'GREENFIELD' DENSITY ANALYSIS

Technical Report - Final

Greater Christchurch Partnership

DOCUMENT CONTROL RECORD

CLIENT	Greater Christchurch Partnership
PROJECT	'Greenfield' Density Analysis
HG PROJECT NO.	2120 147097 01
HG DOCUMENT NO.	R001 147097 01
DOCUMENT	Technical Report - Final

ISSUE AND REVISION RECORD

DATE OF ISSUE	4 February 2021
STATUS	Final report

ORIGINATOR	Craig Friedel	Sam Coles
REVIEWED	Andrew Collins	Mike Tottman
APPROVED FOR ISSUE	Andrew Collins	

OFFICE OF ORIGIN	Christchurch
TELEPHONE	+64 03 962 9770
EMAIL	c.friedel@harrisongrierson.com

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EXECUTIVE SUMMARY

Evaluating 'greenfield' density uptake in Greater Christchurch

Action 3 of the Greater Christchurch Future Development Strategy, Our SPACE, requires an evaluation to be undertaken of the minimum household densities in the residential 'greenfield' priority and intensification areas of the sub-region.

The uptake analysis and key learnings contained in this report confirm that the minimum net densities in the residential 'greenfield' priority areas (the 'GPA') are being exceeded to date in Waimakariri district but that the uptake is more varied in the Selwyn district GPA and more so in the Christchurch City GPA and Intensification Areas due to a range of factors. There are no infrastructure, public transport, or open space constraints that are limiting the ability to achieve the minimum net densities.

Constraints and issues to achieving the minimum 'greenfield' densities

Our SPACE Action 3 requires that the constraints and issues in achieving the minimum 'greenfield' densities in the Canterbury Regional Policy Statement (the 'CRPS') are evaluated.

The consolidated settlement pattern for Greater Christchurch, implemented through planning policies, spatial planning, and non-statutory initiatives, has to a large extent already considered the appropriateness of the Future Development Areas (the 'FDA') from an urban form, land use and strategic infrastructure perspective. The detailed case study evaluations establish that the liveability outcomes at the neighbourhood, block and section scales do not vary significantly across the density spectrum of 10hh/ha to 16hh/ha. The analysis highlights a market preference for standalone, single storey three to four bedrooms dwellings with double garaging and that the proportion of duplex and terraced housing types is limited. It confirms that current market demand is generally being satisfied but that the longer-term housing needs consistent with the Greater Christchurch housing demand profile are not being met.

The national and international research that is summarised in the key learnings of this report confirm that there are a range of supply, demand and institutional constraints that are barriers to achieving higher density developments across the full spectrum. However, these constraints can be overcome to activate higher densities across a range of spatial locations and scales through actions that relate to building partnerships, investing in 'places', improving planning systems and processes and establishing funding arrangements.

The desirability and feasibility of achieving density increases in the FDA

Our SPACE Action 3 requires a determination to be made on whether any changes to the minimum densities in Policy 6.3.7.3(a) of the CRPS are likely to be desirable and achievable in the Selwyn and Waimakariri district FDA.

The research and key learnings establish that an increase in the 12hh/ha minimum net densities in the FDA under Our SPACE to 15hh/ha is desirable as it will optimise the use of the available 'greenfield' land consistent with the current settlement pattern and urban consolidation principles. However, detailed structure planning of the FDA is required to evaluate the feasibility of whether there are appropriate locational attributes to sustain blocks of higher density housing within proximity to local and neighbourhood centres.

The case study analysis and key learnings confirm that the likelihood of poor outcomes arising with an increase in densities to 15hh/ha in the FDA are low. However, any associated policy change needs to be supported by a range of statutory and non-statutory actions (building partnerships, investing in 'places', improving planning systems and establishing appropriate funding) to make the provision of higher densities beyond the current 12hh/ha desirable and feasible from the council's, Greater Christchurch Partnership, iwi and mana whenua, stakeholder, landowner, development sector and community perspectives.

Recommendations

The research and key learnings in this report support an increase in the minimum net densities in the FDA to 15hh/ha on the basis that this policy change is supported by the following priorities:

1. **FDA spatial planning:** Selwyn and Waimakariri District Councils to initiate the development of FDA spatial plans and outline development plans. This will assist to determine the viability and desirability of applying a minimum 15hh/ha net density requirement, or whether alternative densities within each respective FDA are more appropriate.
2. **Address constraints:** Selwyn and Waimakariri District Councils to implement the actions identified to address the constraints and issues (partnerships, investing in 'places', improving planning regulatory and compliance requirements and funding arrangements), based on the FDA structure plans and outline development plans, to enable a minimum net density of 15h/ha to be set for the FDA.
3. **Building the evidence base:** The GCP to integrate the findings of this report with the evidence base being prepared as part of the District Plan Review processes, to implement the Our SPACE Actions and prepare Greater Christchurch 2050. This will provide a clearer understanding of the desirability and feasibility of increasing the minimum net densities and methods for 'activating' higher density developments within the FDA.
4. **Statutory planning - CRPS:** Environment Canterbury, in collaboration with the partner councils and following the completion of the spatial planning, to initiate changes to the CRPS Chapter to increase the minimum net densities within the FDA to 15hh/ha where this is determined to be desirable and feasible.
5. **Statutory planning - Interim density requirements:** The 12hh/ha minimum net densities identified in Our SPACE Action 9.b should be applied alongside this report when considering proposed district plans, and private and council promulgated changes under the Schedule 1 process, on a short-term interim basis until the balance of the recommendations are implemented.

1.0
GLOSSARY OF TERMS

TERM	DEFINITION
CCC	Christchurch City Council
CER	Christchurch Earthquake Recovery Act
CRPS	Canterbury Regional Policy Statement
DPR	Selwyn and Waimakariri District Plan Reviews
FDA	Future Development Areas
GCP	Greater Christchurch Partnership
GPA	Residential 'Greenfield' Priority Areas
GCP PMG	Greater Christchurch Partnership Planning Manager's Group
GCP TWG	Greater Christchurch Partnership Technical Working Group
HBDCA	Housing and Business Capacity Assessment
HDCA	Greater Christchurch Housing Capacity Assessment
HG	Harrison Grierson Consultants Limited
hh/ha	Households per hectare (the residential lot area divided by the number of lots that is calculated as net density unless specified)
LURP	Land Use Recovery Plan
MBIE	Ministry of Business, Innovation and Employment
MfE	Ministry for the Environment
MPI	Ministry for Primary Industries
NPS-UD	National Policy Statement on Urban Development
NPS-UDC	National Policy Statement on Urban Development Capacity
Our SPACE	Our SPACE 2018-2028 Greater Christchurch Settlement Pattern Update
PC1	Proposed Change 1 (PC1) (Chapter 12A)
PIB	Projected Infrastructure Boundary
SDC	Selwyn District Council
RCCZ	Residential Central City Zone
RMDZ	Residential Medium Density Zone
RSDTZ	Residential Suburban Density Transition Zone
UDA	Urban Development Act 2020
UDS	Greater Christchurch Urban Development Strategy and Action Plan
WDC	Waimakariri District Council

2.0 INTRODUCTION

2.1 PROJECT SCOPE

This technical report has been prepared to assist the Greater Christchurch Partnership (the 'GCP') to complete Action 3 of Our SPACE by: firstly, reviewing what minimum densities have been achieved to date in the 'Greenfield Priority Areas' (the 'GPA') and 'Intensification Areas' of Greater Christchurch; secondly, identifying the constraints and issues associated with achieving the minimum densities stated in the Canterbury Regional Policy Statement (the 'CRPS') and district plans; and thirdly, providing actions and recommendations to assist in determining whether any changes to the minimum densities across the 10hh/ha to 15hh/ha range are desirable and achievable across the identified FDA located in the Selwyn and Waimakariri districts. On this last point we note that the 10hh/ha to 15hh/ha density range is currently contained in the CRPS and represented within the current settlement pattern and related planning frameworks, which may change following the Greater Christchurch 2050 review.

The recommendations of this report provide a basis for preparing growth strategies, spatial plans, and non-statutory measures to 'activate' higher density development beyond what is currently provided for in the Our SPACE settlement pattern, the CRPS and the district plans. This report also contains targeted evidence on the optimal 'greenfield' densities within the FDA as part of the Selwyn and Waimakariri District Plan Reviews (the 'DPR') and the Environment Canterbury review of the CRPS scheduled for 2022 pending any changes to the Greater Christchurch settlement pattern.

Key learnings are documented in each chapter, which combine to inform the actions and recommendations in **Section 8.0**.

Image 1: Longhurst subdivision development works, Halswell
Source: https://www.stuff.co.nz

Image 2: 'Green space' corridor within the Faringdon subdivision, Rolleston
Source: Kamo Marsh Landscape Architects

2.2 REPORT PREPARATION PROCESS

HG's project team prepared this technical report with input from members of the Greater Christchurch Partnerships Planning Manager's Group (the 'GCP PMG') and the Officer Technical Working Group (the 'GCP TWG').

All information sources are referenced within the report and in **Appendix 1: Bibliography**.

Section 9.0 establishes that this report has been "noted" by the GCP and can now inform Resource Management Act 1991 (the 'RMA') section 32 evaluations to consider changes to the statutory planning instruments that manage minimum densities across Greater Christchurch. The findings may also assist the Greater Christchurch 2050 settlement pattern review and the

preparation of 'greenfield' spatial plans and other non-statutory approaches for optimising development densities.

2.3 REPORT LIMITATIONS

2.3.1 LIMITATIONS

The following limitations associated with the information contained in this report should be noted:

- **Data and research** - The uptake data and research were provided by the GCP in June 2020 and represents the most contemporary information available at the time.
- **Dynamic nature of the property sector** - Evaluating the multitude of factors that influence the property sector and housing density is dynamic and constantly evolving.
- **National policy and legislative change and reforms** - The Ministry for the Environment (the 'MfE'), Ministry for Primary Industries (the 'MPI') and Ministry of Business, Innovation and Employment (the 'MBIE') have initiated, or are signalling, substantial changes to the national policy and legislation that directs and manages land development and resource management in New Zealand[1].

  These changes once formalised may have a direct and potentially significant influence on the recommendations in this report, including the options for realising the desired outcomes addressing the identified issues and constraints.
- **Impacts and responses to COVID19 on the property and resource management sectors** - The ongoing containment of, and recovery from, the COVID19 global pandemic will have unprecedented effects on population and net migration. Atypical government assistance programmes to assist people to retain or acquire homes or accommodation and 'fast track' consenting processes have already been implemented as immediate responses to the pandemic. The pandemic may have a lasting influence on people's housing preferences and working remotely from home more regularly.
- **Density outcomes analysis** - The conclusions reached have been based on observations and trends within seven case studies that represents a limited sample size to ascertain trends and to test the sensitivity of the methodologies that have been applied.
- **GCP evidence base** - Any analysis that has been undertaken by the Partner Council's to evaluate the appropriateness of housing densities, including through the preparatory work for the proposed changes to the CRPS and DPRs, will need to be considered alongside the findings and recommendations of this report.

2.3.2 LIABILITY STATEMENT

No responsibility is accepted by Harrison Grierson Consultants Limited ('HG') or its directors, servants, agents, staff, or employees for the accuracy of information provided by third parties and/or the use of any part of this report in any other context or for any other purposes.

[1] Examples include RMA Reforms and review of the resource management system, proposed National Policy Statements on Indigenous Biodiversity and Highly Productive Land, Urban Development Authorities and COVID19 Recovery (Fast Track Consenting) Act 2020.

3.0 MANAGING DENSITY IN GREATER CHRISTCHURCH

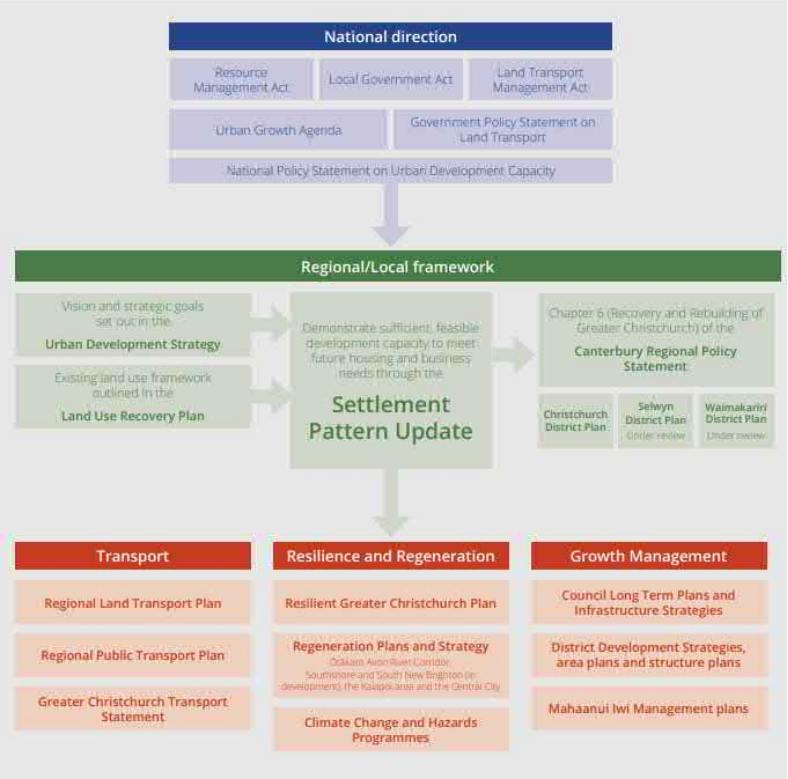
3.1 OVERVIEW

The GCP has been actively managing residential densities to achieve a broad range of social, economic, environmental, and cultural outcomes, which have evolved from, and been implemented through the following key statutory and non-statutory initiatives:

- National Policy Statement on Urban Development (the 'NPS-UD') and its predecessor the National Policy Statement on Urban Development Capacity (the 'NPS-UDC').
- Greater Christchurch Settlement Pattern Update: Our SPACE 2018-2048 ('Our SPACE').
- Housing Development Capacity Assessment (the 'HDCA').
- Greater Christchurch Urban Development Strategy 2007, Updated Action plan 2010 and Strategy Update 2016 (the 'UDS').
- Mahaanui Iwi Management Plan 2013 (the 'Mahaanui IMP').
- Chapter 6 of the CRPS, including the proposed Change in 2020 and the review scheduled to commence in 2022.

Figure 1[2] illustrates how the various national, regional, sub-regional and district-based policies and strategies interact to support housing sufficiency and manage minimum densities across Greater Christchurch.

Figure 1: Planning context



Source: Figure 6 of Our Space 2018-2048 Greater Christchurch Settlement Pattern Update

[2] Figure 1 references the NPS-UDC, which has been replaced by the NPS-UD.

The following section summarises the objectives and policies in the CRPS and the Actions contained in Our Space that are specifically relevant to the evaluation of the minimum net densities that are applied to manage residential 'greenfield' development across Greater Christchurch.

A more detailed summary of the planning instruments and spatial plans for managing urban growth and residential densities in Greater Christchurch is provide in **Appendix 2: Managing urban growth in Greater Christchurch**.

3.2 CANTERBURY REGIONAL POLICY STATEMENT

The CRPS sets the framework for managing urban growth throughout the Canterbury region. Chapter 6 of the CRPS – Recovery and Rebuilding of Greater Christchurch applies to the metropolitan urban area of Greater Christchurch that is illustrated in **Appendix 3: Greater Christchurch 'High Growth Area' map**. It provides a resource management framework to enable and support the earthquake recovery and rebuilding of Greater Christchurch through to 2028.

3.2.1 RELEVANT POLICIES

The following objectives and policies are specifically relevant to evaluating what outcomes, issues and constraints could occur as a consequence of changes to the minimum average net household densities[3]:

- **Objective 6.2.2 Urban form and settlement pattern** - Promotes the consolidation and intensification of urban areas, including by: (a) achieving a proportion of growth through intensification; and (b) providing higher density living environments in targeted locations.
- **Objective 6.2.3 Sustainability** - Deliver quality living environments that incorporate good urban design, provides a range of densities, and uses that are environmentally sustainable.
- **Policy 6.3.1 Development within Greater Christchurch** - Enables the development of existing urban areas, intensification in appropriate locations and within the identified GPA.
- **Policy 6.3.2 Development form and urban design** - Sets the principles of good urban design, including: Tūrangawaewae (sense of place and belonging), integration, connectivity, safety, choice and diversity, environmentally sustainable design, and creativity and innovation.
- **Policy 6.3.7 Residential location, yield, and intensification** - Sets the minimum density requirements for the locations listed in **Table 1**, and requiring a range of lot sizes, densities, and appropriate development controls to support more intensive developments in the specified locations (GPA, intensification areas and 'brownfield' development).

TABLE 1: CRPS - MINIMUM NET DENSITIES

LOCATION	MINIMUM NET DENSITY
'GREENFIELD' PRIORITY AREA (GPA)	
CCC GPA	15hh/ha
SDC GPA	10hh/ha
WDC GPA	10hh/ha
INTENSIFICATION AREAS	
CCC - Central City	50hh/ha
CCC - Residential Medium Density Zone	30hh/ha

The minimum net densities are a method for delivering a range of 'bottom lines' covering land supply within an urban growth 'containment boundary', integrated transport and mode shift, coordinated services, and the management of resources and reverse sensitivity effects.

[3] Refer to **Appendix 2** and **Appendix 4** for a more comprehensive summary of the CRPS and the related objectives and policies.

Map A is included in **Appendix 5: CRPS Chapter 6 - Map A 'Greenfield' Priority Areas** and identifies the existing urban areas and priority areas for housing and business development in Greater Christchurch.

3.2.2 DEFINING NET DENSITY

CRPS Chapter 6 defines 'net density' as:

> *"…the number of lots or household units per hectare (whichever is the greater).*
>
> *The area (ha) includes land for:*
>
> - *Residential purposes, including all open space and on-site parking associated with residential development.*
> - *Local roads and roading corridors, including pedestrian and cycle ways, but excluding State Highways and major arterial roads.*
> - *Local (neighbourhood) reserves.*
>
> *The area (ha) excludes land that is:*
>
> - *Stormwater retention and treatment areas.*
> - *Geotechnically constrained (such as land subject to subsidence or inundation).*
> - *Set aside to protect significant ecological, cultural, historic heritage or landscape values.*
> - *Set aside for esplanade reserves or access strips that form part of a larger regional or sub-regional reserve network.*
> - *For local community services and retail facilities, or for schools, hospitals, or other district, regional or sub-regional facilities."*

The definition of '*Greenfield Priority Area*' is directly linked to the locations illustrated in CRPS Map A, which covers both business and residential development typologies.

The respective district plans include relevant objectives, policies, and methods (that include subdivision and land use rules, outline development plans and design guides), to "give effect" to Chapter 6 of the CRPS.

There is no standardised measure of what defines 'higher density' development in New Zealand (refer to **Section 6.3.2**). This report makes specific reference to higher densities in the context of the district plan and regional policy statement density controls, where any increase in the 12hh/ha minimum net densities that Our SPACE currently applies to the FDA are acknowledged as higher density development when compared to what currently prevails. Densities in the range of 15hh/ha are still not considered to be "high". Development densities in a metropolitan centre, including Christchurch City, will be significantly higher than what would be anticipated within a satellite town that forms part of a polycentric sub-regional settlement pattern. Therefore, this report also generally references any increase in the current densities prescribed in planning instruments as 'higher density' to build the evidence base for preparing spatial plans and policy development processes.

3.3 GREATER CHRISTCHURCH SETTLEMENT PATTERN UPDATE - OUR SPACE

Our Space is a non-statutory 'future development strategy' prepared by the GCP to meet the requirements of the National Policy Statement on Urban Development Capacity (the 'NPS-UDC'), which continues to be a requirement under the National Policy Statement on Urban Development (the 'NPS-UD').

Action 3 of Our Space identifies that an evaluation is required to determine the appropriateness of the existing minimum densities in the CRPS for each council and that: (a) the densities achieved to date are reviewed; (b) the constraints and issues in achieving the minimum densities are identified; and (c) a determination made on whether it is desirable and

achieve to change the minimum densities in the FDA in Waimakariri and Selwyn districts[4] (refer to **Appendix 2 - Figure iii**).

This technical report will assist to determine the optimal densities to be applied to the FDA within the range of 10hh/ha to 15hh/ha. An increase in the minimum densities to 12hh/ha would enable 1,850 additional households to be established in the FDA or 4,600 additional households at 15hh/ha[5] (as illustrated in **Section 4.1 - Figure 4: Residential GPA and FDA locations** and **Appendix 6: GCP Future Development Area locations**)[6].

The CRPS Chapter 6 does not specify a density requirement for the FDA. This will be determined as part of the full review of the CRPS and the Selwyn and Waimakariri DPR's. Until this work is complete, Action 9.b. of Our Space requires the structure planning to be undertaken by SDC and WDC within FDA should achieve a net minimum density of 12hh/ha[7].

Greater Christchurch 2050

The GCP have also agreed to prioritise the development of Greater Christchurch 2050 ('GC2050') that sets a vision and plan for Greater Christchurch to achieve intergenerational wellbeing[8].

The focus for the Greater Christchurch Partnership for the next 12 months is to:

- Develop GC2050 by setting a vision and plan for Greater Christchurch to achieve intergenerational wellbeing that also responds to climate change, and moving towards a zero-carbon economy, noting the opportunity to reset that responding to COVID-19 provides.
- Focus on the partnership with Central Government, alignment with Central Government's Urban Growth Agenda, key policies driving investment, and advocacy on behalf of Greater Christchurch.
- Strengthen the partnership with Mana Whenua and Iwi to ensure aspirations and outcomes for Māori are tangibly integrated into strategy and delivery.
- Progress existing Greater Christchurch Partnership commitments, including Our Space actions (including District Plan Reviews, changes to the CRPS, spatial planning and facilitating redevelopment in existing urban areas), maintaining our focus towards a sustainable urban form which aligns land-use and transport, and enables an integrated and efficient public transport system, including mass rapid transit.
- Co-ordinate Greater Christchurch recovery actions, through forums, where needed.

3.4 'HIGH GROWTH' AREA PLANNING FRAMEWORKS

The following summarises the planning approaches that have been employed by three of New Zealand's other 'high growth' areas[9]. The three sub-regions that have been chosen are Auckland, 'Future Proof' Hamilton and 'Smart Growth' Bay of Plenty.

This context is useful as a comparison of how urban development and housing density is managed across other sub-regions. It is also useful background to the case study analysis in **Section 5.3**, which evaluates the density outcomes at the neighbourhood, block, and site scales within a subdivision located in each of these 'high growth' areas.

[4] Our SPACE. Section 6.2 Further work and implementation. Pg.40

[5] Our SPACE. 5.3 Selwyn and Waimakariri towns. Table 5: Density scenarios. Page 28.

[6] Our SPACE. 5.3 Selwyn and Waimakariri towns. Figure 15. Page 29.

[7] Our SPACE. 6.2 Further work and implementation. Pg.41.

[8] Greater Partnership Committee. Agenda Item 5 - GCP: Focus for the next twelve months. 12 June 2020.

[9] As defined as a Tier 1 urban environments and local authorities in the Appendix of the NPS-UD.

3.4.1 AUCKLAND

Planning framework

The primary planning instrument that manages urban growth across Auckland City is the Auckland Unitary Plan (the 'Unitary Plan'), which promotes a quality compact urban form through greater intensification in both existing and new urban areas across the full spectrum of development types.

The Unitary Plan[10] includes a 'Rural Urban Boundary' to manage the outward expansion of the City and a 'composite spatial pattern'[11] that encourages high density and mixed-use housing typologies to promote housing choice, encourage efficient infrastructure servicing and reduce the demand for travel (and to shorten trips)[12].

The following non-statutory spatial planning initiatives have been developed by Auckland Council to manage urban growth, development capacity and housing densities:

- **Auckland Plan 2050** - Long term spatial plan that guide's Auckland's future over the next 30 years to 2050.
- **Place-based plans** - Auckland Council has prepared a range of Area and Centre Plans, Structure Plans and urban transformation plans to implement Auckland Plan 2050[13] .

Achieving the minimum household density requirements in 'greenfield' areas

Household densities vary across spatial locations and proximity to centres, where they range from 40hh/ha to 200hh/ha in the City, City Fringe and Metropolitan Centres, 20hh/ha to 60hh/ha in town centres, local centres, and satellite towns through to 15hh/ha to 30hh/ha for intensive suburban and less than 15hh/ha for traditional suburban[14].

There has been an obvious improvement in the amount of intensive housing typologies that are being developed, including town houses, units and apartments, and a corresponding reduction in the proportion of standalone dwellings being constructed since the Unitary Plan came into effect.

3.4.2 'FUTURE PROOF' WAIKATO

Planning framework

The primary urban growth strategy for managing urban growth across the Waikato sub-region is *He Whakakaupapa Whanaketanga* Future Proof Strategy: Planning for Growth 2017 ('Future Proof'). Future Proof is implemented through the Waikato Regional Policy Statement and the District Plans for Hamilton City, Waikato District and Waipa District. A core guiding principle in Future Proof is to increase densities in new residential development areas and promote the intensive redevelopment of existing urban areas[15]. Future Proof identifies that higher densities and a more compact urban form can support modal shift from private cars to more sustainable modes of transport, while more effectively using land and allowing people to live closer to key urban areas[16].

[10] Auckland Unitary Plan. Chapter B Regional Policy Statement. B2. Urban growth and form.

[11] Auckland Plan 2050. Evidence Report. 4.4.2 2012 Auckland Plan. Page 34.

[12] Auckland Unitary Plan. Chapter G Rural Urban Boundary.

[13] https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/place-based-plans/Pages/default.aspx

[14] Auckland Plan 2050. 1. Priority 1 - Realise quality, compact urban environments. Figure 10.1 Page P245.

[15] Future Proof 2017. 1.3 Guiding Principles. Page 11.

[16] Future Proof 2017. 6.3 Key Targets for the Settlement Pattern. Page 32.

The Waikato Regional Policy Statement[17] includes an 'urban limit' consistent with the Future Proof land use pattern and urban containment policy[18]. It also includes growth and density requirements that apply to the three territorial authorities, with Hamilton City including minimum ratios (50:50) of infill to 'greenfield' development and minimum percentage growth requirements that vary across the townships in the adjoining Waikato and Waipa Districts. The Hamilton-Waikato Metropolitan Spatial Plan proposes an urban environment that is a mix of higher density growth primarily around centres, and growth along key public transport corridors, with increasing densities in greenfield areas. Identify a 50:50 ratio of 'greenfield' to infill/redevelopment[19].

The following non-statutory sub-regional spatial planning initiatives have been developed to implement Future Proof and the related statutory instruments:

- **Hamilton-Waikato Spatial Plan** - Establishes a growth scenario and related actions for how Hamilton City and neighbouring communities within the Waikato and Waipa districts will grow and develop in the next 100 years.
- **Future Proof Housing and Business Development Capacity Assessment 2017** - Prepared to satisfy the objectives and policies of the NPS-UDC.
- **Hamilton Urban Growth Strategy -** Sets out the spatial vision for the city.
- **Hamilton City Council structure plans -** Structure plans have been prepared for 'greenfield' growth areas to coordinate development.
- **Waipa 2050 District Growth Strategy 2017** - Growth management vision that builds upon the 2009 Waipa District Growth Strategy.
- **Waipa District Council structure plans** - High level blueprints for the growth areas identified in the Growth Strategy.
- **Waikato 2070** - Strategy to guide the growth and development of the Waikato District over the next 50 years.
- **Waikato District Council structure plans** - Structure plans and design guides to coordinate long term framework for managing the development of future growth areas.

Achieving minimum household density requirements in 'greenfield' areas

Minimum household density requirements are prescribed in Future Proof[20] and the Regional Policy Statement[21] to manage development in the central city (50hh/a), intensification areas (30hh/ha) and 'greenfield areas (16hh/ha) of Hamilton City and the 'greenfield' growth areas (12hh/a to 15hh/ha) and 'greenfield' village areas in (8hh/a to 10hh/ha) of the Waipa and Waikato District's.

3.4.3 'SMART GROWTH' WESTERN BAY OF PLENTY

Planning framework

The primary strategy for managing urban growth across the Western Bay of Plenty sub-region is The Smart Growth Strategy 2013 ('Smart Growth'). Smart Growth promotes a more compact urban form by establishing urban limits, encouraging higher density in greenfield subdivisions, and identifying potential areas for residential intensification to occur[22].

[17] Waikato Regional Policy Statement. 6. Built Environment. Policy 6.14 and Map 6-2.
[18] Future Proof 2017. A. Future Proof at a Glance. Page 5.
[19] Hamilton-Waikato Metropolitan Spatial Plan. 2.1 The growth scenario. Page 12.
[20] Future Proof 2017. A. Future Proof at a Glance. Page 5.
[21] Waikato Regional Policy Statement. 6. Built Environment. Policy 6.15.
[22] Smart Growth Strategy. 3.2 The Smart Growth Pillars. Page 15.

Smart Growth is implemented through the Bay of Plenty Regional Policy Statement and the District Plans for Tauranga City and Western Bay of Plenty District to deliver a compact settlement pattern by requiring urban growth to be concentrated in key growth areas and corridors to achieve infrastructure efficiencies, avoid productive rural land, and protect important natural areas[23].

The Bay of Plenty Regional Policy Statement contains an 'urban limit' to implement the Smart Growth land use pattern along with development sequencing in identified Urban Growth Areas and an urban containment policy [24]. The Regional Policy Statement includes growth and density requirements for the two territorial authorities to implement, with average net densities of 12hh/ha from 1 July 2012 rising progressively to 15hh/ha by 1 July 2037 for 'greenfield' Urban Growth Areas[25].

The following non-statutory sub-regional spatial planning initiatives have been developed by the Smart Growth partners to deliver the Smart Growth Strategy 2013:

- **Proposed Smart Growth Future Development Strategy** - Long term spatial plan and implementation programme.
- **Urban Form and Transport Initiative Report** - Outlines an optimal future land use and transport programme for the Western Bay of Plenty sub-region.
- **Smart Growth Housing and Business Development Capacity Assessment 2017** - Prepared to satisfy the objectives and policies of the NPS-UDC.
- **Proposed Tauranga Urban Strategy 2050** - Long term spatial plan and implementation programme for Tauranga City.
- **Tauranga City Council structure plans** - Structure plans to coordinate the development of 'greenfield' growth areas.
- **Western Bay of Plenty District Council** - Location specific urban growth strategies and structure plans to implement the Smart Growth Strategy and coordinate urban growth.

Achieving minimum household density requirements in 'greenfield' areas

The household densities vary across spatial locations and proximity to centres. The suburban residential 'greenfield densities' as they apply to satellite towns are typically between 8hh/ha to 15hh/ha. The density requirements progressively range from between 25hh/ha to 200hh/ha in high to medium density urban areas and City Centres (terraced housing to high rise apartments) through to 10hh/ha to 20hh/ha in medium to low density areas (units/duplexes to conventional suburban homes)[26].

[23] Smart Growth Strategy. 5 Operating Environment. Page 31.

[24] Western Bay of Plenty Regional Policy Statement. Policies UG 5A (urban limits), Policy UG 6A (growth sequencing), Appendix C, Appendix D and Appendix E

[25] Western Bay of Plenty Regional Policy Statement. Policy UG4A (residential yields)

[26] Smart Growth 2013. Residential Development Types in the Western Bay of Plenty. Page 106.

3.5 KEY LEARNINGS - GCP AND HIGH GROWTH' AREA PLANNING FRAMEWORKS

TABLE 2: KEY LEARNINGS - GCP AND 'HIGH GROWTH' AREA PLANNING FRAMEWORKS
The GCP and the 'high growth' areas that have been reviewed have all:
1. Prepared comprehensive and contemporary urban growth strategies that apply 'smart growth' movement urban consolidation principles to achieve the positive outcomes and efficiencies of consolidated settlement patterns.
2. Satisfied the requirements of the NPS-UDC in respect to preparing sub-regional future development strategies and housing and business capacity assessments.
3. Incorporated objectives and policies into regional policy statements and district plans to implement the sub-regional growth strategies.
4. Actively managed settlement patterns through urban containment boundaries that are supported by objectives, policies, and rules.
5. Prepared district-wide and location specific spatial plans, strategies, design guides and infrastructure strategies to enable and coordinate the development of 'greenfield' growth areas.
6. Actively managed housing densities through planning provisions and non-statutory strategies that vary across locational contexts, consistent with the housing demand profiles and settlement patterns contained in the sub-regional urban growth strategies.
7. The densities that are applied to the suburban 'greenfield' areas in the 'high growth' areas are typically between the 8hh/ha to 15hh/ha, that progressively increase based on whether they are 'greenfield' or intensification areas, locational attributes, and proximity to centres to as high as 200hh/ha in Auckland's central business district.

4.0
GREATER CHRISTCHURCH DENSITY UPTAKE, ISSUES AND CONSTRAINTS

4.1 THE GCP 'GREENFIELD' PRIORITY AND INTENSIFICATION AREAS

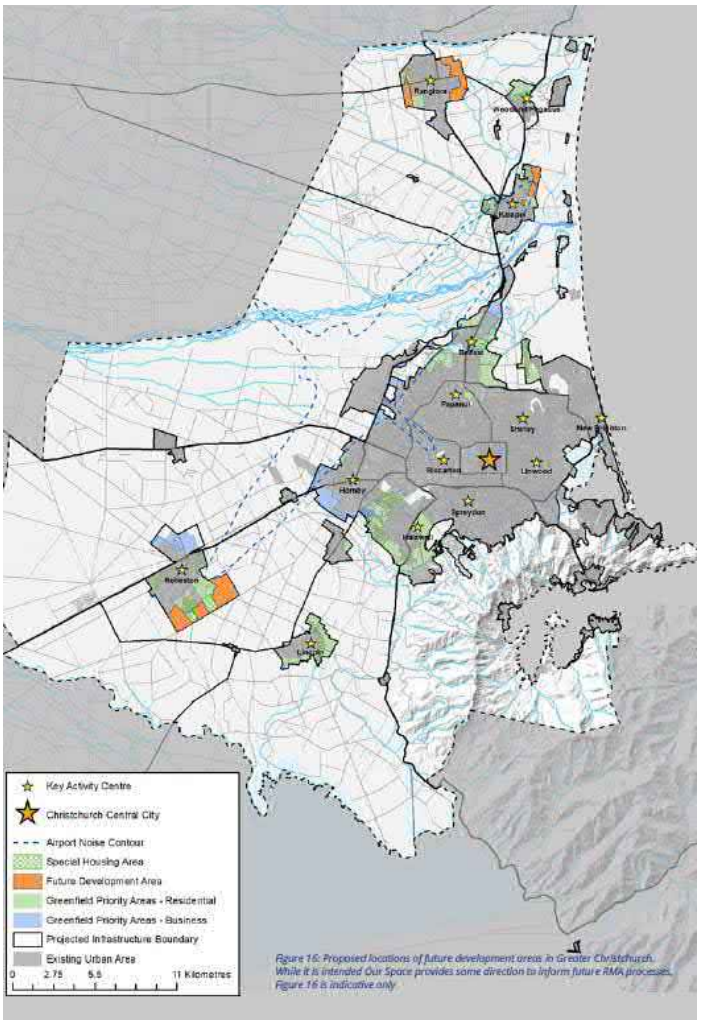
The analysis in this report has been targeted to the GPA[27] and the FDA illustrated in Figure 2 and focuses on outcomes, issues, and constraints across the 10hh/ha to 15hh/ha density spectrum[28]. The FDA are illustrated in more detail in Appendix 6: GCP Future Development Area locations.

More detailed maps of the GPA located in each of the council jurisdictions are provided in Appendix 7: GCP 'Greenfield Priority Area' maps.

These cover the GPA in the northern, southern, and western areas of Christchurch City, Rolleston and Lincoln in Selwyn District and Rangiora, Kaiapoi and Pegasus in Waimakariri District.

The residential Intensification Areas within Christchurch City that are outlined in Section 4.4 below and cover the Residential City Centre Zone, Residential Medium Density Zone, and the Residential Suburban Density Transitional Zone of the Christchurch District Plan.

Figure 2: Residential GPA and FDA locations



Source: Figure 16 of Our Space 2018-2048 Greater Christchurch Settlement Pattern Update

[27] The 'Greenfield Priority Areas - Residential correspond with the 'Greenfield Priority Areas' illustrated in Map A of CRPS Chapter 6 - Refer to Appendix 3: Greater Christchurch 'High Growth Area' map.

[28] The Our SPACE Action 3 and the Request for Service issued by the GCP required the analysis to focus on the 10 to 15hh/ha spectrum of minimum net densities and the GPA and FDA geographic areas, although this report does provide some high-level direction on how higher net densities may provide further opportunities to meet the outcomes prescribed in the CRPS Chapter 6 and Our SPACE.

4.2 DEFINING NET DENSITY AND CALCULATING HOUSEHOLD UPTAKE

The net density uptake analysis incorporates information provided by the GCP summarises the development that has been achieved in the Greater Christchurch residential 'greenfield' and intensification areas up to 30 June 2020.

The CRPS Chapter 6 definition of 'net density' that is detailed in **Section 3.2.2** above has been used to calculate the household uptake data. **Appendix 10: Density uptake calculations - Methodology and limitations** provides a more detailed breakdown of the methodology that was applied and outlines the associated limitations.

We emphasise that this is a point in time review where there is a relatively large amount of GPA land to be developed before a final determination can be made in respect to whether the minimum net densities have been achieved. A conservative approach has been taken in the methodology for collecting the housing uptake data that excludes comprehensive high-density developments, such as retirement villages, from the dataset. There will also be a broad range of market factors, land development, landowner/developer circumstances and purchaser preferences that influence why the actual density yields are higher than the calculated averages achieved in the Christchurch, Selwyn and Waimakariri GPA to date[29].

4.3 GCP RESIDENTIAL GPA UPTAKE DATA

4.3.1 GPA DENSITY UPTAKE AND MINIMUM REQUIREMENTS

The following analysis of the housing yields that have been achieved to date across the GPA over the past decade provides some insights into what factors and trends may be influencing the delivery of the minimum net densities prescribed in CRPS Chapter 6. Reference should be made to the more detailed economic modelling of the plan enable capacity contained in the GCP Housing Development Capacity Assessment under the NPS-UDC[30] and continues to be undertaken by the GCP to monitor housing development capacity.

The density uptake data that has been achieved in the locations illustrated in **Figure 4** (and CRPS Chapter 6 Map A in **Appendix 5**) above are detailed in **Appendix 8: GCP 'Greenfield' Priority Area uptake data**.

4.3.2 GPA SIZE, SCALE, AND LOCATIONAL DISTRIBUTION

Close to half (1,2987ha of the total 2,795.7ha) of the GPA land that was allocated under the UDS and included in CRPS Map A is within the CCC territorial authority boundary, with the remaining 1,497ha being split between Selwyn (878.2ha) and Waimakariri Districts (618.8ha). The size of the GPA located in each of the three territorial authorities is based on the proportional share of 'greenfield' land that was allocated under the Urban Development Strategy (UDS). Other spatial planning initiatives, including the Christchurch City Council's Area Plans, determined the suitability of the 'greenfield' areas for inclusion within the UDS. **Figure 2** illustrates that the GPA are predominantly located on the northern and south-western edge of Christchurch City and on the periphery of the primary townships within Selwyn and Waimakariri District's. These were determined to be the most appropriate locations following the UDS Enquiry by Design process.

The GPA have generally been available to subdivide and develop since December 2013 when Chapter 6 CRPS was inserted under the LURP, although development uptake has been

[29] EMS Ltd. August 2015. Page 50 and City Scope. Jun2011. Page i.

[30] Housing Capacity Assessment: Report 2 - Plan Enabled Capacity, March 2018. Page 139.

influenced by the timing of the district plan zoning that has occurred through private and council-initiated changes and District Plan Reviews[31].

4.3.3 NET HOUSEHOLD DENSITIES

A broad range of average net densities have been delivered to date across the Christchurch City's 18 GPA. Of the 18 GPA where development has commenced, there are seven with average densities ranging between 15hh/ha 19hh/ha that are tracking above the 15hh/ha minimum. Seven of the GPA are tracking below this threshold but generally consistent with the densities established through Schedule 1 plan change processes, with average densities currently ranging between 14.9hh/ha to 12.4hh/ha.

The highest average net densities are being achieved in the Riccarton Racecourse GPA (19hh/ha) in the Western ODP area, which also include the South Masham (16.8hh/ha) and (Yaldhurst (15.4hh/ha) GPA that are also delivering densities well above the minimum 15hh/ha. The lowest average GPA densities are being achieved at Prestons (12.4hh/ha), although this exceeds the minimum 12hh/ha set for this GPA through the Schedule 1 plan change process.

Image 3: Aerial photograph of the Wigram Skies subdivision, Christchurch City
Source: Christchurch City Council, Newsline publication, 25 September 2019

There are also a broad range of net densities being delivered in the Selwyn District GPA. Of the 17 GPA where development has commenced, there are 12 with average densities ranging between 10.1hh/ha to 14.1hh/ha that are tracking above the 10hh/ha minimum. Five of the GPA are tracking below this threshold, with average densities ranging between 9.9hh/ha to 6.3hh/ha.

The highest average density yields are being achieved in Rolleston Area 7 (14.1hh/ha). Rolleston's close proximity to the Southern Motorway and the industrial parks and price points could be an influencing factor as to why the uptake and household densities being achieved are stronger than the other two townships containing GPA in Selwyn District. The lowest average densities are being delivered in Lincoln Area 4 (6.3hh/ha), which may be influenced by the high-water table, stormwater management requirements or market preferences but also because a 47-unit lifestyle villa has been excluded from the density calculations.

The average net densities being achieved in the GPA of Waimakariri District have all exceeded the minimum 10hh/ha minimum, with the Silverstream GPA currently tracking at 16.1hh/ha

[31] This includes the zoning of the 'greenfield' land through the Christchurch District Plan Review process, that enabled some rule-based development constraints to be removed and the Highfield and Prestons areas to be added in response to the earthquakes and the loss of homes.

and Beachgrove GPA at 15.8hh/ha. Of note is that the uptake data suggests that the flood risk and geotechnical constraints conditions in Kaiapoi in particular do not appear to be having a negative influence on developer's choosing to invest in these locations or market preferences or in delivering higher density developments.

4.3.4 GPA DEVELOPMENT UPTAKE TRENDS

The highest average percentage of GPA land that has been developed at the district level is in Waimakariri District, with four of the six Rangiora GPA having been 100% completed and three of the six Kaiapoi GPA being over 80% completed.

There is variation in the percentage completion rates in Selwyn District's GPA, with four of the GPA having been 100% completed, four that are 70% to 96% completed, and eight that are between 58% and 30% completed. The completion rates are much lower in Lincoln (all the GPA are below 58% developed) when compared to Rolleston (two GPA below 75% developed) and Prebbleton (one GPA below 72% developed). There are no GPA in Christchurch City that have been 100% completed, with only three GPA having been 70% or more completed in July 2020.

At a broad level, the uptake data suggests that the 'greenfield' development of the GPA in Christchurch City in particular has been slower on average when compared to the Waimakariri District GPA. The size of the GPA and the number of allotments that are required to be consented and developed will have a direct influence on the time it takes to fully develop the subdivision. As with other measures, there will be a broad range of influences why land has been developed quicker in some areas and why uptake may not be as strong in other settlements and 'greenfield' areas.

Four of the 18 GPA in Christchurch City remain undeveloped. This equates to 176ha of 'greenfield' areas that are available to develop, which is a relatively small proportion of the available 'greenfield' land (1,298.7ha). Three of these are located in the Northern ODP Area (East Papanui, Highfield, and Upper Styx), while the remaining undeveloped location is the South Halswell in the Eastern ODP Area ODP Area. There is also relatively low uptake in the Northern ODP areas, with the exception of the Prestons GPA (71%).

It is unclear what has influenced the landowners from developing the 'shovel ready' land for housing, but there do not appear to be any wider level locational or planning related constraints as other areas in relatively close proximity to these GPA have been developed. The Canterbury Earthquakes had a significant influence on the uptake of the GPA in Greater Christchurch, with development accelerating in the west of the City and within the satellite towns. This was a result of a number of factors, including developer readiness, land conditions and market preferences.

The Rolleston and Prebbleton GPA areas have the highest average percentage of development uptake in Selwyn District. Less than half of the Lincoln GPA have been developed, with the range varying across the five GPA (from 30% through to 58% completed on average). Three of the 10 GPA in Rolleston have been fully developed to densities of 12.5hh/ha, 11.6hh/ha and 9.9hh/ha, respectively. There are two GPA in Rolleston that have not been developed at this point, but they represent a relatively small area of land at 16.6ha of the 489ha of GPA land in the township.

The average percentage of 'greenfield' land that has been completed across the six Rangiora GPA is the highest in Greater Christchurch when averaged across the identified spatial areas, with four of the five GPA having been completely developed. The Arlington and Silverstream subdivisions have been developed to average densities of 16.7hh/ha and 16.1hh/ha, which are some of the highest net density yields across the sub-region achieved to date. Development uptake in the Kaiapoi GPA has also been strong to date.

Image 4: Aerial photograph of the Silverstream subdivision, Kaiapoi
Source: https://silverstreamestate.co.nz/

There is insufficient evidence in the uptake data to determine whether planning processes, locational constraints, market influences or landowner/developer preferences are influencing the release and development of the available 'greenfield' land.

One observation is that developers do not appear to be leaving the development and release of higher density areas towards the end of the subdivision as a way to reduce financial risk. This is illustrated by the following GPA that are at a relatively early stage of development but are delivering average net densities that are higher than the minimum's prescribed in the CRPS - Beachgrove, Kaiapoi at 15.8hh/ha with 59% uptake, Prebbleton 4 at 13.3hh/ha with 57% uptake, and South Masham at 16.8hh/ha at 18%. However, there are also examples where consenting processes have been pursued by developers to enable densities to be varied due to the lack of interest and slow uptake of higher density typologies towards the later phases of the subdivision process.

4.3.5 AVERAGE SECTION SIZES

The obvious correlation between an increase in average minimum net densities and a decrease in average lot sizes is illustrated in Table 3, which summarises the average net densities that have been achieved in the GPA against the average section size where there is measurable data available.

TABLE 3: GCP RESIDENTIAL GPA UPTAKE DATA - NET DENSITY AND AVERAGE SECTION SIZE, JULY 2020

NET DENSITY RANGE	NO. OF GPA IN THE DENSITY RANGE	AVERAGE HH/HA IN THE RANGE	AVERAGE LOT SIZE
9-9.9hh/ha	3	9.6	739m^2
10-10.9hh/ha	11	10.5	700m^2
11-11.9hh/ha	3	11.5	561m^2
12-12.9hh/ha	4	12.5	578m^2
13-13.9hh/ha	3	13.5	527m^2
14-14.9hh/ha	8	14.6	567m^2
15-15.9hh/ha	4	15.4	513m^2

The most common minimum net densities developed to date are within the 10 to 10.9hh/ha (11 GPA) and 14 to 14.9hh/ha (8 GPA) range, which apply to close to half of the 36 GPA where there was measurable data available.

It is noted that the more intensive subdivisions are likely to be containing a range of section sizes but continuing to provide relatively large sections to accommodate standalone dwellings. This is because the average section size in the 15hh/ha to 15.9hh/ha range is still providing for average section sizes of 513m^2. There is also a relatively even spread of average lot sizes, ranging from between 578m^2 to 513m^2 over 1hh/ha to 15.9hh/ha density spectrum. This trend suggests that section sizes appear to be staying within a range that meets housing preferences and optimise land development processes.

4.4 DENSITY UPTAKE IN THE CHRISTCHURCH CITY INTENSIFICATION AREAS

4.4.1 CCC RESIDENTIAL INTENSIFICATION AREA UPTAKE DATA

The density uptake data for the Christchurch City Intensification Areas is detailed in **Appendix 9: Christchurch City Intensification Area uptake data**.

The location and spatial distribution of the Intensification Areas, which are comprised of the Residential Central City Zone (RCCZ), Residential Medium Density Zone (RMDZ), and the - Residential Suburban Density Transition Zone (RSDTZ), are illustrated in the Christchurch District Plan - Planning Maps[32]. The methodology that has been applied to gather the Intensification Area uptake data and the limitations associated with it are contained in **Appendix 10**.

The following analysis of the housing yields that have been achieved to date across the Christchurch City Intensification Areas provide some insights into what factors and trends may be influencing the delivery of the minimum net densities prescribed in CRPS Chapter 6. There is a more detailed analysis of the available capacity within the Intensification Areas contained in the HDCA, which also provides relevant information on projected uptake across the City[33].

