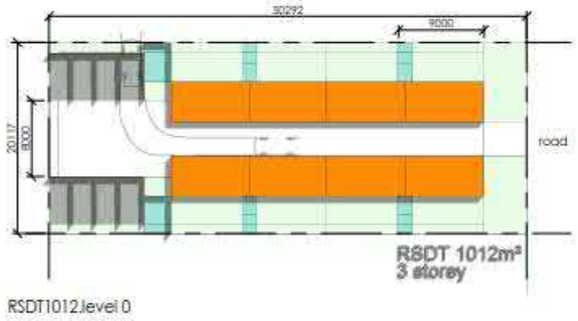
p 11



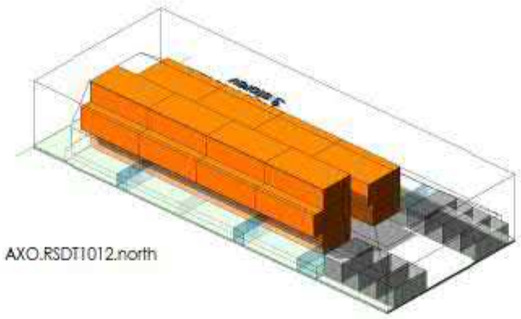
RSDT1012.level 3



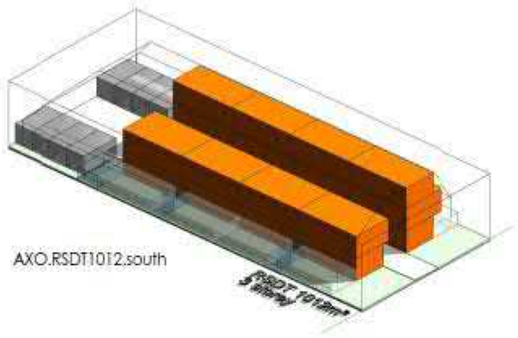
RSDT1012.level 2



RSDT1012.level 0



AXO.RSDT1012.north



AXO.RSDT1012.south

RESIDENTIAL SUBURBAN DENSITY TRANSITION ZONE - 1012m2

DESIGN RESPONSE

4No 3+ bed units / three storey
117m2 unit area

4No 2-bed units / two storey
76m2 unit area

8No vehicle parks
61% OLS paved
0.76 floor area ratio
35% site coverage (45% if garaging provided)

As per 1012m2 Residential suburban design
Depth of unit increased at first floor level due to steeper recession planes, generating additional floor area
Outdoor Living Space maintained at minimum

Mark	Mass: Type	Level	Floor Area	% site area
RSDT1012	car parking	Level 0	100.0 m²	12.4
RSDT1012	landscaping	Level 0	106.7 m²	13.2
RSDT1012	outdoor living	Level 0	243.5 m²	30.1
RSDT1012	paving	Level 0	237.3 m²	29.3
RSDT1012	service+waste	Level 0	47.0 m²	5.8
			734.5 m²	90.8
RSDT1012	res-trans.orange	Level 1	277.2 m²	34.3
			277.2 m²	34.3
RSDT1012	res-trans.orange	Level 2	353.1 m²	43.6
			353.1 m²	43.6
RSDT1012	res-trans.orange	Level 3	138.6 m²	17.1
			138.6 m²	17.1
RSDT1012			1503.4 m²	185.8

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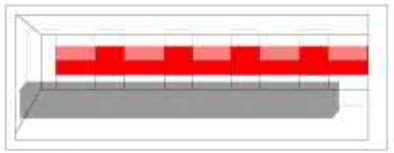
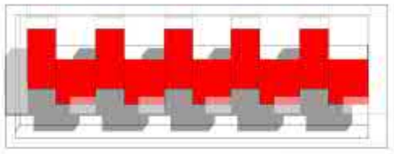
RESIDENTIAL SUBURBAN DENSITY TRANSITION 1012m2
built form standard modelling
16.0607
scale 1 : 500 a3