4.4.2 INTENSIFICATION AREA SCALE AND DISTRIBUTION

The large majority of opportunities for intensification are within the RMDZ and the RSDTZ, with four areas of the 112 locations being within the RCCZ. The RMDZ and RSDTZ are spatially distributed across the City to support the redevelopment and intensification of existing multiple land parcels as comprehensive developments to support the centre's-based policies. The RSDTZ is generally located between the medium density area surrounding the City Centre and the Suburban Zone, or near Key Activity Centres.

4.4.3 AVERAGE NET DENSITIES ACHIEVED

The average net densities that have been achieved up to July 2020 in the four Intensification Areas that comprise the RCCZ range between 38.1hh/ha in Christchurch Central West and 46.4hh/ha in Christchurch Central East. Density uptake to date is tracking lower than the minimum of 50hh/ha. This is likely to be influenced by the progressive development of anchor projects and delivery of the Christchurch Central City Recovery Plan, which is being implemented by a range of government and local agencies and the development sector. It also highlights the challenges in undertaking comprehensive developments that often require sites to be amalgamated.

The average net densities that have been achieved up to July 2020 in the 57 Intensification Areas that comprise the RMDZ range between 0.3hh/ha in Tower Junction and 40.3hh/ha in

[32] Christchurch District Plan

[33] Greater-Christchurch-Housing-Capacity-Assessment-reports-1-4.pdf

Northwood. In total, 37 of the RMDZ Intensification Areas are tracking below the minimum of 30hh/ha. On face value this signals that the development sector may be facing challenges in intensifying and redeveloping residential land or that the market may still prefer alternative lower density housing options. The data available for this analysis also does not identify the area of land that is covered by the RMDZ or the percentage of development that has been achieved to date, which may provide more insight into uptake trends.

The average net densities that have been achieved up to July 2020 in the 51 Intensification Areas that comprise the RSDTZ range between 0.7hh/ha in Tower Junction to 60.3hh/ha in Riccarton Central. It is emphasised that Towner Junction is a predominantly industrial and commercial area where the availability of land for residential redevelopment is limited. The RSDTZ is achieving minimum net densities that are well in excess of the 15hh/ha that apply to the Christchurch GPA with 46 of the 51 RSDTZ Intensification Areas tracking above these densities. There are also three RSDTZ development areas tracking significantly above the 30hh/ha minimum densities that are required to be delivered across the City's RMDZ (Wharenui at 52.9hh/ha, Woolston East at 60.3hh/ha and Woolston South 81.9hh/ha).

Although the analysis includes a very narrow range of data and there will be a broad range of factors influencing the uptake of the Intensification Areas, there appears to be challenges in delivering the minimum net densities across the identified Intensification Areas when compared to the uptake that is being achieved across the GPA. This is consistent with the GCP HDCA prepared under the NPS-UDC, where it was determined that 75% of housing growth was occurring on 'greenfield' land in 2017[34]. In comparison, Our SPACE identifies that intensification accounts for 45% of the identified feasible development capacity necessary to meet projected housing demand[35].

CCC provided some additional insights into the factors that have influenced the uptake of the Intensification Areas, these include that: (a) comparatively low levels of infrastructure investment and other related incentives have been targeted to the Intensification Areas when compared to the GPA; (b) the availability of the GPA has also contributed to an easing in the demand for intensification and redevelopment; (c) locational attributes, including the age of the buildings, land values and the availability of local services and attractions, also influence the amount of intensification that has occurred at a suburb scale; and (d) the uptake of the Intensification Areas is also anticipated to increase as the District Plan provisions begin to take effect as they have only been in place since 2016.

4.5 DENSITY UPTAKE - CONTRAINTS AND ISSUES

4.5.1 OVERVIEW

This section summarises information provided by the GCP on the actual and likely availability of development infrastructure to service the existing densities within the GPA across Greater Christchurch and whether there are any constraints or issues that may have hindered the delivery of the CRPS Chapter 6 minimum average net densities.

It confirms that findings of the GCP HDCA prepared under the NPS-UDC that there are no wastewater, water, stormwater, or transport infrastructure constraints that would preclude all of the identified GPA from being included as 'feasible' development capacity[36]. Many of the obvious development constraints and issues that may be a hindrance to achieving the minimum net household densities have already been addressed through spatial planning exercises, subdivision design and factored into the 'net density' definition.

[34] HBDCA Summary, March 2018. Section 3.2, Figure 11. Page 15.

[35] Our SPACE 2018-2018 - Officer's Report. Section 7. 8 February 2019. Page 20.

[36] Housing capacity Assessment. Section 3 Availability of Infrastructure. March 2018. Page 147.

4.5.2 GCP GPA DENSITY CONSTRAINTS AND ISSUES

Infrastructure

There are no known infrastructure constraints. It is understood that all the GPA have network infrastructure that has either been installed or funded in the Council's Long-Term Plan.

Townsend Fields in Rangiora has high groundwater so requires site specific mitigation at each subdivision consent stage. Stormwater is also managed at a site-specific level within some of Selwyn District's and Christchurch City's GPA. The GCP HDCA identified that some wastewater infrastructure upgrades would be required to enabled additional housing capacity, although these applied to the Shirley and Aranui areas that are not GPA[37].

Public transport

There are no public transport constraints.

Open space

There are no open space constraints. The open space provided meets the requirements in the respective council reserve management plans.

4.5.3 OTHER BARRIERS

The GCP HDCA previously identified the following four key barriers to urban development and change across Greater Christchurch[38], which may be influencing the extent to which the minimum net densities are being achieved. These issues are revisited in Section 8.0 of this report in the context of the FDA.

- **Environmental and planning limits on development** - Environmental constraints such as geotechnical hazards, flood risk, Christchurch International Airport noise contours, significant landscapes, sites of significance and the aquifer protection zone.
- **Capacity of infrastructure networks** - There are limited infrastructure constraints to service the existing GPA, but the capacity of the sub-regional land transport network could be a potential issue for future 'greenfield' areas.
- **Development costs and feasibility** - High land values and construction costs reduce the commercial feasibility of new developments in the sub-region, which is likely to be an influencing factor in respect to the proportion of 'greenfield' land that is developed in comparison to redevelopment and intensification.
- **Perceptions and attitudes** - Poor understanding and perceptions of certain typologies of housing, especially for higher density living, can act as a barrier to some types of housing being brought to the market in the sub-region.

[37] Housing capacity Assessment. Section 3 Availability of Infrastructure. March 2018. Page 147.

[38] Housing Capacity Assessment. Report 4 - Key barriers. March 2018. Page 269.

4.6 KEY LEARNINGS - DENSITY UPTAKE AND CONSTRAINTS ANALYSIS

TABLE 4: KEY LEARNINGS - DENSITY UPTAKE AND ISSUES ANALYSIS

NET DENSITY UPTAKE IN THE GCP GPA
8. The overall average net density that has been achieved to date varies across the GPA: Seven of the 18 GPA in Christchurch City are tracking above the 15hh/ha minimum while noting that Schedule 1 processes provided for densities below this requirement, 12 of the 17 GPA in Selwyn District are tracking above the 10hh/ha and all the GPA in Waimakariri District GPA are currently exceeding the 10hh/ha threshold.
9. It is unclear what has influenced the landowners from not developing some of the GPA, but there do not appear to be any wider level locational or planning related constraints Although development has accelerated in the west of the City and within the satellite towns post-earthquake in response to developer readiness, land conditions and market preferences.
10. Developers do not appear to delay the release of higher density areas to the market towards the end of the development cycle to manage financial risk, while noting that there are examples where resource consents have been sought in response to a lack of interest and slow uptake of higher density typologies towards the later phases of the subdivision process.
11. The most common minimum net densities that have been developed to date are within the 10 to 10.9hh/ha and 14 to 14.9hh/ha range.
12. Section sizes appear to be staying within a range that meets housing preferences (relatively large sections to accommodate standalone housing) and optimise land development processes.
13. A determination of how housing typologies vary when net density increases will be important in determining whether there is a tipping point for when duplex or two-storeyed dwellings becomes viable to develop in the GPA (refer to the **Section 5.3** density case study analysis).
14. The growth in 'greenfield' development accelerated following the Canterbury Earthquakes to meet market demand and preferences, but there are trade-offs in respect to where this growth has occurred and the housing densities that are being delivered to the market.
NET DENSITY UPTAKE IN THE CHRISTCHURCH CITY INTENSIFICATION AREAS
15. The average net densities in the Christchurch City RCCZ appears to be tracking lower than the minimum of 50hh/ha. This is attributed to the timing of the central city redevelopment following the Canterbury Earthquakes.
16. The average density uptake in the RMDZ also appears to be tracking lower than the minimum of 30hh/ha. This is attributed to the development sector challenges in intensifying and redeveloping residential land and market preferences. Additional factors include comparatively low levels of infrastructure investment and other related incentives, the availability of the GPA, locational attributes and the Christchurch District Plan provisions having only been in place since 2016.
17. There continues to be challenges in delivering the minimum net densities across the identified Intensification Areas as it is more complex to develop when compared to 'greenfield' development.
INFRASTRUCTURE CONTRAINTS
18. There are no water, wastewater, stormwater, transport, or open space infrastructure constraints identified by the GCP that may be hindering the delivery of the minimum net densities prescribed in the CRPS Chapter 6 for the GPA and Intensification Areas.
ISSUES AND BARRIERS TO ACHIEVING URBAN DEVELOPMENT AND CHANGE - OUR SPACE
19. Environmental and planning limits on development influence the settlement pattern of Greater Christchurch.
20. Pressure on the capacity of the sub-regional transport network is likely to arise with the development additional 'greenfield' land beyond the existing GPA.
21. Development costs and feasibility means that a higher proportion of 'greenfield' land is being developed that intensification and redevelopment of existing zoned land.
22. Poor perceptions and attitudes towards higher density housing typologies can act as a barrier to some types of housing being brought to the market in the sub-region.

5.0
DENSITY OUTCOMES ANALYSIS

5.1 APPROACH FOR EVALUATING DENSITY OUTCOMES

5.1.1 CONTEXT

Achieving the minimum residential density requirements is a relatively small component of a range of techniques in the CRPS Chapter 6 and Our SPACE to achieve the UDS Vision (refer to Appendix 2).

However, it is critical to ensure that the outcomes resulting from a potential increase to the minimum density requirements in the FDA are well understood. This can be achieved through an assessment of what changes are occurring as densities progressively increase over the 10hh/ha to 15hh/ha density range to confirm: (a) the positive outcomes that need to be maintained; and (b) the negative outcomes, risks, and opportunities.

The outcomes evaluation initially includes the findings of a desktop analysis that has been applied at the wider **regional**, **township** and **suburban scales** as they apply to the Greater Christchurch GPA. This analysis focuses on the influence densities have on the outcomes that relate to urban form, land use, infrastructure, and strategic transport networks.

This approach has been adopted as the location of the GPA, and to a lesser extent the FDA, have already been determined to be consistent with:

1. The settlement pattern and urban form in CRPS Map A and Our SPACE.

2. The land use outcomes in terms of avoiding constraints relating to natural hazards and sensitive sites and environments.

3. Satisfying the pre-requisites that land use, infrastructure and transport is integrated and coordinated effectively through spatial planning and funding arrangements.

A more detailed urban design-based outcomes analysis is then undertaken to three GPA in Greater Christchurch and one 'greenfield' development in each 'high growth area' under the jurisdiction of Auckland Council, 'Future Proof' Hamilton and 'Smart Growth' Western Bay of Plenty. The representative cases studies establish what changes are taking place and what outcomes are occurring as densities increase across the 10.3hh/ha to 16.7hh/ha spectrum at the more localised **neighbourhood**, **block**, and **site scales** in respect to liveability, which includes neighbourhood cohesion, amenity, and character outcomes.

Key learnings across these varying scales and locations are included at the conclusion of this section, which assist to inform the viability and feasibility of increasing the minimum net densities in the FDA in Section 8.0.

5.1.2 METHODOLOGY AND LIMITATIONS

The rationale and methodology for determining the positive and negative outcomes across the various density scales is provided in Appendix 11: Density outcomes analysis - Methodology and limitations.

This methodology statement also outlines how a range of attribute criteria for evaluating the positive and negative density outcomes were prioritised to the localised scales following engagement with the GCP. It also lists some limitations in the approach that has been applied.

5.2 REGIONAL, TOWNSHIP AND SUBURB SCALE DENSITY OUTCOMES

As outlined above, the following assessment of the urban form, land use, infrastructure, and strategic transport network density outcomes at the regional, township and suburb scales is limited to a desktop summary of the relevant policy outcomes in CRPS Chapter 6 and expectations in Our SPACE.

5.2.1 URBAN FORM

Context

Map A in CRPS Chapter 6 (**Appendix 5**) represents the current Greater Christchurch settlement pattern and establishes the urban form of Christchurch City and the satellite towns of Rolleston, Lincoln, and Prebbleton in Selwyn District and Rangiora, Kaiapoi and Woodend/Pegasus in Waimakariri District.

Similarly, the locational attributes and urban form outcomes associated with FDA have also been considered through structure planning undertaken by SDC[39] and WDC[40] and in Our SPACE[41] (refer to **Figure 4: Residential GPA and FDA locations** and **Appendix 6: GCP Future Development Area location maps**).

Positive outcomes that should be maintained

The polycentric urban form of Greater Christchurch is consistent with the UDS principle and preferred growth option of consolidating urban development in and around Christchurch City, and the larger towns in Selwyn and Waimakariri district[42].

The progressive development of the Greater Christchurch GPA and Intensification Areas in Christchurch City has to date been generally consistent with the residential density requirements, while retaining the desired consolidated urban form and realising the associated benefits associated with this settlement pattern. This includes providing for efficient transport and locating development in a manner that considers the intergenerational effects relating to increased exposure to natural hazard risks, climate change and sea level rise[43].

Negative outcomes, risks, and opportunities

The Our SPACE special consultative process highlighted that there is increasing pressure for the GCP and its constituent councils to continue to expand beyond the existing GPA, by bringing forward the statutory planning required to enable the FDA to be developed to support housing sufficiency across the sub-region[44]. **Appendix 2** outlines the changes and reviews that are scheduled to occur to ensure that there is enough zoned and serviced land in the CRPS, and district plans to provide sufficient housing capacity.

The recently enacted NPS-UD is also critical in ensuring there is sufficient housing development capacity, with a particular focus on building up as well as out. A further mechanism under the NPS-UD to support housing sufficiency is that local authorities must have particular regard to the appropriateness of additional significant development capacity that is unanticipated or out of sequence within plans where the prescribed pre-requisites are satisfied[45]. The CGP are prioritising changes to include assessment criteria in the CRPS to provide the parameters for evaluating proposals that support the urban form being extended beyond Map A or the Our SPACE FDA. The Partners are also progressing the development of

[39] Selwyn 2031 and structure plans for Rolleston, Lincoln and Prebbleton.
[40] Waimakariri 2048 and Woodend Pegasus Area Strategy 2013.
[41] Our SPACE. 5.3 Selwyn and Waimakariri towns. Page 28.
[42] Our SPACE. 5.1 Greater Christchurch's settlement pattern. Page 23.
[43] Our SPACE. Executive Summary.
[44] Our SPACE. Report and recommendations of the Hearings Panel. Paragraphs 175 to 186. Pages 46 to 48.
[45] NPS-UD. Policy 8 and 3.8 Unanticipated or out of sequence development. Page 16.

GC2050 which will provide the strategic direction to inform Greater Christchurch spatial planning.

One observation that relates to the form and function of townships and suburban centres, particularly but not necessarily exclusively in the townships in Selwyn and Waimakariri Districts, is that the housing densities do not necessarily align with a traditional concentric urban form, where higher densities typically are established next to town centres and local commercial centres and progressively reduce the further from the centre they become. The timing and uptake of the 'greenfield' land has meant that lower densities vary across townships based on character driven policies but are typically 8hh/ha (approximately 800m^2) have been established on the land that is closest to town centres and more established neighbourhood centres. In contrast, the GPA have been developed to densities of a least 10hh/ha on 'greenfield' land that was until relatively recently rural land at the interface with the township (1hh/4ha). Potential poor outcomes resulting from this land use pattern include increased proximity from the everyday services that people need and an increased risk that conflicts could occur at the interface between urban and rural land uses, as densities increase.

These potential urban form issues can be resolved through actively incentivising and enabling the intensification and redevelopment of land located in close proximity to existing commercial centres to achieve a more optimal urban form where more people live closer to the facilities and services that meet their everyday needs[46]. An example of where this has successfully occurred is the intensification and redevelopment of the Living 1B Zone low density zone to a standard residential zone in Rolleston[47]. The reality however is that the ratio of built form to section sizes at 10hh/ha densities limits the ability to intensify development due to the lack of space within sections and it is unlikely to be economically viable and practical to add additional levels (based on the design of foundations and structural framing), or to redevelop to multi-unit duplexes or terraces due to the age of the housing stock.

More specifically, the NPS-UD now requires that Tier 1 territorial authorities review the height and density of the urban form in their planning instruments to realise as much development capacity in locations that are: (a) within the walkable catchments of rapid transit stops; and (b) on the edge of centres; or (c) commensurate to the levels of accessibility to active or public transport to commercial and community services[48].

5.2.2 LAND USE

Context

Housing density is fundamentally linked to land use, both in respect to determining where urban growth is best located and optimising how it is used through appropriate 'greenfield' densities and encouraging intensification and redevelopment within existing urban areas.

The UDS[49], CRPS Chapter 6[50] and more recently Our SPACE[51], took the following matters into account when determining where the GPA are located on land that:

- Avoids constraints, such as, land stability, Groundwater Protection Zone, outstanding natural features landscapes, sites of ecological significance, geotechnical and liquefaction hazard areas, and coastal and flood hazard areas.

[46] PwC. 2020. Page 13.

[47] https://www.selwyn.govt.nz/property-And-building/planning/strategies-and-plans/selwyn-district-plan/plan-changes/operative-plan-changes/plan-change-11-living-1b

[48] NPS-UD. Policy 3. Page 11.

[49] UDS. Section 3.6 Growth management assumptions and Figure 6, Page 27. Section 6 Action Plan, Page 45.

[50] CRPS Chapter 6. All the objectives and policies combine to achieve sustainable land use outcomes.

[51] Our SPACE. 4.1 Key growth issues for Greater Christchurch. 41. Key growth issues doer Greater Christchurch and Figure 10, Page 21.

- Protects and enhance values of importance to Tangata Whenua, indigenous biodiversity, finite versatile soil resource, water quality is protected and enhanced.
- Maintains the character and amenity of rural areas and settlements.
- Provides high quality living environments incorporating good urban design and support a range of densities and land uses.
- Is resilient to the effects of climate change, including sea level rise.
- Enables land development integrates with, and does not adversely affect, strategic infrastructure and other infrastructure and services.

Positive outcomes that should be maintained

The partner councils have included provisions within their respective district plans to manage housing densities to optimise how urban land is used across the sub-region. This includes objectives, policies, rules, and methods that establish a network of activity and neighbourhood centres that complement Christchurch's central city, incorporating mixed-use and transport-oriented development, supporting increased housing density and choice, and providing access to appropriate community facilities. Our SPACE confirms that higher density housing is essential to supporting the needs and preferences of a growing share of the population in respect to an increasing demand for smaller[52], more affordable residential dwellings, and for achieving the consolidated urban form that most effectively accommodates growth[53].

Image 5: Terraced housing, Christchurch City
Source: Selwyn District Council, Medium Density Housing Guide

Image 6: Fletcher Living housing unit concept plan, central Christchurch
Source: www.fletcherliving.co.nz

The housing demand profile for the sub-region is documented in the HDCA and Our SPACE and is illustrated in **Figure 3** on the following page. A primary mechanism for ensuring this occurs is through establishing appropriate minimum household densities in the residential GPA, while enabling intensification and redevelopment.

The GCP HDCA and uptake analysis in **Section 4.2** indicates that the GPA is clearly viable to develop and that the minimum requirements are being exceeded in most locations but lagging in others at this point in time[54]. CCC in particular have encouraged redevelopment and the provision of affordable and social housing through land use zoning and incentives, such as the Community and Enhanced Development Mechanisms[55]. Our SPACE Action 2 has a specific focus on developing an action plan to increase the provision of social and affordable housing to assist in meeting the sub-regions housing demand profile[56].

[52] HDCA. 3.1 Greater Christchurch urban development indicators. Page 20.
[53] Our SPACE. 4.1 Key growth issues for Greater Christchurch. Page 19.
[54] Our SPACE. 4.1 Key growth issues for Greater Christchurch. Page 19.
[55] Housing Capacity Assessment. 6.4 Redevelopment. Page 213.
[56] Our SPACE. 6.2 Further work and implementation, Action 2. Page 40.

Figure 3: Greater Christchurch housing demand profile

Source: Our SPACE. 3.2 Housing. What key factors will influence our future and changing housing demand profile? Page 13.

Negative outcomes, risks, and opportunities

Ultimately trade-offs are made when the appropriateness of rezoning rural land to expand urban environments is determined under the RMA, including a reduction in productive land that is a finite resource, loss of rural amenity, greater demand on resources and increased risk in adverse reverse sensitivity effects, that require future densities to make the most of the 'greenfield' land that is progressively made available.

The availability of significant areas of flat land, with few environmental or infrastructure servicing constraints, and the absence of natural features to contain growth to the north, west, and south-west of the City means that historically lower density 'greenfield' subdivisions have been more economic to develop within Greater Christchurch than the more intensive forms of housing provided in other metropolitan centre's in New Zealand[57].

The uptake of residential growth within the GPA to the south-west of Christchurch City and to Selwyn and Waimakariri District's has been accelerated and influenced by the Canterbury Earthquakes. This has resulted in a higher proportion of growth occurring in 'greenfield' developments rather than the intensification or redevelopment of existing urban areas[58]. There is also evidence to suggest that 'greenfield' development is more economically feasible

[57] HBDCA Summary. 10. Housing and business interactions. Page 36.

[58] Our SPACE. 4.1 Key growth issues for Greater Christchurch. Page 19.

to develop than the redevelopment of 'brownfield' sites[59]. These trends will be a result of a broad range of socio-economic factors but is likely to have been influenced by price points, the timing of when land and housing was available, personal circumstances and market preferences[60].

Figure 4 illustrates that development trade-offs are occurring within different locations and density yields within Greater Christchurch. This emphasises the need to encourage the intensification and redevelopment of existing urban land, which is now a mandatory requirement under the NPS-UD[61].

Figure 4: Greater Christchurch Area density and location trade-offs

Source: HBDCA Summary, March 2018. Section 10, Figure 17. Page 38.

Enabling intensification and redevelopment and evaluate the appropriateness of higher densities within the FDA[62] will also become increasingly important in the context of effectively managing the finite versatile soils resource, given the likely release of a National Policy Statement on Highly Productive Land[63].

Concerns were raised in submissions on Our SPACE in respect to the influence geotechnically constrained land has on development feasibility and achieving the minimum net density yields prescribed in CRPS Chapter 6[64]. The Our SPACE hearings panel concluded that geotechnical constraints do not specifically hinder development feasibility because the definition of 'net density' provides a mechanism for ensuring the yields are met[65].

Another key challenge is increasing the diversity and affordability of homes, which is estimated to become increasingly important in the future[66]. There is an identified demand for smaller homes and the social housing that is currently not being met the public and private sectors, which can be improved by increasing housing densities and better enabling and incentivising the intensification and redevelopment of existing residential land within district

[59] Market Economics. NPS-UDC: Current Feasibility provisions - Discussion Paper. July 2018. Making room for growth - A strategy founded on poor economics. June 2019.

[60] Housing Capacity Assessment. Report 1 - 4. Other influences of housing demand. Page 24.

[61] NPS-UD. Objective 3 and Policies 1, 3 to 5 and 11.

[62] Our SPACE Officer's Report. Appendix F. Page 20.

[63] MfE and MPI. Valuing highly productive land: A discussion document on a proposed national policy statement for highly productive land. August 2019.

[64] Our SPACE Report and recommendations of the Hearings Panel. Geotechnical constraints. Page 33.

[65] Our SPACE Report and recommendations of the Hearings Panel. Geotechnical constraints. Pages 33 to 36.

[66] Our SPACE. 4.1 Key growth issues for Greater Christchurch. Page 19 and HDCA. Report 1: Overview of housing demand. 2.3 Estimated housing demand by typology. Page 16.

plans. There are also opportunities to increase densities to encourage a range of housing options available through the provision of kāinga nohoanga to better meet the needs of mana whenua across the Greater Christchurch sub-region[67].

5.2.3 INFRASTRUCTURE

Context

Infrastructure needs are signalled through spatial planning and zoning processes to enable capital for network upgrades or extensions to be set aside based on locational needs and likely service demands, including the demand based on the household density calculations.

Positive outcomes that should be maintained

The positives of collaborative partnerships, spatial planning and applying methods like outline development plans are that public facilities (public open space, community, and education facilities), three waters (stormwater, water, and wastewater) infrastructure and utility services (power, gas, and telecommunications) are being successfully coordinated across Greater Christchurch to deliver a range of efficiencies.

The GCP HBDCA established that there are no constraints that would hinder the timing of when the GPA could be developed based on the minimum net densities, thereby satisfying the pre-requisites for being 'plan-enabled' capacity[68].

Our SPACE confirms that the redevelopment of existing urban areas to support higher densities and improve the range of housing that is available to meet the needs of the community is typically not constrained by infrastructure[69].

Negative outcomes, risks, and opportunities

There are no negatives outcomes apparent with the current provision and coordination of infrastructure to service the GPA, which has not been identified as a constraint to achieving the minimum net densities prescribed in CRPS Chapter 6.

Although the uptake analysis in Section 3.0 confirms that infrastructure has been provided to service the minimum net densities of 10hh/ha and it is obvious that provision has successfully been made to service higher housing densities across Greater Christchurch, each council, network utility provider and government agency need to confirm what pressure increased housing densities have on levels of service and capital expenditure.

The ground conditions and susceptibility of some locations in Greater Christchurch to ponding and flood risk requires site specific treatments to ensure stormwater is attenuated and disposed of appropriately. The definition of 'net density' in CRPS Chapter 6 specifically excludes stormwater, which is the primary mechanism for ensuring that the GPA net densities are able to be achieved. The reality is that some land will not be as economically feasible to develop and is likely to influence housing affordability as development costs are passed on to the homeowners.

5.2.4 STRATEGIC TRANSPORT NETWORKS

Context

Chapter 6 of the CRPS and the district plans require that the GPA integrate with the existing strategic transport network and that necessary upgrades and improvements are implemented to maintain the safety and efficiency of these networks. The density of housing and where it is

[67] Our SPACE. 5.6 Land for cultural purposes. Page 35.

[68] Our SPACE. 4.2 Availability of infrastructure. Page 19.

[69] Our SPACE. 5.4 Sequencing and staging of growth. Page 31.

located are key determinants of the relative demand 'greenfield' development places on the existing transport networks and the extent of any related environmental effects.

Positive outcomes that should be maintained

It is evident that improvements have been made in integrating land use and transport planning to achieve higher levels of connectivity, availability of walking and cycling, improved access to public transport and integration of 'greenfield' development into the wider transport network.

Safe and efficient access to strategic transport networks have been a catalyst for industrial and commercial growth to occur that provides employment opportunities that has supported the uptake of the residential GPA, for example Rolleston's I-Zone and I-Port industrial hubs and similar developments in Hornby's Waterloo and Quadrant industrial parks and the airport's Dakota Park in Christchurch City.

The benefits that can be gained from increasing housing density are also a catalyst for government infrastructure funding[70], particularly State Highways and public transport. This has been demonstrated through the extensions and improvements to the Northern and Southern Motorways, the advancements of future public transport modelling across the sub-region and implementation and securing of Government funding for the cycleways programme in Christchurch City (refer to **Images 7** and **8** below).

Image 7: Christchurch Southern Motorway - Main South Road junction
Source: Waka Kotahi NZTA www.nzta.govt.nz/

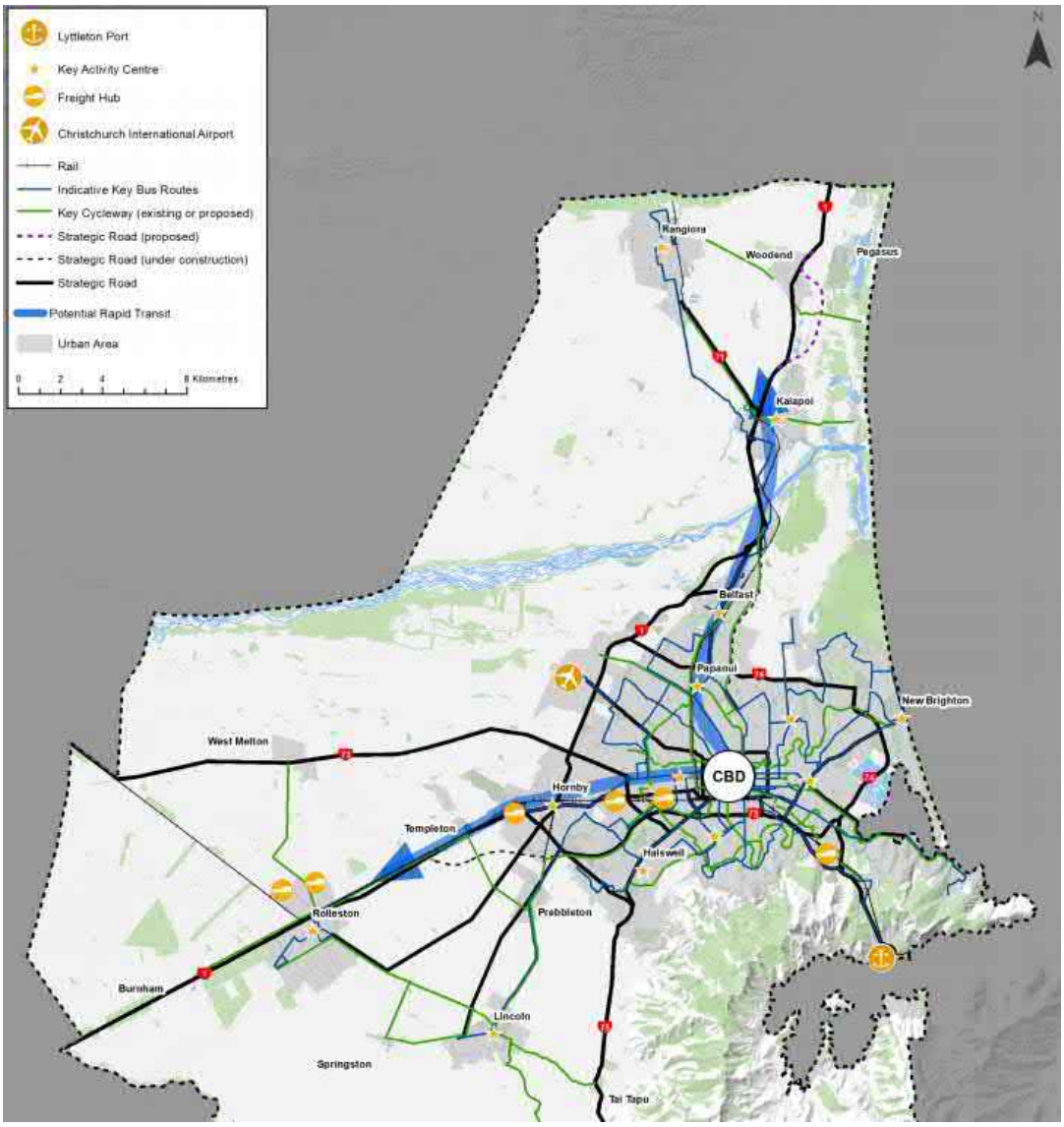
Image 8: Christchurch Northern Corridor - QEII Interchange
Source: Waka Kotahi NZTA www.nzta.govt.nz/

As illustrated in **Figure 5** on the following page, Our SPACE recognises the importance in enabling higher densities and intensification along high demand corridors and key public transport corridors, which is a further opportunity that can enhance land use outcomes[71]. This has also been given primacy under the NPS-UD in respect to increasing density in locations that have access to public or active transport to commercial activities and community services[72] and ensuring out of sequence development is well-connected along transport corridors[73].

Similarly, positive outcomes can be realised with the potential future investment in high frequency public transport north and south-west of Christchurch City, and other cross service enhancements on the network to reduce commuter times in outlying suburbs and townships and encouraging higher density development at key stopping points along transit corridors in Christchurch City[74].

[70] Our SPACE. 4.1 Key growth issues for Greater Christchurch. Page 19.
[71] Our SPACE. 5.3 Selwyn and Waimakariri towns. Page 28.
[72] NPS-UD. Policy 3. Page 11.
[73] NPS-UD. 3.8 Unanticipated or out of sequence developments. Page 16.
[74] Our SPACE Officer's Report. 6. Transport needs and implications. Page 20.

Figure 5: Greater Christchurch's current and future strategic transport network



Source: Our SPACE. 5.5 Transport and other infrastructure. Figure 18. Greater Christchurch transport network. Page 32.

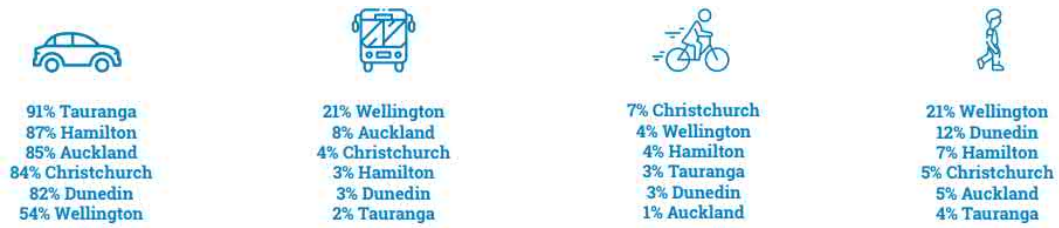
Negative outcomes, risks, and opportunities

A critical basis for initiating the UDS and the subsequent collaborative planning that has occurred across the Greater Christchurch sub-region has been to ensure that the planning, funding, and operation of the strategic land transport network is integrated with land development.

The consolidated settlement pattern and minimum housing densities in the GPA, amongst a wider range of implementation methods and planning processes, assist to encourage active modes of travel and improve the use of public transport. The reality of the dispersed transport network is that a high percentage of people within Greater Christchurch continue to use single occupancy private motor vehicles as their preferred mode of travel.

Figure 6 on the following page illustrates that although Christchurch has the fourth highest percentage (84%) of car use for New Zealand's main centre's behind Tauranga, Hamilton, and Auckland, the third highest uptake of public transport (4%) and highest cycle use (7%).

Figure 6: Primary travel modes for travelling to work in New Zealand's main centre's



Source: Tauranga City Council. Proposed Tauranga Urban Strategy 2050. Our Challenges. Page 19.

There remains an expectation in Our SPACE and the that more active modes of travel and use of public transport will realise a broad range of positive social, economic, and environmental outcomes. This emphasises the need for densities and development controls in the GPA and FDA to require that appropriate walking and cycling networks are provided within and between residential neighbourhoods and commercial centres, and to improve access to public transport facilities (which could include high frequency transit stops in the future).

The ability of the transport network to provide safe, convenient, and efficient ways to travel across Greater Christchurch will have a direct correlation to the viability of increasing housing densities. Our SPACE emphasises the need for the sequencing of growth to align with cross-boundary investments and emphasises the need for collaborative land use planning to occur when developing infrastructure strategies and regional land transport plans[75].

The coordination and integration of land use and transport planning across Greater Christchurch is important given projected population growth and the likelihood that it will increase the number of vehicle movements and travel distances[76]. Transport business cases and partnerships with Government will be critically important to ensure that appropriate network upgrades are undertaken to help increase mode shift away from single occupancy car use across the sub-regions strategic transport network. Funding to improve key transport corridors, investigate the potential for rapid transit and enhance the public transport system and walking and cycle networks will also assist in 'activating' development densities across the sub-region.

5.2.5 REGIONAL, TOWNSHIP AND SUBURB SCALE DENSITY OUTCOMES - SUMMARY LEARNINGS

Urban form

- The progressive development of the Greater Christchurch GPA and Intensification Areas in Christchurch City has to date been generally consistent with the residential density requirements, while retaining the desired consolidated urban form and realising the associated benefits associated with this polycentric settlement pattern.
- The recently enacted NPS-UD will require the GCP to support housing development capacity by encouraging building up as well as out and to manage unanticipated or out of sequence within plans where the prescribed pre-requisites are satisfied.

Land use

- Spatial plans and statutory planning processes have considered the locational attributes, and land use opportunities and constraints, when determining the appropriateness of the residential 'greenfield' areas (including the FDA) and the associated housing density requirements.
- The GCP councils have included provisions within their respective district plans to manage housing densities to optimise how urban land is used across the sub-region.
- There are trade-offs being made when the appropriateness of rezoning rural land to expand urban environments is being determined, which require future densities to make the most of the 'greenfield' land that is progressively being made available.

[75] Our SPACE. 5.4 Sequencing and staging of growth. Page 31.

[76] Our SPACE. 5.5 Transport and other infrastructure. Page 31.

Infrastructure

- The funding and development of public facilities (public open space, community, and education facilities), three waters (stormwater, water, and wastewater) infrastructure and utility services (power, gas, and telecommunications) are being successfully coordinated across Greater Christchurch to deliver a range of efficiencies in line with the housing density requirements.
- The GCP councils will need to continue to partner with network utility providers, developer's, government agency, and the community to ensure that the levels of service and capital investments in infrastructure align with any increases in housing densities.

Strategic transport

- The density of housing and where it is located are key determinants of the relative demand 'greenfield' development places on the existing transport networks and the extent of any related environmental effects.
- It is important to enable higher densities and intensification close to centres and along high demand and key public transport corridors.
- The coordination and integration of land use and transport planning is particularly important given projected population growth and the likelihood that this will increase the number of vehicle movements and travel distances across the sub-region.

5.3 NEIGHBOURHOOD, BLOCK, AND SITE SCALE DENSITY OUTCOMES

As outlined in Section 5.1, the following is a more targeted assessment of the community and development outcomes a change in density has on liveability at the localised neighbourhood, block, and site scales. A range of attributes are applied to four GPA in Greater Christchurch and three 'greenfield' growth areas in Auckland, Hamilton City and Tauranga City to establish what outcomes are occurring across the 10.3hh/ha to 15hh/ha density range.

5.3.1 CASE STUDY AREAS

As identified in the methodology contained in Appendix 11: Density outcomes analysis - Methodology and limitations.

Table 5 lists the seven representative cases studies that have been prepared for the following GCP GPA and 'high growth' area 'greenfield locations. The case studies have been presented in the order they progressively move through the 10.3hh/ha to 16.7hh/ha density range starting from lowest to highest[77].

TABLE 5: LIVEABILITY OUTCOMES ANALYSIS CASE STUDY AREAS
CASE STUDY 1: SPRING GROVE, BELFAST - CHRISTCHURCH CITY - 16.7HH/HA
The Spring Grove subdivision is a GPA in the CRPS, falls within the Belfast Area Plan, and development is coordinated through the East Belfast outline development plan.
CASE STUDY AREA 2: GOLDEN SANDS, PAPAMOA EAST, TAURANGA CITY - 'SMART GROWTH' BAY OF PLENTY - 15.9HH/HA
The Golden Sands subdivision is located within the Wairakei Urban Growth Area in Tauranga City and is a Special Housing Area that is managed through the Papamoa Marjorie Lane Urban Growth Plan.
CASE STUDY AREA 3: HUAPAI TRIANGLE, KUMEŪ - AUCKLAND COUNCIL – 15.3HH/HA
The Huapai Triangle subdivision is a residential 'greenfield' area in the Huapai Precinct Plan in the Auckland Unitary Plan and the Huapai Triangle Special Housing Area resource consents.
CASE STUDY4: LONGHURST, HALSWELL - CHRISTCHURCH CITY - 14.9HH/HA
The Longhurst subdivision is a GPA in the CRPS, falls within the South West Area Plan, and development is coordinated through the Halswell West outline development plan.
CASE STUDY AREA 5: GREENHILL PARK, HAMILTON CITY - 'FUTURE PROOF' - 14.7HH/HA
The Greenhill Park subdivision is within the Rototuna Structure Plan area that is one of five residential 'greenfield' areas' in Hamilton City.
CASE STUDY 6: FARINGDON, ROLLESTON - SELWYN DISTRICT - 12.8HH/HA
The Faringdon subdivision is a GPA in the CRPS, falls within the Rolleston Structure Plan, and development is partially coordinated through the Rolleston Area 6 outline development plan.
CASE STUDY 7: SOVEREIGN PALMS, KAIAPOI - WAIMAKARIRI DISTRICT - 10.3HH/HA
The Sovereign Palms subdivision is a GPA in the CRPS, and development is coordinated through the North Kaiapoi (Area A - ODP Area 156) outline development plan.

5.3.2 CASE STUDY PRESENTATIONS

The case study presentations illustrating the location context and attribute summaries are provided in the following sub-section.

[77] The methodology applied in determining the GPA density uptake (as outlined in **Appendix 10**) and undertaking the case study analysis (as outlined in **Appendix 11**) differs slightly, which is why there is a variation between the household densities and average lot sizes in Section 4.3 when compared to Section 5.3 as they relate to the Spring Grove, Faringdon and Sovereign Palms 'greenfield' subdivisions.

SPRING GROVE, BELFAST, CHRISTCHURCH

GCP GREENFIELD DENSITY ANALYSIS CASE STUDY AREA

Spring Grove is the first stage in a master-planned development with a capacity of between 1300-2000 homes. It located near the Styx River, which has a riparian reseve that contributes good local passive amenity. This location is 11km from the Christchurch CBD, making it one of the closest to the CBD of all case study neighbourhoods. It is well-serviced by existing local amenities.
It is also located nearby to the 2006-2009 development at Northwood.

SPECIAL FEATURES:

- Belfast Local Centre, 30,000m² within 500m
- Belfast School within 500m
- Adjoins the Styx River reserve
- Single-developer (Mike Greer Homes)
- Frequent bus service (15min) to CBD within 500m

Suburb (GPA) Size	288 ha	**15.3 hh/ha**
Case Study Neighbourhood Size	12.2 ha	**204 hh**
Development Year & completion	2019-	**20%**
Indicative Density Policy		15 hh/ha
Actual Density Observed		**16.7 hh/ha**
Average Lot Size		**379m²**
Study Block Size	1.4 ha	**21 lots**

Image Source: Google Streetview
Image Date: 2019

STUDY AREA

NEIGHBOURHOOD SCALE

HOUSING TYPOLOGIES

100% standalone

0% duplex

0% multi-unit

LANDUSE COVERAGE

53% residential

0% commercial

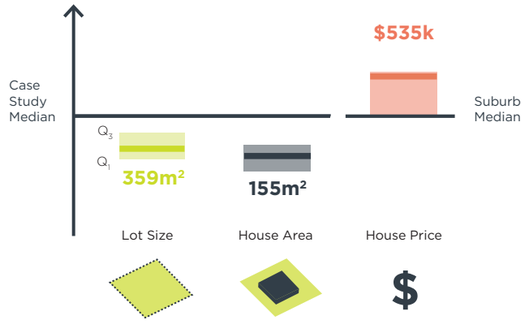
29% streets and lanes

0.4% parks

18% stormwater reserve

Stormwater & Local Purpose Reserve (excluded from density calculations)

NOTE
Neighbourhood Study plan enlagement 200%

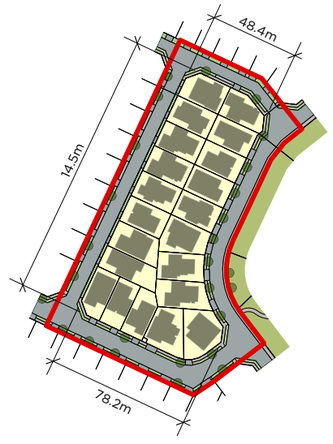


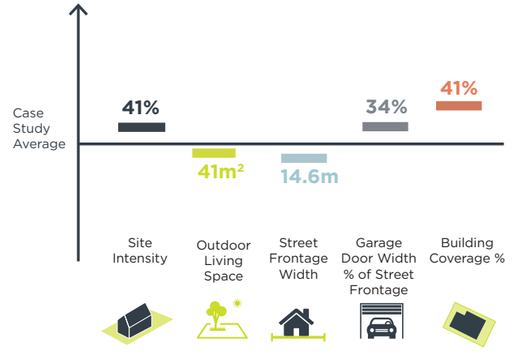
BLOCK SCALE

Residents ability to grow vegetables
24% have space >20m²

# of bedrooms
3.19 average

Solar orientation of outdoor living space
0% facing south





GOLDEN SANDS, PAPAMOA, TAURANGA

GCP GREENFIELD DENSITY ANALYSIS CASE STUDY AREA

The Golden Sands subdivision is located within the Wairakei Urban Growth Area, which is a residential 'greenfield' area under the jurisdiction of Tauranga City Council. It is a Special Housing Area that is managed through the Papamoa Marjorie Lane Urban Growth Plan (Urban Growth Plan 6) of the Tauranga City District Plan.
The Golden Sands case study area is on the southern edge of Urban Growth Plan 6, which is a 'greenfield' area located in the eastern outskirts of Tauranga City

SPECIAL FEATURES:

- 1km to Papamoa Beach.
- 8.5km to Papamoa Hills Regional Park.
- Golden Sands School, Palms Springs Medical Centre, Freedom and Golden Sands Lifestyle Retirement Villages.
- 5.1km to Papamoa College.
- 6.8km to Papamoa Plaza shopping centre.

Suburb (GPA) Size	1291 ha	**12.6 hh/ha**
Case Study Neighbourhood Size	76 ha	**1206 hh**
Development Year & completion	2001-	**90%**
Indicative Density Policy		12.5 hh/ha
Actual Density Observed		**15.9 hh/ha**
Average Lot Size		**406m²**
Study Block Size	2 ha	**22 lots**

Image Source: Google Streetview & Homes.co.nz
Image Date: 2019

STUDY AREA

NEIGHBOURHOOD SCALE

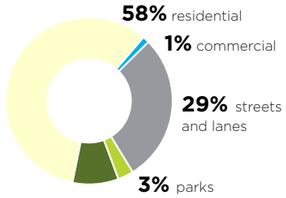
HOUSING TYPOLOGIES

91.3% standalone

8.7% duplex

0% multi-unit

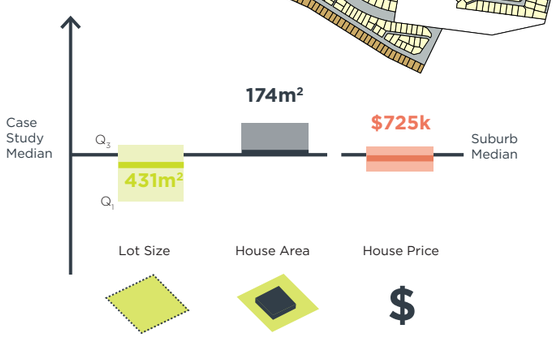
LANDUSE COVERAGE



58% residential
1% commercial
29% streets and lanes
3% parks
9% stormwater reserve

NOTE
Retirement Villages have been excluded from the study area

Stormwater & Local Purpose Reserve (excluded from density calculations)

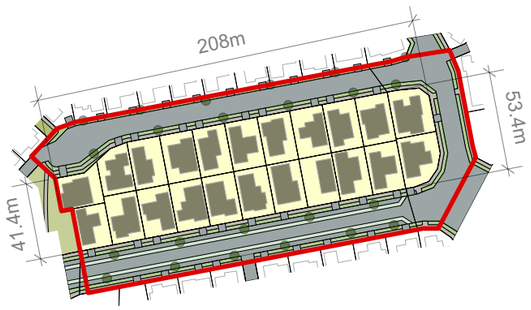


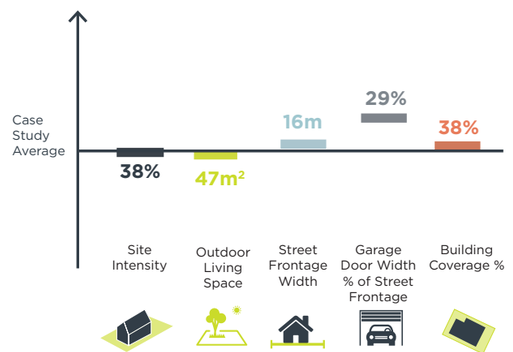
BLOCK SCALE

Residents ability to grow vegetables
55% have space >20m²

# of bedrooms
3.64 average

Solar orientation of outdoor living space
0% facing south





HUAPAI TRIANGLE, KUMEU, AUCKLAND

GCP GREENFIELD DENSITY ANALYSIS CASE STUDY AREA

The Huapai Triangle case study area is located on the north western edge of Kumeū-Huapai, in Auckland's northwest and will represent a sizeable urban expansion to the existing satellite township. The triangle growth area comprises development stages delivered by a range of developers and house builders.