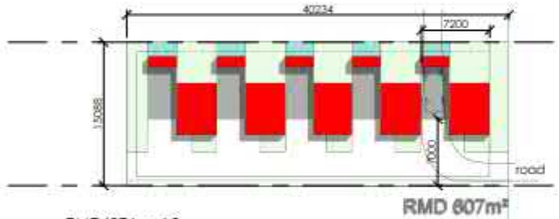
p 12



RMD607.level 3



RMD607.level 2



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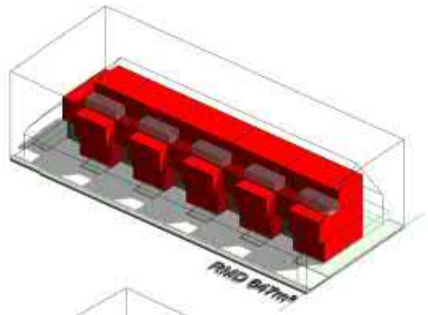

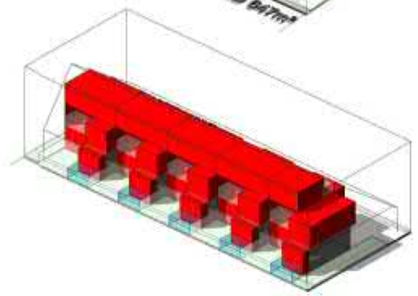

RESIDENTIAL MEDIUM DENSITY ZONE - 607m2

DESIGN RESPONSE

4No 2-bed units
three storey - 83m2
1No 2-bed units
three storey - 75m2

5No vehicle parks (5No garaged)
73% OLS paved

0.83 floor area ratio (excluding balconies)
40% site coverage (including attached garaging)

Mass: Type	Level	Floor Area	% site area
landscaping	Level 0	96.9 m²	16.0
outdoor living	Level 0	90.0 m²	14.8
paving	Level 0	185.2 m²	30.5
service+waste	Level 0	22.4 m²	3.7
		394.5 m²	65.0
building	Level 1	129.9 m²	21.4
car parking	Level 1	82.5 m²	13.6
		212.4 m²	35.0
building	Level 2	193.4 m²	31.9
outdoor living	Level 2	31.4 m²	5.2
		224.7 m²	37.0
building	Level 3	99.0 m²	16.3
outdoor living	Level 3	31.5 m²	5.2
		130.5 m²	21.5
RMD607		962.1 m²	158.5

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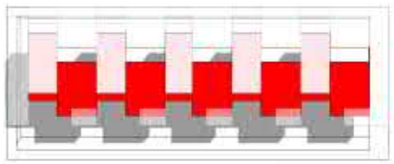
RESIDENTIAL MEDIUM DENSITY 607m2
built form standard modelling
16.0607
scale 1 : 500 a3

p 13

RMD647.level 3



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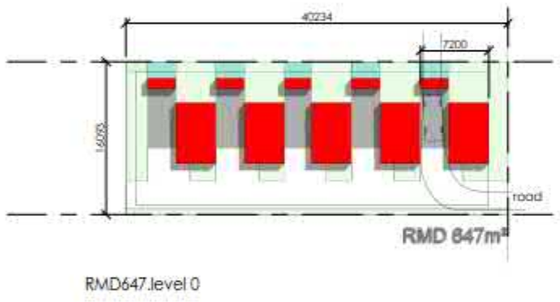

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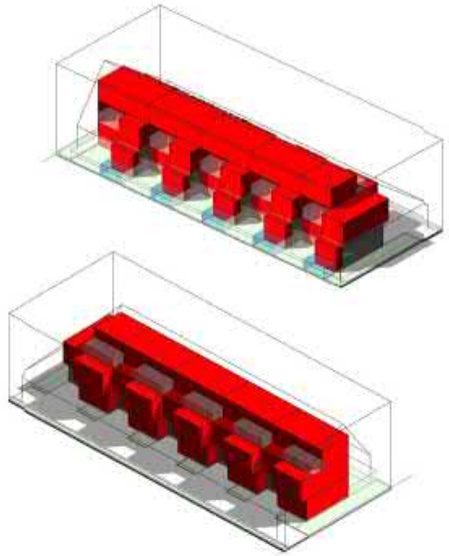