The Huapai Triangle is a Special Housing Area and Precicnt under the Auckland Unitary Plan, using Mixed-Housing Suburban Zone provisions.

SPECIAL FEATURES:
- Huapai Domain
- Huapai School
- Matua Ngaru School and
- Country Club retirement village
- 1.1 km to connect to State Highway 16
- Bus service

Suburb (GPA) Size	632 ha	**14.1 hh/ha**
Case Study Neighbourhood Size	35 ha	**487hh**
Development Year & completion	2013-	**76%**
Indicative Density Policy		15 hh/ha
Actual Density Observed		**15.3 hh/ha**
Average Lot Size		**405 m²**
Study Block Size	1.7 ha	**27 lots**

Image Source: Google Streetview & Homes.co.nz
Image Date: 2019

STUDY AREA

NEIGHBOURHOOD SCALE

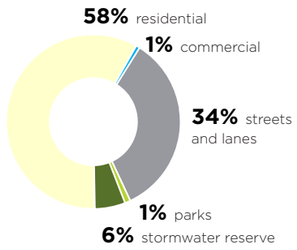
HOUSING TYPOLOGIES

93.4% standalone

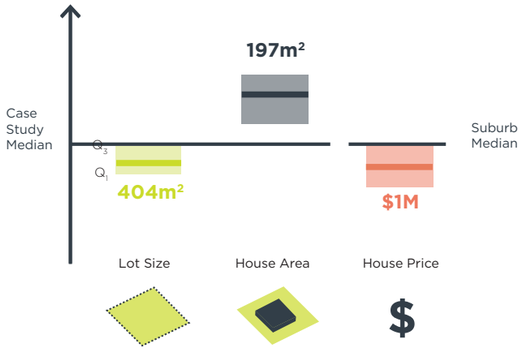
1.1% duplex

5.5% multi-unit

LANDUSE COVERAGE



Stormwater & Local Purpose Reserve (excluded from density calculations)

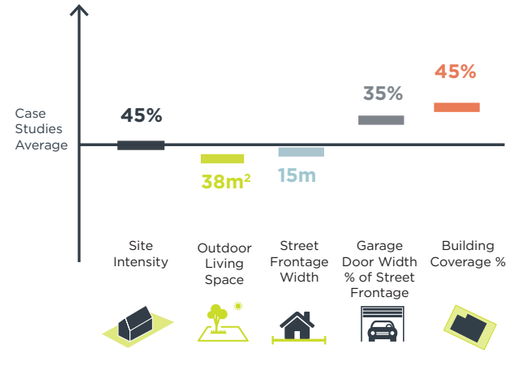


BLOCK SCALE

Residents ability to grow vegetables
36% have space >20m²

# of bedrooms
3.96 average

Solar orientation of outdoor living space
14% facing south



LONGHURST, HALSWELL, CHRISTCHURCH

GCP GREENFIELD DENSITY ANALYSIS CASE STUDY AREA

The Longhurst subdivision is one of 18 residential GPA's within Christchurch City that are identified in CRPS Map A.

The Longhurst case study area is located on the south-western edge of Christchurch City in the suburb of Halswell. It was developed through a masterplan and includes

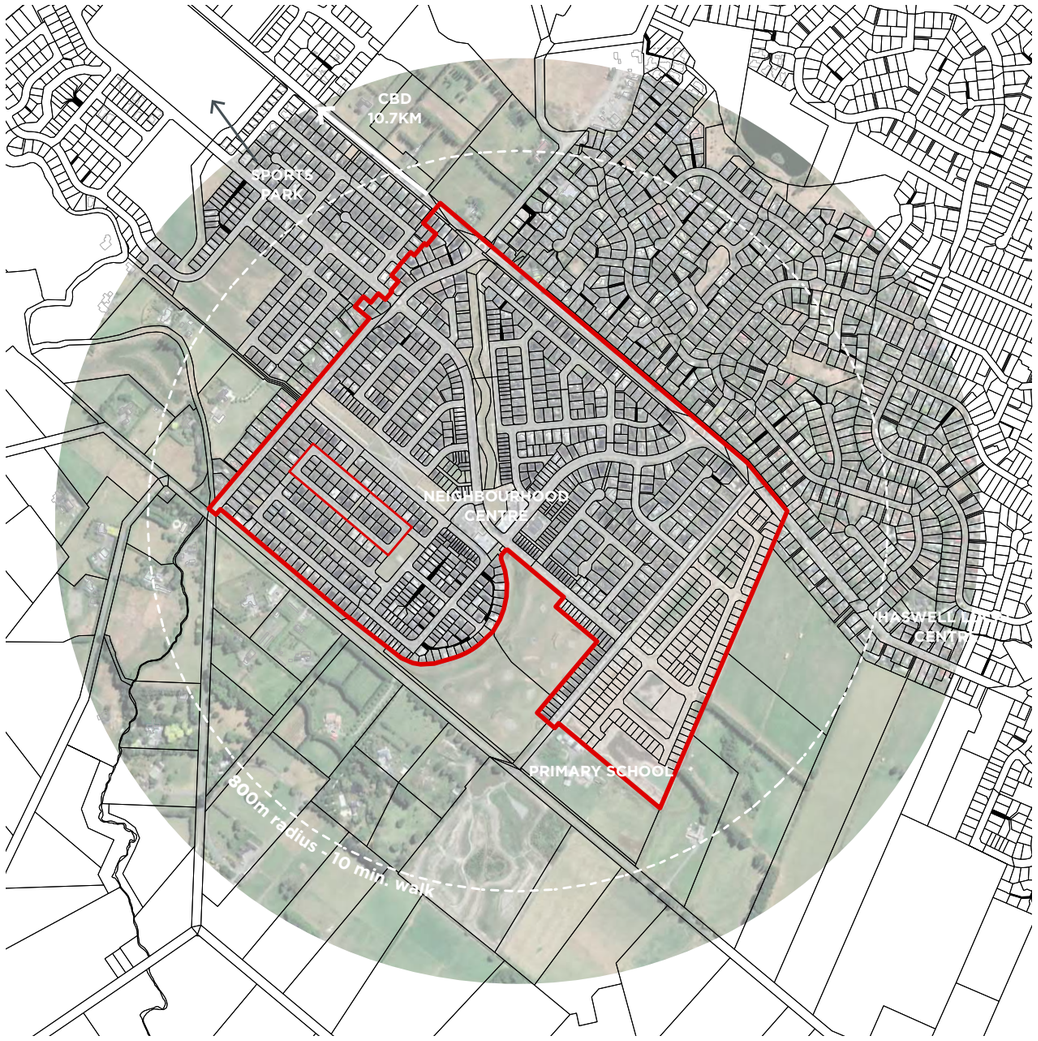
SPECIAL FEATURES:

- Includes Longhurst Shops, 3000m2 Neighbourhood Centre
- 2.4km to Haswell Local Centre
- A large network of Local stormwater reserves and parks
- Knights Stream recreation area
- Adjoins the Seven Oaks School
- Bus service - Orange Line

Suburb (GPA) Size	637 ha	**13.2hh/ha**
Case Study Neighbourhood Size	68 ha	**1008hh**
Development Year & completion	2011-2018	**100%**
Indicative Density Policy		15 hh/ha
Actual Density Observed		**14.9 hh/ha**
Average Lot Size		**446 m²**
Study Block Size	2.2 ha	**26 lots**

Image Source: Google Streetview & Homes.co.nz
Image Date: 2019

STUDY AREA



NEIGHBOURHOOD SCALE

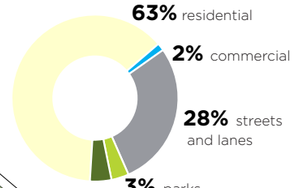
HOUSING TYPOLOGIES

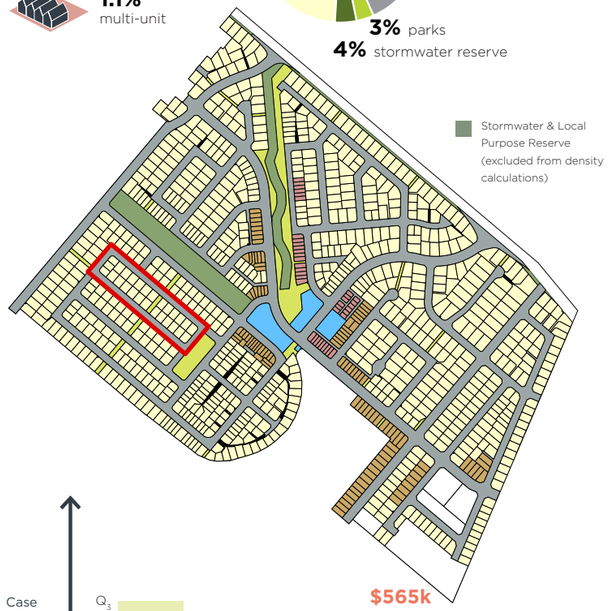
86.4% standalone

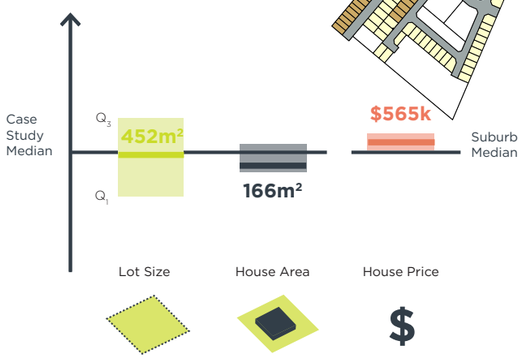
12.5% duplex

1.1% multi-unit

LANDUSE COVERAGE





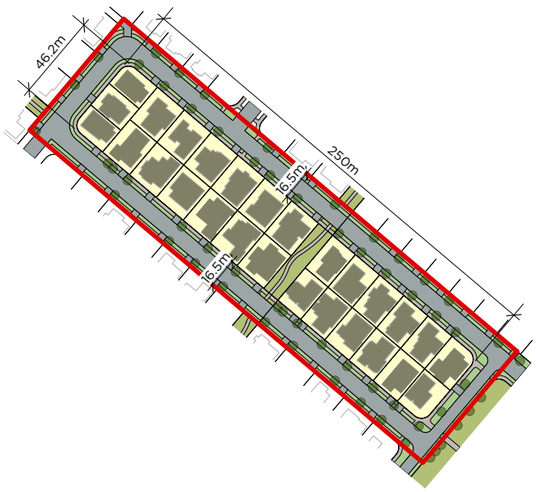


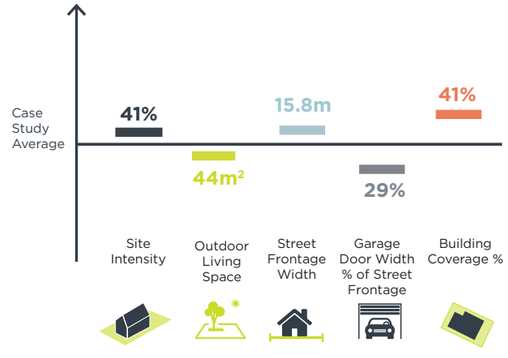
BLOCK SCALE

Residents ability to grow vegetables
44% have space >20m²

# of bedrooms
3.48 average

Solar orientation of outdoor living space
0% facing south





GREENHILL PARK, CHARTWELL, HAMILTON

GCP GREENFIELD DENSITY ANALYSIS CASE STUDY AREA

Greenhill Park is a new growth area on the north eastern edge of Hamilton, located 7km to the CBD -making this the closest proximity case study area to the CBD. It is developed by Chedworth Properties will have a total capacity of 1600 sections, once completed and homes are built by a selection of 8 building companies. The development includes Design Guidelines for houses and landscaping.

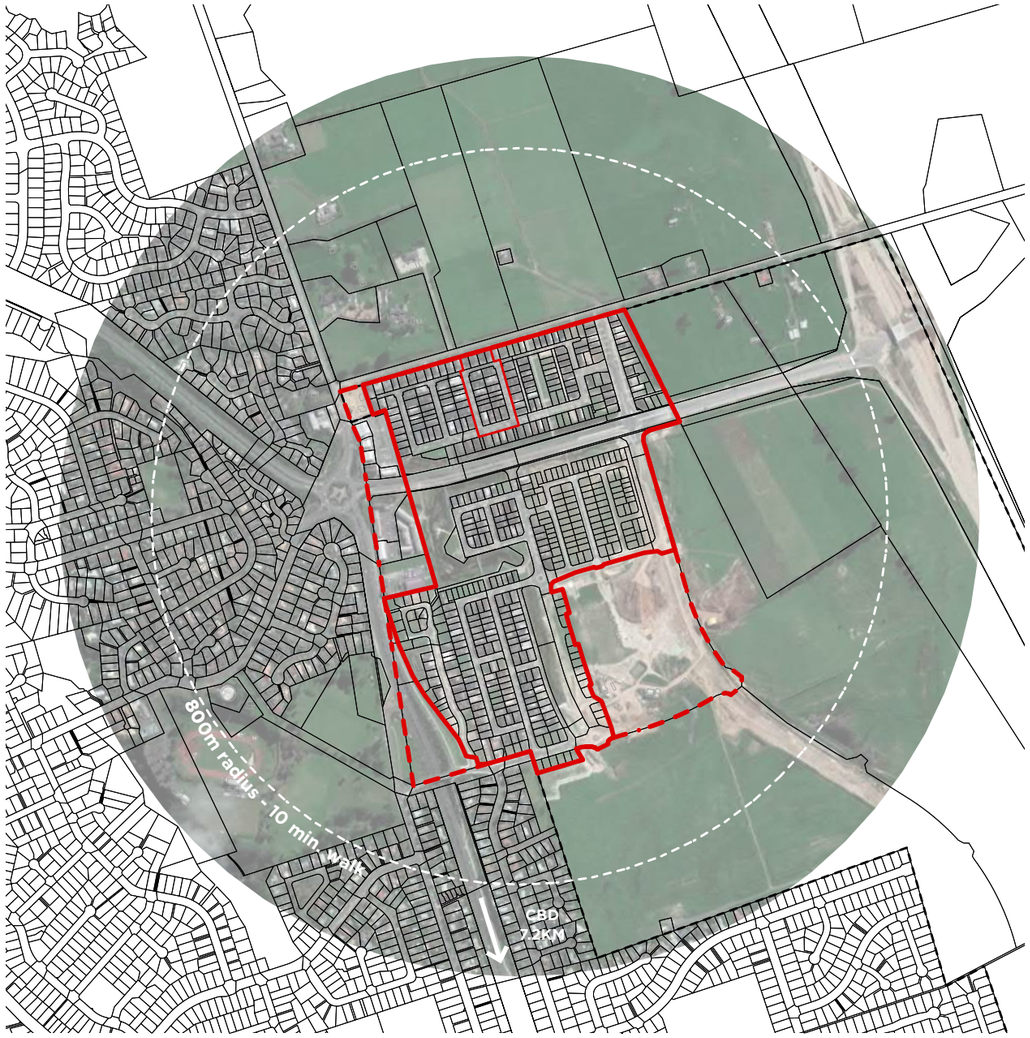
SPECIAL FEATURES:

- 16ha of land to be provided in Open Space throughout the development.
- 3km to Chartwell Shopping Centre (30,000m² retail)
- 3.7km to Hukanui Primary and Fairfield College
- Located on Wairere Drive urban route (ring road)
- 1km to Sports Park and Reserve

Suburb (GPA) Size	902 ha	**14.3 hh/ha**
Case Study Neighbourhood Size	35 ha	**517 hh**
Development Year & completion	2016-	**75% (est)**
Indicative Density Policy		16 hh/ha
Actual Density Observed		**14.7 hh/ha**
Average Lot Size		**414 m²**
Study Block Size	1.5 ha	**20 lots**

Image Source: Google Streetview & Google Earth
Image Date: 2019

STUDY AREA



NEIGHBOURHOOD SCALE

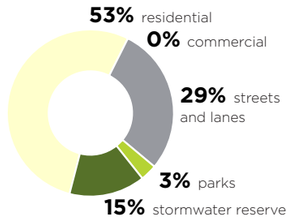
HOUSING TYPOLOGIES

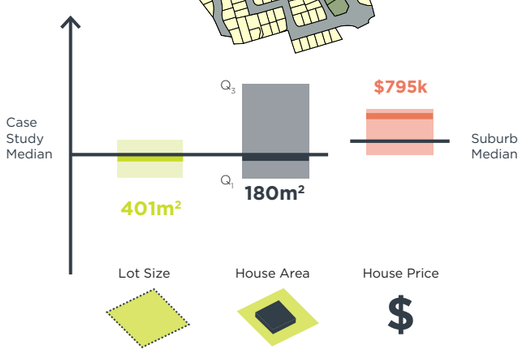
93.5% standalone

6.5% duplex

0% multi-unit

LANDUSE COVERAGE



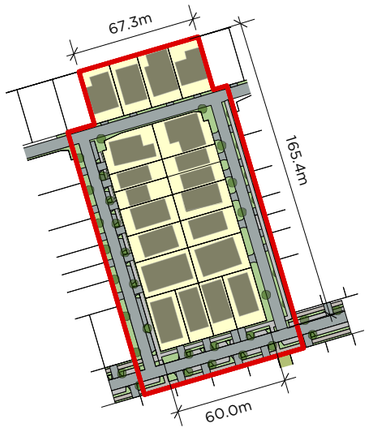


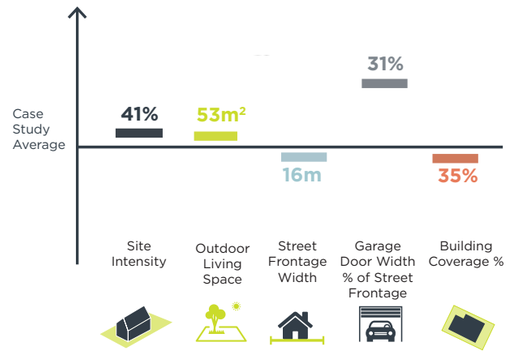
BLOCK SCALE

Residents ability to grow vegetables
65% have space >20m²

# of bedrooms
3.45 average

Solar orientation of outdoor living space
0% facing south





FARINGDON, ROLLESTON

GCP GREENFIELD DENSITY ANALYSIS CASE STUDY AREA

The Faringdon subdivision is one of 19 residential GPA's within the 'high growth area' of Selwyn District that are identified in CRPS Map A.

The Faringdon case study area is located on the south-eastern edge of Rolleston, which has experienced a significant amount of 'greenfield' subdivision following the Canterbury Earthquakes.

SPECIAL FEATURES:

- Southpoint shops - 2,000m2 Local Centre
- Adjoins the 34ha Foster Park recreation area
- Lineal green corridors and mixed housing densities
- Lemonwood Grove School, BestStart Preschool and Three Trees Preschool
- 2.2km to Rolleston College
- 4.5km to connect to the Southern Motorway
- Bus service - Lines 85 and 820

Suburb Size	1008 ha	**11.2 hh/ha**
Case Study Neighbourhood Size	76 ha	**971 hh**
Development Year & completion	2016-	**96%**
Indicative Density Policy		12 hh/ha
Actual Density Observed		**12.8 hh/ha**
Average Lot Size		**515m²**
Study Block Size	1.9 ha	**18 lots**

Image Source: Google Streetview
Image Date: 2019

STUDY AREA

NEIGHBOURHOOD SCALE

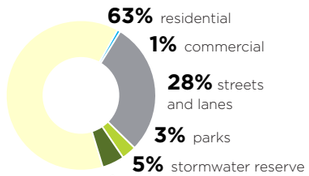
HOUSING TYPOLOGIES

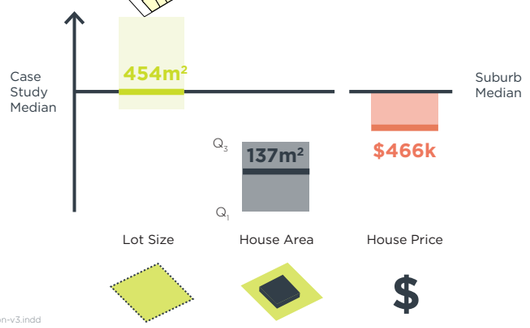
86.6% standalone

9.5% duplex

3.9% multi-unit

LANDUSE COVERAGE



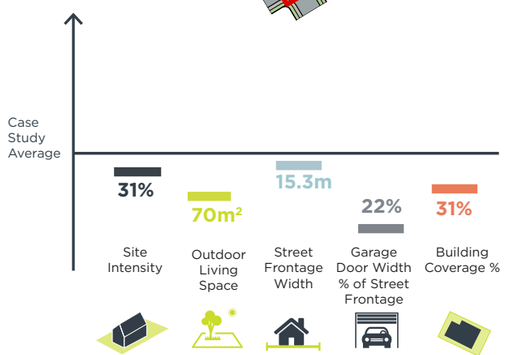


BLOCK SCALE

Residents ability to grow vegetables
82% have space >20m²

# of bedrooms
3.14 average

Solar orientation of outdoor living space
0% facing south



SOVEREIGN PALMS, KAIAPOI, CHRISTCHURCH

GCP GREENFIELD DENSITY ANALYSIS CASE STUDY AREA

The Sovereign Palms case study area is located on the north-eastern edge of Kaiapoi. It was planned by Suburban Estates Limited in three stages (Sovereign Palms, Sovereign Lakes and Sovereign Greens). The area includes a new golf course and high-amenity lake reserve. Homes are constructed by a range of builders and are subject to a covenant requiring a minimum house area (175m^2 to 210m^2 GFA depending on lot size).
The Sovereign Palms subdivision is one of 12 residential GPA's within the 'high growth area' of Waimakariri District that are identified in CRPS Map A.

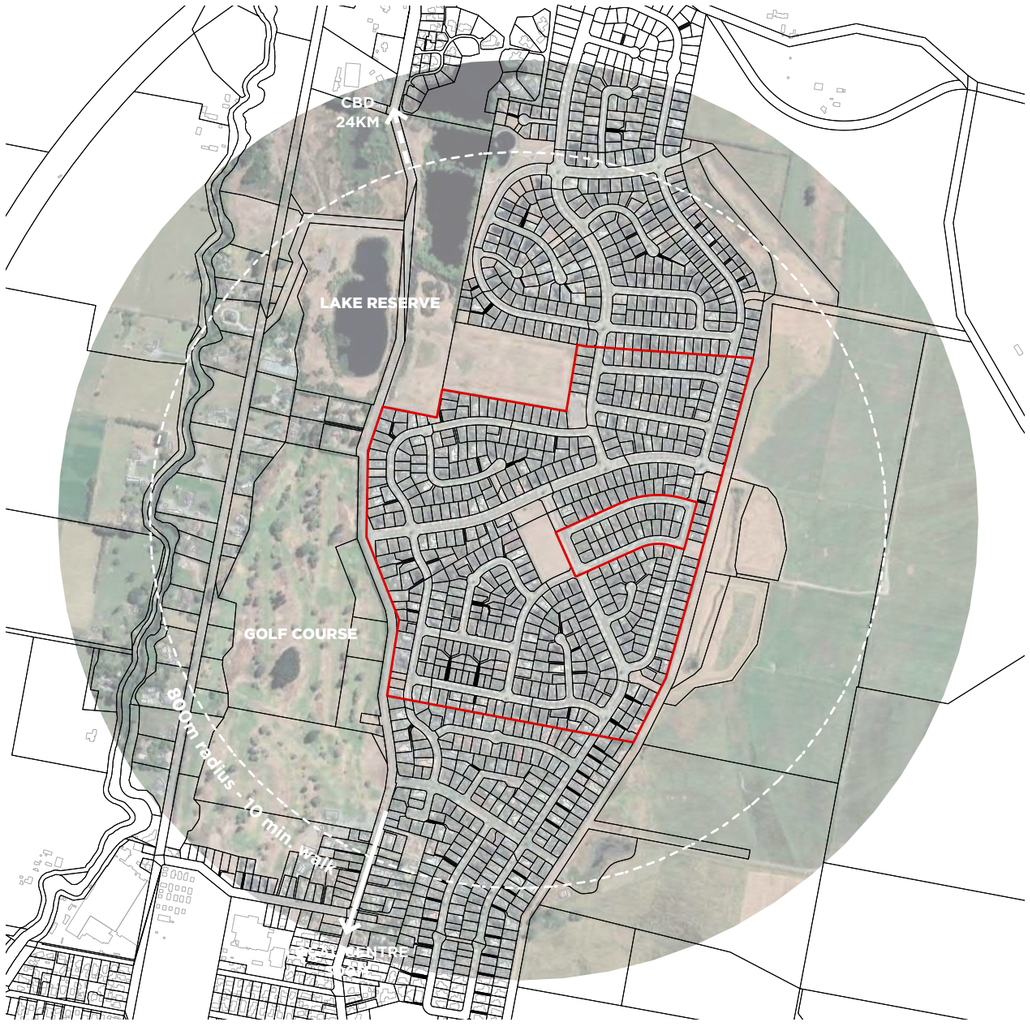
SPECIAL FEATURES:

- 2.5km to Kaiapoi Town Centre
- Adjoins Kaiapoi Golf Course and 25ha Lakes Reserve.
- Sovereign Star Nursery and Preschool.
- 2.2km to Kaiapoi North School.
- 6km to connect to the Northern Motorway.
- Bus service - Line 95.

Suburb (GPA) Size	1920 ha	**10.3 hh/ha**
Case Study Neighbourhood Size	51 ha	**530 hh**
Development Year & completion	2013	**100%**
Indicative Density Policy		10 hh/ha
Actual Density Observed		**10.3 hh/ha**
Average Lot Size		**691 m^2**
Study Block Size	3.1 ha	**24 lots**

Image Source: Google Streetview & Homes.co.nz
Image Date: 2019

STUDY AREA



NEIGHBOURHOOD SCALE

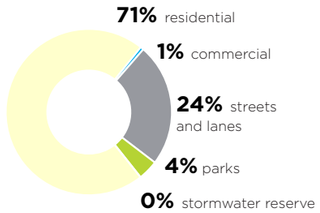
HOUSING TYPOLOGIES

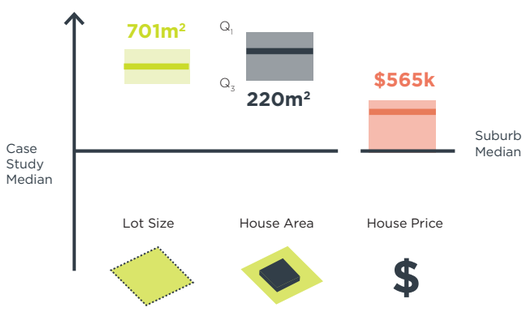
100% standalone

0% duplex

0% multi-unit

LANDUSE COVERAGE



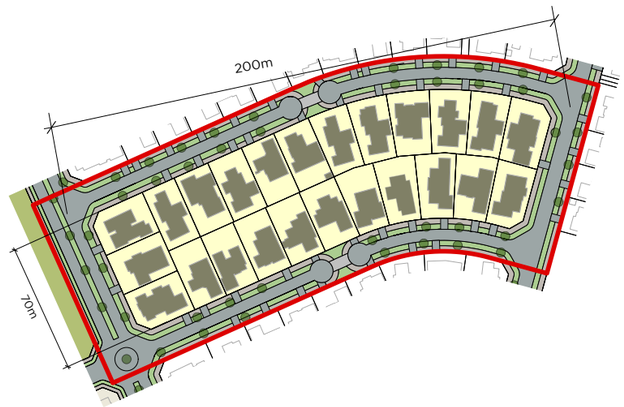


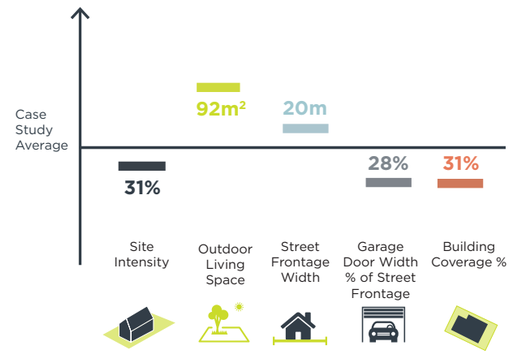
BLOCK SCALE

Residents ability to grow vegetables
79% have space >20m^2

# of bedrooms
3.83 average

Solar orientation of outdoor living space
13% facing south





5.3.3 THE INFLUENCE OF PLANNING RULES ON DENSITY OUTCOMES

All of the case study neighbourhoods show a high degree of compliance with the planning and development controls contained within their respective district, particularly in respect to densities. This suggests that there may be a general reluctance by developers to use the resource consent process to move outside of the standard regulatory design parameters, but it could also indicate that the planning rules happen to be well-suited to the market's needs.

An analysis of the case study attributes highlights what planning rules influence density outcomes at the neighbourhood, block, and site scales, which are:

Lot shape factor rules: On average a 15m lot width is required across the six district plans, with only slight variations with the dimensions and setback controls. Although there is consistency in the rules, they do indirectly encourage wider sites that are better suited to standalone dwellings, as opposed to narrower/deeper sites that can more easily accommodate duplex or terraced units.

Height in relation to boundary rules: Height-in-relation to boundary setbacks and recession planes are a factor in determining the width of a lot or dwelling to create open space and reduce the shading of living areas. However, these development controls also encourage single-storey dwellings and discourage multi-level housing typologies.

Figure 7 above illustrates the amount of land required to accommodate a two-storey dwelling using a simple "box on box" construction method that provides for an upper floor that is two rooms wide.

A 15m site has been used as a baseline to demonstrate the effect that a double-width garage would have in relation to street activation and amenity.

If a stepped upper floor were provided, then the lot width could be slightly decreased by up to 2m. It would not significantly increase the useable floor area of the house, but it would require more complex construction techniques employing structural design for the upper floor, stairs, and cladding and weathertightness solutions resulting from having two roofs.

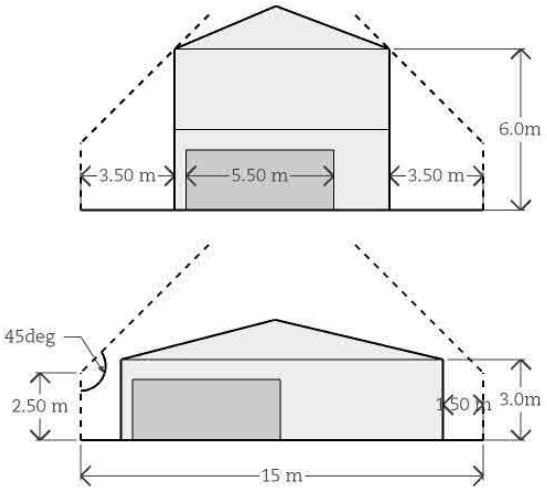


Figure 7 – Height to boundary and lot width comparison

Narrower lots of between 10m to 14m could encourage the construction of two storey house types with a single-width garage. Similarly, duplex houses could be a suitable method for achieving large homes on slimmer lots. An observation of the case study analysis is that duplex housing comprises only 6% of the dwellings constructed within the Greater Christchurch case study neighbourhoods. This could be market driven or a signal that the height to boundary rules need to be more permissive to encourage an increase in the proportion of two-storeyed dwellings.

Building coverage and landscaped area rules: These do not appear to be influencing the provision of higher density housing typologies as the rules requiring the landscaping

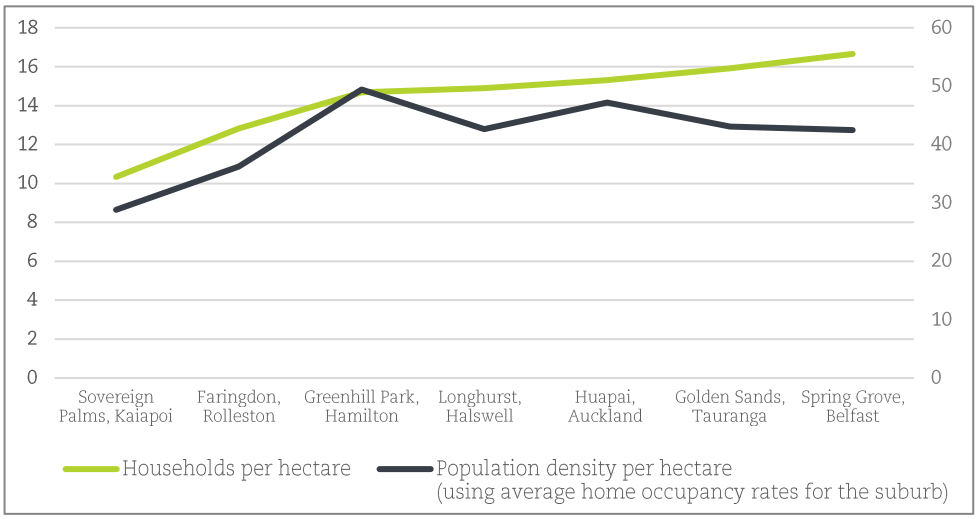
rules of front yard, provision for private outdoor living space and similar open space controls have been comfortably satisfied. The orientation of outdoor space and access to daylight is more easily achievable with single storey designs and conversely, it is likely to be a challenge for two storey dwellings to comply.

Height rules: All areas enable a two-storey house with a reasonable roof pitch. A 10m height has been applied in some case study areas, which enables a 3-storey house on some sites but would be difficult to achieve without a very wide section to enable compliance with the height in relation to boundary rule.

Affordability, housing mix and average lot size: Very few of the district plans have rules to manage housing mix or to promote a range of lot sizes. Some have affordability criteria, which are driving the supply of small clusters of compact dwellings. No areas have minimum requirements for duplex, terraces, or apartments. This indicates that traditional bulk and location standards to manage amenity are still being preferred to rules that actively require a range of sections sizes that can accommodate varied housing typologies.

Population and household size increase with density: The case study analysis confirms that population density and average household size (bedrooms per dwelling) is increasing in line with an increase in household density (refer to Chart 1). This is seen as a positive outcome as it confirms that the available 'greenfield' land is being optimised to accommodate more people.

Chart 1: Households per hectare and population density



Planning framework outcomes analysis - Summary learnings

- Developers appeared to be complying with the minimum net density and the related land use rules, which signals that there is either too much risk and uncertainty with the consenting process or that the rules are fit for purpose.
- Traditional height in relation to boundary rules may be hindering rather than enabling two storey homes and innovative design, particularly on narrower sites.
- Planning rules in general do not appear to be changing as density increases, meaning they do not appear to being 'tuned' in to respond to, or enable higher density housing.
- Most rules are generally enabling, although few or no rules are actively encouraging higher densities.
- Increases in housing density is closely linked to higher households per hectare, which is seen as a positive outcome as the land is being used more efficiently.

5.3.4 PUBLIC AND COMMUNAL OPEN SPACE OUTCOMES

The amount of land provided as neighbourhood parks and open space is important to liveability, especially when density increases as it is expected that higher densities have less quantum of private outdoor space per dwelling. The amount of a higher density housing will dictate the demand for recreation, access to the natural environment and appreciation of open-ness. There is also a community benefit to quality open space including playgrounds, picnic spots.

Observations from the case study analysis are that as density increases:

The amount of overall land being allocated to parks generally decreases: Chart 2 illustrates that this decrease is moderate in the 10hh/ha to 14hh/ha range but is far more pronounced for higher density areas over 14hh/ha. It is noted that the definition of net density removes the calculation of stormwater and esplanade reserves, geotechnically constrained land, as well as land that is set aside for local service and facilities and sites of significance.

Chart 2: Households per hectare and parks

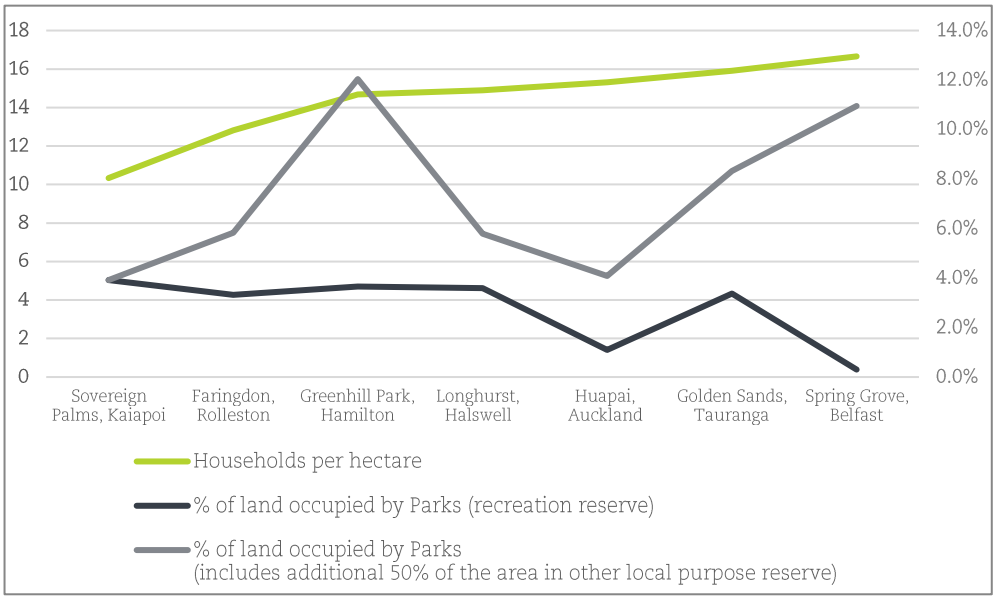
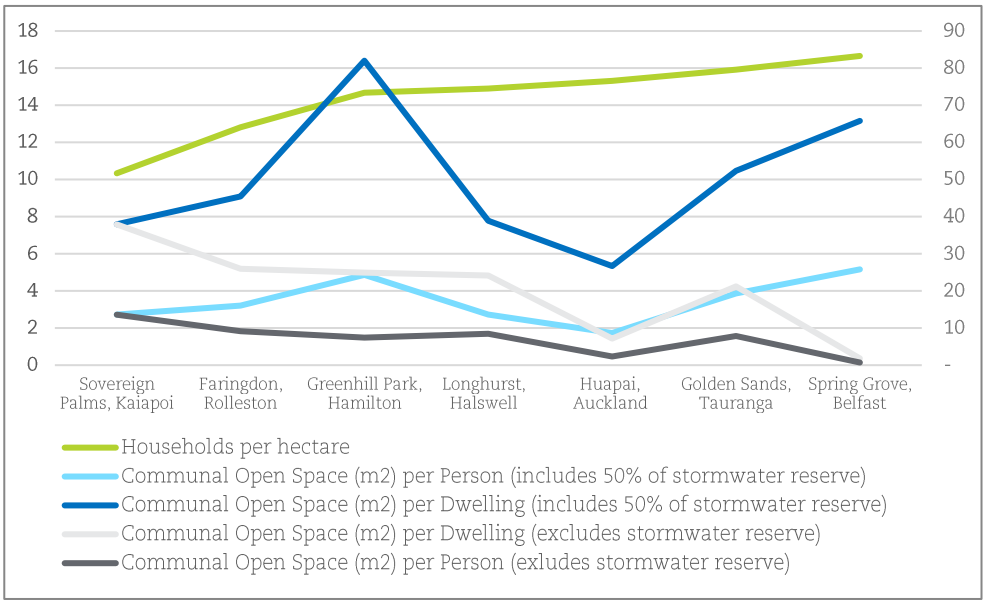


Chart 3 highlights that when the percentage of land that is allocated to parks is calculated on a per-dwelling and per-person basis there is a compounding trend, where higher density areas result in less communal open space per dwelling or person.

The apparent reduction in available open space is a concern as higher density housing typically has a greater reliance on public rather than private outdoor space to meet their health and wellbeing needs. This trend suggests that policies on the quantum of open space provision may not be accounting for and responding to higher density requirements. The challenge is that it is not feasible for councils to increase reserve allocation within an area without the certainty that higher density housing will be developed in the future, with spatial planning playing an important role in ensuring the right balance is being met. There will also be a tipping point where the number of higher density housing within a block make it viable to have communal or public space specifically allocated to meet the resident's specific needs, which does not appear to have been reached within the 10hh/ha to 15hh/ha density range.

We have observed that all areas have some larger open spaces available in schools, stormwater reserves, and sports parks. However, these spaces do not always serve as suitable replacements for local parks and playgrounds, which have a specific purpose and function within a community. For the purpose of this assessment of open space quantum, we have counted landscaped utility (stormwater) reserves with public access as contributing to communal open space, but at a discounted rate of 50%.

Chart 3: Households per hectare and communal open space



Communal open space outcomes - Summary learnings

- Access to local parks is marginally decreasing as density is increasing, which represents a reduction in liveability and wellbeing (particularly for those living within higher density housing).
- Density policy and the methods for calculating reserve provision within 'greenfield' areas should be considered together.
- Further analysis of the quality and type of the open spaces being provided would be beneficial, particularly to better understand the overlap between recreation reserve and other ('local purpose') reserves that offer recreational benefits. It is also possible that not all case study neighbourhoods have developed their local parks and playgrounds within their earlier stages of development.

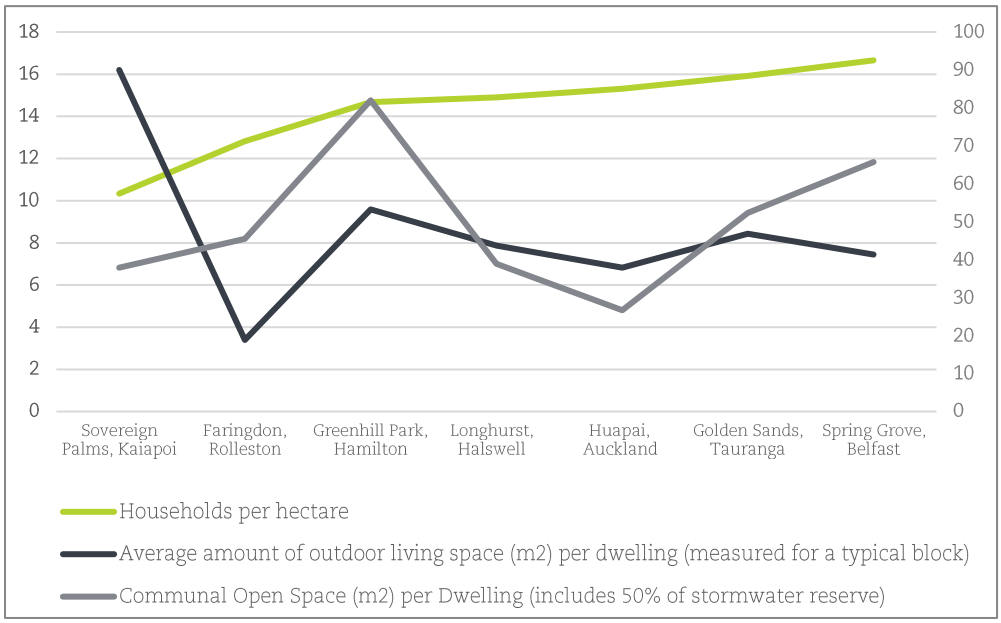
5.3.5 PRIVATE OUTDOOR SPACE OUTCOMES

Observations from the case studies are, as density increases:

Land coverage in private open space and communal open space per dwelling decreases, while the **orientation of (and sunlight admission to) private outdoor space does not change** significantly as density increases.

There are no significant observable constraints that would prevent subdivisions from being designed with appropriate block orientations that enable solar access to outdoor living spaces (refer to Chart 4). Any constraints, where they are present, may be due to suburb-scale elements such as the presence of natural features or the alignment arterial roads.

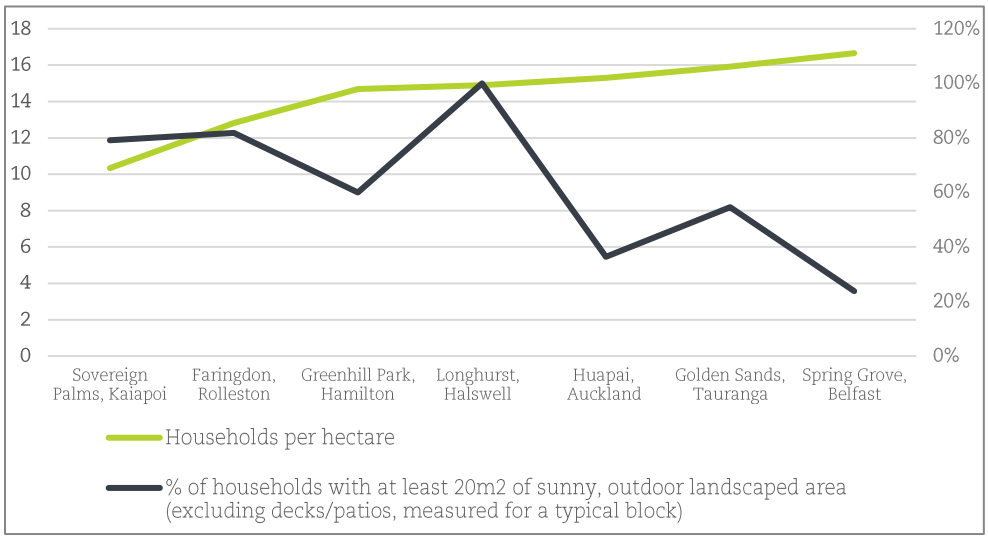
Chart 4: Households per hectare and communal vs private open space



The building heights significantly influence the extent to which housing is able to gain sufficient solar access, although this does not present a significant constraint in the 10hh/a to 15hh/ha range as 90% of housing established with the case studies are single level, detached house types. However, single level homes on smaller sections are more likely to be constrained by site coverage and the requirement to provide sufficient yard space to accommodate appropriate outdoor living areas.

The amount and quality of quality landscaped area within private lots is generally decreasing: A decrease in the amount of landscaped area within private yards is also evident as density increases, which is particularly pronounced above 14hh/ha (refer to Chart 5. This is important as any reduction in the landscaped areas below 20m^2 will significantly impact on the ability for residents to gain access to appropriate outdoor space or to accommodate a reasonably-sized vegetable garden, room for a trampoline or pool, or secure area for children and/or a pet.

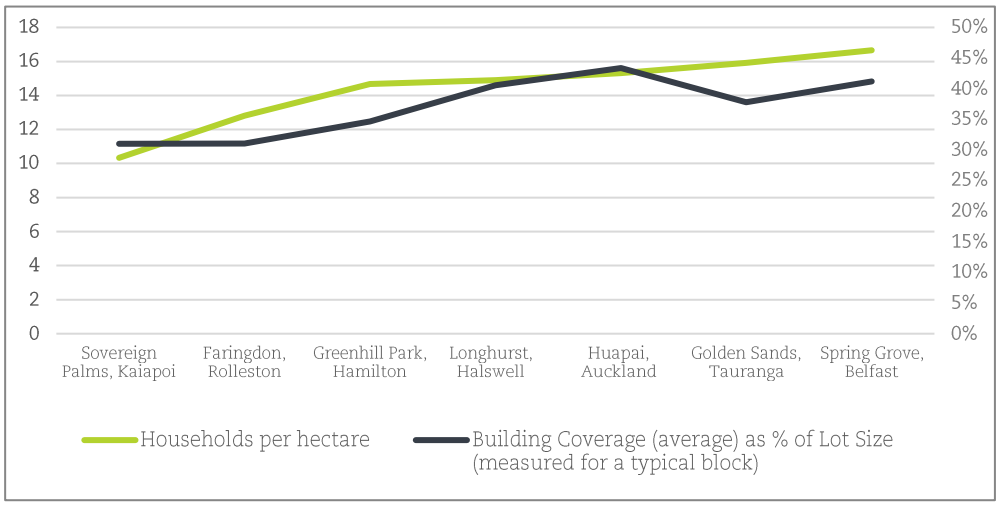
Chart 5: Households per hectare and outdoor landscaped areas



Outdoor space provided in front and side yards is of less benefit to residents than space in the main private outdoor space, especially when the quantum, of space becomes less than about 40m^2. While the case study locations are all providing 20m^2 of useable private outdoor space (on average) and slightly higher with lower densities, it also appears that locations at all densities allocate a significant proportion of their total space within front yards (and driveways) and side yards, where it is of marginal value to residents. This becomes an issue when the total outdoor living space within sites is less than 40m^2.