RESIDENTIAL MEDIUM DENSITY ZONE - 647m2

DESIGN RESPONSE

4No 3-bed units
three storey - 101m2
1No 3-bed unit
three storey - 90m2

5No vehicle parks (5No garaged)
66% OLS paved

0.93 floor area ratio (excluding balconies)
42% site coverage (including attached garaging)

Mass: Type	Level	Floor Area	% site area
landscaping	Level 0	99.1 m²	15.3
outdoor living	Level 0	90.2 m²	13.9
paving	Level 0	185.2 m²	28.6
service+waste	Level 0	26.3 m²	4.1
		400.7 m²	61.9
building	Level 1	150.9 m²	23.3
car parking	Level 1	93.7 m²	14.5
		244.5 m²	37.8
building	Level 2	225.5 m²	34.9
outdoor living	Level 2	30.8 m²	4.8
		256.3 m²	39.6
building	Level 3	132.0 m²	20.4
outdoor living	Level 3	31.5 m²	4.9
		163.5 m²	25.3
RMD647		1065.0 m²	164.6

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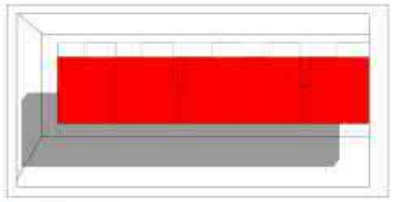
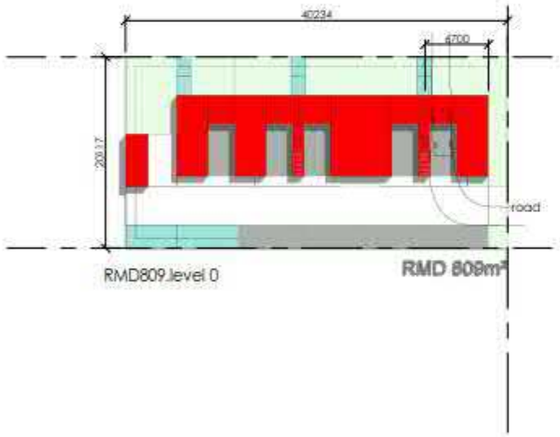
RESIDENTIAL MEDIUM DENSITY 647m2
built form standard modelling
16.0607
scale 1 : 500 a3

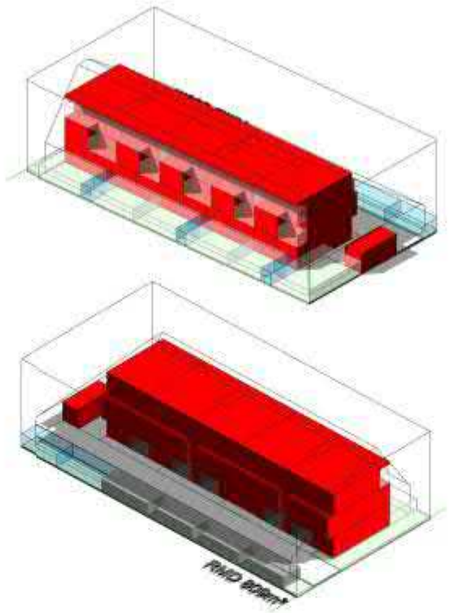
p 14



RMD809.level 3

RMD809.level 2





RESIDENTIAL MEDIUM DENSITY ZONE - 809m2

DESIGN RESPONSE

1No 4-bed unit
three storey - 132m2
4No 3-bed units
two storey - 91m2
4No 1-bed units
top floor - 45m2

9No vehicle parks (5No garaged)
25% OLS paved

0.99 floor area ratio (excluding balconies)
38% site coverage (including attached garaging)

Mass Type	Level	Floor Area	% site area
car parking	Level 0	66.0 m²	8.2
driveway	Level 0	206.3 m²	25.5
landscaping	Level 0	44.1 m²	5.4
outdoor living	Level 0	157.4 m²	19.4
service+waste	Level 0	47.6 m²	5.9
		521.4 m²	64.4
building	Level 1	215.5 m²	26.6
car parking	Level 1	77.0 m²	9.5
		292.5 m²	36.1
building	Level 2	279.5 m²	34.5
outdoor living	Level 2	24.6 m²	3.0
		304.1 m²	37.6
building	Level 3	230.3 m²	28.5
outdoor living	Level 3	49.4 m²	6.1
		279.7 m²	34.6
RMD809		1397.6 m²	172.7