Developers appear to be complying with the minimum building setbacks (front and internal setbacks), **building coverage** (refer to Chart 6 below), **car parking sizes**, and similar planning rules that leaves little room for innovative housing designs as there a few areas where house designs can be adjusted.

Chart 6: Households per hectare and building coverage as a percentage of lot size



Private open space outcomes - Summary learnings

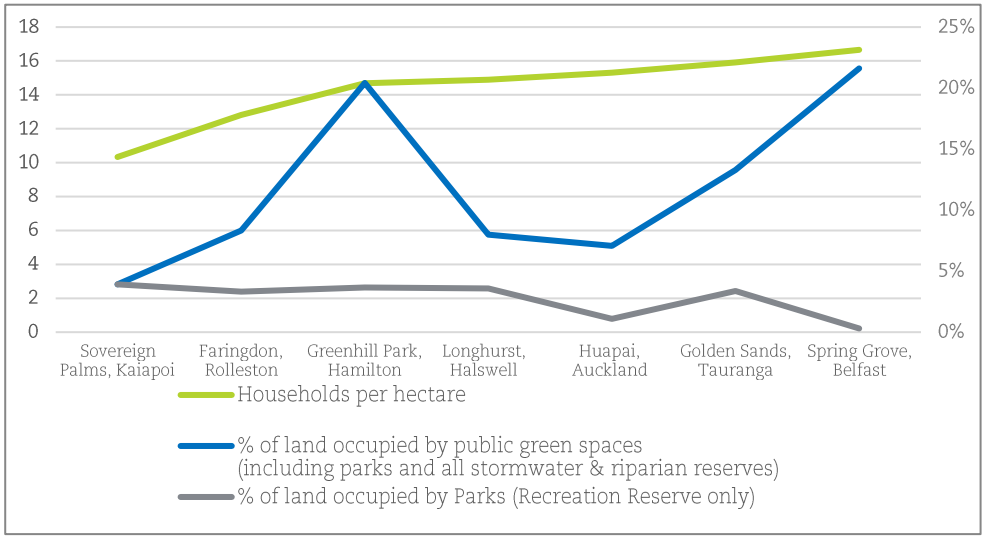
- There is a slight trend that increased densities contribute to less private outdoor space per dwelling. This trend is closely related to building coverage and building typology outcomes.
- Planning rules could be more closely linked to density policies, where yards, building coverage as a percentage of lot size and outdoor space requirements could be more responsive to variations in density.

5.3.6 ENVIRONMENTAL OUTCOMES

Observations from the case study areas are, as density increases:

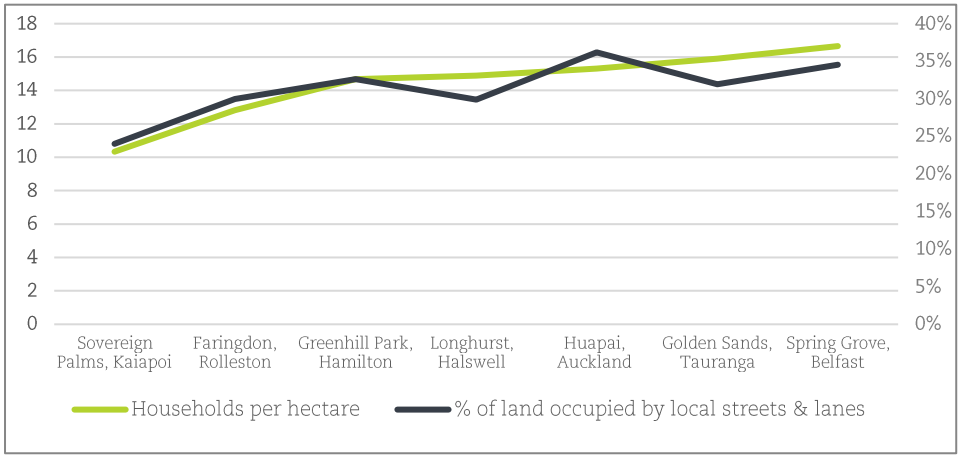
Land coverage allocated to parks decreases, **land coverage in private open space slightly decreases**, **building coverage as a percentage of lot area increases**, **the number of street trees slightly decreases** and **residents' ability to grow vegetables slightly decreases**. Chart 7 illustrates that the overall land coverage allocated to parks is decreasing as density increases.

Chart 7: Households per hectare and the percentage of land in public parks and stormwater reserves



A similar but inverse relationship with the increase in land allocated to streets and lanes (refer to Chart 8). Several neighbourhoods, particularly Faringdon and Greenhill Park, demonstrate street designs that have a much higher proportion of landscaping as shrubs rather than lawn.

Chart 8: Households per hectare and the percentage of land occupied by streets and lanes



Several case study neighbourhoods also have significant stormwater reserves that have been attractively landscaped. The environmental benefits of these public areas, which are often landscaped and formed as features within a subdivision design is potentially very significant but have not been accounted for in the graphs and case study presentations as they are excluded from the net density calculations.

Environmental outcomes - Summary learnings

- Higher densities result in less land being allocated to parks and open space that influence levels of amenity and the wellbeing of residents.
- The impacts of the reduced availability of open space as density increases may be reduced by the relative availability of areas that are excluded from the net density calculations, such as stormwater reserves and land set aside to protect sensitive environments.
- Small-scale interventions can demonstrate very beneficial results to overall environmental indicators, including the provision of street trees and high-quality landscaping within streets and private lots.

- Neighbourhoods should consider environmental indicators in the design and allocation of space. Policy alignment could ensure that the amount and quality of space benefitting the environment is maintained to an appropriate level and these policies should respond to higher densities.

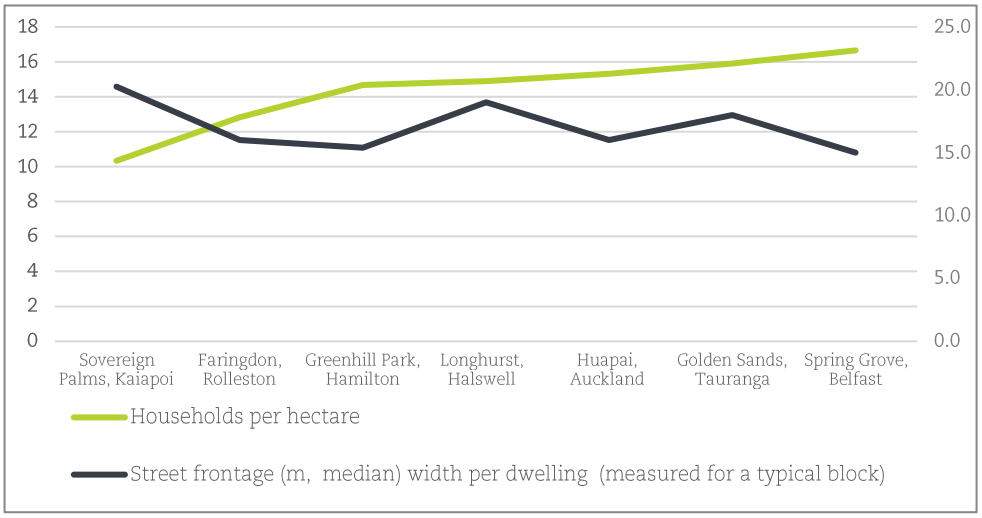
5.3.7 STREETSCAPE CHARACTER OUTCOMES

Observations from the case study areas are, as density increases:

Typical street frontage width per dwelling remains consistent across case study areas at approximately 15m to 17m: The trend in Chart 9 suggests that either:
(a) developers are reluctant to deliver narrower lots to the market (15m is sufficient for a single storey house with a double garage, any less width might typically require a two-storey house or a single/tandem garage solution); or (b) planning rules are influencing minimum lot widths or shape factors and are contributing to consistent street frontages.

In all likelihood it is a combination of these factors, but lot frontage (and lot shape factor) rules will have a strong influence on the minimum achievable lot widths in a development. This analysis has not assessed the proportion of rear lots within a study area, but we note that several of the council's apply subdivision rules to restrict the number of lots that can be access via a right of way or private lane.

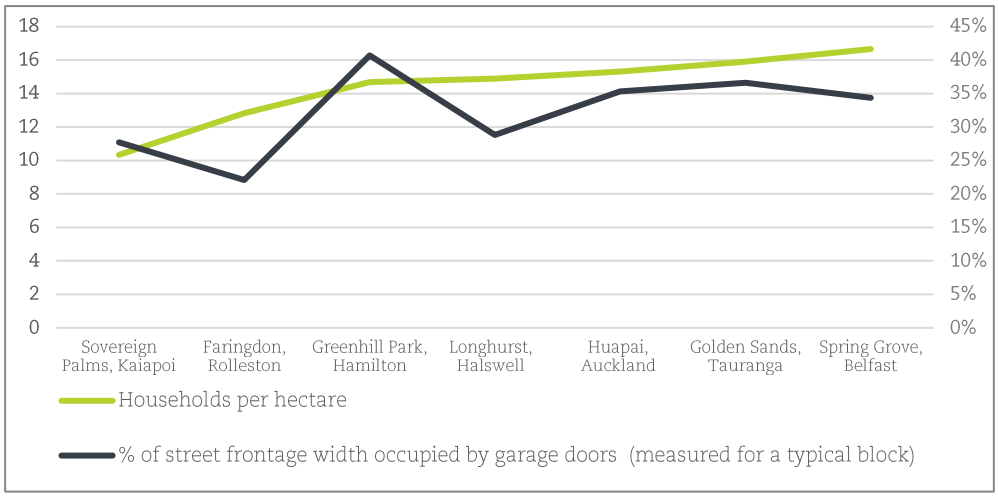
Chart 9: Households per hectare and street frontage widths



Garage doors as a percentage of street frontage is increasing: Chart 10 illustrates a general alignment between garage doors fronting the street and density.

A higher proportion of street frontage being occupied by garage doors contributes to lower activation, passive surveillance of the street, and a lower amenity. This effect particularly noticeable where more than 35% of the street frontage is occupied by garages, which often equates to approximately 50% of the overall house width.

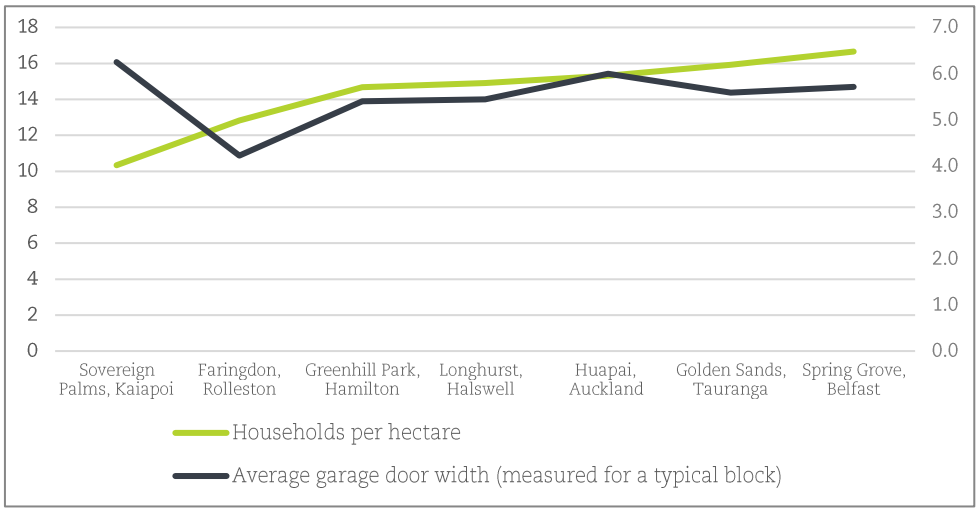
Chart 10: Households per hectare and the percentage of garage doors fronting the street



Average garage door width is slightly increasing: The increase in the percentage of garage door widths illustrated in Chart 11 is a concern as we would typically expect higher densities to result in a reduction in the garage door width as the section sizes reduce in size and width. This suggests that there is a market resistance to single-width garaging, even at higher densities where reduced section sizes make on-site space a premium.

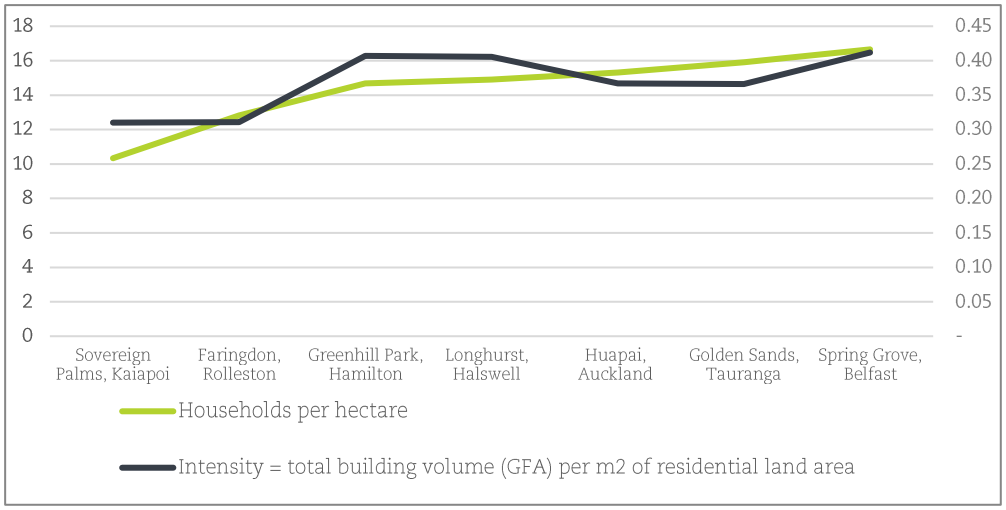
A demand for double-width garages may indicate either a demand for higher car ownership due to lack of public transport options in new growth areas, or demand for on-site parking due to a lack of on-street parks.

Chart 11: Households per hectare and garage door widths



Building intensity increases in line with density: The trend in Chart 12 confirms that most dwellings being constructed in the 10hh to 15hh/ha density range are single storey, with gross floor areas having some variation but remaining relatively consistent across the board.

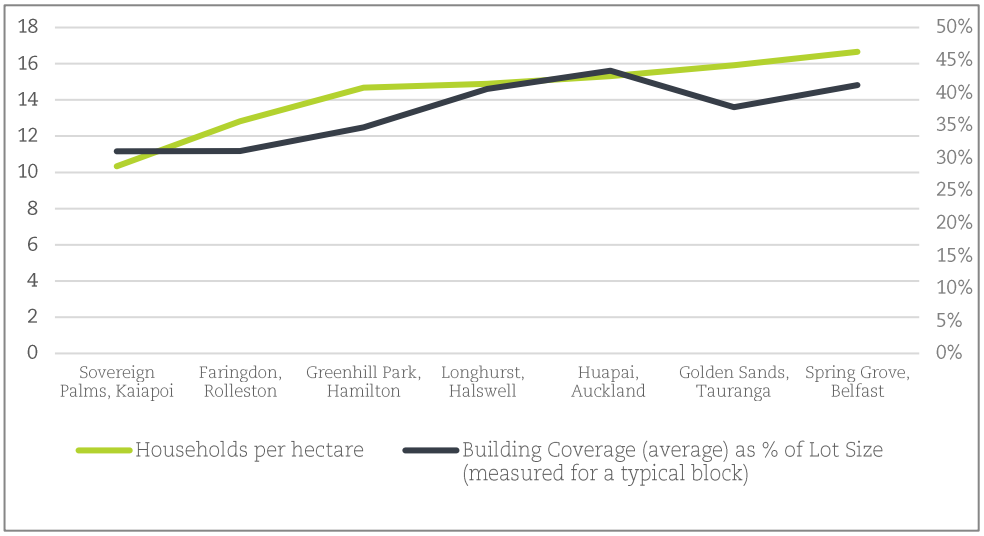
Chart 12: Households per hectare and gross floor area



Building coverage is increasing in line with density: The trend in Chart 13 confirms that the percentage of building coverage increases as density increases, which is to be expected as standalone single storey dwellings continue to be developed on smaller sections.

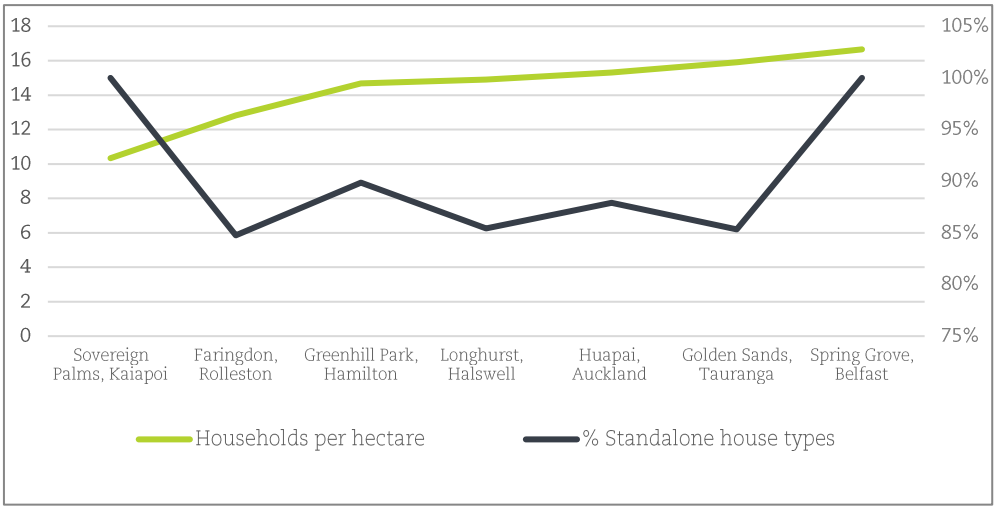
We cannot confirm whether a tipping point has been reached where more two storeyed dwellings become viable, given that only 2% to 3% of homes within the Belfast case study area have two storeys despite it having a density yield of more than 16hh/ha.

Chart 13: Households per hectare and building coverage as a percentage of lot size



The percentage of duplex and multi-unit versus standalone dwellings is not significantly affected: Chart 14 illustrates that on average only 6% of homes within the Greater Christchurch case study neighbourhoods are duplex, and 76% of homes have either a double or triple garage.

Chart 14: Households per hectare and the percentage of standalone homes



Street character outcomes - Summary learnings

- The minimum lot frontage and shape factor rules may be significantly affecting density by requiring reasonably wide lots of 15m or more. This may also indirectly be encouraging a preference for single-storey houses with double garage.
- Density policies and lot frontage rules at this scale do not appear to be encouraging more intensive housing typologies or enabling duplex or two storeyed typologies.
- Density policy could be targeted to manage frontage widths to maintain streetscape amenity as densities increase.
- There is no consistency in street design evident, with streetscape amenity varying across the cases study locations.

5.3.8 LOCAL TRANSPORT OUTCOMES

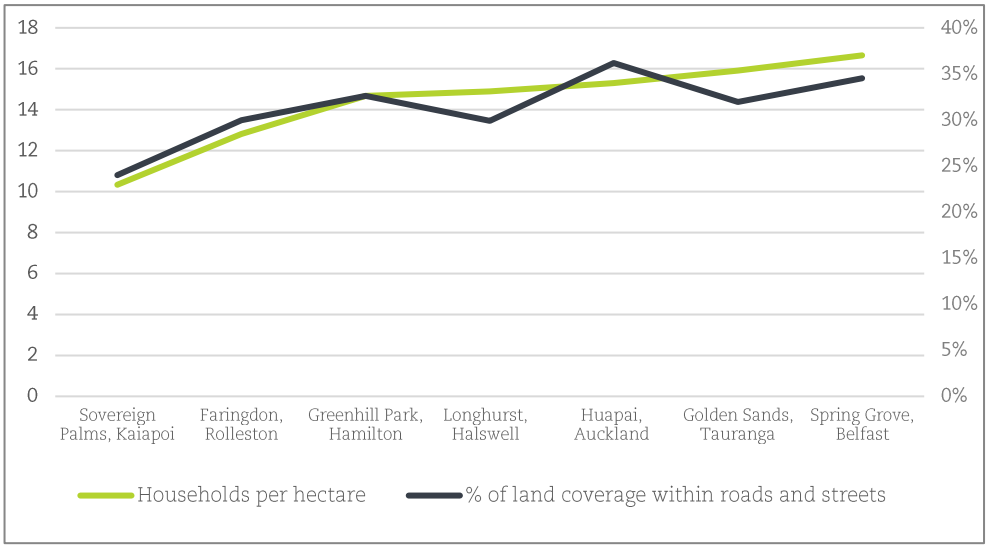
Observations from the case study areas are, as density increases:

The percentage of land coverage in proportion to streets is generally increasing: Chart 15 illustrates that the proportion of land that is allocated to sections and streets is generally consistent as density increases. This suggests that more streets are required to service the additional lots. It reinforces the preference for developers to invest in supplying lots with standard frontage widths and direct access to public streets, which is more desirable than the alternative that is to provide rear lots or rights of way serving a large number of sections. In our experience the difference between 24% and 33% of land that is dedicated to streets is substantial in terms of the costs of land, construction, and maintenance.

We expected to observe a difference in the type of streets being delivered as density increases across the spectrum. However, there does not appear to be any particular trend to suggest that higher density areas have consistently narrower streets, or streets with fewer amenities. The Huapai and Belfast case study areas both utilised indented car park bays for on-street visitor car parking consist with more innovative street

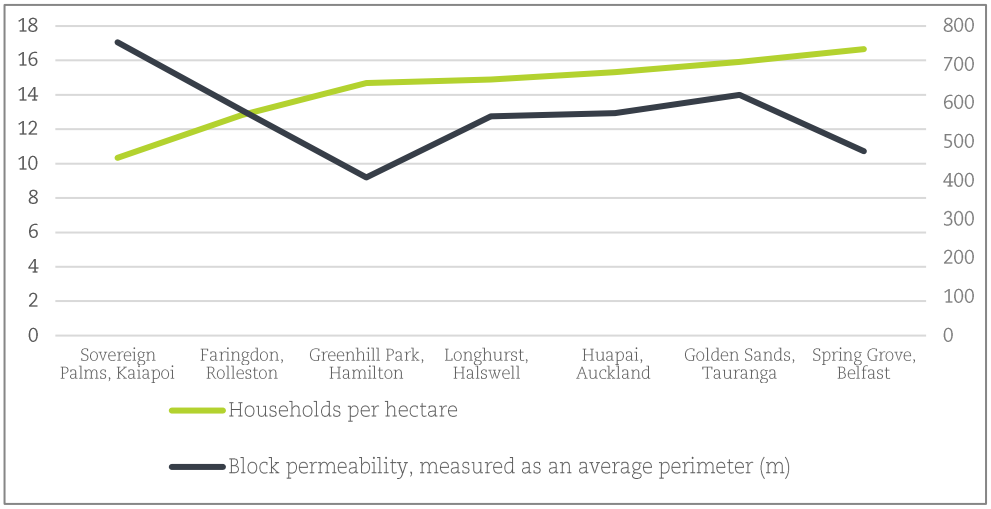
designs that should be encouraged to promote the safety and efficiency of the local road network. Most streets in the case study neighbourhoods have footpaths on one side only, which is seen as a poor outcome in respect to accessibility.

Chart 15: Households per hectare and the provision of streets



Average block perimeter decreases slightly: Chart 16 indicates that there is no significant trend between density and block perimeter. This suggests that road layouts are not necessarily being altered to create more rear lots or larger block sizes in higher density developments. Higher block permeability, determined by having lower average block perimeters, means that the neighbourhoods would have better transport efficiency and liveability outcomes.

Chart 16: Households per hectare and average block perimeters



It is also observed that the scale of the study areas means that most are within a '10-minute' 800m walkable catchment and all are serviced by local bus services and have access to State Highways where they are in outlying townships. The distances to metropolitan central business district vary from 10.7km for Longhurst to 28.6km for Huapai. All the sections within the study areas appear to be within walking or cycling distance to pre-schools, education facilities and open space reserves. Sovereign Palms and Greenhill Park do not contain a local commercial centre within the study area, so at this point in time there is a greater reliance on private motor vehicles to access everyday serviced and facilities.

Local transport outcomes - Summary learnings

- Increases in density across the 10hh/ha to 15hh/ha range do not have a particularly strong influence on the layout or design of the transport network within the neighbourhood.
- We have observed differences in the urban form across all case study areas, with a higher number of rear lanes and small lanes within higher density areas, however this is a weak correlation and there is not a clear outcome that can be linked to density without further research.
- The average block perimeters appear to be consistent as density increases. Ideally, we would want to see a trend that permeability increases, with smaller block sizes being provided at higher densities.

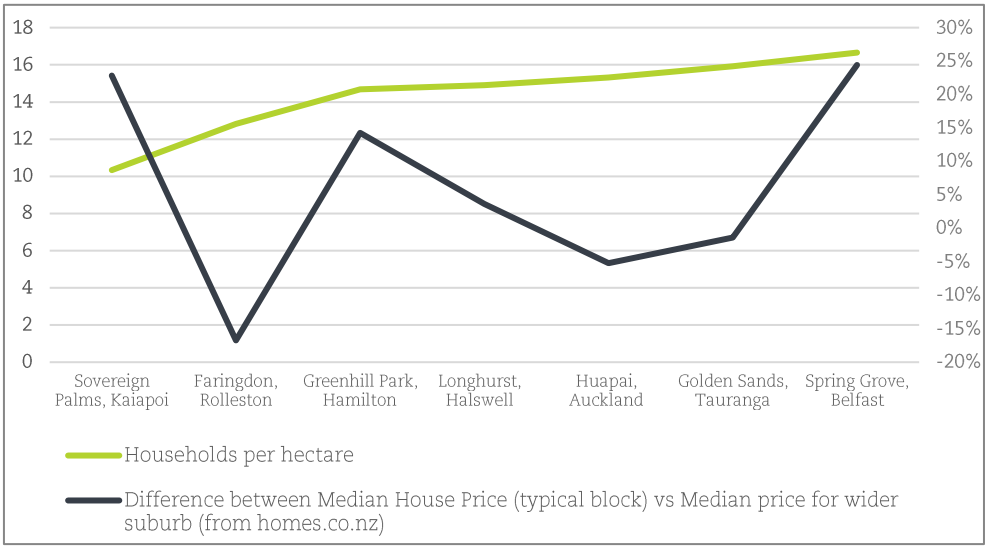
5.3.9 HOUSING AFFORDABILITY AND CHOICE OUTCOMES

Observations from the case study areas are that as density increases:

House prices do not appear to be significantly affected in relation to neighbourhood density: An observable trend is that house prices within the study area neighbourhoods tend to be lower than those of their wider or neighbouring suburbs. This probably reflects the lower average lot or house size within the study areas compared to the averages within neighbouring areas.

Chart 17 indicates that house prices do not appear to be changing in response to density, with case study neighbourhoods achieving higher or lower pricing levels at each end of the density spectrum.

Chart 17: Households per hectare and median house prices



The four GCP GPA are significantly more affordable (Longhurst - $586,000; Sovereign Palms - $565,000; Spring Grove - $535,000; And Faringdon - $466,000), than the three 'high growth' area average prices (Huapai - $1,000,000; Greenhill - $795,000; and Golden Sands - $725,000). As a result, there does not appear to be a correlation between density and price or proximity central business districts, with the underlying land value and development costs likely to be influencing factors.

Typology mix (% of each type) is remaining consistent and vast majority of houses are provided as standalone types: Chart 18 indicates than an increase in density across the 10hh/ha to 15hh/ha range is still predominately being developed to

accommodate single standalone dwellings. There is no apparent threshold for when duplex or multi-unit homes become more feasible to develop.

In our experience, some of the reasons that are attributed to why standalone dwellings are preferred to duplex and other higher density housing typologies include:

a. building companies often building a single house, avoiding issues of party walls, easements, fire rating and shared utilities.

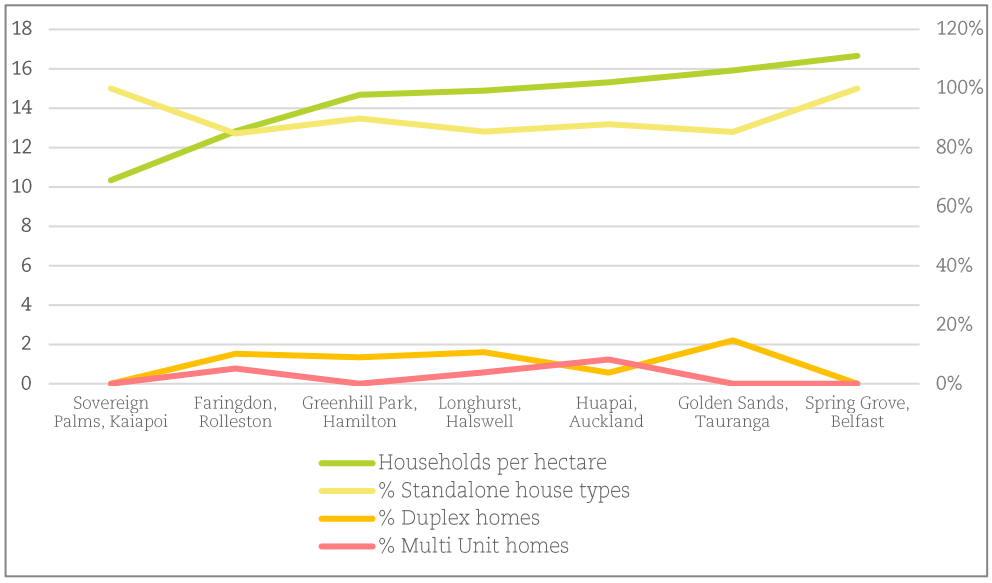
b. it can be more difficult to configure sites accommodate duplex units as they need to be wider.

c. more people prefer their own house and land where there are likely to be less issues relating to shared maintenance of utility and shared open space areas and perceptions of increased noise and reduced privacy.

d. garage provision is often reduced and access arrangements challenging to configure.

e. banks sometimes prefer detached housing on standalone titles when capitalising land and housing developments.

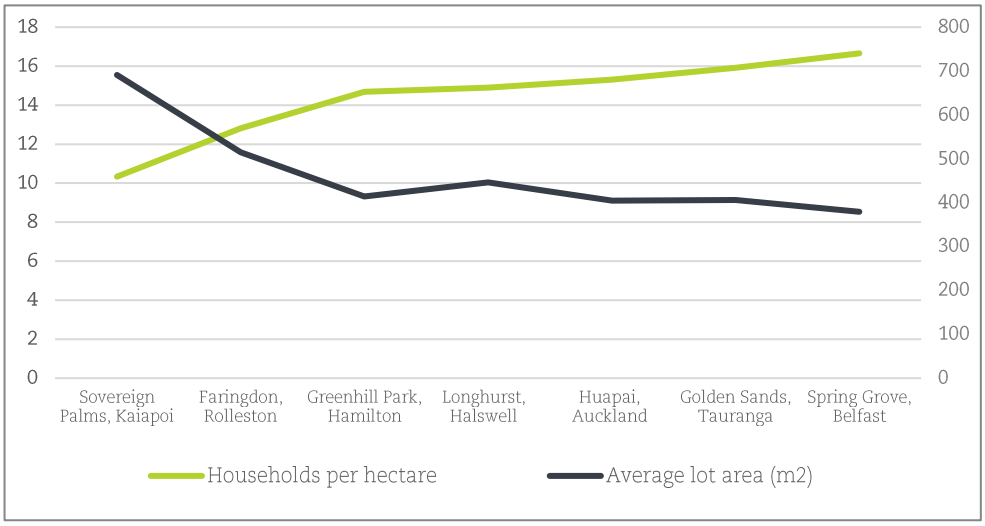
Chart 18: Households per hectare and housing types



The lot sizes are decreasing: Chart 19 illustrates the obvious trend that the average lot sizes decrease as density increases. This more pronounced in the 10hh/ha to 12hh/ha range where there is a relatively step decline in average section sizes, from 700m^2 to 400m^2, and where there is likely to be a broader range of section sizes within the subdivisions.

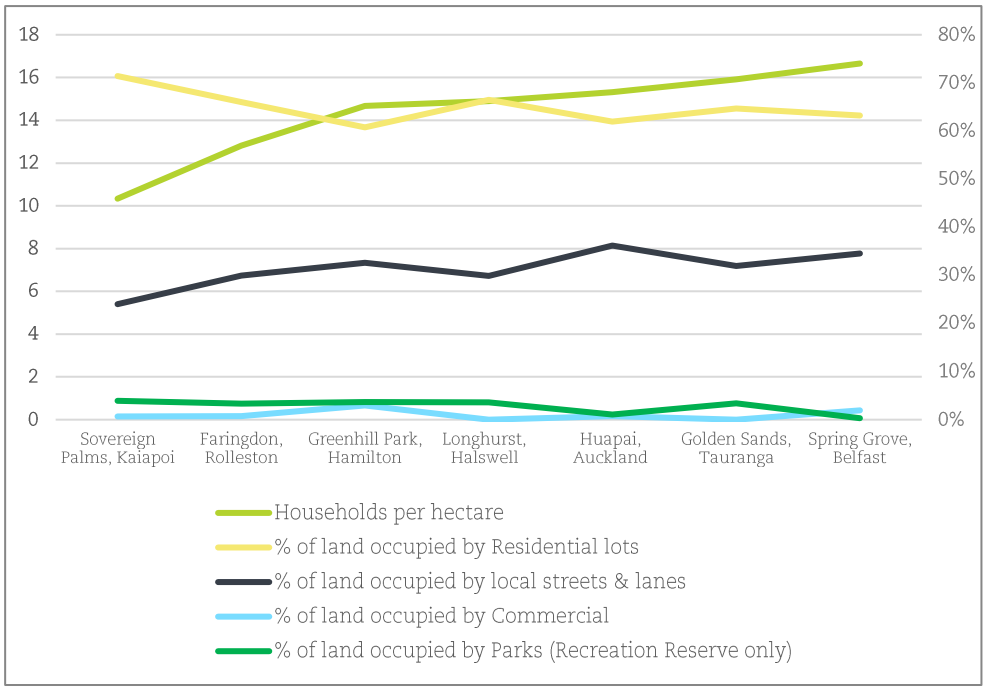
However, the average lot areas between the 13hh/ha to 16hh/ha range remain relatively consistent, with average section sizes sitting at around 420m^2. This suggests that lot sizes are reaching a common minimum viable product at around 400m^2, which is bought about through a combination of market forces and planning rules.

Chart 19: Households per hectare and average lot area



Increases in density have a relatively small influence on how the land is used. There is a slight trend towards an increased proportion of streets compared to residential, and a slightly lower proportion of land for parks as density increases (Chart 20).

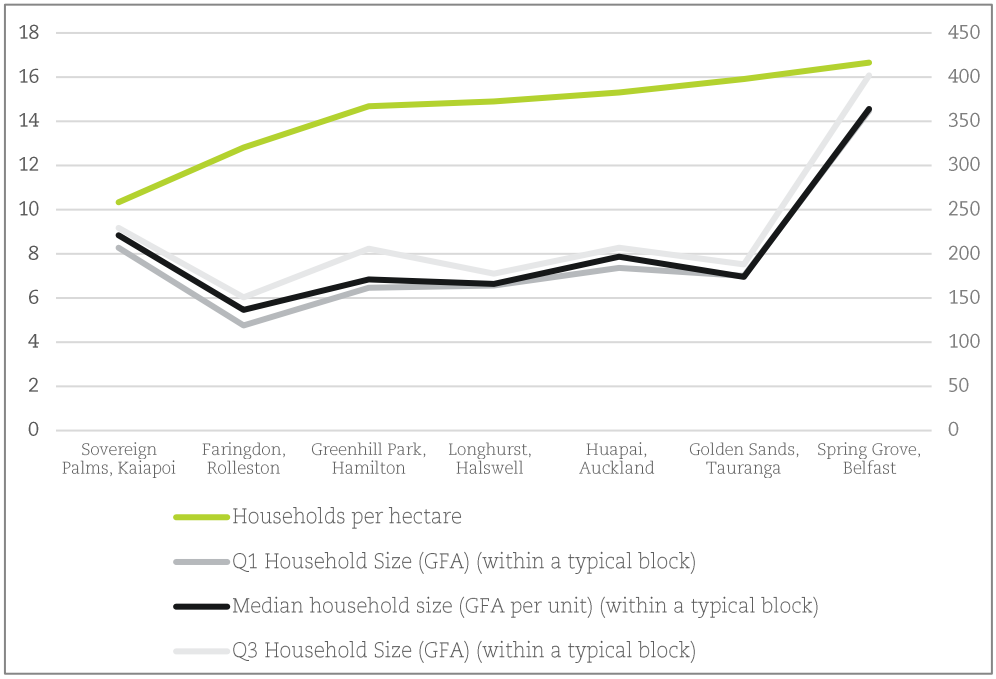
Chart 20: Households per hectare and land uses



The average and range of household sizes is increasing: While the correlation illustrated in Chart 21 is not particularly strong, the trend runs counter to what would typically occur when densities increase.

This outcome does not appear to be driven by the preference for single over double storey homes or other housing typologies, so it is possibly arising from market or developer preferences.

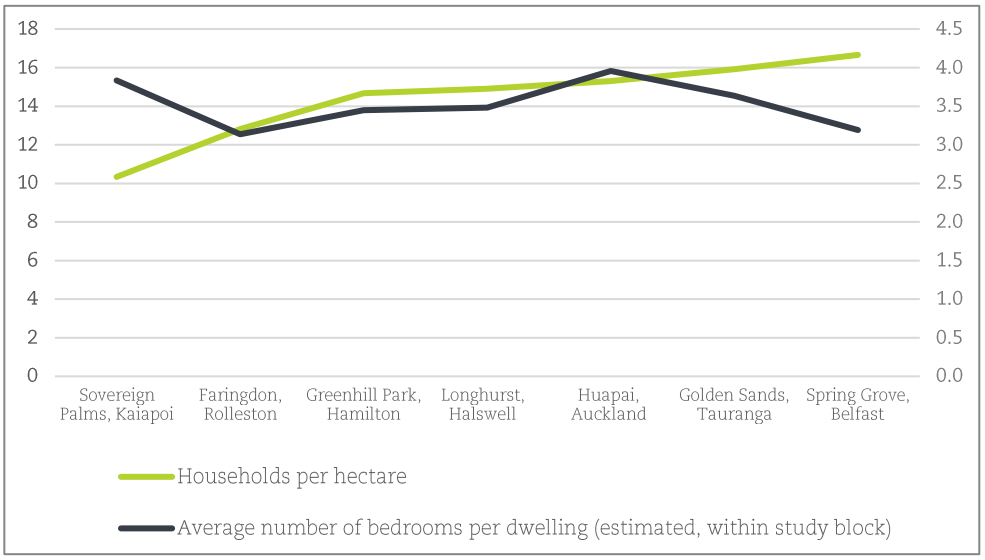
Chart 21: Density and household size (GFA)



The spread of housing sizes is staying very consistent within each case study area, but this indicates our selection of a "typical" study block which does not necessarily reflect the overall study area. Further research could determine if household size range changes significantly at different densities, but we have reported on the type of dwelling and the lot size range at the neighbourhood scale, which is also closely linked to floor area.

Average bedrooms per dwelling is remaining fairly consistent: The case study analysis indicates that density is not a strong factor in determining bedroom sizes, with three to four-bedroom homes remaining the norm across the spectrum (refer to Chart 22). The absence of single- and two-bedroom homes will have an influence on affordability and does not necessarily align with the housing demand profile for Greater Christchurch, which is illustrated in Figure 6 in Section 5.2.2.

Chart 22: Density and average number of bedrooms per dwelling



An observation of interest is that the number of bedrooms appears to drop from four to three bedrooms at densities of around 14hh/ha. Further research to expand the sample to cover a wider range of lot types and locations would improve this understanding.

Housing affordability and choice outcomes - Summary learnings

- Housing affordability and choice are not closely linked to density outcomes within the range of 10hh/ha to 15hh/ha.
- The vast majority of homes being developed across the case study areas are three-to-four-bedroom homes, with absence of single- and two-bedroom homes likely to be having an influence on affordability and fails to respond to the Greater Christchurch housing demand profile.
- There is a correlation between increases in density and reduced average lot sizes, although the extent of change is more pronounced in the 10hh/ha to 12hh/ha range (on average between 700m^2 to 400m^2) while lot sizes are relatively consistent between the 12hh/ha to 16hh/ha (around 400m^2 on average). Increases in density across the 10hh/ha to 15hh/ha spectrum are therefore likely to limit the range of section sizes being available within subdivisions that may reduce housing diversity.
- There does not appear to be a correlation between density and price or proximity to central business districts.

5.4 KEY LEARNINGS - DENSITY OUTCOMES EVALUATION

TABLE 6: KEY LEARNINGS - DENSITY OUTCOMES

POSITIVE OUTCOMES THAT NEED TO BE MAINTAINED
URBAN FORM
23. Maintain a consolidated settlement pattern that optimises the use of the available 'greenfield' land through appropriate densities.
24. Retain minimum net density requirements and encourage intensification and redevelopment, particularly in close proximity to town centres and neighbourhood centres.
LAND USE
25. Continue to require that development optimises the available land by encouraging minimum densities that respond to the Greater Christchurch housing demand profile.
26. Continue to formulate and apply appropriate 'greenfield' location selection principles to sustainably manage finite resources, manage and improve resilience to natural hazard risks, protect and enhance sensitive sites and maintain the operation of strategic infrastructure and strategic transport networks.
INFRASTRUCTURE
27. Maintain and extend the collaborative partnerships, spatial planning and coordination of land development that has successfully enabled the infrastructure to be funded and developed to service increased density in the GPA and Intensification Area.
STRATEGIC TRANSPORT
28. Continue to fund, improve, and coordinate upgrades to the strategic transport network that are assisting with the uptake of the GPA and will support increased density.
29. Continue to promote and encourage mode shift and improve access to public transport that assists to realise the benefits of increased densities.
'LIVEABILITY'
30. There is a high degree of consistency in liveability outcomes, where the effects on increasing densities up to 16hh/ha appear to be subtle and there is no threshold within this range that significantly alter the quality of the development.
31. House design, size and affordability is consistent across all density ranges in the study.
32. Height, building coverage and landscape rules do not appear to be hindering higher density from occurring on 'greenfield' land.
33. Population densities and the gross floor area of dwellings is increasing in line with density, which signals that the land is being used more efficiently.
34. The provision of streets marginally increases with density, while there did not appear to be any reduction in streetscape amenity or noticeably narrow streets.
NEGATIVE OUTCOMES, RISKS AND OPPORTUNITIES
URBAN FORM
35. Ensure appropriate frameworks are in place to manage 'out of sequence' growth where they may compromise the maintenance of the sub-regions consolidated settlement pattern, including through the Our SPACE Actions, Changes to the CRPS and the GC2050 review.
36. Formulate and apply methods to increase densities and to incentivise and enable intensification and redevelopment in the locations set out in Policy 3 of the NPS-UD.
LAND USE
37. Acknowledge and manage the locational trade-offs and distributional effects associated with developing 'greenfield' land across Greater Christchurch, which can be improved through increasing densities in 'greenfield' areas where it remains feasible to develop and continues to be meet market demand.
38. Incentivise and encourage intensification and redevelopment to increase the diversity and affordability of homes through increasing densities under appropriate circumstances.

TABLE 6: KEY LEARNINGS - DENSITY OUTCOMES
39. Review the impacts of locational land use constraints, such as geotechnical conditions and methods for managing stormwater, where these are identified to be affecting development feasibility and achieving the minimum net densities.
INFRASTRUCTURE
40. Ensure that any increased densities continue to be viable to service with the necessary infrastructure, utility services, open space, and community facilities.
STRATEGIC TRANSPORT
41. Review approaches for sequencing growth, aligning cross boundary funding, and implementing measures to further promote mode shift, including incentivising intensification and redevelopment in close proximity to critical transport infrastructure.
42. Promote partnerships and continue to invest in preparing business cases to secure funding for critical transport network upgrades and improvements to 'unlock' the benefits and viability of increased densities.
'LIVEABILITY'
43. The 15m wide lot widths and height to boundary rules encourage wide street frontages that enable single level standalone dwellings, while discouraging two storey dwellings and the creation of narrower sections for duplex units and terraced housing.
44. Evaluate the appropriateness of developing rules to require a range of section sizes or mix of housing typologies and reviewing the appropriateness of reducing building setbacks and height in relation to boundary restrictions.
45. The number of parks and amount of land dedicated to public and private open space decreases as density increases, which reduces liveability.
46. Only 6% of homes in the GCP case studies are duplex, with 76% having either double or triple garaging and the large majority of developments accommodate three-to-four-bedroom homes - Housing provision needs to be better aligned with the housing demand profile.
47. There is no consistency in street design across the cases study areas, with some locations having highly landscaped streets while other having more limited streetscape amenity.
48. The average block perimeters appear to be consistent as density increases, where ideally permeability and provision for active travel modes should be increasing within higher density developments.

6.0
NATIONAL AND INTERNATIONAL RESEARCH

6.1.1 INTRODUCTION

The following section summarises the findings of a desktop literary review of national and international research that considers the benefits of achieving higher densities and the methods for overcoming any identified constraints and issues.

The research articles that have been sourced focus on the following themes:

- The benefits of increased densities.
- Constraints and issues to increasing densities.
- Methods for activating density and overcoming constraints and issues.

There is limited national and international research undertaken on the impacts of increases in housing densities within satellite towns, particularly in respect to the positive and negative outcomes in increasing densities across the 10hh/ha to 15hh/ha range.

Therefore, the learnings for each of the themes identified above provide more general direction on the benefits, constraints, and issues with increasing housing densities across a much wider spectrum and typically within the context of larger metropolitan centres. The research also reinforces that the GCP is already implementing a range of measures to manage urban development and housing densities in line with best practice.

6.2 THE BENEFITS OF INCREASED HOUSING DENSITIES

6.2.1 LOCATIONAL AND DISTRIBUTIONAL BENEFITS OF DENSITY

The national and international research confirms that the approach being applied by the GCP to work collaboratively to manage urban growth in a manner that support consolidated settlement patterns. The evidence reiterates the benefits this approach is able to deliver in respect to the efficient use of land and infrastructure, promoting and optimising mixed land use activities, coordinating investment in multi-modal transport systems, providing quality public spaces and parks, supporting local businesses, facilities, and services, contributing to an improved sense of 'place' and creating healthy, vibrant, and resilient local urban environments[78].

The management of the locational and distributional spread of 'greenfield' development and actively encouraging varying housing densities are essential to achieving consolidated settlement patterns and the associated benefits that can be derived from them, particularly in locations like Greater Christchurch where there are few natural constrains to contain outward expansion[79]. A key benefit of consolidated settlement patterns is ensuring higher densities are located in areas that encourage modal shift by allowing people to live closer to key urban areas, while also reducing infrastructure costs and managing the loss of fertile rural land[80].

[78] Tauranga City Council. Proposed Tauranga Urban Strategy 2050. Page 22; EMS Ltd. August 2015. Page 1. Haarhoff, E. et al. 2016. Page 2; Auckland Council. Sept 2011. Page 84 to 86. Betanzo, M. Apr2007. Pages 39 & 40; Plan Melbourne 2017 to 2020. Directions 2.1 and 2.2. Pages 46 to 49; PwC. Jul2020. Page 9; Goodman, R. et al. Planning reform, land release and the supply of housing. Feb2010. Page 15.

[79] Smart Growth HDCA 2017. Introduction. Page 8.

[80] Future Proof Strategy. 6.3 Key targets for the Settlement Pattern. Page 32; PwC. 2020. Page 12.

The benefits of well-designed density

Ministry for the Environment research establishes that well designed urban environments and residential neighbourhoods containing a mix of housing densities have the potential to create value for communities, individuals, the economy, and the environment, are illustrated in Figure 8[81].

Figure 8: The benefits of well-designed density

Source: Adapted from Franks, B. https://trendsideas.com/gallery/stories/market-report-urban-design/

High density developments need to be supported with the following elements:

- Safe, accessible, and well connected for pedestrians and cyclists to optimise active transport.
- High-quality public realm and open space.
- Services and destinations that support local living.
- Access to quality public transport that connects people to jobs and higher-order services.
- Housing and population densities that make local services and transport viable.
- Thriving local economies.

The '20-minute neighbourhood' concept employed in the Plan Melbourne 2017-2050 spatial plan illustrated in Figure 9 on the following page is an innovative and aspirational approach that emphasises the local benefits that can be realised from increasing densities in locations that are closer in proximity to people's everyday needs.

[81] MfE. The Value of Urban Design. Jun2005.

It is important to acknowledge that this concept is likely to be more viable within larger metropolitan centres and that significant public and private investment is needed to make the 20-minute neighbourhood a reality[82].

Figure 9: The '20-minute neighbourhood'

Source: Plan Melbourne 2017-2050. Direction 5.1 Create a city of 20-minute neighbourhoods. Pages 98 and 99.

The research reinforces the benefits of consolidated settlement patterns (urban containment) and enabling higher densities (building up rather than out) in appropriate locations (optimising the available land resource) at the macro urban form scales through to the neighbourhood scales.

6.2.2 INCREMENTAL BENEFITS OF INCREASED HOUSEHOLD DENSITIES

This density analysis has been purposefully targeted to a relatively small range of 10hh/ha 15hh/ha of density increases consistent with smaller townships on the periphery of a large urban conurbation.

The benefits that are able to be realised at the maximum 15hh/ha density range are therefore going to be more limited than what can be achieved at much higher densities that are typical and more readily achievable within significantly larger metropolitan centres.

Figure 10 over the page illustrates the likely tipping points at which the densities generally start to deliver benefits in respect to a higher proportion of more intensive housing typologies and modes of travel. More detailed research is required to qualify these tipping points for New Zealand and the Greater Christchurch sub-region, including expert advice from property valuers, construction companies and the development sector.

[82] Plan Melbourne 2017-2050. Direction 5.1 Create a city of 20-minute neighbourhoods. Pages 98 and 99.

Figure 10: Housing densities and transport networks

HOUSING DENSITY	HOUSING AND TRANSPORT NETWORKS
10-15hh/ha	Predominantly single level standalone housing
20+hh/ha*	Local connector Network[83]
25hh/ha	Duplex housing and two storey housing
25-30hh/ha	20-minute neighbourhood[84]
30-35hh/ha	Terraced housing
30-40+hh/ha*	Quality transit network[85]
40-60hh/ha*	High frequency transit[86]
50hh/ha	Three to five storeys
70hh/ha	Six + storeys

* these are based on gross rather than net density calculations.

6.3 CONSTRAINTS ATTRIBUTED TO HIGHER DENSITY HOUSING

6.3.1 SUPPLY AND DEMAND CONSTRAINTS

Market demand and supply for higher density housing typologies, including duplex, multi-units, and apartments, is suppressed in New Zealand compared to standalone dwellings, which the research attributes to the following influences are covered in this section: (a) negative perceptions; (b) lack of diversity and drivers for change; (c) housing market trade-offs and preferences; and (d) development sector influences and market supply.

Perceptions[87]

Higher density housing typologies are often assumed to be of low-quality design, too expensive, have reduced parking options or lack amenity, privacy, and outdoor living areas. These perceptions are typically maintained even though sections that accommodate standalone dwellings are becoming increasingly becoming smaller in 'greenfield' areas.

One of the risks in increasing housing densities, particularly when change occurs within already established neighbourhoods and communities, is resistance and negative perceptions from existing residence that can translate to reduced market demand and risk to developers.

Lack of diversity and drivers for change[88]

The research indicates that small numbers of higher density housing being established in subdivisions can reduce the ability for it to integrate into the wider neighbourhood where open space, transport networks and local services are geared towards lower densities. It is also evident that there is a narrow range of people that prefer higher density living. Young students and professionals, singles or couples and frequent movers or residence that want the flexibility to 'lock and go' are attracted to higher density living.

[83] Ken Tremaine Consulting. Smart Growth Comparative Cities, Report 2. Page 47.

[84] Stanley, J. & Hansen, R. People love the idea of 20-minute neighbourhoods. So why isn't it top of the agenda? - Link.

[85] Ken Tremaine Consulting. Smart Growth Comparative Cities, Report 2. Page 47.

[86] Ken Tremaine Consulting. Smart Growth Comparative Cities, Report 2. Page 47.

[87] Gjerde, M. Why New Zealand can't get high-density housing right? 14 June 2017; EMS Ltd. Aug2015, Page 51; City Scope. Jun2011. Executive Summary I, ii & iv; Smart Growth HDCA 2017. Housing demand assessment, Page 21; BRANZ. Mar2020, Page 49.

[88] City Scope. Jun2011. Executive Summary, vii & xii; Smart Growth Strategy 2013, Page 106; RM Review Panel. Jun2020, Page 353.

The drivers for higher density housing vary across centres but often a catalyst for change is needed for the market to respond, such as severe transport issues (health and wellbeing, congestion, commuter delays and costs) that can be remedied by redeveloping closer to commercial centres and employment hubs. The research highlights that people are willing to choose higher density housing to avoid or reduce commuting. Other drivers are also likely to become more influential in making higher density living more popular, including affordability and an aging population.

Other catalysts for changes in density are significant natural events. For example, the Canterbury Earthquakes resulted in Christchurch's central city being out of commission for a long period of time to manage safety and enable the rebuilding and recovery works to take place. This resulted in commercial developments and accommodation moving to other locations within the sub-region. Suburbs like Addington saw an increased uptake of higher density multi-storeyed housing that enable residents to enjoy the locational benefits of access to employment, a vibrant café and restaurant scene, proximity to Hagley Park, AMI stadium and Addington raceway, the Riccarton Mall and Tower Junction retail precincts and access to strategic roads.

These drivers for change emphasise the need to increase the supply of higher density housing around existing and new public transport corridors and rapid transit services to better meet demand. These drivers for change may be missing from smaller centre's where tipping points have yet to be reached within the housing market.

Housing market trade-offs and preferences[89]

There are trade-offs taking place within price envelopes and geographically constrained housing markets, which influences the extent to which people are willing and able to invest in locations and higher density housing options. For example, families may prefer lower density housing close to schools and community facilities and are willing absorb the costs of family members commuting to work, while students may prefer to be closer to a campus and their everyday needs to minimise travel costs. Land is also more expensive when it is close to employment and other valued amenities, with the market response often being to optimise returns on investment through developing more intensive housing, including vertical builds to allow more residents to share the higher cost of land.

These trade-offs emphasise the importance of ensuring higher density housing is distributed across a wider sub-market so that it is available to a higher proportion of the market. It also indicates that investment in local services and particularly transport networks increase land prices, that is then a catalyst for the market to provide higher density housing to meet demand.

The difference in price between multi-unit housing and detached dwellings is often too close to encourage a shift from the latter to the former, which generally makes it more economic to purchase a standalone dwelling for a higher proportion of the housing market. The demand for 'greenfield' development and lower density housing is often high due to a combination of restrictions on intensifying existing suburbs, low pricing of the true cost of private motor vehicle use and the lack of recognition of the environmental impacts of urban expansion. It is evident that housing price points and locational choices often fails to account for the wider costs of dispersed settlement patterns on society, strategic infrastructure, or the environment.

Affordability is, and will continue to be, a key determinant of the proportion of society that will choose higher density housing as an economically viable choice. The cost of land will inevitable be higher the closer it is to services and employment opportunities, while the price of building higher density housing also impacts on affordability. Horizontally attached units are the most affordable option as they are cheaper to construct than vertical builds. The most

[89] Page. I. 2017, Page 42; Rehm, M. & Yang, Y. Jun2020, Page 1; NZ Productivity Commission. Mar2012, Page 111; Building Better Homes, Towns and Cities. Jan2018, Pages 56 to 58; City Scope. Jun2011. Executive Summary, vii & xii. M, Te. Urbanerds Seminar, Aug2020; RM Review Panel. Jun2020, Page 352; Auckland Council. Sep2011. Page 69.

affordable higher density typologies for median-income households are typically flats and terraced houses on the fringe a metropolitan centre and outer suburbs due to reduced land and construction costs. The cost of building multi-level apartments and mixed-use developments is significantly higher.

Although not limited to higher density housing, the speculative gain that investors and property owners are able to realise has resulted in housing becoming a commodity, which influences housing affordability. This can only be resolved through Central Government interventions such as a capital gains tax.

Development sector influences and market supply[90]

Capacity, capability, and performance of the construction sector has a major influence on the countries housing market, including the affordability and availability of higher density housing. The building sector is generally responsive to change, for example adapting to land supply constraints, customer preferences and regulatory change. There are no apparent constraints relating to the cost of materials or capacity in the sector to meet projected demand that could influence the cost and affordability of higher density housing.

The research indicates that the building sector generally struggles to achieve the efficiencies that can be realised through economies of scale due to its small size, which also exposes the industry to risk during boom-bust cycles in respect to securing finance and managing low periods of productivity. The size of the industry also influences the price and affordability of higher density housing, where cost cutting innovations like building multi-level housing off-site rather than on-site is in its infancy and is expensive to establish. Similarly, the construction of multi-level apartments is often not seen as being viable because build costs are the same as a commercial fit out that is likely to yield a higher market return.

The development feasibility and financial risk management practices of the development sector also influences the quality and amount of higher density housing that is available in New Zealand. Developers and financiers apply practices to manage risk that dictates acceptable profit margins and influence the operational structures that supply housing that satisfies a market need to ensure cash flow. The management of financial risk is fundamentally important to the residential development process as it is directly influenced by market preferences. This is particularly relevant to the supply of housing being provided by at the market at any given time when developers need to meet market demand or they will fail to recuperate returns on their investments. As a result, housing supply does not always correlate with longer term housing needs.

The cases study analysis in **Section 5.3** confirms that this is occurring in Greater Christchurch and the other 'high growth' areas where there is a strong supply of single storey standalone homes with three to four bedrooms and double garaging at reasonably similar price points and quality across the 10hh/a to 15hh/ha density range. However, there is a very low proportion of higher density housing typologies being developed in the GPA, which is required to satisfy the sub-regions estimated housing demand profile (refer to **Figure 3**).

6.3.2 INSTITUTIONAL CONSTRAINTS

The research identifies a range of institutional constraints that influence land development and the supply and demand of higher density housing in New Zealand. These issues are identified, while the methods to overcome these constraints to activate higher densities where interventions that are within the control of local authorities are outlined in **Section 6.2.4**.

[90] Johnson, A. et al. Feb2018. Pages 19 & 25; EMS Ltd. Aug2015. Page 51; Page, I. 2017. Page 42; Bryson, K.& Allen, N. 2017. Page 47; Murphy, L. Mar2019. Page 12; Te, M. Urbanerds Seminar, Aug2020.

Planning systems and processes[91]

A number of housing supply and affordability issues with the countries planning system and processes have been identified through government and development sector-initiated reviews. These issues influence the cost and risk for the development sector to provide housing to the market, including a higher proportion of higher density housing typologies.

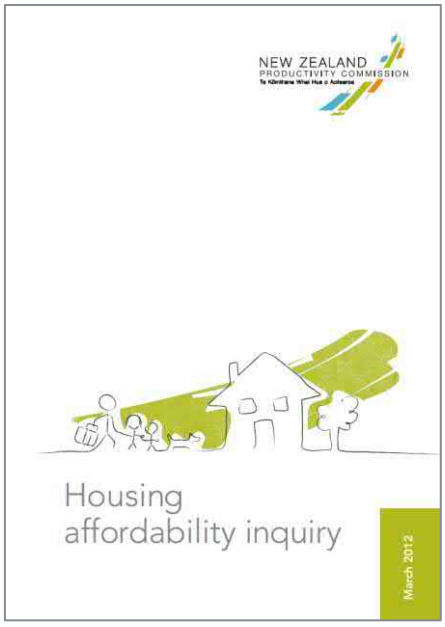
Central Government

The absence of Government direction and leadership has been cited as a constraint to enabling higher density housing. This extends to setting clearer expectations around the role and the contributions they can make to enabling higher density housing and implementing alternative institutional frameworks to take integrated planning, design, and development to the next level so that it is more responsive to market needs, preferences, and changes.

Councils

The New Zealand Productivity Commission's Housing Affordability Enquiry identifies that the widespread planning preference for increasing residential density and control of 'greenfield' expansion is limiting housing choice and creates scarcity in supply. The Enquiry also identified that the misalignment of planning policy coupled with the imposition of consenting compliance requirements combine to increase house prices and to contribute to affordability issues.

Other research emphasises that uncertainty with planning rules translates to delays and costs that the development sector needs to manage before proceeding with a project. This uncertainty is highlighted by the absence of a universally or accepted standardised measure or definition of the varying types of densities that occur across the country by either Council's or the built environment industry.



District plans in New Zealand will typically require resource consent for higher density housing development to assess a broad range 'effects' that vary substantially between different territorial authorities. For example, the following evaluations and assessments may be required: (a) visual appearance; (b) the function of intensive forms of residential development typologies; (c) minimum lot size, building setbacks, building recession planes and height restrictions; and (d) carparking.

The research identifies that not only does the consenting process contribute to cost and uncertainty, but traditional planning rules can conspire to limit the size and intensity of development. Controls on height, building setbacks, shading, and urban design to protect the privacy, amenity and outlook associated with adjoining properties and the character of neighbourhoods can lead to conservative designs to avoid complex consenting processes. However, this can have the effect of reducing innovation, failing to maximise the full potential of sites, and discouraging higher density housing projects from proceeding.

[91] NZ Housing Productivity Commission. Mar2012, Page 9; Tindale, A. Sep2018, Pages 3 & 12; Allen, N. & O'Donnell, G. 2020, Page 47; Gjerde, M. Why New Zealand can't get high-density housing right? Jun2017; Beacon Pathway and the Property Council NZ. 2019. Pages 49 & 50; EMS Ltd. Aug2015. Page 50; City Scope. Jun2011, Summary iv & xiv; Johnson, A. et al. Feb2019, Page 25; Gjerde, M. & Kiddle, R. 2019. Page 5; City Scope. Jun2011. Summary iv; Hills, R. et al. May2020. Page 50; Auckland Council. Sep2011. Page 51.

The administration and interpretation of planning rules is also identified as a constraint that reduces certainty and increases the risk and cost associated with higher density housing projects.

This is exacerbated where there is a lack of clear guidance to assist in interpreting subjective assessment criteria and the absence of experienced staff in projects that can generate consequential costs with reworking designs, establishing, and delivering 'workable solutions', holding land, managing finances, and meeting deadlines.

Private covenants[92]

Private land covenants are a contract between parties recorded on certificates of title that legally binds them to obligations for a fixed period of time, or in perpetuity. Some of these are imposed by councils through consent notices, but others by developers to maximise the value of the subdivision.

Efforts to encourage higher density can sometimes be frustrated by restrictive land covenants such as minimum lot size or house size, height and setback rules, requirements for planting or protection of existing vegetation, or requirements for off-street parking or double garaging. They can also stifle competition, have the effect of increasing house prices and decreasing affordability and are seen by some as a method of social exclusion.

Targeted research undertaken in Rolleston, Canterbury examined the prevalence of covenants on a housing in 'greenfield' subdivisions highlight the impacts private covenants have in precluding higher density housing, and potentially how it is redeveloped in the future. It found that 75% of 'greenfield' sites included private covenants requiring a house of at least 160m^2 (some of at least 200m^2) in size, with many also including detailed design standards and developer approval processes. Similar research has confirmed that private convents are likely to be inhibiting some areas within the Auckland City to grow and change as population and housing demand increases.

6.4 METHODS AND ALTERNATIVE APPROACHES FOR ACTIVATING DENSITY

The following section provides direction on some of the methods identified in the research to overcome the issues and constraints associated with providing higher density housing and the methods for how the densities can be 'activated'.

These are summarised under the following themes:

- **Partnerships** - Collaborative multi-agency partnerships, Iwi and mana whenua, urban development authorities and public/private partnerships, and partnering with the community.
- **Investing in 'places'** - Spatial planning, optimising locational attributes and 'place-making', and improving perceptions and attitudes.
- **Improving planning regulatory and compliance requirements** - Central Government and local authority initiatives and improvements.
- **Funding models** - Investing in infrastructure and funding arrangements.
- **Te Papa peninsula exemplar** - Provides a summary of the approach applied by Tauranga City Council and its partner organisations to plan for, and activate, higher density neighbourhoods.

[92] Fredrickson, C. Jul2018, Page 40; NZ Productivity Commission. Mar2012, Page 117. Gibbons, T. Apr2019, Page 15 to 18; Auckland Council. Sep2011. Page 51.

6.4.1 PARTNERSHIPS

Collaborative multi-agency partnerships

Collaborative partnerships, including the GCP and Auckland Council, Future Proof Hamilton, and Smart Growth Western Bay of Plenty outlined in Section 3.4, have been operating effectively to coordinate urban development within most of New Zealand's 'high growth' areas for some time. These partnerships have been formed partly in response to the lack of direction within the 'effects'-based RMA for managing urban development, but to also coordinate spatial planning and funding to satisfy other statutory responsibilities.

These partnerships have assisted to identify strategic growth management issues and to develop policy led responses to improve social, environmental, cultural, and economic wellbeing, including through initiatives to manage settlement patterns, enable higher density housing and to improve affordability to achieve the locational and distributional benefits of housing density outlined in the previous section[93]. The importance of these collaborative partnerships has been reinforced initially under the under the NPS-UDC and more recently the NPS-UD, which requires future development strategies and capacity assessments to be prepared for 'high growth areas' that extend across housing sub-markets and territorial authority boundaries.

Urban development authorities and public/private partnerships

The current land development model in Greater Christchurch and New Zealand requires private developers to act in response to the planning framework that is in place to meet market demand while managing risk. It is evident in the research that when the development sector does act, outcomes in respect to the supply of higher density housing, particularly in townships outside of metropolitan centres, are limited by scale and lack of coordination across sites[94].

The research emphasises that the establishment of urban development agencies to coordinate and implement strategic planning initiatives are an effective way to successfully compliment policy-based approaches. This is because urban development agencies assist the market to provide higher density housing by reducing risk to developers by coordinating the establishment of services and infrastructure[95]. Development agencies can also be funded from multiple sources, including public/private partnerships, to effectively coordinate intensive housing projects, reduce development risk to the development sector and coordinate the development of council-owned property as a catalyst for change[96]. Urban development agencies can also be effective more at overcoming barriers for redeveloping existing urban areas, such as assisting to assemble multiple owned land to make it more feasible to develop in a coherent manner[97].

The coming into force of the Urban Development Act 2020 (the 'UDA') on 7 August 2020 enables Kāinga Ora to work in partnership with iwi and mana whenua, local government, development sector representatives and communities to deliver large-scale projects[98]. The UDA facilitates the delivery of large-scale transformational housing projects with supporting transport infrastructure and business and industrial developments outside of the standardised RMA processes using powers to reconfigure reserves, build and upgrade infrastructure and acquire land.

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[93] EMS Ltd. Aug2015. Page 51; Auckland Council. Sep2011. Page 51; Auckland Council. Sep2011. Page 51; Hamilton-Waikato Metropolitan Spatial Plan. Sept2020. Page 4.

[94] Auckland Council. Sep2011. Page 51.

[95] Auckland Council. Sep2011. Page 51.

[96] M. Gjerde. Why New Zealand can't get high-density housing right? Victoria University. Jun2017.

[97] M. Gjerde. Why New Zealand can't get high-density housing right? Victoria University. Jun2017; NZ Productivity Commission. Mar2012. Page 110.

[98] Simpson Grierson. Urban development and fast-tracking consents: New legislation summary. Aug2020.

This emphasises the importance in the GCP preparing comprehensive spatial pans and business cases to demonstrate the benefits that can be gained by partnership with development agencies such as Kāinga Ora. This investment will be critical in realising the incremental benefits of increased housing densities identified in the previous section, including public transport upgrades and potentially rapid transit services.

Partnering with the community

The research emphasises the importance of forming community partnerships by actively engaging with the community through collaborative planning processes, which improves the success rates of higher density housing initiatives and correcting negative public perceptions that were identified as a constraint in the previous section[99].

This applies to both the establishment of preferred sub-regional settlement patterns and the urban form of metropolitan centres, through to more localised relationship building, engagement, and collaboration that is essential when promoting policy changes to increase development densities. Active engagement with the community and the myriad of stakeholders and interest groups when making policy planning decisions on housing densities will ultimately improve understanding and buy-in, promote collective decision-making, and reduce costs and delays[100].

6.4.2 INVESTING IN 'PLACES'

There are a range of methods already being employed by the GCP to realise the benefits of well-designed higher density developments, including by undertaking spatial planning at the sub-regional, district/city-wide and development area scales and enabling development through significant public investment in infrastructure and community facilities. The following research lends support to this approach continuing, while the NPS-UD and other changes occurring in New Zealand's planning system are signalling that investing in places to enable higher density housing is becoming increasingly important.

Spatial planning

The research and 'high growth' area case study analysis in Section 5.0 confirms the critical role spatial planning plays in enabling housing choice to meet demand, while managing urban development within environmental limits and avoiding pressure ion the capacity of sub-regional transport networks[101]. The mandatory requirement for Tier 1 local authorities to prepare future development strategies under the NPS-UDC and now under the NPS-UD reiterate the importance of sub-regional spatial planning to determine and respond to housing needs.

The GC2050 settlement pattern review will be a critical project in determining the location and quantum of 'greenfield' growth and the tools for incentivising the redevelopment and intensification of existing urban areas. It also represents an opportunity to determine the methods for enabling medium and mixed density housing in proximity to the town centres and commercial centres across Greater Christchurch and along key transport corridors[102].

Master planning across multiple blocks and site boundaries is identified in the research as an important approach for establishing how housing densities can be optimised, along with determining the infrastructure, transport and open space provision required to make these environments attractive for people to live, work and play. Design-led processes enable sites to be developed progressively over time, while ensuring a degree of certainty that each site will

[99] EMS Ltd. Aug2015. Page 51.

[100] Tauranga City Council. Tauranga 2050. Page 59.

[101] Wellington City Council, Draft Spatial Plan for Wellington City - Link; Tauranga City Council. Tauranga 2050. Page 39 & 40. Housing Capacity Assessment. Report 4 - 4.3 Opportunities and barriers. Page 268; Tauranga City Council. Tauranga 2050. Page 39.

[102] NPS-UD. Policy 3. Page 11; Wellington City Council, Draft Spatial Plan for Wellington City - Link.

have access to outlook, sunlight, and outdoor space[103]. This assists to reduce the number of development controls as the master plan provides more certainty that the desired outcomes will be achieved.

Significant benefits can be gained by integrating land use and transport planning at both the larger scale spatial plans and more localised master planning by establishing the network upgrades required to support mode shift through well connected and safe walking and cycling networks and access to public transport services and facilities[104].

The research establishes that proximity and access to everyday needs is important as locational rather than built form attributes are often the most important factors that influence people to choose higher density housing[105]. This includes in particular the ability to access destinations via walking and cycling and proximity to public transport and related facilities, such as transport hubs, Park N' Rides or rapid transit stops[106]. Investment in appropriate transport networks and infrastructure, including through investment in public transport extensions, open space, street trees, 'liveable streets' and multi-use walking and cycling corridors and connections, are also important catalysts for making higher density more attractive to the housing market[107].

Improving perceptions and attitudes

Perceptions and attitudes towards higher density housing typologies were identified as a barrier to intensification in Our SPACE[108]. The research confirms that good urban design, quality architecture and investment in public spaces are fundamental to improving perceptions of higher density housing[109]. Incentives to develop exemplar projects and investment in urban design guides, publicity highlighting the benefits of higher density housing and how to be a 'good neighbour' are initiatives that can be pursued to improve public perceptions[110].

'Place-based' planning processes undertaken in partnership with iwi, mana whenua and local communities where higher density development is planned has proven to be successful in enabling integration by identifying the local character, identity, and values of the area to inform how it will look and function as it grows and develops over time[111]. Successfully implemented well-functioning higher density developments with high amenity, such as Hobsonville Point in Auckland and the Lakes in Tauranga, have also assisted to change negative perceptions.

6.4.3 IMPROVING PLANNING SYSTEMS AND PROCESSES

The institutional constraints in **Section 6.1.4** confirm the need for Central Government direction and council's to constantly review how efficient and effective their policies, systems and processes are in providing certainty to communities, housing markets and developer's. Improvements in these areas will also assist in addressing some of the supply and demand constraints listed under **Section 6.1.3** as they relate to the provision and uptake of higher density housing.

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[103] Gjerde, M. Why New Zealand can't get high-density housing right? Victoria University. Jun2017.

[104] Wellington City Council, Draft Spatial Plan for Wellington City - Link.

[105] Nahkies, B. & Dean., D Medium density housing - Motivations, attitudes, and preferences. Page 10; EMS Ltd. Aug2015. Page 51; Tauranga City Council. Tauranga 2050. Page 55; Haarhoff, E. et al. 2016. Page 17; Wellington City Council, Draft Spatial Plan for Wellington City.

[106] Auckland Council. Sep2011. Page 51; Hamilton-Waikato Metropolitan Spatial Plan. Sept2020. Pages 17, 33 & 34.

[107] Wellington City Council, Draft Spatial Plan for Wellington City; Betanzo, M. Pros and cons of high-density urban environments. Apr2007. Page 40.

[108] Housing Capacity Assessment. Report 4 - 4.3 Opportunities and barriers. Page 268.

[109] EMS Ltd. Aug2015. Page 51.

[110] Tauranga City Council. Tauranga 2050. Page 59; BRANZ. 2020, Page 49.

[111] Wellington City Council, Draft Spatial Plan for Wellington City.

Central Government

As identified in the previous section, the absence of Government direction and leadership has been cited as a constraint to enabling higher density housing and addressing the issues with the planning system that are constraining supply. The release of the NPS-UDC, NPS-UD, RMA Reforms and the passing of the UDA are all indications that the Government are being more active in assisting Council's to realise the benefits of increased housing densities and to provide certainty to the infrastructure providers, the development sector, and the community.

The NPS-UD provides strong direction that councils must set housing bottom lines based to address housing demand profiles established through development capacity assessments and spatial planning through future development strategies to establish locations where higher density housing and intensification is required in proximity to centres and transport hubs. The removal of car parking rates within the jurisdiction of Tier 1 Council's to a large extent takes this consideration out of council's hands and should give rise to efficiencies. The removal of car parking standards may improve the feasibility and affordability of higher density developments, although the wider implications of this approach on the public realm and the safety and efficiency of transport networks remain unknown at this stage.

The previous section confirmed the influence land covenants have in hindering higher density development by reducing competition, increasing house prices, decreasing affordability. The options for reducing the influence of private covenants on the supply and uptake of higher density housing typologies are relatively limited and would require Government interventions similar to what has been implemented in New South Wales, Australia, and England[112].

Councils

Planning processes and administration

The previous section identifies that planning systems and processes present a relatively significant degree of uncertainty and risk to the development sector when subdividing land for housing developments. It is important for councils to review district plans and regulatory processes, with fast-track consenting processes being one method being employed successfully across the country[113].

The large metropolitan council's, including Auckland Council, Christchurch City Council and Tauranga City Council, have enabled higher density housing through 'up-zoning' to implement intensification and redevelopment strategies and amending rules to focus on design outcomes in preference to standardised minimum lot size, car parking, outdoor living space, or density controls [114]. Other initiatives, such as Christchurch City Council's Community and Enhanced Development Mechanism, assist to encourage land amalgamation and reduce costs to developer's through development contribution rebates[115].

Pros and cons of managing density through gross and net requirements

A positive in managing density through net requirements is that it enables councils to exclude land from the density calculations, such as stormwater management areas, esplanade reserves or land that needs to be set aside for cultural or environmental reasons. It is therefore a true measure of the density of housing as a ratio of the 'developable' area of land that is difficult to quantify using a gross density calculation.

The net density calculations are a standard method that is used across many of the countries council's, so its application is typically well understood by both council's and the land development sector.

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[112] Fredrickson, C. Jul2018, Page 36.

[113] Auckland Unitary Plan. Flexible tools to implement change. Page 65.

[114] Auckland Unitary Plan. Flexible tools to implement change. Page 65; Auckland Council. Sep2011. Page 51; Auckland Plan 2050. Section D - Stage and Adaptable Implementation. Page 65; CRPS Chapter 6. Objective 6.2.2 & Policy 6.3.7; Tauranga City Council. Plan Change 26 - Housing choice.

[115] Gjerde, M. & R. Kiddle, R. 2019. Page 26.

Some of the issues and challenges in managing density through net requirements include:

- Commercially motivated developers may look to reduce the number of parks, then streets, then residential lots without any net density requirements, which is likely to reduce amenity and access to essential open space and safe and efficient transport networks.
- Standardised minimum density requirements do not influence the quality of a subdivision or how lots have been laid out in isolation of other levers, such as spatial plans, subdivision assessment matters, minimum average lot sizes, non-statutory guides, and other incentives.
- Applying standardised minimum net density standards is a relatively blunt instrument that sometimes fails to be responsive to the context of 'greenfield' land (for example relative proximity commercial centres, public transport, and employment opportunities influence the viability of increased housing densities) or commercial and market needs (developer's deliver what the market is wanting at a particular point in time having factored in risks and financing that may not align with wider longer term community needs relating to changing demographics or affordability issues).

Overall, we consider that the application of minimum net densities is an appropriate lever to apply to ensure that the ratio of land for housing versus 'public' space, while recognising that it needs to be supported by a range of other methods (such as partnerships, investing in places, improving planning systems and processes and funding) to ensure the benefits able to be gained from higher density housing can be realised.

It is important to note that Selwyn and Waimakariri are both reviewing their respective district plans and the effectiveness of the land use zones and subdivision standards, rules, and methods for managing housing densities. CCC has also recently released a report that reviews and makes some innovative recommendations on how urban design outcomes associated with medium density housing could be improved, albeit in the context of housing densities in the 30hh/ha to 50hh/ha range[116]. Some of the recommended actions, such as preparing further urban design guidance, upskilling planning staff and introducing funding mechanisms for capital works to improve public spaces in higher density neighbourhoods, could also be applied to the 'greenfield' residential areas in Greater Christchurch.

The findings of the initiatives outlined above should also be considered when reviewing the housing density policies with the Greater Christchurch sub-region, including the future change to Chapter 6 of the CRPS and the progressive development of the GC2050 spatial plan.

Monitoring

Monitoring is a critical feedback mechanism to close the policy formulation, policy evaluation and policy administration loop through continual refinement and improvement. Monitoring the outcomes and feasibility of higher density housing is important in: (a) identifying issues and constraints created through planning rules and administrative processes to inform continuous improvement; (b) providing an understanding of whether the desired outcomes are being achieved and whether unanticipated issues are arising; and (c) establishing robust, accurate and accessible information to encourage effective participation and to inform decision-making processes.

The NPS-UD carries on the mandatory monitoring requirements under the NPS-UDC by requiring that local authorities to monitor the demand and supply of housing on a quarterly basis to ensure decision are being based on quality information[117]. This includes measuring the proportion of intensification and redevelopment that has occurred in existing urban areas as well as in 'greenfield' locations. Monitoring the wider outcomes associated with higher density housing is also needed so that the GCP have a better understanding of housing demand and market feasibility.

[116] CCC. Urban design review of medium and high-density housing in Christchurch. Pages 517 to 574.
[117] NPS-UD. Policy 3.9 Monitoring requirements. Page 17.

6.4.4 FUNDING OPTIONS

Our SPACE identifies that development costs and feasibility and key challenges to overcome when managing housing across Greater Christchurch over the next 30 years, this is particularly the unlocking the benefits of higher density housing[118].

Investing in infrastructure

The research confirms that investment in public works by council's, including in partnership with central Government and other agencies, to improve land transport networks (including walking and cycling and key activators of density such as rapid transit services), public spaces, community facilities and commercial centres are critical in uplifting land values to incentivise developers to invest in locations where the benefits of higher density can be realised[119]. The public and private investment in the central city and other town centres such as Rangiora and Kaiapoi as part of the Canterbury Earthquake rebuild are examples where these centres are now better placed to support higher density housing through land value uplift, improved accessibility, and attractive environments. Another opportunity lies with the significant council investment in Rolleston's town centre.

There is evidence suggesting that because infrastructure funding is averaged over regions and sub-catchments, they sometimes do not fully account for the cost of servicing different localities, particularly lower density areas[120]. This is also true for transport funding and quantifying the true cost of commuting long distances. This signals that there could be benefits in establishing mechanisms for determining the true cost of infrastructure is appropriately targeted, which becomes increasingly important when local authority finances become stretched and debt levels rise[121].

Funding arrangements

Council's employ a number of approaches to recuperate the cost of development, including the development and financial contributions, general and targeted rates annual uniform and use charges and development agreements. The RMA Reform Panel confirmed that one issue facing council's is that they are unable to realise the true benefit of the uplift in value that occurs when infrastructure investment occurs through these processes[122]. This can create inefficiencies through 'bottle necks' and delays in allocating funding to manage debt as council's receive a small proportion of the benefits of increased incomes, profits and spending that accrue to Central Government[123].

Alternative arrangements to redistribute the monetary benefits and reduce financial risk to council's and developer's in establishing the critical infrastructure to support higher density housing need to be considered at the national, sub-regional local levels.

6.4.5 PLANNING FOR HIGHER DENSITIES - THE UFTI, TE PAPA PENINSULA SPATIAL PLAN AND PROPOSED PLAN CHANGE 26

The 'Smart Growth' UFTI initiative to review the urban form of the Western Bay of Plenty 'high growth' area and the Tauranga City Council Te Papa Peninsula Spatial Plan and Plan Change 26 (housing choices) demonstrate how higher densities can be enabled through:

- Collaborative multi-agency, Government, community, and iwi and mana whenua partnerships.
- Development of a comprehensive and aspirational spatial plan.

[118] Housing Capacity Assessment. Report 4 - 4.3 Opportunities and barriers. Page 268.

[119] RM Review Panel. Jun2020, Page 352; Tauranga City Council. Tauranga 2050. Pages 55 & 59.

[120] Auckland Council. Sep2011. Pages 11 & 51.

[121] Auckland Council. Sep2011. Page 59.

[122] RM Review Panel. Jun2020, Page 352.

[123] Johnson, A. et al. Feb2018. Page 25.

- Improving planning regulatory and compliance requirements.
- Applying funding models and investing in transport and improving the quality of neighbourhoods to support higher density housing.

Coordinating and funding land use and transport infrastructure

As identified in Section 3.4, the UFTI is a collaboration between Smart Growth Bay of Plenty and the NZ Transport Agency that was formed in 2019. It has developed a long-term, integrated masterplan for urban development and transport that is fully aligned with the Government's new transport policy statement and urban growth agenda.

The UFTI brings together and coordinates the delivery of projects that are dependent on land transport investment to 'unlock' housing supply and alleviate congestion across the sub-region. One of the catalysts for the formation of the UFTI was the realisation that the current growth scenario is delivering a high ratio of low-density development, at densities of between 15hh/ha to 17hh/ha, that is requiring significant public investment in public transport and other infrastructure[124].

The UFTI Final Report includes transport modelling and economic analysis that confirms that one of the key drivers for realising transport related benefits is urban form, with increased housing densities achieving greater benefits and returns on investment[125]. One of the 'bottom lines' associated with the Government transport funding arrangements in the sub-region is enabling higher density development in areas along corridors and centres that are close to employment, amenities, infrastructure, and demand through the 'connected centres' programme[126]. One of the targets of the 'connected centres' programme is to achieve densities of 30hh/ha over a medium term (10 year) timeframes in each 'greenfield' growth area (refer to Image 7).

Image 7: Incremental increases in 'greenfield' housing densities

Source: Tauranga City Council, Plan Change 26 - Housing Choice

These increases in household densities are to be supported by multi-modal links, a macro-urban form and neighbourhoods that are structured to ensure higher-density, mixed-use, walkable, human-scale development focusses around frequent transit[127].

The Te Papa spatial plan

The Te Papa Spatial Plan is a 30-year plan prepared to coordinate how greater housing choice, safe and efficient transport options, local amenities, and infrastructure will be provided within a residential 'greenfield' area[128]. The spatial plan is consistent with the Government and UFTIs clear directions on the need to provide for higher density housing and movement choices in

[124] Smart Growth. UFTI Final Report. Jul2020. Pages 33.
[125] Smart Growth. UFTI Final Report. Jul2020. Pages 44.
[126] Smart Growth. UFTI Final Report. Jul11. Pages 52 & 53.
[127] Smart Growth. UFTI Final Report. Jul11. Pages 62, 75 & 76.
[128] Te Papa Plan: Outcomes and Ideas. Apr2020. Pages 3, 12, 14 & 16.

'healthy', 'liveable' and 'connected' neighbourhoods and around centres and along transport routes[129].

The spatial planning undertaken to coordinate the development of the Te Papa Peninsula in Tauranga is a good example of illustrating to the future councils, the community, and investors how housing densities can be progressively increased over time.

Plan change 26 - Establishing the necessary planning systems and processes

Tauranga City Council has initiated a housing choice plan change ('Plan Change 26') to ensure the necessary planning provisions and systems are in place to incentivise increased housing across the City.

Plan Change 26 is intended to: (a) help address residential development capacity constraints, including the shortage of developable land; (b) enable more housing choice through a variety of housing types and site sizes to meet changing needs; (c) reduce pressure on urban expansion and the associated infrastructure costs by enabling more intensification of existing urban areas; and (d) deliver a more compact city as outlined in spatial plans.

Plan change 26 proposes a range of changes to land use zones, urban design assessment criteria, rules for managing townhouses and apartments, and duplex across various residential environments to enable and encourage the uptake of higher density housing.

A particular focus of Plan Change 26 is implementing the Te Papa Spatial Plan by providing for increased density, such as apartment living and townhouses/terraced houses, and planning for the public amenities, infrastructure and community initiatives needed to support a larger population within these neighbourhoods.

Image 8: Te Papa Peninsula duplex

Image 9: Te Papa Two storeyed duplex

Source: Tauranga City Council, Plan Change 26 - Housing Choice

[129] Te Papa Plan: Outcomes and Ideas. Apr2020. Page 3.

6.5 KEY LEARNINGS - NATIONAL AND INTERNATIONAL RESEARCH

TABLE 7: KEY LEARNINGS - NATIONAL AND INTERNATIONAL RESEARCH

THE BENEFITS OF INCREASED HOUSING DENSITIES
LOCATIONAL AND DISTRIBUTIONAL BENEFITS OF DENSITY
49. The national and international research confirms the benefits and efficiencies in working collaboratively to manage urban growth, maintaining consolidated settlement patterns, and increasing density.
50. Well-designed urban environments and residential neighbourhoods containing a mix of housing densities to create value for communities, individuals, the economy, and the environment.
51. The research reinforces the benefits of consolidated settlement patterns (urban containment) and enabling higher densities (building up rather than out) in appropriate locations (optimising the available land resource) at the macro urban form scales through to the neighbourhood scales.
INCREMENTAL BENEFITS OF INCREASED HOUSEHOLD DENSITIES
52. The benefits of housing density increase incrementally, although the benefits of higher densities beyond the 15hh/ha range are typical and more readily achievable within significantly larger metropolitan centres than satellite towns.
CONSTRAINTS ATTRIBUTED TO HIGH DENSITY HOUSING
SUPPLY AND DEMAND CONSTRAINTS
53. Market demand and supply for higher density housing typologies, including duplex, multi-units, and apartments, is suppressed in New Zealand compared to standalone dwellings, which the research attributes to negative perceptions, lack of diversity and drivers for change, housing market trade-offs and preferences and development sector influences and market supply.
INSTITUTIONAL CONSTRAINTS
54. Planning systems and processes, including a lack of Government direction and leadership and council's plans and processes, can hinder the supply of higher density housing and presents a risk and expense to the development sector.
METHODS AND ALTERNATIVE APPROACHES FOR ACTIVATING DENSITY
PARTNERSHIPS
55. The research emphasises the importance of managing urban growth and enabling higher density housing by partnering with Government agencies, iwi and mana whenua, urban development authorities, the development sector, and the community to overcome constraints, and co-ordinate development, allocate funding, and achieve buy-in for higher density housing.
INVESTING IN 'PLACES'
56. Investing in the development and implementation of spatial plans across sub-regions, settlement wide master plans and detailed outline development plans across multiple blocks and across site boundaries is critical in establishing how housing densities can be optimised, along with determining the infrastructure, transport and open space provision required to make these environments attractive for people to live, work and play.
57. Establishing higher density housing in proximity to everyday needs is important as locational rather than built form attributes are often the most important factors that influence people to choose higher density housing, while also achieving efficiencies in transport investment and promoting active modes and utilisation of public transport.
58. The research confirms that good urban design, quality architecture and investment in public spaces through 'place making' are fundamental to improving perceptions of higher density housing. Incentives to develop exemplar projects and investment in urban design guides, publicity highlighting the benefits of higher density housing and introducing design elements into neighbourhoods to improve public perceptions and attitudes.
IMPROVING PLANNING REGULATIONS AND COMPLIANCE REQUIREMENTS
59. Continual reviews and improvement to the planning processes and provisions for managing higher density housing for improving liveability outcomes in the 10hh/ha to 15hh/ha density range, are needed to occur in combination with spatial plans and related workstreams (such as the NPS-UD).

TABLE 7: KEY LEARNINGS - NATIONAL AND INTERNATIONAL RESEARCH
60. The application of minimum net densities is an appropriate lever to apply, while recognising that it is a blunt instrument that needs to be supported by a range of other methods (partnerships, investing in places, improving planning systems and processes and funding) to ensure the benefits able to be gained from higher density housing can be realised.
61. Monitoring the outcomes and feasibility of higher density housing needs to be prioritised further to identify and address constraints hindering higher density housing, improve planning provisions and processes, gauge whether desired outcomes are being achieved and to inform decision-making.
FUNDING OPTIONS
62. Investment in public works by council's, including in partnership with Government and other agencies, to improve land transport networks (including walking and cycling and key activators of density such as high frequency transit services), public spaces, community facilities and commercial centres are critical in uplifting land values to incentivise developers to invest in locations where the benefits of higher density can be realised.
63. Alternative arrangements to redistribute the monetary benefits and reduce financial risk to council's and developer's in establishing the critical infrastructure needed to support higher density housing.
TE PAPA PENINSULA EXEMPLAR PROJECT
64. The 'Smart Growth' UFTI initiative to review the urban form of Western Bay of Plenty sub-region and the Tauranga City Council Te Papa Peninsula Spatial Plan and Plan Change 26 (housing choices) demonstrate how higher densities can be enabled through: a. collaborative multi-agency, Government, community, and iwi and mana whenua partnerships. b. development of a comprehensive and aspirational spatial plan. c. improving planning regulatory and compliance requirements. d. applying funding models and investing in transport and improving the quality of neighbourhoods to support higher density housing.

7.0
GCP AND DEVELOPER INSIGHTS

7.1.1 CONTEXT

The viability and feasibility of increasing net densities requires advice from the GCP and the development sector to establish the appropriateness of increasing net densities within the FDA.

This section provides the following:

1. Advice received from the GCP councils, the Canterbury District Health Board (the 'CDHB') and Mahaanui Kurataiao Limited on the findings of this report and insights into the levers that can be applied to activate higher densities within 'greenfield' land as well as the FDA.

2. A summary of the relevant submissions and evidence presented by development sector representatives during the Our SPACE hearings in February and March 2019.

3. Advice from the three developer's that are active in the Greater Christchurch sub-region on the findings of this report and the levers that can be applied to activate density from the market perspective.

These insights assist to formulate the recommendations in Section 8.0 on the viability and feasibility of increasing the minimum net densities with the FDA across the 10hh/ha to 15hh/ha spectrum.

7.2 GCP AND DEVELOPER INSIGHTS

The following sub-section summarises the insights received from the CCC, Mahaanui Kurataiao Limited on behalf of Papatipu Rūnanga and the CDHB on the working draft of the technical report that was circulated for comment.

SDC and WDC were given the opportunity to provide their insights on the uptake analysis, research, and outcomes analysis for inclusion in the technical report but no response was received.

Christchurch City Council

- Market preferences dictate that people will generally seek to own the largest home on the largest section they are able to afford. If the market predominantly delivers this product, it will continue to be the typology with the greatest take-up and inferred demand.
- Contemporary locational preferences within Greater Christchurch are not highly influenced by proximity to public transport and other core services where the relative ease of travel reduces the extent to which people have to trade off dwelling and section size for more intensive housing typologies offered in more accessible locations. However, increases in the cost of travel and reduced reliance on single occupancy private cars may result in residents beginning to value accessibility to services more strongly.
- What a developer offers to the market in terms of section size is driven by land and development cost and required returns on investment that are influenced by rules and market preferences. Developers in Christchurch City would have continued to meet the historical market preferences for larger section sizes had the policies and rules not been changed to require that developable land be used more efficiently.
- A continuation of lower density yields within the FDA represents a missed opportunity to support mass rapid transit, public transport, and the efficient provision of strategic infrastructure. It may also make it more difficult for intensification and redevelopment of

existing urban land to compete with 'greenfield' development that has fewer development constraints, lower risk and is typically more economic to develop.

Canterbury District Health Board

- Support the identification of the key issues that should be addressed, including that: (a) Land around homes has to be usable land and not taken up with driveways and unusable sides of houses; (b) Open space within schools and other similar facilities do not substitute for open parks in a community; (c) Building more densely does not solve the problem of affordable housing by itself.
- Reiterate the need for there to be a focus on maintaining arable land when infill housing can be done and that the full cost of affordability needs to consider transport and living costs associated with people living in greenfield areas that are located far from necessary facilities.
- Emphasise that consideration needs to be given to 3Waters infrastructure from a public health perspective because: (a) It is vital that reliable and safe drinking water is provided to communities; (b) Effective wastewater treatment and disposal is an essential part of providing for growth and the intensification of residential development; and (c) The effective management of stormwater is an integral part of maintaining stream and river health, reducing runoff and sedimentation and reducing flooding risk by ensuring that both municipal stormwater detention/retention ponds and residential stormwater holding tanks form part of any intensive residential developments.

Mahaanui Kurataiao Limited on behalf of Papatipu Rūnanga

- The Mahaanui Iwi Management Plan (the 'MIMP') does not provide specific guidance on the detailed consideration of minimum net densities, including within the FDA. The more important considerations from a mana whenua perspective in respect to development densities relate to kaitiakitanga and applying a holistic approach to land development. This requires that the determination of net densities within any given location to be informed by the natural values and the assimilative capacity of catchments and the environment[130].
- The interests and values of mana whenua should be applied to inform the preparation of the FDA outline development plans and detailed subdivision design stages. The process for engaging with Papatipu Rūnanga and the principles contained in the Ngāi Tahu Subdivision and Development Guidelines should be applied to recognise and acknowledge places of cultural significance within 'greenfield' subdivisions.
- The RMA process allows land development to occur as long as prescribed thresholds are not exceeded, while Te Ao Māori requires that the use and development of land is reciprocated at the same time with environmental restoration to ensure that outcomes are not limited to managing adverse effects. It is unclear how the adoption of minimum net densities enables these values to be realised.
- The density of housing within Kāinga Nohoanga should form a component part of the density analysis.

[130] This requirement is expressed in Nga Kaupapa/Policy 1.1 of the MIMP that highlights the importance of long-term intergenerational thinking and recognising the natural limits of the land to support intensified development.

7.3 DEVELOPER PERSPECTIVES

7.3.1 DEVELOPER INSIGHTS - OUR SPACE SUBMISSIONS

The Our SPACE hearings considered a range of submissions that were received on the appropriateness of the 'greenfield' housing densities, including support for higher densities within the FDA and along transport corridors to manage sprawl and vehicle dependency through to the negative social problems with large medium density environments[131].

Although these are all relevant considerations that have been covered in this report to varying degrees, the insights from the following developers are particularly relevant when considering the impacts increasing housing densities across the GPA and FDA could have on the market:

Gillman Wheelans (Submission 019)

- The aim of Our SPACE to significantly increase the stock of multi-unit dwellings does not appropriately account for current market demand profiles.
- Whilst multi-unit developments may use less land, they are more expensive per square metre to build due to the complexities of vertical height and multi-level construction.
- The target that 45% of growth will be to be met by redevelopment of existing housing areas (through intensification) and the hope that the population will embrace high density living is unlikely to occur.

Suburban Estates Ltd, Sovereign Palms Ltd and Doncaster Developments (Submission 051)

- Our SPACE relies on a future change in consumer preferences to higher density housing and the redevelopment of existing urban sites, rather than planning to meet the preferences of the housing market.
- The housing market and buyer preferences are difficult to predict and slow to change. Provisions that attempt to force a move to higher densities are likely to be resisted, or developments that would otherwise proceed may not eventuate.
- There is a clear current demand for development in Selwyn and Waimakariri at a density that is lower than that in the Christchurch City to satisfy lifestyle preferences.
- Concerns with the 15hh/ha minimum densities relate to poor housing outcomes that is contributing to people preferring to move to the Selwyn and Waimakariri districts.
- The monitoring of section and house sales has identified a resistance to the 15hh/ha densities that are required to be provided in CCC from both the market (who do not want to live in, or next to smaller sections) and housing companies (who struggle to sell the smaller sections).