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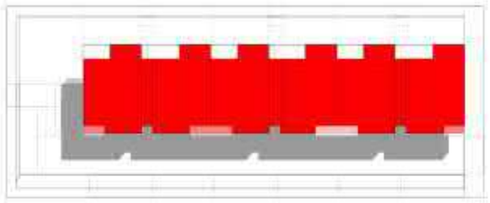
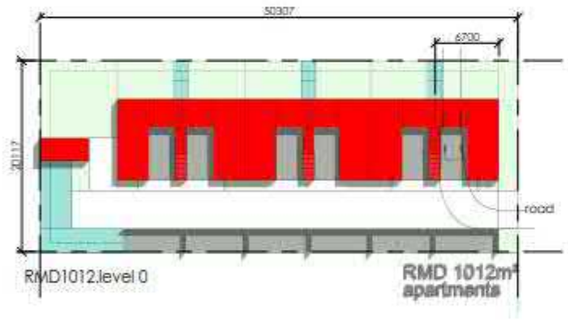
RESIDENTIAL MEDIUM DENSITY 809m2
built form standard modelling
16.0607
scale 1 : 500 a3

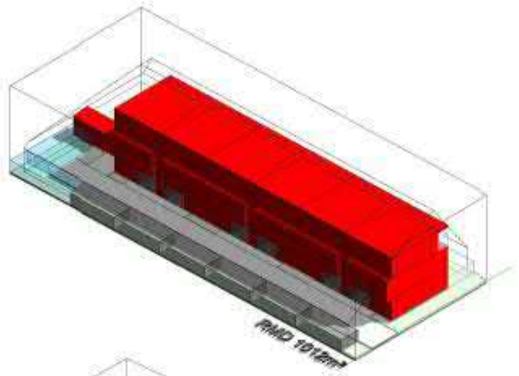
p 15

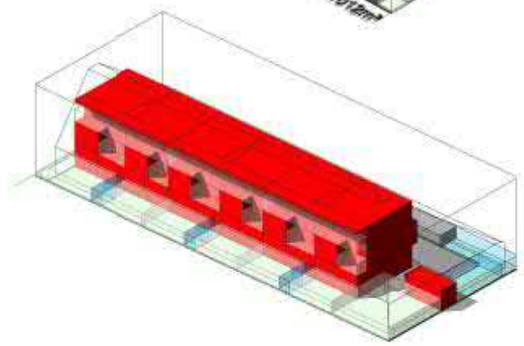
RMD1012.level 3



RMD1012.level 2







RESIDENTIAL MEDIUM DENSITY ZONE - 1012m2

DESIGN RESPONSE

6No 3-bed units
two storey - 91m2
6No 1-bed units
top floor - 45m2

12No vehicle parks (6No garaged)
30% OLS paved
20% of site landscaped

0.96 floor area ratio (excl balconies)
37% site coverage

Mass: Type	Level	Floor Area	% site area
car parking	Level 0	99.0 m²	9.8
driveway	Level 0	234.2 m²	23.1
landscaping	Level 0	57.0 m²	5.6
outdoor living	Level 0	209.2 m²	20.7
service+waste	Level 0	63.1 m²	6.2
		662.5 m²	65.5
building	Level 1	261.5 m²	25.8
car parking	Level 1	92.4 m²	9.1
		353.9 m²	35.0
building	Level 2	340.4 m²	33.6
outdoor living	Level 2	30.6 m²	3.0
		371.0 m²	36.7
building	Level 3	281.4 m²	27.8
outdoor living	Level 3	60.3 m²	6.0
		341.7 m²	33.8
RMD1012		1729.1 m²	170.9

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RESIDENTIAL MEDIUM DENSITY 1012m2
built form standard modelling
16.0607
scale 1 : 500 a3

p 16

Version Control

Date:	9 February 2018
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Contributors:	Housing Capacity Team, CCC, ECAN, SDC and WDC
Purpose:	Housing Development Capacity Assessment – NPS-UDC
Owner:	GCP