Hughes Developments (Submission 055)

- The Faringdon subdivision in Rolleston has included a range of densities its development, with densities changing in response to dynamic market demands (Low density - 550m^2, Medium Density - 400m^2 to 549m^2 and Comprehensive Medium Density - less than 400m^2).
- The difficulty of prescribing a density of 15hh/ha is that it limits the ability to respond to the market. Frequently layouts and density are amended via new consents or variations to respond to the dynamic nature of the housing market.
- By prescribing a density requirement that is difficult to achieve in the first instance, the ability to supply people with what they want becomes constrained. The residual outcome

[131] Our SPACE Our SPACE Officers report. Appendix 1: Panel's recommendation on submissions. Pages 65, 67, 70, 126, 136, 145 and 152 and https://www.greaterchristchurch.org.nz/background/our-space/ourspace-submissions/

is that lots are created that satisfy the compliance requirements yet fail to satisfy the purchaser's preference.

Lincoln Developments Limited (Submission 069)

- There is strong demand for medium density lots (300m^2 to 500m^2 size range) which can accommodate single storey standalone two to three-bedroom houses with double garaging in the Flemington subdivision, Lincoln.
- There is very little if any demand for comprehensive medium density housing (300m^2 and less and generally two storey terrace and duplex housing).

7.3.2 TARGETETED DEVELOPMENT SECTOR INSIGHTS

Three developers that have a long-standing track record subdividing land across the Greater Christchurch sub-region were interviewed to gather their insights into the land development process, the application of the minimum net densities and the recommendations contained in the working draft of the technical report.

One of the three developers that was approached confirmed that they were unavailable to discuss the project due to increasing frustrations with how Christchurch City Council was processing 'greenfield' subdivision applications. This response, and similar insights provided by the other two developers, confirms that the institutional constraints that present a risk to the development sector outlined in **Section 6.3.2** are occurring in Greater Christchurch.

The key points made by the two remaining land development sector representatives are summarised below:

Davie Lovell-Smith on behalf of R D Hughes Developments

- The need to comply with the minimum net densities is disproportionality influenced by stormwater requirements, where locations that manage discharges to ground have higher yields in comparison to areas that utilise on-site attenuation as stormwater is excluded from the calculation.
- Front building setbacks remove a relatively large area of the site that unnecessarily limits the amount of developable land that is available when densities increase.
- There are frustrations being experienced with the administration of the RMA, including inconsistencies in interpreting rules that are contributing to frustrating delays, and costs to address subjective queries through what are often adversarial processes.
- Outline development plans need to incorporate multi-disciplinary input from the outset to ensure they are fit for purpose as urban-design lead processes often fail to account for the fundamental aspects of land development. For example, ensuring that contours are identified as the fall of the land influences where roads, services, stormwater treatment facilities and open space is located on 'greenfield' sites.
- Government intervention rather than council/private sector partnerships is needed to incentivise affordable social housing.
- The demand for duplex and terraced housing fluctuates but is typically not as sought after as single level standalone dwellings. Flexibility in the minimum net density policies and rules is needed to enable developers to be able to respond quickly to changes that are constantly occurring in the property sector.
- The appropriateness of the housing densities identified in private plan changes based on the 12hh/ha minimum net densities set out in Action 3 of Our SPACE should be considered under the Schedule 1 process. This is because the evidence contained in private plan change requests, which includes the preparation outline development plans and

subdivision controls, have determined the appropriate densities as a component part of the private plan change request (refer also to **Section 8.4.7**).

Suburban Estates

- Net densities must be flexible to enable developers to respond to changes in market preferences, which are difficult to predict and slow to change.
- Reiteration of the Our SPACE submission points summarised in the previous subsection that the councils are relying on future changes in consumer preferences to higher density housing and the redevelopment of existing urban sites rather than applying planning approaches that are based on proven preferences of the housing market. As a consequence, provisions that attempt to force the market in a certain direction are likely to be resisted, or developments that would otherwise proceed may not eventuate.
- Confirmation that housing demand in Waimakariri and Selwyn districts for lower densities (10hh/ha) is driven by lifestyle choices and market perceptions that 15hh/ha minimum densities are resulting in poor outcomes. The monitoring of section and house sales has confirmed this continued resistance, which is contributing to developers procuring land in Selwyn and Waimakariri districts.

7.4 KEY LEARNINGS - GCP AND DEVELOPER INSIGHTS

TABLE 8: KEY LEARNINGS - GCP AND DEVELOPMENT SECTOR INSIGHTS

GCP COUNCIL, CDHB AND PAPATIPU RŪNANGA INSIGHTS
CHRISTCHURCH CITY COUNCIL
65. Market preferences for the largest home on the largest section people are able to afford is contributing to an inferred demand for low density development.
66. Increases in the cost of travel and reduced reliance on single occupancy private cars may result in residents beginning to value accessibility to public transport and core services more strongly when evaluating the trade-offs associated with locational preferences and housing densities.
67. Developers in Christchurch City would have continued to meet the historical market preferences for larger section sizes had the policies and rules not been changed to require that developable land be used more efficiently.
68. A continuation of lower density yields within the FDA is a missed opportunity to support mass rapid transit, public transport, and the efficient provision of strategic infrastructure and it may also hinder the intensification and redevelopment of existing urban land to compete with 'greenfield' development.
MAHAANUI KURATAIAO LTD ON BEHALF OF PAPATIPU RŪNANGA
69. The determination of net densities within any given location needs to be informed by a holistic approach to land development that recognises the natural values, the assimilative capacity of catchments and the environment and where development is reciprocated with environmental restoration, consistent with Te Ao Māori and kaitiakitanga.
70. The interests and values of mana whenua need to be integrated into the FDA outline development plans and considered during the detailed subdivision design stages, consistent with the MIMP and Ngāi Tahu Subdivision and Development Guidelines.
71. The density of housing within Kāinga Nohoanga should form a component part of the density analysis and consequent actions and Recommendations of the technical report.
CANTERBURY DISTRICT HEALTH BOARD
72. There needs to be a focus on maintaining arable land when infill housing can be done, the full cost of affordability needs to consider transport and living costs associated with 'greenfield areas' located far from necessary facilities and consideration needs to be given to the public health aspects of 3Waters infrastructure.
DEVELOPMENT SECTOR INSIGHTS
DEVELOPMENT SECTOR OUR SPACE SUBMISSIONS
73. Increasing the net densities (from 10hh/ha to 15hh/ha) to meet future consumer changes may fail to provide the flexibility developers' and building companies need to respond to current market dynamics and satisfy contemporary demand profiles.
74. Developers are providing a range of housing types, but the amount of higher density housing that is viable to be developed fluctuates based on market demand.
75. The risks in having inflexible minimum net density requirements are that developers will not commit to establishing sections and constructing housing that cannot sell within a reasonable timeframe (that increases financial risks).
76. Multi-unit developments use less land per unit but are typically more expensive to build per metre due to the complexities of vertical height and multiple levels.
77. There are distinct lifestyle preferences between the housing markets and typologies in Christchurch City compared to Selwyn and Waimakariri districts, particularly around poor perceptions of higher density housing and related liveability outcomes.
TARGETED DEVELOPMENT SECTOR DISCUSSIONS
78. Two of the three representatives of the development sector confirmed frustrations with the delays and costs associated with land development and higher density housing applications, which confirms the institutional constraints outlined in Section 6.3.2.
79. The appropriateness of the housing densities identified in private plan changes should be considered under the Schedule 1 process where evidence has been prepared to establish the proposed densities, rules, and outline development plans.

TABLE 8: KEY LEARNINGS - GCP AND DEVELOPMENT SECTOR INSIGHTS
80. Locations that manage discharges to ground have higher yields in comparison to areas that utilise on-site attenuation as stormwater that is not sufficiently recognised as it is excluded from the net density calculation.
81. Front building setbacks unnecessarily limit the amount of developable land that is available when densities increase.
82. Outline development plans need to incorporate multi-disciplinary input from the outset to ensure they account for the fundamental aspects of land development.
83. Government intervention rather than council/private sector partnerships is needed to incentive affordable social housing.
84. Flexibility in the minimum net density policies and rules is needed to enable developers to be able to respond to fluctuations in demand for duplex and terraced housing.
85. The continued resistance to developing to 15hh/ha in Christchurch City is being confirmed in the monitoring of section and house sales and has contributed to developers procuring land in Selwyn and Waimakariri districts.

8.0
FUTURE DEVELOPMENT AREA DENSITIES

8.1 OVERVIEW

This section evaluates the practicalities and viability of increasing the minimum net densities in the FDA within the range of 10hh/ha to 15hh/ha. These evaluations draw on the density uptake analysis and constraints and issues evaluations in the GCP GPA and Intensification Areas in Section 4.0, the GCP and 'high growth' area outcomes analysis in Section 5.0, the national and international research in Section 6.0 and the council and developer insights documented in Section 7.0.

The spatial context of the FDA is initially introduced. This is followed by an analysis of how the identified constraints can be overcome through actions that will enable the household densities to be increased to 15hh/ha to achieve what are relatively significant long-term positive outcomes. The desirability and feasibility of increasing the minimum net densities in the FDA is then evaluated as it will require a commitment to satisfy the long-term housing demand profile by building on existing partnerships and allocating funding to make this policy change feasible from the council, GCP, iwi and mana whenua, community, stakeholder, and market perspectives.

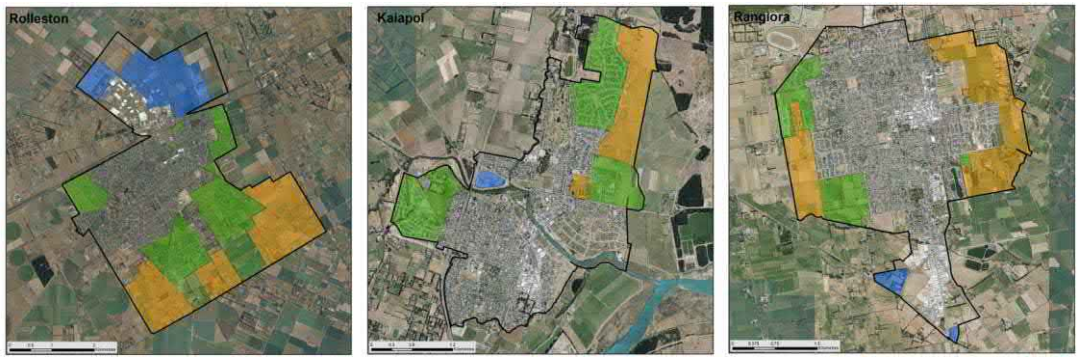
A brief summary of what additional information may need to be gathered to form a more robust evidence base is then provided, followed by recommendations and actions to assist in evaluating the appropriateness of increasing the minimum net densities in the FDA to 15hh/ha.

8.2 FDA CONTEXT

The context and locational attributes of each FDA, including in respect to their relative proximity to town centres, neighbourhood centres, local facilities and services and access to strategic transport networks and public transport, are key determinants of what level of increases in housing density are practical within any given location.

The FDA are the orange land areas illustrated in Figure 11 below and Appendix 6.

Figure 11: Greater Christchurch Future Development Areas



Source: Our SPACE: 5.3 Selwyn and Waimakariri towns. Figure 15. Page 29.

8.2.1 SPATIAL PLANNING

The density outcomes analysis in Section 5.2.1 has documented that the locational and urban form outcomes that arise from the development of FDAs have already been determined in sub-regional and township level growth strategies and spatial plans. These planning initiatives have ensured that the location of the FDA avoid constraints, protect natural values, are

resilient to the effects of climate change and sea level rise and future land development can be integrated into strategic infrastructure and other services.

The settlement pattern in Our SPACE limits the FDA to Rolleston in Selwyn district and Rangiora and Kaiapoi in Waimakariri district, in recognition that these are the primary urban centres in the respective development strategies ('Selwyn 2031' and 'Waimakariri 2048') that are best placed to accommodate a large proportion of the future housing demand. This spatial planning has also ensured that significant investment has already been made in establishing and upgrading strategic transport networks, infrastructure, commercial centres, and community facilities in these towns to support ongoing residential growth.

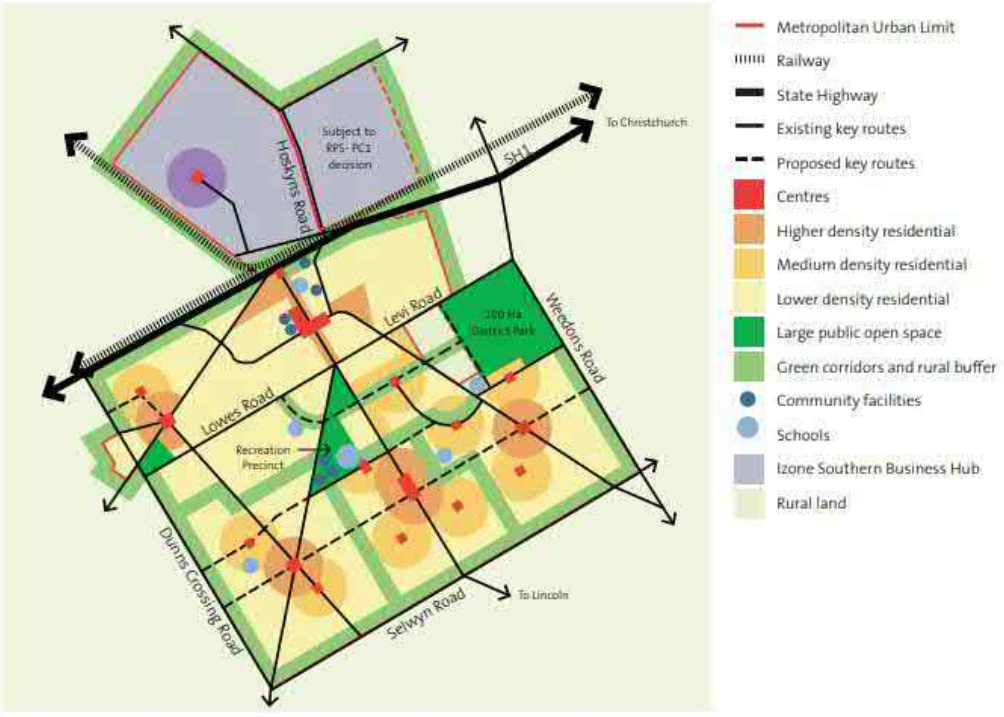
8.2.2 LOCATIONAL ATTRIBUTES

Rolleston FDA

The Rolleston FDA extends along the south-eastern extent of the township, which covers an area that is generally contained by Dunns Crossing Road, Selwyn Road and Weedons Road. The Acland Park and South Faringdon special housing areas separate the FDA into three distinct areas that are currently zoned Rural Inner Plains in the Selwyn District Plan. The Rolleston FDA are generally between 3km to 5km from the town centre and connections to State Highway 1.

The FDA are contained within the Projected Infrastructure Boundary of CRPS Chapter 6 Map A and development of these areas has been signalled in the Rolleston Structure Plan (refer to Figure 12). The structure plan indicates the location of future neighbourhood centres, transport networks, green belt, and other features to ensure the progressive development of each 'greenfield' area is integrated within township and surrounding environments.

Figure 12: Rolleston Structure Plan and the FDA



Source: Rolleston Structure Plan. Figure 6.12. Page 61.

Importantly, the indicative household densities range from between 10hh/ha to 20hh/ha based on locational attributes and proximity to local and neighbourhood centres. This establishes that there is an expectation for nodes of higher density housing around local

centres, key movement corridors and recreation areas as the township grows, albeit within the estimated growth timeframe of 2075.

It is understood that SDC will be undertaking further structure planning of the FDA under Action 9.b of Our SPACE to implement Selwyn 2031 and in response to the DPR.

Kaiapoi FDA

As with the Rolleston and Rangiora FDA, the Kaiapoi FDA are also contained within the Projected Infrastructure Boundary of CRPS Chapter 6 Map A. The FDA are referenced as being contained within the 'Infrastructure Support Boundary' in the Waimakariri 2048 District Development Strategy ('Waimakariri 2048'). There is no spatial plan currently in place anticipating the likely future densities for the Kaiapoi FDA or the location of any future proposed local commercial centres. It is understood that WDC have initiated the development of a structure plan for Kaiapoi under Action 9.b of Our SPACE, to implement Waimakariri 2048 and in response to the DPR.

The Kaiapoi FDA is also spilt between two separate areas. The first is relatively small and is comprised of a square block of land located on Beach Road that is in reasonably close proximity to the town centre and adjoins a GPA. The second FDA is much larger in size, occupying the north-eastern fringe of the township boundary adjacent to the Sovereign Palms GPA. The land is currently zoned Rural in the Waimakariri District Plan.

Rangiora FDA

The Rangiora FDA are also within the Projected Infrastructure Boundary of CRPS Chapter 6 Map A and are referenced as 'Infrastructure Support Boundary' in Waimakariri 2048. It is understood that WDC has also commenced the preparation of a structure plan for Rangiora, which will inform the likely future densities for the FDA and the location of any future proposed local commercial centres.

The FDA are split between two large blocks that generally sit on the eastern and western edges of the township boundary. The eastern FDA occupies the land north of Boys Road as far as Coldstream Road. The second FDA occupies the south-western block between the western township boundary and Lehmann's Road. The FDA are currently zoned Rural in the Waimakariri District Plan.

8.2.3 SUMMARY

It is evident from this brief overview that the appropriateness of the FDA as the future growth areas for the townships has been signalled in growth strategies, Our SPACE and the CRPS Chapter 6. It also illustrates that some reasonably detailed spatial planning has already been undertaken or is underway to manage and coordinate urban growth and development within the FDA. This ongoing structure planning will be fundamental in determining the optimal housing densities and supporting infrastructure for each FDA, based on context and location attributes, to enable these environments to be integrated into the existing townships.

8.3 CONSTRAINTS AND ACTIONS TO ENABLE INCREASED DENSITY IN THE FDA

The following analysis summarises the various constraints and issues associated with an increase in the net densities within the FDA.

All of the suggested statutory and non-statutory options listed in Table 9 to determine the appropriateness of increasing the net densities to 15hh/ha will be contingent on SDC and WDC considering the appropriateness of implementing a range of initiatives in partnership with the GCP, stakeholders, iwi and mana whenua, community, landowners, and the development sector.

TABLE 9: CONSTRAINTS AND ACTIONS TO ENABLE HIGHER HOUSING DENSITIES IN THE 'FDA'

ISSUE/CONTRAINT	ACTIONS	KEY LEARNINGS
URBAN FORM OUTCOMES		
The incremental benefits (illustrated in **Figures 7**, **8** & **9**) of increasing housing densities significantly above 15hh/ha are unlikely to be achievable within the FDA without a review of the current Greater Christchurch settlement pattern.	• Maintain and build on collaborative multi-agency, government, iwi and mana whenua, community, landowner, development sector and stakeholder partnerships to quantify and realise the incremental benefits of higher housing densities across the sub-region (as per the 'Smart Growth' Bay of Plenty UFTI). • Invest in the development and implementation of a comprehensive and aspirational spatial plan for the sub-region that identifies the costs and benefits of increasing housing densities (as per the 'Smart Growth Bay of Plenty UFTI and Tauranga City Council Te Papa Peninsula spatial plan, **Section 6.4.5**). • Improve planning regulatory and compliance requirements (as per Tauranga City Council Plan Change 26 - Housing choices, **Section 6.4.5**). • Applying funding models, investing in transport, and improving the quality of neighbourhoods to support higher density housing (as per the funding commitment to implement the UFTI, Te Peninsula Spatial Plan and Plan Change 26, **Section 6.4.5**).	**1, 2, 3, 4, 5, 6, 7, 19, 20, 23, 24, 25, 26, 27, 28, 29, 35, 36, 37, 38, 39, 40, 41, 42, 49, 50, 51, 52, 54, 55, 56, 57, 58 59, 60, 61, 62, 63, 64, 66, 69, 70, 71, 82 & 84**
Increasing the densities in the FDA may have implications in respect to the concentric urban form of the townships, where the highest densities (potentially being 15hh/ha) being on the urban fringe with lower densities (currently approximately 8hh/ha) being established in proximity to town centres.	• Actions to 'give effect' to Policy 3 of the NPS-UD will require that housing densities are increased to optimise locational attributes, building development capacity in locations that are: (a) within the walkable catchments of rapid transit stops; and (b) on the edge of centres; or (c) commensurate to the levels of accessibility to active or public transport to commercial and community services. • Initiate spatial and statutory planning initiatives to increase densities in existing residential zones to incentivise and encourage intensification and redevelopment to increase the diversity and affordability of homes.	**1, 2, 3, 4, 5, 6, 7, 23, 24, 25, 26, 27, 28, 29, 35, 36, 37, 38, 40, 41, 42, 49, 50, 51, 52, 56, 59, 64, 66, 68, 69, 70, 71, 82 & 84**
LAND USE, TRANSPORT, AND INFRASTRUCTURE OUTCOMES		
There are trade-offs associated with the accelerated growth in the SDC and WDC GPA (**Figure 4**), including environmental and planning limits and potential future pressure on the capacity of the sub-regional transport network. Increases in housing densities will optimise the available 'greenfield' land.	• Evaluate the appropriateness of increasing densities in the FDA to 15hh/ha where there is community buy-in, and it remains feasible for the market to continue to provide high quality living environments. This will ensure that the available 'greenfield' land will be used more optimally, consistent with the consolidated sub-regional settlement pattern. • Ensure that detailed spatial planning informs the determination of housing densities based on the locational attributes of each FDA (including proximity to local and neighbourhood centres and transport networks). This could include evaluating the appropriateness of applying minimum densities of 15hh/ha or higher to locations that are within an 800m walkable block to a local or	**1, 2, 3, 4, 5, 6, 7, 19, 20, 23, 24, 25, 26, 27, 28, 29, 35, 36, 37, 38, 39, 40, 41, 42, 49, 51, 54, 55, 56, 57, 58, 59, 60, 61, 62,**

TABLE 9: CONSTRAINTS AND ACTIONS TO ENABLE HIGHER HOUSING DENSITIES IN THE 'FDA'

ISSUE/CONTRAINT	ACTIONS	KEY LEARNINGS
	neighbourhood centre and 12hh/ha to areas where accessibility is reduced. • Consider the appropriateness of providing flexibility on the location, extent, and function of local and neighbourhood centres to recognise the important influence they will have in making higher density housing more viable in the FDA., (including realising the benefits of the 20-minute neighbourhood in **Figure 8**). • Maintain and strengthen partnerships with central government, iwi and mana whenua, landowners, infrastructure providers, development sector and the community to invest in infrastructure upgrades that facilitate higher density housing in the FDA.	**65, 66, 67, 68, 69, 70, 72, 73, 75, 77, 82, 84 & 85**
Although the uptake analysis did not indicate that geotechnical conditions or stormwater management was a constraint, the locational attributes of the FDA may hinder the viability of increasing the densities to 15hh/ha.	• Undertake structure planning of the FDA to identify and address any location specific land use constraints to facilitate increased housing densities. • Continue to apply the net density requirements to the FDA, which removes stormwater and geotechnically constrained land from the calculations.	**1, 2, 5, 6, 19, 24, 26, 27, 39, 40 & 57**
The viability of increasing the densities to 15hh/ha will rely on the necessary infrastructure (including integrated transport, open space 3 Waters, community facilities and utility services) being established and integrated into existing networks.	• Undertake structure planning and initiate long term planning processes to establish the viability of increasing the minimum densities to 15h//ha in the FDA. These processes will provide certainty on the timing and funding for public amenities such as parks, schools, public transport, and other items that would attract people into buying higher density dwellings. They will also provide the market confidence that council is investing in the FDA enabling higher density housing. • Consider development contribution policies, rates remissions, public/private partnerships, or infrastructure funds to enable higher density housing within the FDA. • Maintain and strengthen existing partnerships with central government, iwi and mana whenua, landowners, infrastructure providers, development sector and the community to invest in infrastructure upgrades that facilitate higher density housing in the FDA. • Maintain the strategic transport network and continue investing in local networks that accommodate safe and convenient walking and cycling connections and access to public transport. Integrating land use with transport networks and systems will be critical in 'activating' higher densities in the FDA. Public transport networks should be in place to support this growth and provide choice from the outset.	**1, 2, 3, 4, 5, 6, 18, 19, 20, 26, 27, 28, 29, 40, 41, 42, 47, 48, 49, 55, 56, 57, 59, 62, 63, 66, 68, 69, 72, 80 & 82**
LIVEABILITY OUTCOMES		
The 15m wide lot widths and height to boundary rules encourage wide street frontages that discourage two storey dwellings and the creation of narrower	• Consider prescribing the minimum allocations of land that is required for landscaping and solar access. • Consider relaxing planning rules and methods for managing the location of housing within sites to enable higher density housing, such as	**43, 54, 59, 61 & 81**

TABLE 9: CONSTRAINTS AND ACTIONS TO ENABLE HIGHER HOUSING DENSITIES IN THE 'FDA'

ISSUE/CONTRAINT	ACTIONS	KEY LEARNINGS
sections for duplex units and terraced housing. Planning rules absorb a lot of space within front and side yards, which is likely to be more pronounced as density increase.	reducing boundary setbacks and height in relation to boundary restrictions.	
The district plans did not contain rules to require a range of section sizes or mix of housing typologies. As a consequence, there is likely to be limited unique design features within neighbourhoods, which is likely to be more pronounced at densities of 15hh/ha.	• Consider linking density policies to rules and methods that are more responsive to managing the interaction between yards, building coverage percentage and outdoor space across a broader spectrum of housing densities. • Establish design consultation or review processes with developers, iwi and mana whenua, and the community to establish unique design elements for each FDA. Examples include information on the historic context of the site, preservation of features that characterise the area, integration of cultural motifs and recorded histories or landscape features.	**32, 43, 44, 46, 54, 55, 56, 58, 59, 61, 69, 70, 77 & 81**
The representative case study analysis indicates that only 6% of homes in the GCP case studies are duplex, with 76% having either double or triple garaging and the large majority of developments accommodate three to four-bedroom homes. This trend is likely to continue if densities of 15hh/ha are applied in the FDA, which will not immediately translate into the provision of homes that align with the housing demand profile (**Figure 3**) or are affordable with public investment.	• Evaluate the appropriateness of linking density policies closer to housing types or sizes, to encourage diversity in supply. • Invest in 'place making' and public spaces to improve perceptions and the liveability outcomes associated with higher density housing.	**27, 46, 53, 54, 55, 56, 57, 58, 59, 61,**
The representative case study analysis indicates that the amount of land that is dedicated to public and private open space is likely to be decreasing as density increases across the 10hh/ha to 15hh/ha spectrum, which can reduce liveability.	• Develop environmental indicators and incorporate these as assessment matters to guide the design and allocation of public and private space within neighbourhoods, blocks, and sections. • Review the provision and appropriateness of public recreational amenity that is being provided within multi-purpose Local Purpose (Utility) Reserves, which could include amending the density definition to account for some of this land. • Align density policies with rules and methods to ensure that the amount and quality of private open space is maintained to an appropriate level within high density areas. • Review the methodology for determining reserve provision to ensure appropriate public open space is available to support higher density nodes (that will inevitably have less private open space available). • Invest in quality public spaces to support blocks of higher density housing in proximity to local and neighbourhood centres and key transport routes.	**27, 40, 45, 54, 55, 56, 57, 58, 59, 61, 62, 64 70 & 78**

TABLE 9: CONSTRAINTS AND ACTIONS TO ENABLE HIGHER HOUSING DENSITIES IN THE 'FDA'

ISSUE/CONTRAINT	ACTIONS	KEY LEARNINGS
The design of streets was not consistent across the representative case study areas with some areas having highly landscaped streets while others have very limited amenity. This variation in street design and streetscape amenity is likely to be more pronounced with a standardised increase in the FDA densities to 15hh/ha.	• Provide flexible street designs within the road classifications and design standards of district plans, supported by design standards, to encourage high amenity design solutions for local streets and lanes. • Prepare a place-based street design code that includes minimum standards for medium-density residential areas such as a footpath on both sides, street trees, visitor car parks, cycle parking or lanes. • Invest in improving the quality and functionality of local streets where they support and service nodes of high-density housing.	**27, 28, 29, 34, 40, 41, 47, 48, 54, 56, 57, 58, 59, 61, 62, 64, 66, 68, 69 & 70**
MARKET PREFERENCES		
The GPA uptake data, representative cases study outcomes analysis, national and international research, and development sector insights indicate a clear market preference for single storey standalone dwellings with three to four bedrooms and double garaging. This means that housing typologies and price points are unlikely to vary with an increase in density in the FDA to 15hh/ha, which may fail to provide for the longer term GCP housing profile.	• Maintain and strengthen partnerships to overcome the constraints to increasing the housing densities in the FDA. This could include forming public/private development models or partnering with urban development authorities such as Kāinga Ora to develop nodes of higher density housing. • Encourage a quantum of lower priced or sized dwellings to be established within the FDA by partnering with central government, housing providers and developers to subsidise first home buyers/low-income buyers. • Invest in improving the quality and functionality of higher density housing nodes, including through funding infrastructure improvements and 'place-making' initiatives. • Consider a 'rising lid' type policy that is applied in the Smart Growth Bay of Plenty and Future Proof Waikato sub-regions, where minimum density requirements increase progressively over time. This approach 'evens the playing field' between new and recently approved developments and sets expectations that increases in density is anticipated to enable the necessary planning to occur.	**6, 8, 11, 12, 46, 53, 54, 55, 56, 57, 58, 59, 61, 62, 64, 65, 68, 69, 71, 73, 74, 76, 77, 84 & 85**
Poor perceptions and attitudes towards higher density housing is a barrier to the provision of housing to meet the longer term GCP housing demand profile.	• Investing in 'places' by developing and implementing sub-regional (GC2050 and future development strategies prepared under the NPS-UD) spatial plans, township structure plans (for Rolleston, Kaiapoi and Rangiora) and FDA specific outline development plans. These initiatives should aim to identify blocks of higher density housing that optimise the locational attributes of each FDA. • Invest in public spaces to improve the perceptions and achieve the positive outcomes associated with higher density housing. • Contribute to exemplar projects, prepare urban design and street guides, and publish materials to that assist in delivering positive liveability outcomes. The presence of exemplars and successful developments will improve attitudes towards higher density living and. It is important that this guidance offers "accepted solutions" for multi-unit or	**6, 9, 22, 37, 38, 39, 42, 46, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60, 62, 63, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 79, 82, 84 & 85**

TABLE 9: CONSTRAINTS AND ACTIONS TO ENABLE HIGHER HOUSING DENSITIES IN THE 'FDA'

ISSUE/CONTRAINT	ACTIONS	KEY LEARNINGS
	comprehensive developments to provide certainty for consenting processes. • Apply the learnings and adapt the approaches that have been successful in other locations. Hobsonville Point in Auckland and the Lakes in Tauranga are examples where quality developments with high amenity has assisted to change negative perceptions attributed to medium and comprehensive housing. • Establish expectations around appropriate design outcomes through consistent and clear administration of relevant district plan provisions, including the application of non-statutory urban design guides and the Ngāi Tahu Subdivision and Development Guidelines.	
Institutional constraints, including the uncertainties presented by planning processes and systems, present a risk and expense to the market that could hinder the supply of higher density housing.	• Maintain and strengthen partnerships with central government, iwi and mana whenua, urban development authorities, landowners, development sector and the community to gain buy-in and assist to realise higher densities in the FDA. • Continually review and refine planning processes and provisions to improve the liveability outcomes and market attitudes towards higher density housing, including reviewing densities to incentivise Kāinga Nohoanga. • Consider introducing streamlined processes for evaluating subdivision and land use applications for higher density housing. Auckland Council's Housing Project Office is an example of where streamlined processes have successfully coordinated the delivery of high-density housing projects. • Consider applying a minimum net density of 15hh/ha with graduated densities based on the locational attributes in the FDA where it is supported by a range of other methods and have 'partnership' buy-in to make it feasible and achievable. • Prioritise monitoring to measure perceptions, liveability outcomes, and the ongoing feasibility of higher density housing to share knowledge, evaluate and share success, address issues, and inform decision-making.	**9, 21, 24, 25, 27, 28, 29, 35, 36, 37, 42, 50, 51, 52, 53, 54, 55, 56, 59, 60, 61, 62, 64, 67, 68, 69, 70, 78, 80, 84 & 85**
OTHER EXTERNALITIES		
A large proportion of developers are placing covenants on 'greenfield' land to require minimum house sizes, which is limiting the range of housing being provided to the market.	• Requires government intervention to review the appropriateness of private agreements placing restrictions on minimum floor area or price.	**54**
Establish alternative funding agreements to redistribute the monetary benefits and reduce the financial risk to council's and developers when establishing the infrastructure required to support higher density housing in the FDA.	• Requires government intervention to revise the financial models relating to the financing of public infrastructure and the redistribution of tax revenues.	**54**

TABLE 9: CONSTRAINTS AND ACTIONS TO ENABLE HIGHER HOUSING DENSITIES IN THE 'FDA'

ISSUE/CONTRAINT	ACTIONS	KEY LEARNINGS
Although the NPS-UD provides stronger direction on managing urban development, there needs to be stronger national direction on practicalities and approaches for increasing density in 'greenfield' areas on the edge of satellite towns.	• Requires government-initiated research, cost-benefit analysis, regulatory reforms, and guidance to provide certainty to the GCP, development sector, landowners, and the community.	54

8.3.1 CONCLUSION

There are a range of constraints and issues that could arise if the minimum densities are increased to 15hh/ha that may limit the effectiveness of any associated policy changes. These constraints and issues relate primarily to urban form, land use, infrastructure, transport, and liveability outcomes, but also to market preferences and institutional systems and processes that present risks to the development sector when evaluating the feasibility of developing higher density housing.

Overall, we consider that the identified constraints and issues can be overcome to enable the minimum net densities to be increased to 15hh/ha in the FDA to optimise 'greenfield' land and meet the longer-term housing demand profile. The relative success of whether higher densities can be 'activated' in the FDA relies to a large extent on SDC and WDC (in partnership with the GCP, iwi and mana whenua, stakeholders, landowners, developers, and the community) committing resources and funding to implement the recommended options.

8.4 DESIRABILITY AND FEASIBILITY OF INCREASING THE FDA NET DENSITIES

8.4.1 OVERVIEW

This section evaluates the desirability and feasibility of increasing the minimum net densities for the GCP FDA to 15hh/ha, having weighed up the benefits and risks from both local and private sector perspectives and considering relevant national and international research. It is evident that the balance needs to be met in the FDA densities between enabling the development sector to continue to provide high quality residential developments to meet present demand, while encouraging higher density developments that use less land and resources, satisfies the GCP housing demand profile and effectively manages intergenerational environmental effects associated with climate change, sea level rise, infrastructure provision, and safe and efficient sub-regional transport network.

This is no easy task and requires multiple levers to be pulled to support any increase in the minimum net densities from 12hh/ha to 15hh/ha.

8.4.2 THE BENEFITS OF INCREASING THE MINIMUM DENSITIES TO 15HH/HA

Section 6.2 of this report sets out the benefits associated with well-designed high-density environments (Figure 8). The research and evidence that has been gathered confirms that increasing densities in the FDA will contribute to efficiencies in the coordination of land use and infrastructure, support mixed land use activities, optimise investments in multi-modal transport systems, promote quality and quantity of public spaces and parks, support local businesses, facilities, and services, contributes to an improved sense of 'place' and create healthy, vibrant, and resilient local urban environments.

The obvious and real benefit of increasing the minimum net densities to 15hh/ha is that it would enable 4,600 additional households to be accommodated within the FDA, consistent with the urban consolidation principles imbedded in the UDS and CRPS Chapter 6 (Section 3.2). The optimisation of the use of the FDA to this extent represents a relatively

significant efficiency gain in respect to protecting productive rural land resource and containing a higher proportion of people within a smaller area would reduce the that contribute to travel and infrastructure servicing costs.

8.4.3 THE PRACTICALITIES OF ACHIEVING THE INCREMENTAL BENEFITS OF SIGNIFICANTLY HIGHER DENSITIES IN THE FDA

Increasing the densities beyond 15hh/ha under the current settlement pattern is unlikely to be practical as there are not the usual catalysts for higher density housing in the FDA that are present in other 'high growth' areas at this point in time.

These catalysts for change have been sourced from the national and international research documented in Sections 6.2 and 6.3 and are listed in Table 10 below:

TABLE 10: THE TYPICAL CATALYSTS FOR HIGHER DENSITY HOUSING AND THE FDA

TYPICAL CATALYST FOR HIGHER DENSITY HOUSING	FDA CONTEXT
Population pressure	Net migration is typically lower in Greater Christchurch when compared to other metropolitan centres, meaning that housing supply and affordability issues are less pronounced.
Critical housing affordability issues	The representative case study analysis in Section 5.3.9 indicates that price points across the 10hh/ha to 15hh/ha spectrum are significantly lower in the GCP GPA (approximately $500,000) when compared to the same housing located at similar distances from central business districts in Hamilton and Tauranga (approximately $750,000) and Auckland ($1,000,000).
Critical transport delays	The roads of national significance programme and the associated local network upgrades when complete will ensure that commuter times will be low in comparison to other regions. The structure planning and long-term planning processes undertaken by SDC and WDC have assisted in ensuring the FDA can connect to the strategic road network and also have public transport services provided as they develop. Frequency of public transport is driven by demand and service vehicle capacity. Rapid transit services, which by their nature of being rapid are limited stop services, are unlikely to be feasible in the FDA given that they require areas of much higher density and/or connecting services to be viable. The FDA are not suited to the option of transit-oriented design. Existing town and suburb activity centres are much better placed to develop into these over times by adding density and increasing the frequency and range of public transport services available.
Infrastructure and utility servicing constraints	The growth management strategies, structure planning and long-term planning processes undertaken by SDC and WDC have assisted in ensuring the FDA can be serviced at densities of at least 12hh/ha.
Natural or physical barriers	The FDA locations have been selected to avoid urban development from encroaching into sensitive areas that have environmental or cultural values attributed to them or are susceptible to natural hazards and measures are being put in place to manage the long-term effects of climate change.

8.4.4 STRUCTURE PLANNING IS REQUIRED TO DETERMINE THE FEASIBILITY OF 15HH/HA DENSITIES IN THE FDA

Any increase in the minimum net density from 12hh/ha (as expressed in Our SPACE Action 3) to 15hh/ha will require political and community buy-in to gauge support for higher density developments and to enable the councils to allocate the necessary funding to successfully develop and implement the policy changes.

We consider that SDC and WDC, in partnership with the GCP, iwi and mana whenua, stakeholders, landowners, developers and the community, should apply a holistic approach to determining the optimal densities in the FDA by investing in structure planning and preparing outline development plans. Comprehensive structure planning of the FDA is the first critical step in aligning densities with locational context and attributes, while determining the

desirability and feasibility of a minimum 15hh/ha density requirement in CRPS Chapter 6 and the district plans.

Structure planning exercises and preparation of outline development plans provide an opportunity to evaluate the appropriateness of blocks of higher density housing in close proximity to centres and key transport connections, while ensuring these are supported by appropriate public space and multi-purpose walking and cycling connections to safely and conveniently access public transport connections and other services and facilities in the area (such as early childhood learning centres and schools). It also enables the council's and communities to influence what housing and land is being delivered to the market and establishing the amenities and services that will make it attractive for people to live in higher density developments.

The research and the Te Papa Peninsula exemplar in Section 6.4.5 confirm that effective spatial planning is an important step in signalling expectations and facilitating discussions on the benefits of higher densities, while also gaining community buy-in.

The availability of adopted structure plans with detailed outline development plans will provide the necessary confidence that the options for activating higher densities in the FDA listed in Table 9 in Section 8.3 can then be initiated with the assurance that the desired outcomes can be realistically achieved, and funding allocated (to maintain and build partnerships, upgrade infrastructure, invest in 'place making' and public spaces and improve planning processes).

8.4.5 WHAT IS THE LIKELIHOOD THAT POOR OUTCOMES COULD EVENTUATE AS A CONSEQUENCE OF INCREASING DENSITIES IN THE FDA?

As outlined in Section 8.2, Rolleston, Rangiora and Kaiapoi are all priority growth areas in Selwyn 2031 and Waimakariri 2048 so the townships have the infrastructure and community facilities in place, and employment and recreational opportunities, to support higher density housing. There is also an acknowledgement in these growth strategies that higher density housing needs to be to occur within these centres to meet future housing demand and provide diversity.

The character and amenity effects of increasing the net densities to 15hh/ha can be integrated into the FDA with appropriate structure planning and urban design evaluations that optimise the locational attributes of each 'greenfield' area. The representative case study analysis of the Greater Christchurch and 'high growth area' 'greenfield' developments in Section 5.3 suggest that the quality of the housing and the neighbourhoods they are established within is unlikely to vary significantly between the 12hh/ha to 15hh/ha density range.

Overall liveability trends indicate that there is a slightly reduced level of residential open space amenity as density increases from 10hh/ha to 16hh/ha. Almost all other liveability attributes are generally consistent across the density range that has been evaluated. Critically, there is no measurable difference in the quality or type of house that is being provided. This means that density at 15hh/ha is not going to be a significant constraint to development of a particular house style. Street design is likely to be more compact at densities of 15hh/ha, although this does not necessarily equate to a difference in the number of amenities or the specific quality of each development.

Higher density nodes are likely to have a different character, where people may perceive compact streetscape environments as a negative attribute, even if they are landscaped well and provisioned with excellent amenities. However, the Golden Sands, Belfast and Huapai Triangle cases studies provide confidence that the liveability outcomes are unlikely to be substantially compromised at 15h/ha densities. This is likely to be influenced by the economic realities that quality is always going to be a premium to encourage sales. Any risk that the amenity and character of the FDA would be compromised if a minimum net density of 15hh/ha were applied can be addressed through the implementation of the initiatives outlined in Section 8.3 and listed in Table 9.

8.4.6 METHODS FOR ACTIVATING HIGHER DENSITIES IN THE FDA

The research on housing supply and demand constraints in Section 6.3, and the development sector insights in Section 7.3, highlight the significant risks at play when making policy changes that aim to provide long term benefits to the community but risk failing to meet more immediate housing demand profiles. It is critically important that the existing partnerships with the development sector are strengthened to ensure it is feasible to increase the minimum densities to 15hh/ha in the FDA to optime the 'greenfield' land and meet the long-tern housing demand profile.

There are examples where SDC and WDC have successfully partnered with developers for the wider benefit of the community. One example is the I-Zone industrial park in Rolleston that has been a catalyst for significant employment and infrastructure investment. Other examples are the town centre upgrades in Rolleston, Rangiora and Kaiapoi that is substantially improving public spaces and commercial development in these centres to enable these communities to be more self-sufficient.

There is an opportunity to extend these public/private sector partnerships to determine the desirability and feasibility of blocks of intensive housing in appropriate locations within the FDA to achieve longer term benefits, which developers are unlikely to be able to deliver in isolation of support from councils. This includes investigating methods for reducing the risk associated with land holding costs and delays in unlocking the equity to service loans required to develop densities and housing typologies that may not be meeting current market demand).

As outlined in the suggested options in Table 9 of the previous section, the primary methods for 'activating' higher densities in the FDA include:

- **Partnerships** - Collaborative multi-agency partnerships, iwi and mana whenua, urban development authorities and public/private development initiatives, housing providers, and housing companies.
- **Investing in 'places'** - Structure planning, optimising locational attributes and 'place-making' to improve perceptions and attitudes.
- **Improving planning regulatory and compliance requirements** - Continual monitoring and refinement of planning provisions that manage subdivision and land use outcomes as they relate to higher density developments.
- **Funding models** - Investing in public infrastructure and funding arrangements to make higher density developments feasible within the FDA.

8.4.7 IMPLEMENTING THE ACTIONS AND RECOMMENDATIONS

This report includes actions and recommendations to assist in determining the appropriateness of increasing the minimum net densities in the FDA specifically and to more generally 'activate' the benefits that can be achieved by increasing development densities across a range of urban environments. The findings may therefore influence the preparatory work and decision making on a range of statutory and non-statutory processes in the interim period between when this technical report is endorsed by the GCP and when it may be fully implemented.

We consider that at this juncture the 12hh/ha minimum net densities identified in Our SPACE Policy 9.b should be considered alongside the findings of this report when considering proposed district plan provisions[132], council-initiated changes and privately promulgated plan changes[133] until this draft technical report is endorsed by the GCP and more certainty is provided on the extent to which the recommendations are progressively implemented.

[132] Including Policy UG-P13.4 of the Proposed Selwyn District Plan

[133] Where they have been accepted for processing under clause 25(2)(b) of the RMA Schedule 1

8.5 INFORMATION GAPS

The following information gaps have been identified that would assist to build a stronger evidence base to determine the outcomes relating to increases in density across the 10hh/ha to 15hh/ha spectrum and the viability and feasibility of increasing the net densities within the FDA:

- Expert advice from land valuation experts and economist input to qualify the housing market trends and observations. In particular, the case study analysis in Section 5.0 highlights that higher density does not appear to result in higher house prices so there needs to be a stronger appreciation of developer margins at higher densities.
- Stakeholder engagement and land-owner input.
- The incorporation of GCP and partner council planning programmes that have yet to be released into the public realm will assist to build a stronger evidence base. These include the section 32 evaluations and provisions contained in the Draft District Plans prepared as part of the Selwyn and Waimakariri DPR's, proposed Changes to the CRPS and other technical reports prepared to inform these processes.
- We have not undertaken any detailed analysis to determine the extent to which positive or negative outcomes relating to density policy requirements extend beyond 15hh/ha. Doing so might reveal other thresholds and trends that contribute to a greater provision two-storey housing, terraced housing, and other dwelling types being developed.
- Council and private-led growth planning, master planning and resource consenting processes bring layers of context-specific complexity to each 'greenfield' growth area. We have sought to compare baseline outcomes but have not drilled down to fully understand the decision-making at the planning stage. We consider that the detailed structure planning and preparation of outline development plans will provide an important evidence base to determine the viability of increasing the minimum net densities to 15hh/ha in the FDA.

8.6 RECOMMENDATIONS

RECOMMENDATION 1: PREPARE SPATIAL PLANS FOR THE FDA

SDC and WDC to initiate the development of FDA spatial plans and outline development plans. This will assist to determine the viability and desirability of applying a minimum 15hh/ha net density requirement, or whether alternative densities within each respective FDA are more appropriate (as outlined in Section 8.3 and listed in Table 9).

RECOMMENDATION 2: IMPLEMENT THE ACTIONS TO ADDRESS THE IDENTIFIED ISSUES AND CONSTRAINTS

SDC and WDC to implement the actions identified to address the constraints and issues outlined in Section 8.3 and listed in Table 9, based on the outcomes of FDA structure plans and outline development plans, to enable a minimum net density of 15h/ha to be set for the FDA.

These include prioritising the following:

- *Partnerships* - Maintaining and building collaborative multi-agency partnerships, iwi and mana whenua, urban development authorities and public/private development initiatives, housing providers, and housing companies.
- *Investing in 'places'* - Optimising locational attributes and the activating the benefits of higher density development nodes through open space, transport and infrastructure upgrades and 'place-making' to improve perceptions and attitudes.
- *Improving planning regulatory and compliance requirements* - Continually monitor and refine the planning provisions that manage subdivision and land use outcomes as they relate to higher density developments.
- *Funding models* - Investing in public infrastructure and funding arrangements to make densities of 15hh/ha feasible within the FDA.

RECOMMENDATION 3: BUILDING THE EVIDENCE BASE

The GCP to integrate the findings of this report with the evidence base being prepared as part of the DPR processes, to implement the Our SPACE Actions and prepare Greater Christchurch 2050. This will provide a clearer understanding of the desirability and feasibility of increasing the minimum net densities and methods for 'activating' higher density developments within the district plans (as outlined in Section 8.4).

RECOMMENDATION 4: STATUTORY PLANNING - CRPS

Environment Canterbury, in collaboration with the partner councils, to initiate changes to the CRPS Chapter 6 to increase the minimum net densities within the FDA to 15h/ha or what is determined to be desirable, consistent with the outcome of the spatial planning outlined in Recommendation 1 (Our SPACE Action 9, as amended by these recommendations).

RECOMMENDATION 5: INTERIM DENSITY REQUIREMENTS

The 12hh/ha minimum net densities identified in Our SPACE Policy 9.b should be considered alongside this report when considering proposed district plans, and private plan and council promulgated changes under the Schedule 1 process, on a short-term interim basis until the balance of the recommendations of this report have been implemented.

9.0
NEXT STEPS

This technical report was provided to the GCP to consider the findings and determine its appropriateness for release to the public. The report was “noted” by the GCP at its meeting held on 12 February 2021.

This technical report can now inform the CRPS changes, DPR’s and other statutory processes under the RMA and be a resource for the development of outputs under the NPS-UD and other non-statutory planning strategies. Recommendation 5 sets out the general weighting that should be applied for determining the appropriate ‘greenfield’ densities as part of non-statutory and statutory planning processes on an interim basis pending the implementation of the balance of the Recommendations.

10.0 CONCLUSION

Project scope

Section 1.0 sets out the scope of this report, which is to prepare a technical report to address Action 3 of Our SPACE. This has been achieved through the provision of: (a) a summary of how density is managed in Greater Christchurch, Auckland, 'Future Proof' Waikato and 'Smart Growth' Western Bay of Plenty; (b) an analysis of 'greenfield' uptake data and identification of any related constraints and issues; (c) an evaluation of the positive and negative outcomes in achieving densities across the 10hh/ha to 15hh/ha range; (d) a summary of relevant national and international research; and (e) gathering of developer and council insights.

These tasks and the key learnings provided at the conclusion of each Section combine to enable a review of the desirability and feasibility of increasing the minimum net densities in the Greater Christchurch FDA, and for recommendations and actions to be made to address the identified constraints to enable the densities to increase to 15hh/ha.

Managing density in 'high growth' areas

The review of how the Greater Christchurch and other 'high growth' area collaborative partnerships manage urban growth and densities in Section 3.0 confirms that a consistent approach has been applied across these sub-regions. All of the sub-regions that were evaluated have prepared comprehensive urban growth strategies to manage long-term urban development capacity and growth to realise the benefits of consolidated settlement patterns. These strategies are being successfully implemented through urban containment policies, planning provisions and non-statutory strategies to actively manage development densities.

The densities being applied to suburban 'greenfield' areas are typically between 8hh/ha to 15hh/ha in suburban 'greenfield' areas, which progressively increase based on locational attributes. This confirms that 15hh/ha densities are generally consistent with what is being applied in similar environments by other 'high growth' areas across the country, albeit at the higher end of the density range.

Density uptake, issues, and constraints

The density uptake analysis of the GCP residential GPA and Christchurch City Intensification Areas in Section 4.0 identifies that uptake in the Waimakariri district GPA has been strong and that the densities are exceeding the minimum 10hh/ha. The GPA uptake in Selwyn district, and more so in Christchurch City, is more varied. There are no trends to indicate any wider level locational or planning constraints that may be hindering the ability for the development sector to satisfy the minimum net density requirements. The most common densities being delivered to the market to date are within the 10 to 10.9hh/ha and 14 to 14.9hh/ha range that are satisfying the housing preferences for standalone homes and to optimise land development processes. Uptake of the Intensification Areas in Christchurch City were typically tracking below the minimum density requirements, which is attributed to market preferences, comparatively low investment in infrastructure, locational characteristics and development sector challenges in intensifying and redeveloping residential land.

There was no infrastructure (water, wastewater, and stormwater), public transport or open space infrastructure constraints hindering the development of the GPA or Intensification Areas to satisfy the minimum net densities. The barriers to achieving the broader level urban development outcomes are introduced in Section 4.0 and discussed in latter sections of the report, including environmental and planning limits, pressure on the sub-regional transport networks, proportional growth of 'greenfield' land to intensification and redevelopment, and poor perceptions and attitudes to higher density developments.

Density outcomes analysis

The desktop analysis of the urban form, land use, infrastructure and strategic transport outcomes relating to the establishment and development of the GPA in Section 5.0 confirms that a consolidated urban form is being maintained. The NPS-UD will require this settlement pattern to be reviewed to encourage building up as well as out to meet housing sufficiency needs of the sub-region. The settlement pattern identified in the UDS and Our SPACE, the CRPS and district plan policies and spatial plans has ensured that the land use attributes of the FDA have to a large extent predetermined the appropriateness of these locations as possible future GPA. The research confirms that the density of housing and where it is located are key determinants of the relative demand that 'greenfield' development places on the existing and future transport, infrastructure networks and community facilities and services. This places a priority on ensuring that higher densities are located in close proximity to centres and along high demand and key public transport corridors, and to sequence growth, align cross boundary funding, and implement measures to promote mode shift to incentivise active transport.

The more detailed attributes-based analysis of seven representative case study areas across the 10.3hh/ha to 16.7hh/ha range establishes that density increases do not significantly change the 'liveability', quality, or nature of development at the neighbourhood, block, or section scales. The analysis indicates a developer preference to provide for three to four-bedroom standalone homes with double garaging to meet current market needs across Greater Christchurch and the three 'high growth' areas. There is a low proportion of duplex housing (6%) across all the locations and densities, which is failing to meet the longer-term housing demand profile for Greater Christchurch.

A positive finding is that liveability outcomes and the quality of development do not appear to reduce as densities increase and that most district plan rules do not appear to be hindering higher densities from establishing within 'greenfield' areas. The representative case study analysis highlights that building setback and height to boundary rules should be reviewed as they discourage two storey dwellings and the creation of narrower sections for duplex units and terracing. Other trends relating to increases in density that require responses include the lack of consistency in street design, encouraging permeability and increasing private and open space to provide certainty that streetscape amenity, active transport and the provision of open space aligns with density.

The outcomes analysis in Section 5.0 confirms that there are a range of positive and negative outcomes occurring as densities increase within 'greenfield' areas, but there are actions that can be taken that can make a policy change to increase the minimum net densities in the FDA to 15hh/ha appropriate.

National and international research

The national and international research in Section 6.0 confirms the significant locational and distributional benefits that can be achieved in increasing development density to support a mix of housing types within well-designed neighbourhoods. It is established that the benefits of density increase incrementally, but these are more readily achievable within significantly larger metropolitan centres than satellite towns that form part of a polycentric sub-regional settlement pattern.

The research confirms that the supply of higher density housing in New Zealand is suppressed due to supply and demand constraints (negative perceptions, lack of diversity and drivers for change, housing market trade-offs and preferences and development sector influences on market supply) and institutional constraints (planning systems and processes). Section 6.0 outlines a range of methods and alternative approaches for activating density, which includes building partnerships, investing in 'places', improving planning regulations and compliance requirements and investigating funding options. The Te Papa Peninsula exemplar case study combines all of these methods to illustrate how the establishment of higher densities within a residential 'greenfield' growth area in Tauranga City are being coordinated.

Developer and council insights

The development sector insights documented in Section 7.0 highlight the tension between the need to satisfy existing market demand and the associated financial risk exposure to landowners and developers, while needing to provide higher density housing that satisfies the longer-term housing demand profiles. The developer insights highlight the risks in applying a single lever increase in the minimum net densities to 15hh/ha, which is likely to fail to meet distinct lifestyle preferences between housing sub-markets in Christchurch City and the Selwyn and Waimakariri districts and presents a financial risk to developers.

It is evident that the balance needs to be met in the FDA densities between enabling the development sector to continue to provide high quality residential developments to meet present demand, while encouraging higher density developments that use less land and resources, satisfies the GCP housing demand profile and effectively manages intergenerational environmental effects associated with climate change, sea level rise, infrastructure provision, and safe and efficient sub-regional transport network.

The desirability and feasibility of increasing the minimum net densities in the FDA

The contextual analysis of the FDA in Section 8.0 confirms that locational attributes, including proximity to centres, local facilities and services and access to strategic transport and public transport, are an important influence on the ability of each 'greenfield' area to support higher densities. A list of urban form, land use, transport, and infrastructure, liveability, market preferences and other constraints to increasing the minimum net densities are outlined in Section 8.0, with actions provided to enable them to be addressed.

This section establishes that it can be desirable and feasible to increase the minimum net densities in the FDA to 15hh/ha to optimise the use of the available 'greenfield' land and satisfies the GCP housing demand profile, but it requires more detailed spatial planning of each FDA to evaluate whether there are appropriate locational attributes to sustain blocks of higher density housing within proximity to local and neighbourhood centres. There is insufficient evidence to support increasing the densities in the FDA above 15hh/ha under the current settlement pattern due to a lack of drivers and market feasibility.

The case study analysis confirms that there is a low likelihood of poor outcomes arising with an increase in minimum net densities to 15hh/ha. However, this policy change needs to be supported by a range of other statutory and non-statutory actions to build partnerships, invest in 'places', improve planning and regulatory and compliance requirements and establish funding models to enable blocks of higher density housing in proximity to neighbourhood and local centres to become a realistic goal. The importance of integrating the findings of this technical report with other work streams being undertaken by the GCP and the partner councils to consider the appropriateness of developments is emphasised. The integration of this research is required to build the evidence base for a change to increase the minimum net densities to 15hh/ha in the FDA in Chapter 6 of the CRPS.

To conclude, we consider that there is sufficient and appropriate research outlined in this technical report, in combination with the recommendations listed in Section 8.0, to confirm that an increase in the minimum net densities to 15hh/ha in the FDA is appropriate. However, any policy change needs to be supported by spatial planning and the implementation of actions to make an increase in the minimum densities feasible and desirable from the council, community, stakeholder, landowner, and development sector perspectives. The 12hh/ha identified in Our SPACE Action 9.b should be applied when considering proposed district plan provisions, private plan change requests and council promulgated changes under the Schedule 1 process on a short-term interim basis until the balance of the recommendations of this report are implemented.

APPENDICES

APPENDIX 1
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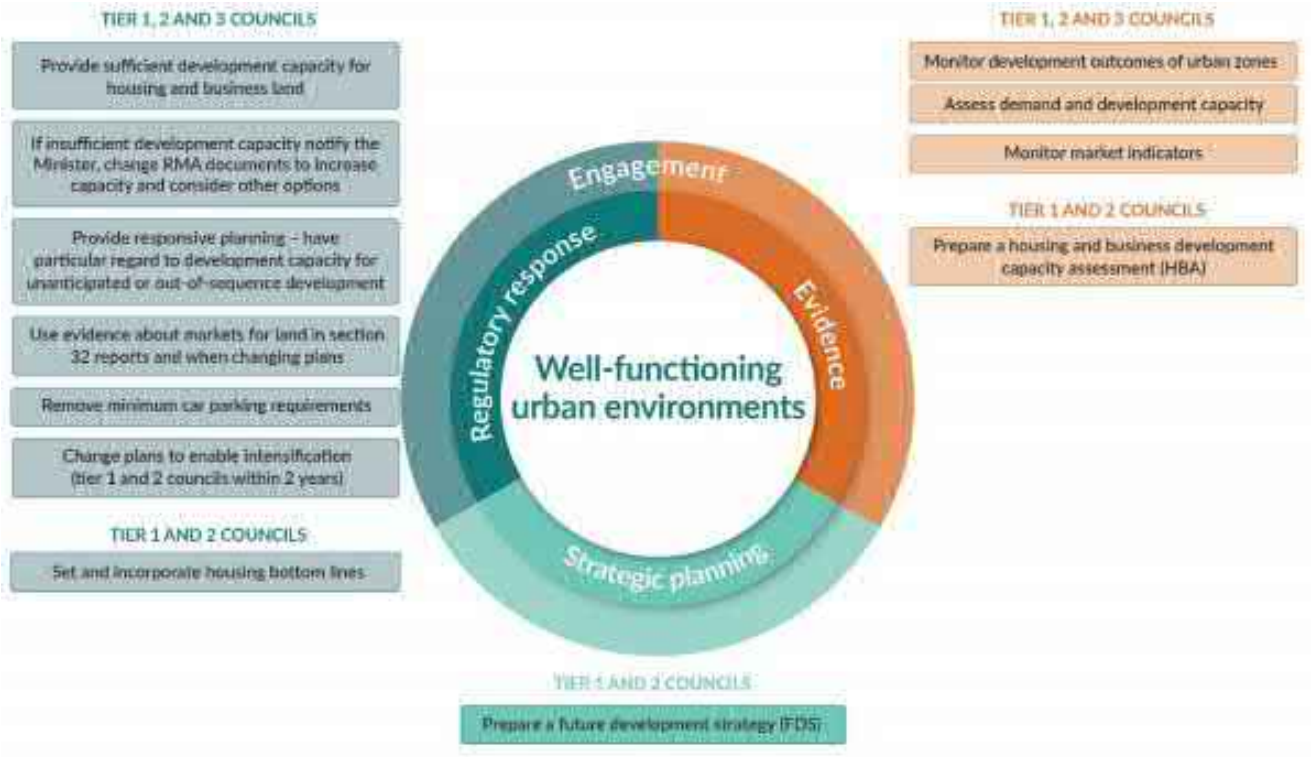
APPENDIX 2
MANAGING URBAN GROWTH IN GREATER CHRISTCHURCH

NATIONAL POLICY STATEMENT ON URBAN DEVELOPMENT (NPS-UD)

The NPS-UD was Gazetted on 23 July 2020, takes effect on 20 August 2020, and replaces the National Policy Statement on Urban Development Capacity (NPS-UDC). The NPS-UD contains objectives and policies to support well-functioning urban environments that enable all people and communities to provide for their wellbeing by providing sufficient development capacity (Objectives 1 and 4, Policies 6 and 8). The NPS-UD implementation programme is detailed in Figure i below.

Figure i: NPS-UD Implementation programme



Source: MfE. NPS-UD Introductory Guide. Implementation Programme. Figure 2. Page 12.

The NPS-UD 2020 requires councils to plan well for growth and ensure a well-functioning urban environment for all people, communities, and future generations (Policy 1). The NPS contains objectives and policies to: (a) ensure urban development occurs in a way that takes into account the principles of the *te Tiriti o Waitangi* Treaty of Waitangi (Objective 5 and Policy 9); (b) requires that plans make room for growth both 'up' and 'out' in defined locations (Objective 3, Policies 3, 4) and that rules are not unnecessarily constraining growth (Objective 2 and Policy 11); (c) develop, monitor and maintain an evidence base about demand, supply and prices for housing and land to inform planning decisions (Objective 7); (d) align and coordinate planning and infrastructure across urban areas (Objective 6); and (e) reduce greenhouse gas emissions and are resilient to climate change (Objective 8).

The objectives and high-level policies of the NPS-UD apply to all councils that have all or part of an urban environment within their district or region. Table 1 of the Appendix in the NPS-UD determines that Greater Christchurch Councils are Tier 1 urban environments and local authorities and encourages them to continue to work collaboratively (Policy 10).

A critical difference between the NPS-UD on National Policy Statement on Urban Development Capacity (NPS-UDC) discussed below is that it provides further direction on where sufficient development capacity (Objective 3 and Policies 2 to 5) should be provided. This includes through increasing permissible building heights within walkable catchments and density based on accessibility to active or public transport and a range of commercial activities and community services where there is locational demand (Policies 3 to 5).

The need for council's to be more responsive to development opportunities is retained through the preparation and implementation of Future Development Strategies and Housing and Business Capacity Assessments. It includes a requirement that housing bottom lines are set for the short, medium, and long term (Policy 7), similar to the minimum housing targets in the NPS-UDC.

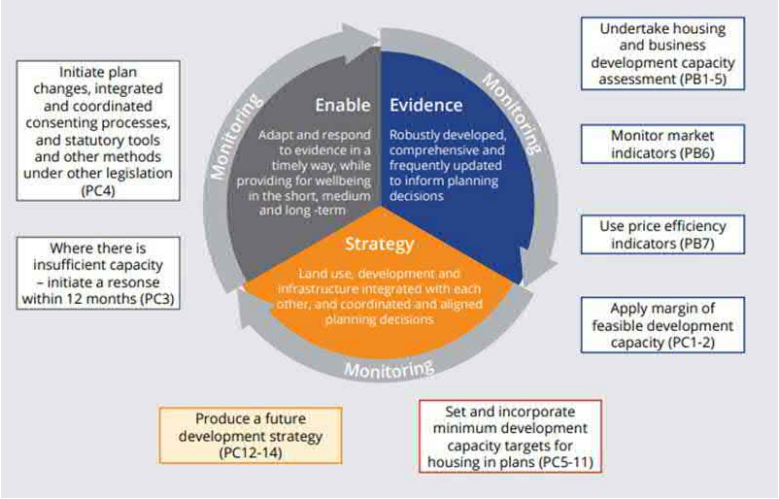
A key aim of the NPS-UD requires local authorities to open up more development capacity, so more homes can be built in response to demand. The NPS-UD provides direction to ensure capacity is provided in places that improve accessibility (Policy 1), encourage intensification to improve land-use flexibility in the areas of highest demand (Policies 3 to 5) and deliver development outcomes that are commensurate to zones.

NATIONAL POLICY STATEMENT ON URBAN DEVELOPMENT CAPACITY (NPS-UDC)

INTRODUCTION

The NPS-UDC contains objectives and policies to support commercially feasible urban development capacity as a matter of national significance. **Appendix 3: Greater Christchurch 'High Growth Area' map** illustrates the portion of the district that is contained within the Greater Christchurch area. This geographic area qualified as a 'High Growth Area' under the NPS-UDC prerequisites, meaning that all the objectives and policies apply to that portion of the district.

Figure ii: NPS-UDC policies and their interrelationships



Source: Our SPACE, Section 2.4 NPS-UDC, Figure 4. P6

The NPS-UDC encouraged integration and coordination of land use and infrastructure planning and required that development capacity be supported by adequate development infrastructure (OD1), which included land transport networks.

Planning for future urban growth needed to promote the efficient use of land and infrastructure (PA3).

Integrated urban planning had to proactively ensure that infrastructure was available to support the future urban development capacity (PB3 (b)) by aligning planning responses with Long Term Plans and Infrastructure Strategies (PC13 (c)) and working with infrastructure and utility providers (PD2 and D4) to ensure the urban capacity was feasible.

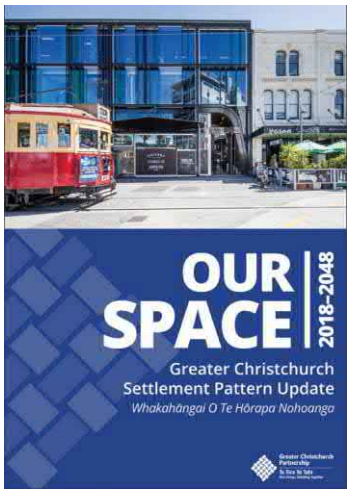
The interrelationship between the NPS-UDC policies in supporting housing sufficiency are illustrated in **Figure ii**.

The Greater Christchurch Partners[134] worked collaboratively to 'give effect' to the NPS-UDC. This included publishing market indicator monitoring reports, preparing housing and business development capacity assessments (HDCA and BDCA), and adopting the Our SPACE future development strategy.

[134] The Partnership comprises Canterbury Regional Council, Christchurch City Council, Selwyn District Council, Waimakariri District Council, New Zealand Transport Agency, Te Rūnanga o Ngāi Tahu, Canterbury District Health Board, Regenerate Christchurch, and the Greater Christchurch Group of DPMC.

WHAKAHĀNGAI O TE HŌRAPA NOHOANGA GREATER CHRISTCHURCH SETTLEMENT PATTERN UPDATE: OUR SPACE 2018-2048 (OUR SPACE)

BACKGROUND AND CONTEXT



Our Space is a non-statutory document prepared by the GCP to meet the requirements of the National Policy Statement on Urban Development Capacity (NPS-UDC) for local authorities with a 'high growth' urban area to produce a 'future development strategy'.

Specifically, Our Space:

- Sets out how Greater Christchurch and territorial authority targets for housing for the next thirty years will accommodate an additional 150,000 people.
- Identifies locations for housing growth through to 2048 that encourage central city and suburban centre living, while providing for growth in Rolleston, Rangiora and Kaiapoi.
- Reinforces the role of key centres in providing additional retail and office floorspace, in particular the central city and the potential for surrounding industrial zones to transition to commercial uses over time, if needed.
- Recognises that the existing industrial land provision is sufficient to cater for anticipated industrial growth through to 2048.
- Outlines a series of implementation actions and further work required by partners, recognising that although the long term is addressed in Our Space, additional work is required to ensure that planning directions for the longer term are appropriately investigated and implemented, and effectively respond to emerging drivers of change for Greater Christchurch.

SUFFICIENCY OF HOUSING DEVELOPMENT CAPACITY

Our Space identified that there is sufficient housing development capacity in Greater Christchurch as a whole to meet demand over the medium term (next ten years). However, insufficient development capacity was identified in certain locations over the medium term and overall when long term (the next thirty years) demand was considered.

Our SPACE identifies that the provision of housing to meet projected demand is projected to be split across the redevelopment of existing urban areas in Christchurch City, the existing GPA identified within the three territorial authority boundaries and within the new 'greenfield' and redevelopment areas in Selwyn and Waimakariri districts. The approaches for meeting the projected housing demand across Greater Christchurch are illustrated in Figure ii.

Figure ii: Approaches for meeting the project housing demand

Source: Our SPACE, 5.1 Greater Christchurch's settlement pattern, Figure 12. Pg.24

At the territorial authority level, given the range of reported feasibility, development capacity in Selwyn and Waimakariri was identified as potentially not being sufficient to meet demand over the medium term, while the significant development capacity in Christchurch City was expected to be sufficient over the long term.

Our Space states the following in regard to the projected shortfalls in development capacity in Selwyn and Waimakariri, and the proposed planning response[135]:

> *"Given the projected shortfalls in housing development capacity in Selwyn and Waimakariri to meet their future needs, a change to the CRPS is proposed to allow Chapter 6 and Map A the flexibility to respond to identified medium term capacity needs. Additional capacity will be directed in the first instance to the key towns of Rolleston,*

[135] Greater Christchurch Partnership. Our SPACE, Section 5.3 Selwyn and Waimakariri towns. Pg.28

Rangiora and Kaiapoi in support of the public transport enhancement opportunities mentioned elsewhere in this Update. This is likely to identify future development areas in the two districts that are within the Projected Infrastructure Boundary. Such a change would be prepared subsequent to this Update and would likely be notified in 2019. These new areas will provide much of the capacity required over both the medium and long term. A 2019 change to the CRPS would ensure that land can be rezoned to meet medium term capacity needs, and the longer term will be further considered as part of a comprehensive review of the CRPS scheduled for 2022."

Our Space identifies a proposed change to Chapter 6 of the CRPS as a subsequent action to be undertaken by Environment Canterbury (ECan), Selwyn District Council (SDC) and Waimakariri District Council (WDC) in 2019[136].

Action 3 of Our SPACE is discussed in **Section 3.3** of the technical report and illustrated in **Figure iii** below.

Figure iii: Our SPACE Action 3

No.	Description	Lead Partners	Timeframe
IMPROVE OUR TOOLS AND EVIDENCE BASE			
3	Undertake an evaluation of the appropriateness of existing minimum densities specified in the CRPS for each territorial authority including a review of what has been achieved to date, constraints and issues associated with achieving these minimum densities, and whether any changes to minimum densities is likely to be desirable and achievable across future development areas in Selwyn and Waimakariri districts. **Linked processes: Canterbury Regional Policy Statement review, Selwyn, and Waimakariri District Plan Reviews**	CCC, SDC, WDC, ECan	2019-2022

Source: Our SPACE, 6.2 Further work and implementation. Pg.40

Further background information on the proposed change to Chapter 6 of the CPRS is provided in a later section in this document.

DENSITIES IN 'GREENFIELD PRIORITY AREAS' AND 'FUTURE DEVELOPMENT AREAS'

The Hearing Panel's Recommendations Report considered how minimum residential densities in the GPA and FDA should be managed, noting that submissions were received seeking higher densities, particularly in Rolleston, Rangiora and Kaiapoi, while other submissions sought more flexibility in the density requirements in Chapter 6 of the CRPS.

The Recommendations Report noted the view of Officers that the evidence base supporting any change to the density requirements was not yet sufficient, and that a specific and timely piece of work was required to establish a robust and agreed position on this matter[137].

CCC considered that a minimum of 15hh/ha in Rolleston, Rangiora and Kaiapoi would be appropriate. Other submitters considered that 12hh/ha was reasonably achievable, while others considered 10hh/ha provided more flexibility. Others again considered that lower densities might be required given the presence of TC3 land.

The Chief Executives of ECan, SDC and WDC recommended to the Hearing Panel that Our Space direct an increase to the minimum density requirements in the FDA to 12hh/ha as the basis for the structure planning being undertaken by those councils and to be reflected in their district plan reviews. This was on the basis of their understanding that densities of about 12hh/ha have been achieved in a number of Selwyn and Waimakariri development areas in recent years. The Chief Executive for CCC reiterated her council's position regarding the preference for 15hh/ha.

Action 9 of Our SPACE that is set out in **Figure iv** confirms the parameters for a change to CRPS Chapter 6 to determine the appropriateness of 'unlocking' the FDA and that structure planning and the DPR's should apply 12hh/ha densities until the evidence base set out in Action 3 is completed.

[136] Greater Christchurch Partnership. Our SPACE, Section 6.2 Further work and implementation. Pg.40

[137] Greater Christchurch Partnership. Our SPACE: Report and Recommendations of the Hearing Panel incorporating Addendum dated 5 June 2019. Paragraphs 133 to 143. Pg.36.

Figure iv: Our SPACE Action 9

No.	Description	Lead Partners	Timeframe
IMPROVE OUR TOOLS AND EVIDENCE BASE			
9	a. Prepare a Proposed Change to Chapter 6 of the CRPS at the earliest opportunity to: • modify Map A to identify the Future Urban Development Areas shown in Figure 15, and include a policy in Chapter 6 of the CRPS that enables land within the Future Development Areas to be rezoned in District Plans for urban development if there is a projected shortfall in housing development capacity in Table 3 of Our Space, or if the capacity assessment referred to in Action 6 (or subsequent periodic capacity assessments) identifies a projected shortfall in feasible development capacity. • enable territorial authorities to respond to changes in the sufficiency of development capacity over the medium term on a rolling basis as a result of periodic capacity assessments. b. Selwyn and Waimakariri District Councils to undertake structure planning (including the consideration of development infrastructure and the downstream effects on the Greater Christchurch transport network) and review of District Plans over the next year for the identified Future Development Areas in the 2019 CRPS Change set out in Action 9a above, to provide for the projected medium term shortfall shown in Table 3 or the capacity assessment referred to in Action 6 (or subsequent periodic capacity assessments), at a minimum residential density of 12 households per hectare, informed by the evaluation undertaken as Action 3 above. The policy will sit within the existing objective and policy framework of Chapter 6 of the CRPS which applies to all local authorities in the Greater Christchurch Area, and which, in relation to the integration of land use and transport, includes Policies 6.3.3, 6.3.4 and 6.3.5 **Linked processes: Selwyn and Waimakariri District Plan Reviews**	ECan, SDC, WDC	2019

Source: Our SPACE, 6.2 Further work and implementation. Pg.41

Our SPACE outlines how an increase in the minimum net densities within the existing GPA can assist in meeting the projected household demand across Greater Christchurch. These are illustrated in Table A below.

Table A: Minimum household density scenarios

	Density scenarios and anticipated yields from FDAs^					
	Selwyn			Waimakariri		
Theoretical additional capacity enabled in existing urban areas*	Density 10 hh/ha	Density 12 hh/ha	Density 15 hh/ha	Density 10 hh/ha	Density 12 hh/ha	Density 15 hh/ha
0	4,700	5,650	7,050	4,500	5,400	6,750
500	5,200	6,150	7,550	5,000	5,900	7,250
1,000	5,700	6,650	8,050	5,500	6,400	7,750
1,500	6,200	7,150	8,550	6,000	6,900	8,250
2,000	6,700	7,650	9,050	6,500	7,400	8,750
2,500				7,000	7,900	9,250

Source: Our SPACE, 5.1 Greater Christchurch's settlement pattern, Table 5. Pg.28

The Chief Executives also recommended the GCP work collaboratively over the next year to review and agree appropriate future density settings across Greater Christchurch to inform the district plan reviews and provide guidance on how density matters should be progressed as part of the full CRPS review.

In this context, the Recommendations Report notes the Hearing Panel's view that there was a potential policy gap for the FDA, as current provisions in the CRPS only apply to the GPA, and that it was appropriate that they signal a minimum net density of 12 households per hectare for residentially zoned land in Selwyn and Waimakariri that fall within Greater Christchurch.

Our Space identifies an evaluation of the appropriateness of existing minimum densities in the CRPS as a subsequent action to be undertaken by ECan, CCC, SDC and WDC between 2019 and 2022[138]. Our SPACE Action 3 is provided in **Figure 2** in **Section 2.3** of the Report.

This technical report is the basis for filling the identified gap in evidence for determining the optimal densities that are best applied to the FDA to assist in meeting the projected housing demand across Greater Christchurch.

HOUSING DEVELOPMENT CAPACITY ASSESSMENT (HDCA)

The GCP prepared a Housing Development Capacity Assessment in February 2018 to fulfil its obligations under PB1 of the NPS-UDC[139].

Our SPACE summarises the population growth scenario that was formulated in the preparation of the HDCA. The adopted scenario projects that the population of Greater Christchurch will grow by an additional 150,000 people from 2018 to 2048 to an estimated 640,000 people. This represents approximately 74,000 new households across the sub-region by 2048[140].

The HDCA records that Greater Christchurch is, for the most part, a medium density urban area, with most residential areas supporting between 20 and 40 people per hectare[141]. There are some higher density areas in the sub-region, including in Addington and Riccarton in the west of Christchurch City. Activity centres are focal points for higher density living as they are well served by the public transport network and concentrations of public and private services.

In terms of housing demand across Greater Christchurch, the HDCA identifies that although standalone homes will continue to be in demand there is an emerging trend towards smaller household sizes than historically offered within the housing market[142]. This shift in the desirability for higher density housing is attributed to the changing demographic and household profile in Greater Christchurch where there is a growing demand for townhouses and apartments[143]. This demand for more intensive housing typologies is most likely to be in Christchurch City and provided through the private rental market, but the estimates indicate that some demand for smaller homes will also be evident in the larger towns in Selwyn and Waimakariri districts by 2048.

Housing sufficiency analysis across Greater Christchurch based on 2018 population projects, which is the demand and supply of feasible development capacity, indicates that there are 73,875 households available in the short term,

39,100 households in the medium term and a projected shortfall of 9,150 households in the long term based on the 2018 population estimates[144].

The housing sufficiency estimates for Greater Christchurch are outlined in **Table B** below.

Section 5.0 of the Report summarises the outcomes of the targeted consultation that was carried out with the mandatory stakeholders[145] during the preparation of the HDCA, which included specific feedback on the viability and feasibility of apply different minimum household densities across Greater Christchurch.

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[138] Greater Christchurch Partnership. Our SPACE, Section 6.2 Further work and implementation. Pg.40

[139] NPS-UDC PB1 requires local authorities to carry out a HDBCA on at least a three-yearly basis that, amongst other matters: (a) Estimates 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 (c) Assesses interactions between housing and business activities, and their impacts on each other

[140] Greater Christchurch Partnership. Our SPACE, 3.1 Population and household growth. Pg.11.

[141] Greater Christchurch Partnership. HDCA Report 4 - Housing and Business Interactions, 3.3.1 Urban Form and Accessibility. Pg.252

[142] Greater Christchurch Partnership. HBDCA - 3.2 Household composition by location, dwelling type, and tenure. Pg.10.

[143] Greater Christchurch Partnership. HBDCA - 3.2 Household composition by location, dwelling type, and tenure. Pg.10.

[144] Greater Christchurch Partnership. Our SPACE, 3.2 Housing, Pg.15.

[145] NPS-UDC PB5 of the NPS-UDC required that the GCP seek and use the input of Iwi Authorities, the property development sector, significant landowners, social housing providers, requiring authorities, and the providers of development infrastructure and other infrastructure when preparing the HDCA

Table B: Greater Christchurch housing sufficiency 2018 to 2048

	Housing Development Capacity	Housing Target	Sufficiency of Housing Development Capacity	
			Medium Term (2018–2028)	Medium and Long Term (2018–2048)
Christchurch City	59,950*	55,950	+ 38,875	+ 4,000
Selwyn	9,725**	17,290	+ 1,825***	- 5,475***
Waimakariri	4,200**	13,360	- 1,600***	- 7,675***
Greater Christchurch	**73,875**	**86,600**	**+ 39,100*** **	**- 9,150*** **

Source: Our SPACE, 3.2 Housing, Figure 3. Pg.15

GREATER CHRISTCHURCH URBAN DEVELOPMENT STRATEGY 2007, UPDATED ACTION PLAN 2010 AND STRATEGY UPDATE 2016 (UDS)

The UDS was developed by the Greater Christchurch Partners in consultation with the communities of Christchurch City and Selwyn and Waimakariri districts.

The UDS Vision[146], which has guided the content of CRPS Chapter 6 and Our SPACE, is that:

> *"By the year 2041, Greater Christchurch has a vibrant inner city and suburban centres surrounded by thriving rural communities and towns, connected by efficient and sustainable infrastructure. There are a wealth of public spaces ranging from bustling inner-city streets to expansive open spaces and parks, which embrace natural systems, landscapes, and heritage.*
>
> *Innovative businesses are welcome and can thrive supported by a wide range of attractive facilities and opportunities. Prosperous communities can enjoy a variety of lifestyles in good health and safety, enriched by the diversity of cultures and the beautiful environment of Greater Christchurch.*
>
> *The Greater Christchurch area will have:*
>
> *> Enriched lifestyles*
>
> *> Enhanced environments*
>
> *> Prosperous economies*
>
> *> Managed growth, and*
>
> *> Integrated and collaborative leadership."*

It includes several Strategic Goals and Actions to deliver on the Vision for the Greater Christchurch area by 2041. This included managing urban growth through consolidated settlement patterns and applying an integrated approach between land use planning and the provision of efficient and cost-effective transport networks.

The UDS is the basis for how urban growth has been managed in Greater Christchurch for the past 15 years. It signals that the make-up the average number of persons per household will decline, there will be an aging population and estimates that 74,800 additional households are required between 2006 and 2041[147]. The UDS identifies that managing residential densities is a critical method for containing the extent of urban development in the sub-region.

The following net densities and associated 'bottom lines' covering land supply, a growth 'containment boundary', integrated transport and mode shift, servicing, and the management of resources and reverse sensitivity effects:

- Christchurch central city intensification areas - 50hh/ha
- Christchurch city intensification areas - 30hh/ha
- Christchurch 'greenfield' areas - 15hh/ha

[146] UDS. 1.1 Vision. Page 8.

[147] Christchurch City Council, Environment Canterbury, Transit NZ, Selwyn District Council and Waimakariri District Council. Greater Christchurch Urban Development Strategy and Action Plan, 3.6 Growth Management Assumptions - Manage Growth Pg.26

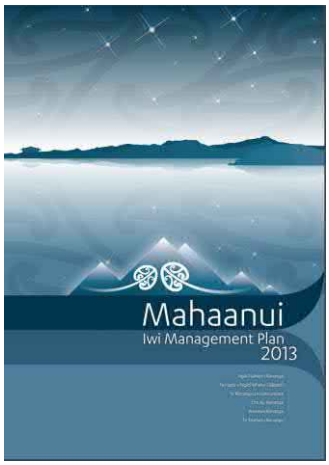
- Selwyn and Waimakariri 'greenfield' areas – 10hh/ha

A key step in meeting this Vision has been achieved through the integration of the UDS principles into Chapter 6 of the CRPS and the Christchurch City and Selwyn and Waimakariri district plans.

MAHAANUI IWI MANAGEMENT PLAN 2013 (MAHAANUI IMP)

The Mahaanui IMP is an expression of kaitiakitanga (guardianship and conservation) and rangatiratanga (sovereignty). In the context of the planning instruments that apply across Greater Christchurch, the Mahaanui IMP also provides a tool for local authorities, other agencies, and the wider community to meet statutory obligations under the RMA.

The regional objectives, issues and policies are divided into eight policy sections, with following provisions contained in Section 5 Papatūānuku (Land) being the most relevant to urban development and residential household densities across Greater Christchurch.



The Ngā Paetae objectives ensure that the mauri of land and soil resources is protected (Objective 1), and that rural and urban land uses occur in a manner that is consistent with land capability as well as the capacity of catchments. This recognises the limits and availability of water and requires that inappropriate land use practices are avoided (Objectives 4 and 5). Policies confirm that it is critical that Ngāi Tahu are involved in the preparation and implementation of broader Development Plans and strategies for managing urban growth, Papakāinga/Kāinga Nohoanga and residential household densities to ensure that Tāngata Whenua values are recognised and provided for (P3.1 to P3.3).

The Mahaanui IMP acknowledges that subdivision and development can have significant effects on Tāngata Whenua values, but that it can also represent a range of opportunities to enhance those values (P4.1 and 4.3). These policies also encourage engagement with Papatipu Ngā Rūnunga by local authorities and developers to reduce the impact of development, including because of increased residential densities, on existing infrastructure and the environment.

CANTERBURY REGIONAL POLICY STATEMENT

CHAPTER 6 OF THE CANTERBURY REGIONAL POLICY STATEMENT (CRPS)

Background and context

The CRPS sets the framework for managing urban growth throughout the Canterbury region. Chapter 6 of the Canterbury Regional Policy Statement (CRPS) – Recovery and Rebuilding of Greater Christchurch and applies to the metropolitan urban area of Greater Christchurch that is illustrated in **Appendix 3: Greater Christchurch 'High Growth Area' map**. It provides a resource management framework to enable and support earthquake recovery and rebuilding, including restoration and enhancement, for Greater Christchurch through to 2028.

Insertion of Chapter 6 into the CRPS was directed by the Minister for Canterbury Earthquake Recovery (the Minister) through the Land Use Recovery Plan (LURP). The LURP is a statutory planning document prepared under the Canterbury Earthquake Recovery (CER) Act. The LURP directed changes to Resource Management Act (RMA) documents, including amendments to district plans and the insertion of Chapter 6 into the CRPS.

Prior to the insertion of Chapter 6, a Proposed Change 1 (PC1) (Chapter 12A) to the CRPS had been notified in 2007. This proposed change sought to provide the sub-regional policy framework under the RMA that would set the direction for the growth, development, and enhancement of the urban and rural areas of Greater Christchurch for the period through to 2041, in accordance with the UDS.

At the time of the February 2011 earthquake, PC1 was subject to appeals in the Environment Court. When the CER Act came into force, the UDS partners (now known as the GCP) asked the Minister to insert a modified version of PC1 into the CRPS under section 27 of the CER Act. This had the effect of making PC1, which was inserted as Chapter 12A of the CRPS, operative and removing the appeals from the Environment Court.

Following judicial review of the Minister's decision to insert Chapter 12A into the CRPS, and a subsequent appeal to the Court of Appeal, Chapter 12A was removed from the CRPS and Environment Canterbury was directed by the

Minister to prepare a recovery plan (the LURP). As noted above, the LURP directed the insertion of Chapter 6 into the CRPS.

> *"…providing patterns of development that optimise use of existing network capacity and ensuring that, where possible, new building projects support increased uptake of active and public transport and provide opportunities for modal choice."*

Objectives and policies related to residential household densities

An outline of the objectives and policies in Chapter 6 of the CRPS that are considered most relevant to the scope of this project is provided in **Appendix 4: CRPS Chapter 6 - Residential density policy framework** and are summarised below. Reference should also be made to https://eplan.ecan.govt.nz/ for the full CRPS objectives and policies.

- **Objective 6.2.1 Recovery Framework** - Enables the recovery, rebuilding and development in Greater Christchurch that avoids urban development outside of existing urban areas or GPA.
- **Objective 6.2.2 Urban form and settlement pattern** - Promotes the consolidation and intensification of urban areas, including by: (a) achieving a proportion of growth through intensification; and (b) providing higher density living environments in targeted locations.
- **Objective 6.2.3 Sustainability** - Deliver quality living environments that incorporate good urban design, provides a range of densities, and uses that are environmentally sustainable.
- **Objective 6.2.4 Integration of transport and land use** - Advocates for the integration of land use patterns with transport infrastructure to facilitate the movement of people, goods, and services, while managing the identified adverse effects and promoting the identified outcomes.
- **Policy 6.3.1 Development within Greater Christchurch** - Enables the development of existing urban areas, intensification in appropriate locations and the within identified GPA.
- **Policy 6.3.2 Development form and urban design** - Sets the principles of good urban design, including: Tūrangawaewae (sense of place and belonging), integration, connectivity, safety, choice and diversity, environmentally sustainable design, and creativity and innovation.
- **Policy 6.3.4 Transport effectiveness** - Ensures an efficient and effective transport network that supports business and residential recovery so that it maintains and improves movement of people and goods around Greater Christchurch.
- **Policy 6.3.5 Integration of land use and infrastructure** - Ensures land use aligns with the nature, timing and sequencing of new development and is coordinated with the development, funding, implementation and operation of transport and other infrastructure.
- **Policy 6.3.7 Residential location, yield, and intensification** - Sets the minimum density requirements for the locations listed in Table 1 in Section 2.2 of the Report, and requiring a range of lot sizes, densities, and appropriate development controls to support more intensive developments in the specified locations (GPA, intensification areas and 'brownfield' development) to address housing affordability.

The net densities are a method for delivering a range of 'bottom lines' covering land supply, a growth 'containment boundary', integrated transport and mode shift, servicing, and the management of resources and reverse sensitivity effects.

Map A is included in **Appendix 5: CRPS Chapter 6 - Map A 'Greenfield Priority Areas'** and identifies the existing urban areas and priority areas for housing and business development in Greater Christchurch. These areas were identified as required to provide enough land zoned for urban purposes to enable recovery and rebuilding through to 2028, following the 2010 and 2011 Canterbury earthquakes.

The GCP had previously considered the longer-term growth needs of Greater Christchurch through to 2041, with the extent of planned greenfield areas to support future growth outlined by the Projected Infrastructure Boundary (PIB) on Map A. Map A is supported by policies that enable development within the Existing Urban Area and the GPA, and ensure that urban activities only occur within these areas, unless they are otherwise expressly provided for in the CRPS.

Defining net density

CRPS Chapter 6 defines 'net density', which is included in Section 2.2.2 of the Technical Report.

The definition of '*Greenfield Priority Area*' is directly linked to the locations illustrated in Map A, which covers both business and residential development typologies.

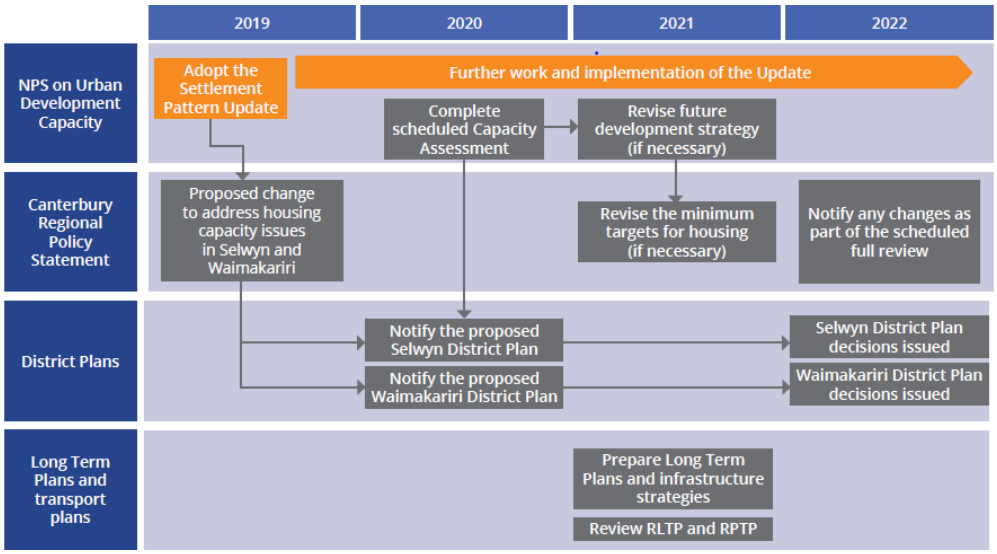
'*Intensification*' is defined as an increase in the residential household yield within existing an urban area.

CRPS CHANGE 2020

Following the adoption of Our Space in June 2019, ECan is now progressing the proposed change to Chapter 6 of the CRPS as to address Action 9 of Our SPACE that is outlined above.

Figure v illustrates how the CRPS changes are proposed to respond to the evolving evidence gathered under the NPS-UDC and how these will in turn require changes to the district plans.

Figure v: Responsive planning across Greater Christchurch



Source: Our SPACE, 6.1 Responsive planning, Figure 20. Pg.39

To help address projected housing development capacity shortfalls in Selwyn and Waimakariri, Our Space identifies additional greenfield areas for housing development in Rolleston, Rangiora and Kaiapoi. These FDA are situated within the PIB and are consistent with the long-term growth strategy set out in the UDS. However, as the FDA sit outside the Existing Urban Area and the GPA identified on Map A, the land cannot currently be used for urban activities. As a result, the existing planning and policy framework in the CRPS is an impediment to the rezoning of land within the FDA to respond to any identified development capacity shortfalls.

The proposed change to Chapter 6 aligns with the strategy set out in Our Space, which was strongly guided by the vision and strategic goals of the UDS, and the extensive planning framework that has already been developed for Greater Christchurch to support long term growth. It will provide a planning framework that will enable councils in Greater Christchurch to respond to changes in the sufficiency of their available development capacity.

The proposed change seeks to make the following amendments to the operative CRPS:

- Amend Map A to identify FDA in Rolleston, Rangiora and Kaiapoi.
- Insert a new policy (Policy 6.3.12) to enable land within these FDA to be rezoned by SDC and WDC if required to meet their medium term (ten year) housing needs. The proposed policy provisions require that development within any FDA promotes the efficient use of urban land, provides opportunities for higher density living environments, including appropriate mixed-use development, and housing choices that meet the needs of people and communities for a range of dwelling types, and supports the efficient provision and use of network infrastructure.
- Make consequential changes to objectives, policies, text, and definitions in Chapter 6.

This is a targeted change to Chapter 6 to enable the councils in Greater Christchurch to give effect to the NPS-UDC. A more comprehensive review of Chapter 6 is scheduled to begin in the 2020/21 financial year as part of the full review of the CRPS.

The proposed new policy (Policy 6.3.12) will sit within the current objective and policy framework of the CRPS. Existing objectives and policies, including those related to transport effectiveness, land use and transport integration, outline development plans and natural hazards, would similarly apply to urban development in FDA.

The proposed amendments to Chapter 6 do not specify a density requirement for the FDA. This will be determined through the evaluation work that will inform the full review of the CRPS and the Selwyn and Waimakariri DPR's and includes the findings of this technical report (Action 3 of Our SPACE). Until this work is complete, Our Space sets out that new housing in FDA should achieve a net minimum density of 12 households per hectare.

Of particular note is that SDC and WDC are both undertaking comprehensive reviews of the district plans that manage development across their respective districts. The minimum net densities for consideration as part of the DPR's will be informed by the findings of this technical report and associated changes to the CRPS.

CRPS REVIEW 2022

For completeness, a full review of the CRPS is proposed to occur in 2022. This is signalled in Action 12 of Our SPACE, which is summarised in **Figure vi** below.

Figure vi: Our SPACE Action 12

Linked processes: Selwyn and Waimakariri District Plan Reviews

No.	Description	Lead Partners	Timeframe
IMPROVE OUR TOOLS AND EVIDENCE BASE			
12	Undertake a review of Chapter 6 (Recovery and Rebuilding of Greater Christchurch) of the Canterbury Regional Policy Statement as part of the scheduled full review, being informed by further planning work being undertaken by Councils and responding to any identified needs in the next Capacity Assessment due to be completed in 2020. Environment Canterbury will, prior to notification, engage with submitters on Our Space who sought the inclusion of land for business or housing development in relation to the appropriateness of including the subject land within Map A of Chapter 6. **Linked processes: Selwyn and Waimakariri District Plan Reviews**	ECan	2022

Source: Our SPACE, 6.2 Further work and implementation. Pg.42

APPENDIX 3
GREATER CHRISTCHURCH 'HIGH GROWTH AREA' MAP

SOURCE: Greater Christchurch Partnership. Our SPACE, Greater Christchurch Area, Figure 1. Pg.2

APPENDIX 4
CRPS CHAPTER 6 - RESIDENTIAL DENSITY POLICY FRAMEWORK

Objective 6.2.1 Recovery framework

This objective seeks that recovery, rebuilding and development are enabled within Greater Christchurch through a land use and infrastructure framework that, amongst other things, identifies priority areas for urban development within Greater Christchurch (6.2.1(1)); avoids urban development outside of existing urban areas or greenfield priority areas for development, unless expressly provided for in the CRPS (3); integrates strategic and other infrastructure and services with land use development (9) and; optimises use of existing infrastructure (11).

Objective 6.2.2 Urban form and settlement pattern

In accordance with this objective, the urban form and settlement pattern in Greater Christchurch is to be managed to provide sufficient land for rebuilding and recovery needs and set a foundation for future growth, with an urban form that achieves consolidation and intensification of urban areas, and avoids unplanned expansion of urban areas, including by: aiming to achieve targets for intensification as a proportion of overall growth (6.2.2(1)); providing higher density living environments including mixed use developments and a greater range of housing types, particularly in and around the Central City, in and around Key Activity Centres, and larger neighbourhood centres, and in greenfield priority areas and brownfield sites (2); providing for the development of greenfield priority areas on the periphery of Christchurch's urban area, and surrounding towns at a rate and in locations that meet anticipated demand and enables the efficient provision and use of network infrastructure (4).

The objective sets targets for the contribution of infill and intensification as a proportion of overall growth. The explanatory text refers to changing demographic patterns, including an ageing population and smaller households which are expected to increase the desirability of higher density housing. The demolition and ageing of housing stock provide an opportunity for redevelopment at higher densities and an increased range of housing types that provides not only choice for those needing to relocate, but also for future generations. Increased intensification is anticipated to occur over time as rebuild opportunities are realised, requiring appropriately located and designed greenfield development that also provides for medium density housing during the time of transition.

Objective 6.2.3 Sustainability

This objective seeks that recovery and rebuilding is undertaken in Greater Christchurch that, amongst other things, provides for quality living environments incorporating good urban design (6.2.3(1)), provides a range of densities and uses (4), and is healthy, environmentally sustainable, functionally efficient, and prosperous (5).

Objective 6.2.4 Integration of transport infrastructure and land use

Objective 6.2.4 advocates the integration of land use patterns with transport infrastructure. Transport infrastructure should be prioritised such that it maximises integration with the priority areas and new settlement patterns and facilitates the movement of people and goods and provision of services in Greater Christchurch, while managing congestion, reducing dependency on private motor vehicles and promoting active and public transport modes, reducing emissions, optimising existing capacity within the network and enhancing transport safety.

Policy 6.3.1 Development within Greater Christchurch

This policy requires development to, amongst other things, enable development of existing urban areas and greenfield priority areas, including intensification in appropriate locations, where it supports the recovery of Greater Christchurch (6.3.1 (3)).

Policy 6.3.2 Development form and urban design

Policy 6.3.2 sets out principles of good urban design, which business development, residential development and the establishment of public space must give effect to, including: tūrangawaewae (sense of place and belonging), integration, connectivity, safety, choice and diversity, environmentally sustainable design, and creativity and innovation.

The explanatory text refers to good urban design being critical to the rebuilding and recovery of Greater Christchurch, and the ability for good urban design to increase the functionality, amenity, and efficiency of urban areas.

Policy 6.3.3 Development in accordance with outline development plans

In accordance with Policy 6.3.3, development in greenfield priority areas (and rural residential development) is to occur in accordance with provisions set out in an outline development plan (ODP) or other rules for the area. This policy sets out requirements applicable to ODPs and associated rules, including the need for the distribution of varying densities to be illustrated.

Policy 6.3.4 Transport effectiveness

This policy seeks to ensure an efficient and effective transport network that supports business and residential recovery so that it maintains and improves movement of people and goods around Greater Christchurch in a number of ways. This includes by avoiding development that will overload strategic freight routes (6.3.4(1)) and providing patterns of development that optimise use of existing network capacity and ensuring that, where possible, new building projects support increased uptake of active and public transport and provide opportunities for modal choice (2).

Policy 6.3.5 Integration of land use and infrastructure

This policy directs that recovery of Greater Christchurch is to be assisted by the integration of land use development with infrastructure in a number of ways, including by identifying priority areas for development to enable reliable forward planning for infrastructure development and delivery (6.3.5)(1)) and ensuring that the nature, timing and sequencing of new development are coordinated with the development, funding, implementation and operation of transport and other
infrastructure (2).

Policy 6.3.7 Residential location, yield, and intensification

Policy 6.3.7 sets out minimum density requirements for greenfield priority areas within Selwyn District, Waimakariri District and Christchurch City, and for intensification areas within Christchurch City, as follows:

Development in greenfield priority areas shall achieve at least the following residential net densities averaged over the whole of an outline development plan (ODP) area (except where subject to an existing operative ODP with specific density provisions):

(a) 10 household units per hectare in greenfield areas in Selwyn and Waimakariri District.

(b) 15 household units per hectare in greenfield areas in Christchurch City.

Intensification development within Christchurch City must achieve an average of:

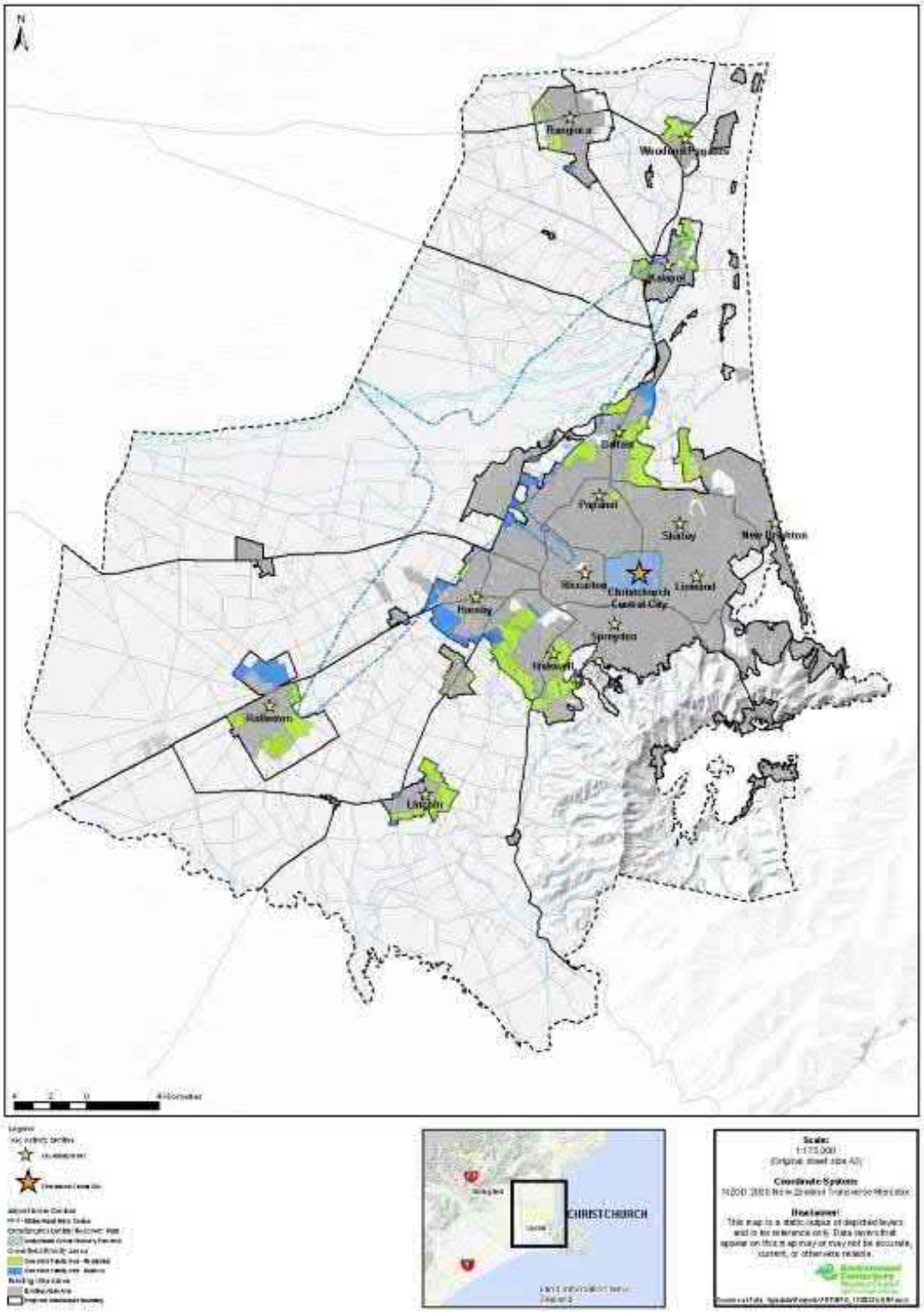
(a) 50 household units per hectare for intensification development within the Central City.

(b) 30 household units per hectare for intensification development elsewhere.

Housing affordability is to be addressed by providing sufficient intensification and greenfield priority area land to meet housing demand during the recovery period, enabling brownfield development and providing for a range of lot sizes, densities and appropriate development controls that support more intensive developments such as mixed-use developments, apartments, townhouses and terraced housing (6.3.7(6)).

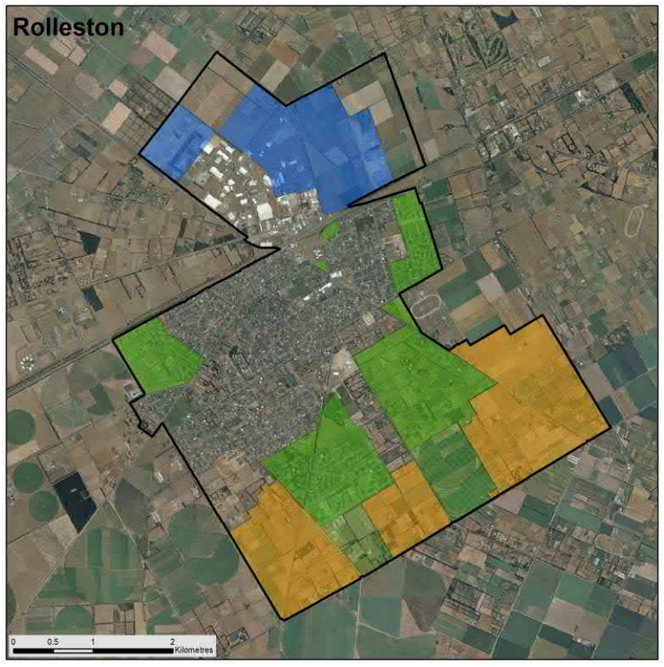
The explanatory text to the policy refers to intensification in identified areas to support a sustainable urban form. Minimum densities are identified as a tool to ensure priority areas are efficiently used, and to help create a compact urban form that supports existing centres and can be served efficiently by infrastructure and ensure housing supply and housing choice.

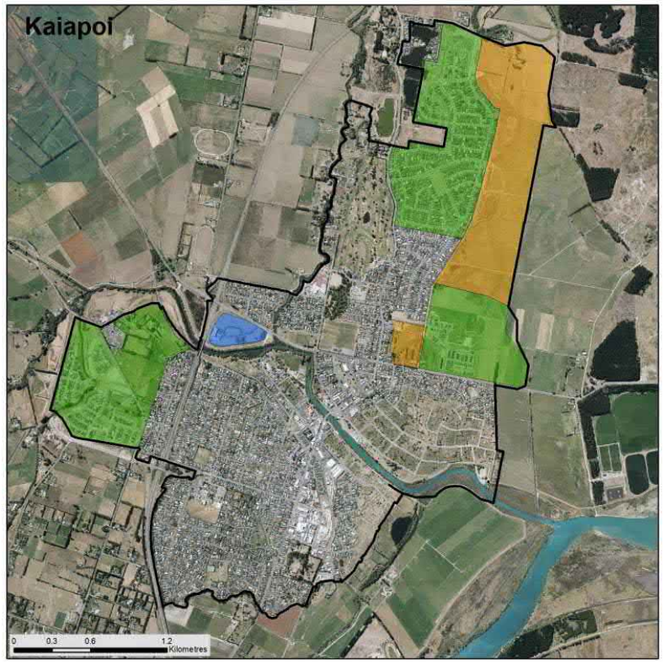
APPENDIX 5
CRPS CHAPTER 6 - MAP A 'GREENFIELD' PRIORITY AREAS

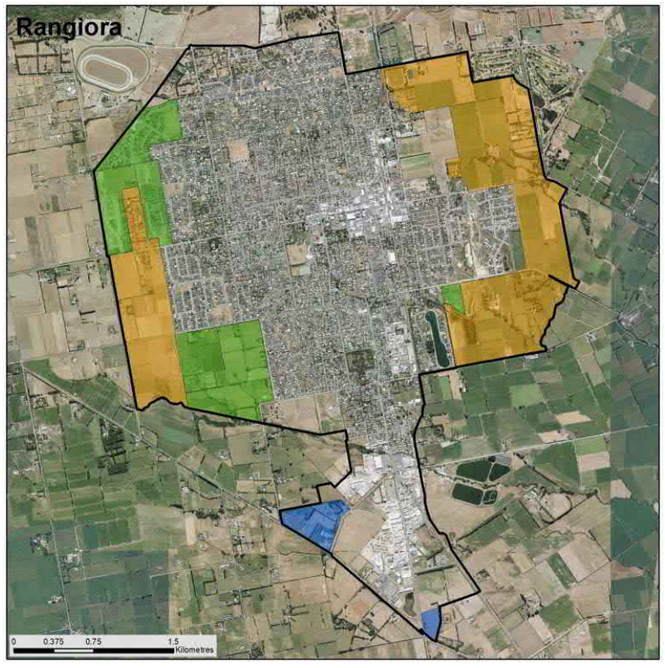


SOURCE: ECan, Canterbury Regional Policy Statement, Chapter 6 - Recovery and Rebuilding of Greater Christchurch. 15 January 2013

APPENDIX 6
GCP 'FUTURE DEVELOPMENT AREA' LOCATION MAPS

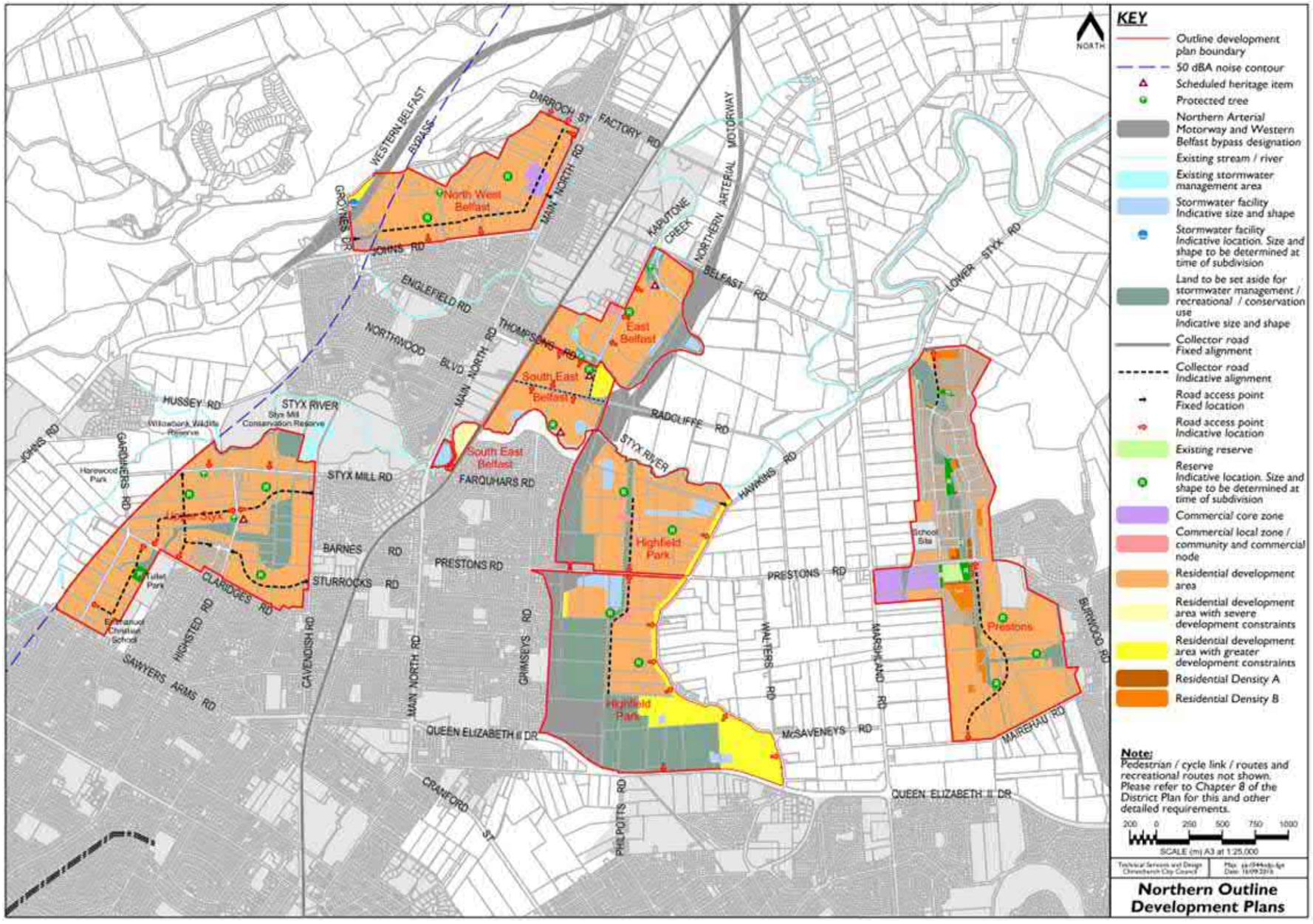




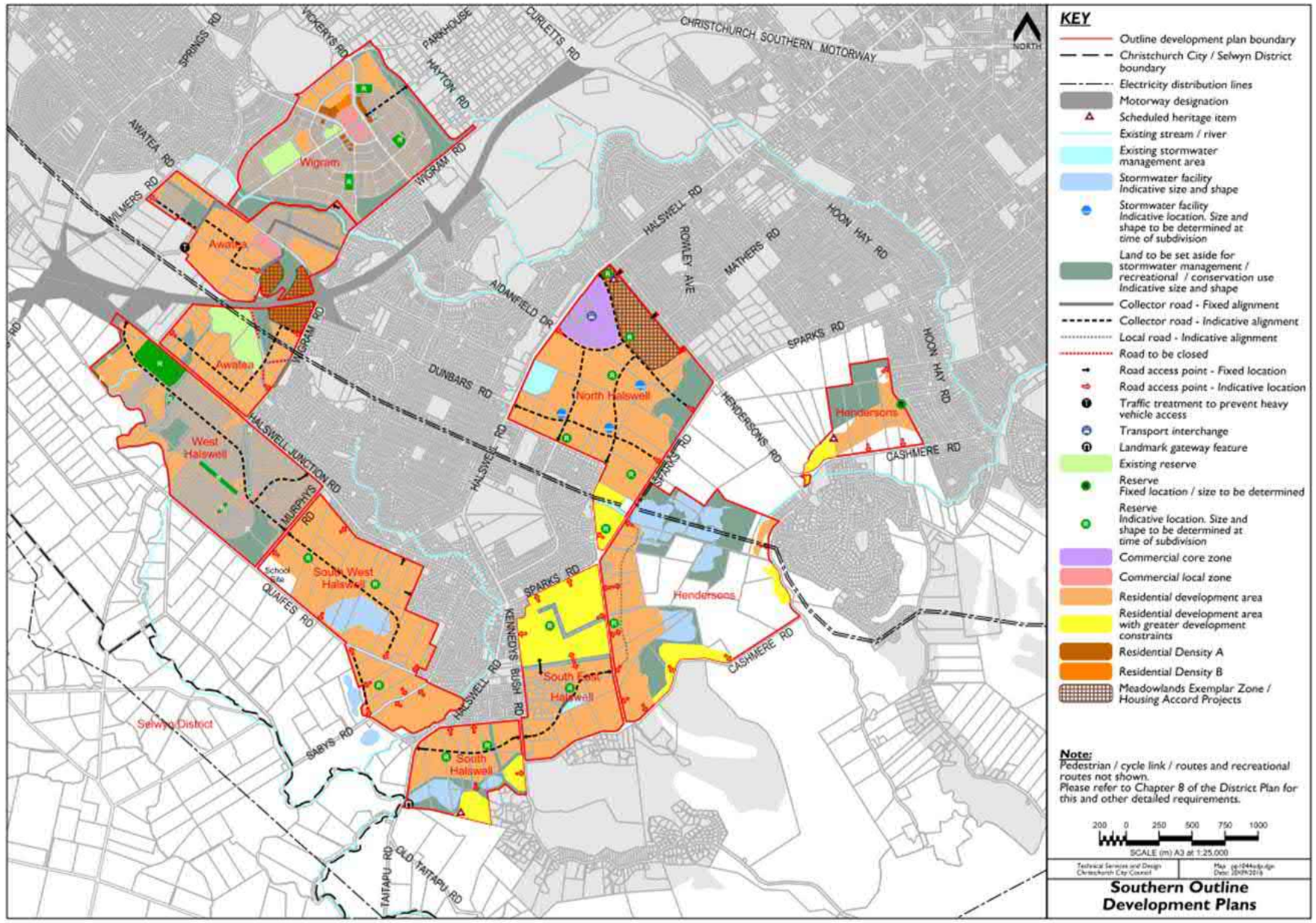


APPENDIX 7
GCP 'GREENFIELD PRIORITY AREA' MAPS

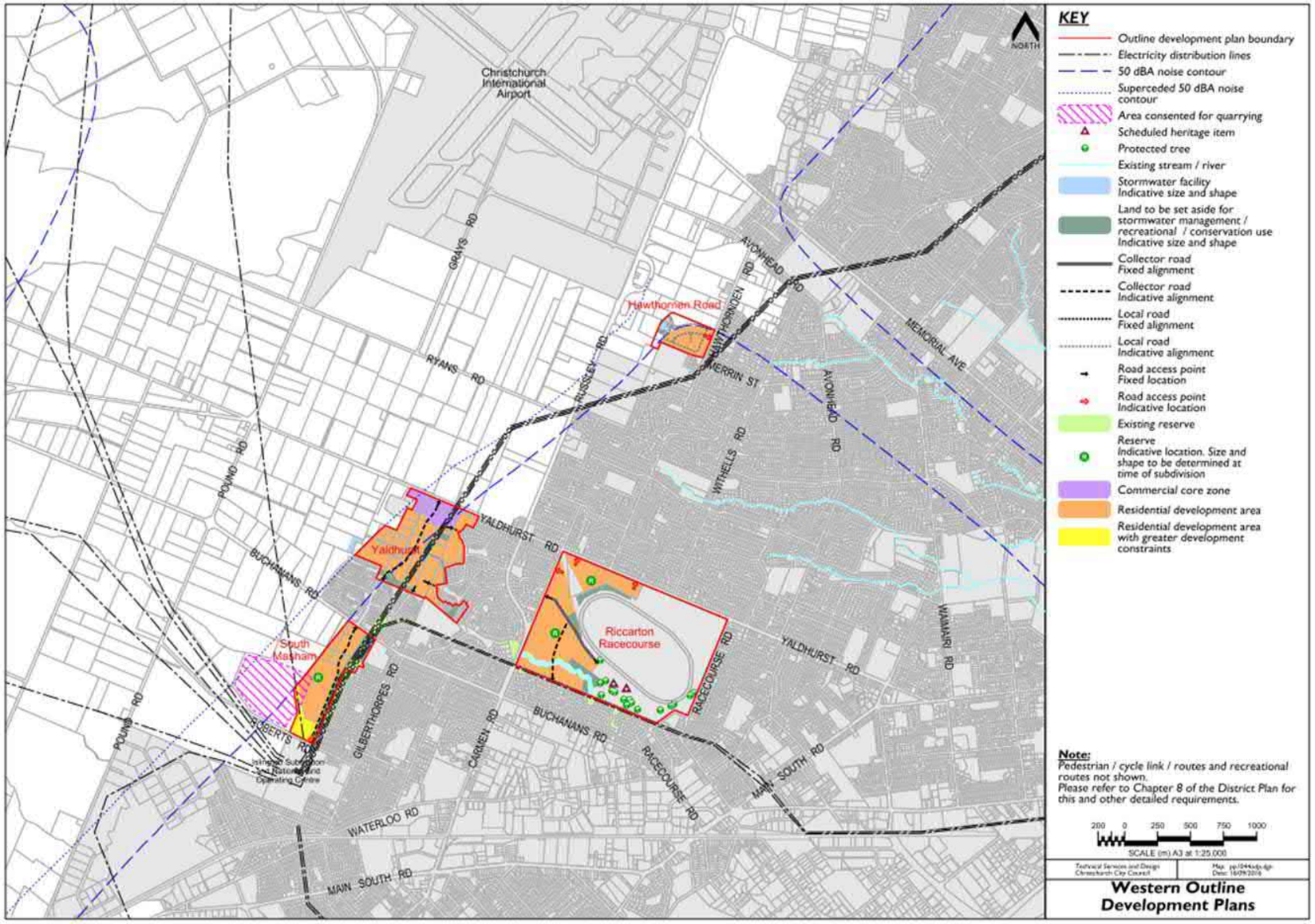
CHRISTCHURCH CITY 'GPA' MAPS - NORTHERN ODP AREAS



CHRISTCHURCH CITY 'GPA' MAPS - SOUTHERN ODP AREAS



CHRISTCHURCH CITY 'GPA' MAPS - WESTERN ODP AREAS



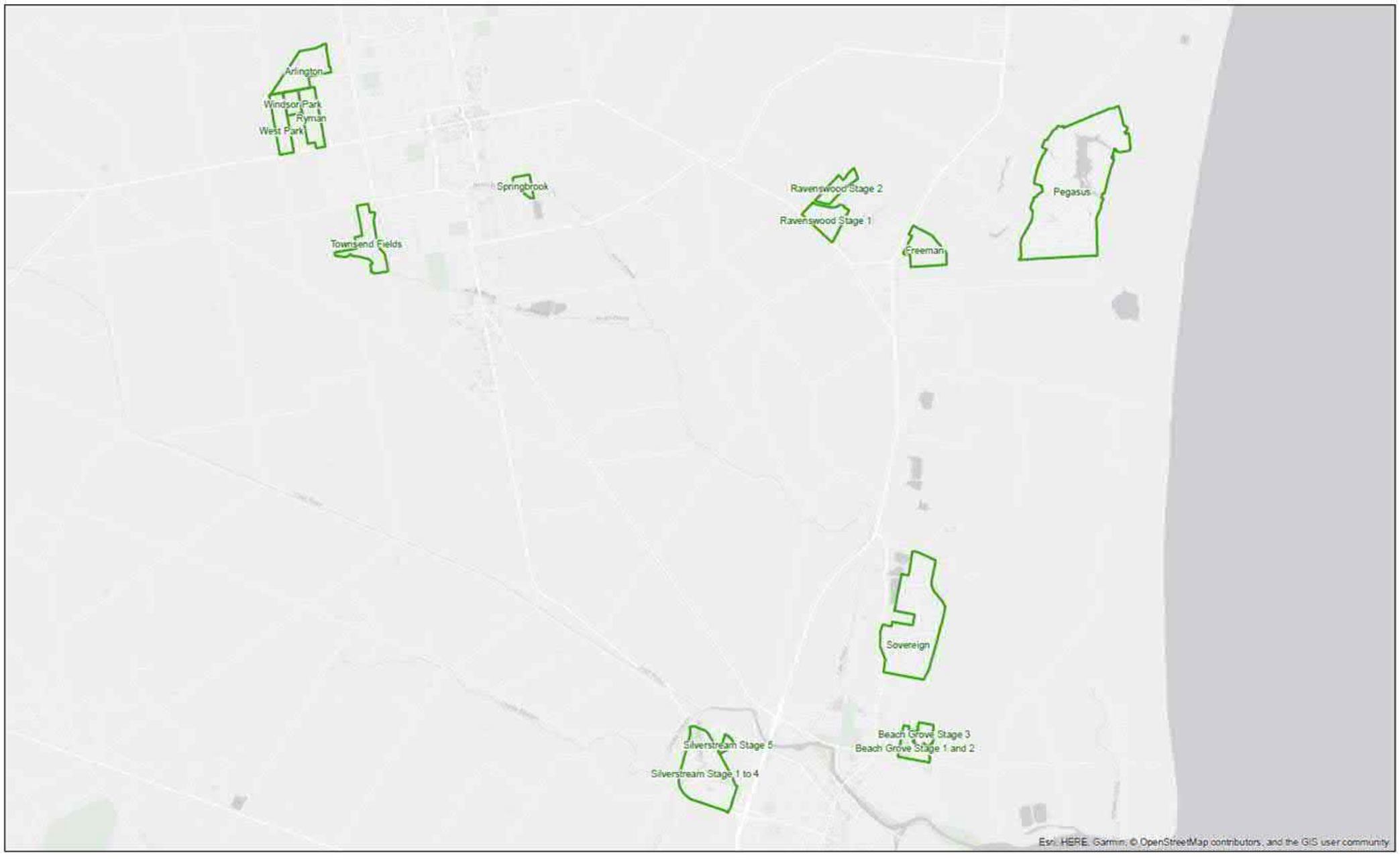
SELWYN DISTRICT 'GPA' MAPS - ROLLESTON

Notes: This land is no longer a GPA*. This area is now designated as Foster Recreation Park**. Area 9 is a water treatment plant and owned by SDC.

SELWYN DISTRICT 'GPA' MAPS - LINCOLN

SELWYN DISTRICT 'GPA' MAPS - PREBBLETON

WAIMAKARIRI DISTRICT 'GPA' MAP - RANGIORA AND KAIPOI 'GPA' AND PEGASUS



APPENDIX 8
GCP 'GREENFIELD PRIORITY AREA' UPTAKE DATA

GCP 'GPA' UPTAKE DATA, JULY 2020						
GPA NAME/ LOCATION	**GPA SIZE**	**AVERAGE NET DENSITY ACHIEVED TO DATE**	**% COMPLETE (LOTS) ACHIEVED TO DATE**	**AVERAGE SECTION SIZE**	**AVERAGE SECTION SIZE RANGE**	**COMMENT**
CHRISTCHURCH CITY - GPA ZONED BEFORE THE LURP WITH MINIMUM DENSITIES BETWEEN 13-15HH/HA (ANNOTATED AS #) AND THOSE WHERE THE CRPS 15HH/HA MINIMUM NET DENSITY APPLIES						
APPENDIX 6 - CHRISTCHURCH CITY 'GPA' MAPS - NORTHERN ODP AREAS (#PART ODP ONLY)						
East Belfast	40.7ha	18hh/ha	24%	534m^2	294m^2 to 966m^2	-
East Papanui	17.2ha	-	0%	-	-	Densities range from 10hh/ha to 30hh/ha. No lots had been created as of July 2020.
Highfield	95.3ha	-	0%	-	-	Contains a consented retirement village. Consented subdivision yields less that 15hh/ha but contain an encumbrance to require higher densities on adjacent land.
North West Belfast #	80.0ha	14.9hh/ha	3%	676m^2	457m^2 to 866m^2	
Prestons #	164.4ha	12.4hh/ha	71%	638m^2	149m^2 to 1,607m^2	Contains a retirement village, which has been excluded from the density yield calculation.
South East Belfast	35.2ha	-	0%	-	-	No lots had been created as of July 2020.
Upper Styx #	131.4ha	14.9hh/ha	30%	609m^2	192m^2 to 949m^2	Contains a retirement village, which has been excluded from the density yield calculation.
7	**563.9ha**				**149m^2 to 1,607m^2**	
APPENDIX 6 - CHRISTCHURCH CITY 'GPA' MAP - WESTERN ODP AREAS						
Riccarton Racecourse	35.6ha	19.0hh/ha	29%	596m^2	145m^2 to 860m^2	-
South Masham	16.3ha	16.8hh/ha	18%	531m^2	161m^2 to 745m^2	-
Yaldhurst #	31.8ha	15.4hh/ha	44%	600m^2	125m^2 to 988m^2	Not all of the ODP area has been included as rezoned under the previous City Plan.
3	**83.7ha**				**125m^2 to 988m^2**	
APPENDIX 6 - CHRISTCHURCH CITY 'GPA' MAP - EASTERN ODP AREAS						
Awatea #	111.2ha	15.5hh/ha	49%	501m^2	115m^2 to 975m^2	-
Hendersons	51.7ha	14.2hh/ha	7%	519m^2	221m^2 to 681m^2	-
North Halswell	112.1ha	13.4hh/ha	11%	556m^2	174m^2 to 781m^2	-
South East Halswell	41.6ha	12.9hh/ha	26%	598m^2	121m^2 to 937m^2	Lower density allotments with consent conditions to subdivide into higher densities to yield 15hh/ha average densities.
South Halswell	28.8ha	-	0%	-	-	No lots had been created as of July 2020.
South West Halswell	106.7ha	15hh/ha	18%	549m^2	128m^2 to 769m^2	-
Wigram	95.0ha	14.0hh/ha	85%	599m^2	220m^2 to 962m^2	-
West Halswell	104.0ha	14.5hh/ha	91%	508m^2	150m^2 to 603m^2	-
8					**115m^2 to 975m^2**	

GCP 'GPA' UPTAKE DATA, JULY 2020						
GPA NAME/ LOCATION	**GPA SIZE**	**AVERAGE NET DENSITY ACHIEVED TO DATE**	**% COMPLETE (LOTS) ACHIEVED TO DATE**	**AVERAGE SECTION SIZE**	**AVERAGE SECTION SIZE RANGE**	**COMMENT**
SELWYN DISTRICT – CRPS 10HH/HA MIN. NET DENSITY						
APPENDIX 6 - SELWYN DISTRICT 'GPA' MAP - ROLLESTON						
Rolleston 1 (Stonebrook)	60.0ha	11.6hh/ha	100%	644m^2	300m^2 to 1,500m^2	-
Rolleston 3	48.5ha	9.9hh/ha	100%	763m^2	250m^2 to 1,600m^2	78-unit lifestyle villa have been excluded (3ha).
Rolleston 4	7.2ha	-	0%	-	-	No lots had been created as of July 2020.
Rolleston 6 (Faringdon)	82.4ha	12.0hh/ha	96%	528m^2	200m^2 to 1,000m^2	-
Rolleston 7	3.6ha	14.1hh/ha	77%	469m^2	400m^2 to 600m^2	-
Rolleston 9	9.4ha	-	0%	-	-	SDC owned site that accommodates a wastewater pumping station.
Rolleston 10	31.5ha	11.5hh/ha	45%	527m^2	400m^2 to 1,300m^2	-
Rolleston 11	139.6ha	9.4hh/ha	75%	735m^2	400m^2 to 2,500m^2	-
Rolleston SF	38.4ha	12.5hh/ha	100%	546m^2	250m^2 to 1,300m^2	-
Rolleston AP	69.2ha	11.4hh/ha	43%	512m^2	400m^2 to 900m^2	-
10					**250m^2 to 2500m^2**	
APPENDIX 6 - SELWYN DISTRICT 'GPA' MAP - LINCOLN						
Lincoln 1	49.7ha	10.1hh/ha	30%	779m^2	400m^2 to 1,200m^2	-
Lincoln 2	49.7ha	9.6hh/ha	45%	719m^2	500m^2 to 1,600m^2	-
Lincoln 3	160.6ha	10.3hh/ha	58%	651m^2	400m^2 to 2,200m^2	-
Lincoln 4	58.0ha	6.3hh/ha	48%	1,202m^2	400m^2 to 1,900m^2	47-unit lifestyle villa have been excluded (2.3ha).
Lincoln 5	12.5ha	7.5hh/ha	32%	769m^2	600m^2 to 1,000m^2	-
5					**400m^2 to 2,220m^2**	
APPENDIX 6 - SELWYN DISTRICT 'GPA' MAP - PREBBLETON						
Prebbleton 1	13.5ha	10.3hh/ha	72%	712m^2	500m^2 to 1,000m^2	-
Prebbleton 2	6.5ha	10.6hh/ha	100%	751m^2	500m^2 to 1,000m^2	-
Prebbleton 3	15.1ha	10.7hh/ha	95%	718m^2	400m^2 to 900m^2	-
Prebbleton 4	22.8ha	13.3hh/ha	57%	548m^2	400m^2 to 1,400m^2	114-unit BUPA has been excluded (7.2ha).
4					**400m^2 to 1,400m^2**	

GCP 'GPA' UPTAKE DATA, JULY 2020						
GPA NAME/ LOCATION	**GPA SIZE**	**AVERAGE NET DENSITY ACHIEVED TO DATE**	**% COMPLETE (LOTS) ACHIEVED TO DATE**	**AVERAGE SECTION SIZE**	**AVERAGE SECTION SIZE RANGE**	**COMMENT**
WAIMAKARIRI DISTRICT - CRPS 10HH/HA MIN. NET DENSITY						
APPENDIX 6 - WAIMAKARIRI DISTRICT 'GPA' MAP - RANGIORA						
Arlington	25.6ha	16.7hh/ha	100%	646m^2	195m^2 to 2,123m^2	Some undersized, single lots.
Rymans Charles Upham Retirement Village	17.0ha	-	-	-	-	Retirement Village has been excluded.
Westpark	15.0ha	10.9hh/ha	100%	669m^2	330m^2 to 3,196m^2	Some undersized, single lots.
Windsor Park	6.3ha	14.6hh/ha	100%	465m^2	253m^2 to 820m^2	Majority of development is undersized, single lots.
Townsend Fields	7.3ha	10.9hh/ha	20%	683m^2	601m^2 to 783m^2	-
Springbrook	5.2ha	9.6hh/ha	100%	812m^2	600m^2 to 1,550m^2	-
6					**253m^2 to 3,196m^2**	
APPENDIX 6 - WAIMAKARIRI DISTRICT 'GPA' MAP - KAIAPOI/WOODEND AND PEGASUS						
Sovereign Palms Kaiapoi	87.8ha	10.5hh/ha	100%	692m^2	177m^2 to 1,348m^2	Some undersized, single lots.
Beachgrove, Kaiapoi	37.9ha	15.8hh/ha	59%	443m^2	159m^2 to 709m^2	Majority of development is undersized, single lots
Silverstream, Kaiapoi	84.8ha	16.1hh/ha	83%	393m^2	177m^2 to 3,257m^2	Some undersized, single lots.
Ravenswood, Woodend	139.2ha	13.7hh/ha	25%	455m^2	310m^2 to 860m^2	Some undersized, single lots.
Freeman, Woodend	17.2ha	10.9hh/ha	97%	654m^2	589m^2 to 915m^2	Comprehensive Residential Development has been excluded (0.4ha).
Pegasus Town, Pegasus[148]	175.5ha	10.5hh/ha	98%	582m^2	148m^2 to 2,294m^2	Some undersized, single lots. Comprehensive Residential development has been excluded (3.4ha).
6					**148m^2 to 3,257m^2**	

[148] Pegasus is not a GPA in CRPS Map. It has been included because it has very similar densities and development controls so may assist in understanding any related outcomes, constraints, or issues.

APPENDIX 9
CHRISTCHURCH CITY INTENSIFICATION AREA UPTAKE DATA

CCC INTENSIFICATION AREA UPTAKE DATA, JULY 2020	
INTENSIFICATION AREA LOCATION	**NET DENSITY ACHIEVED TO DATE**
RESIDENTIAL CENTAL CITY ZONE - 50HH/HA MINIMUM NET DENSITY	
Christchurch Central-South	44.8hh/ha
Christchurch Central-East	46.4hh/ha
Christchurch Central-North	41.7hh/ha
Christchurch Central-West	38.1hh/ha
RCC Zone Summary	**42.8hh/ha** **Average net density range - 38.1hh/ha to 46.4hh/ha**
RESIDENTIAL MEDIUM DENSITY ZONE - 30HH/HA MINIMUM NET DENSITY	
Addington East	35.4hh/ha
Addington West	27.9hh/ha
Aidanfield	21.2hh/ha
Bishopdale North	16.9hh/ha
Awatea North	33.3hh/ha
Bishopdale South	15hh/ha
Bishopdale West	18.2hh/ha
Broomfield	28.9hh/ha
Edgeware	37.1hh/ha
Charleston	25.9hh/ha
Clifton Hill	12.9hh/ha
Deans Bush	15.3hh/ha
Dallington	14.8hh/ha
Halswell West	26.9hh/ha
Hei Hei	15.4hh/ha
Sydenham Central	34.9hh/ha
Sydenham South	33.3hh/ha
Hornby Central	24.5hh/ha
Sydenham West	30.8hh/ha
Tower Junction	0.3hh/ha
Linwood North	18.9hh/ha
Hornby South	18.1hh/ha
Waimairi Beach	13.7hh/ha

Hornby West	17hh/ha
Lancaster Park	29.9hh/ha
Linwood East	16.9hh/ha
Linwood West	31.6hh/ha
Merivale	29.6hh/ha
Mona Vale	25.2hh/ha
Riccarton South	33.7hh/ha
Riccarton West	32.3hh/ha
New Brighton	20.6hh/ha
North Beach	21.3hh/ha
Northcote	20.3hh/ha
Northlands	28.5hh/ha
Northwood	40.3hh/ha
Papanui East	24.0hh/ha
Phillipstown	30.6hh/ha
Papanui West	16.8hh/ha
Riccarton Central	4.0hh/ha
Riccarton East	34.9hh/ha
Richmond North	16.9hh/ha
Richmond South	33.3hh/ha
Rutland	17.9hh/ha
Shirley East	17.2hh/ha
Spreydon North	30.3hh/ha
Shirley West	17.5hh/ha
St Albans West	29.7hh/ha
St Albans East	34.8hh/ha
Waltham	38.8hh/ha
Sydenham North	38.5hh/ha
Sumner	34.2hh/ha
Wigram North	16.9hh/ha
Woolston North	22.8hh/ha
Wigram West	36.7hh/ha
Woolston East	24.0hh/ha
Yaldhurst	34.6hh/ha
RMD Zone Summary	**24.9hh/ha** **Average net density range - 0.3hh/ha to 40.3hh/ha**

RESIDENTIAL SUBURBAN DENSITY TRANSITIONAL ZONE	
Addington West	21.0hh/ha
Beckenham	22.6hh/ha
Hornby West	20.8hh/ha
Malvern	18.3hh/ha
Papanui North	17.8hh/ha
Ilam South	21.4hh/ha
Ilam University	20.0hh/ha
Riccarton West	22.1hh/ha
Rutland	18.5hh/ha
Sockburn North	3.0hh/ha
Spreydon North	19.0hh/ha
Bush Inn	28.5hh/ha
Charleston	23.3hh/ha
Edgeware	25.0hh/ha
Linwood North	19.5hh/ha
St Albans East	25.9hh/ha
St Albans West	29.0hh/ha
Ensors	18.2hh/ha
Hillmorton	21.0hh/ha
Hornby Central	1.1hh/ha
Waltham	20.2hh/ha
Hornby South	24.7hh/ha
Woolston North	16.3hh/ha
Ilam North	20.6hh/ha
Islington-Hornby Industrial	18.8hh/ha
Linwood East	21.0hh/ha
Linwood West	18.7hh/ha
Mairehau South	18.8hh/ha
Merivale	24.7hh/ha
Mona Vale	17.0hh/ha
New Brighton	20.4hh/ha
Northcote	22.7hh/ha
Northlands	9.0hh/ha
Sydenham South	25.4hh/ha
Opawa	19.1hh/ha

Phillipstown	21.5hh/ha
Papanui West	22.2hh/ha
Riccarton Central	60.3hh/ha
Richmond North	15.8hh/ha
Tower Junction	0.7hh/ha
Richmond South	26.2hh/ha
Somerfield East	19.0hh/ha
St Albans North	24.0hh/ha
Somerfield West	20.8hh/ha
Spreydon South	22.9hh/ha
Spreydon West	18.6hh/ha
Sydenham North	11.9hh/ha
Sumner	52.9hh/ha
Wharenui	22.9hh/ha
Woolston East	20.8hh/ha
Woolston South	27.8hh/ha
RSDT Zone Summary	**22.4hh/ha** **Average net density range - 0.7hh/ha to 81.9hh/ha**

APPENDIX 10
GCP DENSITY UPTAKE CALCULATIONS - METHDOLOGY AND LIMITATIONS

CALCULATING 'NET DENSITY'

Table i breaks down what types of land were identified for the 'net density' calculation.

TABLE I: GCP DENSITY UPTAKE DATA METHODOLOGY

CRPS 'NET DENSITY' DEFINITION	LAND USES CONSIDERED TO IDENTIFY 'GPA' UPTAKE
INCLUDED IN THE 'NET DENSITY' CALCULATION	
• Residential purposes, including all open space and on-site parking associated with residential development.	• Residential sections.
• Local roads and roading corridors, including pedestrian and cycle ways.	• Roading, pedestrian and cycle ways and linkages.
• Local (neighbourhood) reserves.	• Neighbourhood parks, reserves.
EXCLUDED IN THE 'NET DENSITY' CALCULATION	
• Stormwater retention and treatment areas.	• Stormwater management areas (including drainage reserves), lakes, streams, rivers within development that receive stormwater.
• Geotechnically constrained (such as land subject to subsidence or inundation).	• Within Christchurch City, geotechnically constrained areas are identified as yellow on the Outline Development Plan (refer to maps) and have not been required to yield 15hh/ha but are expected to yield on average 10hh/ha. However, for the most part these areas have not been developed to date and have been excluded from the density calculations.
• Set aside to protect significant ecological, cultural, historic heritage or landscape values.	• Land identified in the District Plan as having significant values including Significant Natural Areas, heritage sites, wāhi tapu sites, Outstanding Natural Landscapes and Features and esplanades of scheduled waterways (waterways listed as having certain values/purpose and therefore subject to esplanade provisions).
• Set aside for esplanade reserves or access strips that form part of a larger regional or sub-regional reserve network.	• No regional/sub-regional reserve networks were identified.
• For local community services and retail facilities, or for schools, hospitals, or other district, regional or sub-regional facilities.	• Substations; High voltage electricity pylons; Commercial activities; Schools; Hospitals; Churches; Community halls/centres; Large parks/reserves greater than 2ha; Community facilities (including multi-sports centres but not parks such as rugby fields etc).
• State Highways and major arterial roads.	• Road reserve for Stage Highways or arterial roads

For each 'GPA', the land is identified for one of the above uses and the appropriate land is excluded to calculate the net size of each 'greenfield' area. The total residential sections were calculated from Valuation or Building Consent if developed, the lot configurations illustrated in survey plans in certificates issued pursuant to section 224 of the RMA, approved subdivision consent scheme plans, or manually checking aerial photos.

The GCP has agreed that comprehensive and multi-unit developments, that include retirement villages, are separated out for each 'GPA'. The exclusion of these development typologies from the density yield calculations is required as it may lead to the actual density yields being higher than what is indicated in the housing uptake data.

GENERAL LIMITATIONS OF THE APPLIED METHODOLOGY

The calculation of partially developed sites is problematic and compounded by the evolving nature of subdivision development. The uptake data is therefore a point in time summary that will be subject to change until the 'greenfield' site is fully developed.

There will be variations arising from the use of different information management systems for capturing, analysing, and presenting the uptake data within each of the Council's so a best judgement has been relied upon.

There will be a degree of variations in the uptake data due to the interpretation and application of the following categories in the CRPS net density definition:

- Land set aside to protect significant ecological, cultural, historic heritage or landscape values.
- Land set aside for esplanade reserves or access strips that form part of a larger regional or sub-regional reserve network.
- Land set aside for other district, regional or sub-regional facilities.

DENSITY UPTAKE METHODOLOGY AND LIMITATIONS - CHRISTCHURCH CITY COUNCIL

The following two approaches were followed by CCC to calculate densities:

1. GIS spatial analysis assessed yields for land developed to date and a projected density yield for the GPA once fully developed, which is represented within brackets in **Table 3** below.

2. The GIS spatial analysis was validated through a review of all subdivision consents applicable to GPA, which is still to be recorded in Table 3 below.

It is noted that for Christchurch City, not all GPA were required to yield 15hh/ha. Some, such as Prestons, Wigram, Yaldhurst and Awatea were rezoned, or in the process of being rezoned prior to the CRPS being changed (to include the 15hh/ha minimum density requirement).

Constrained Land

Some ODP's within CCC identify 'greenfield land' as constrained. 'Greenfield' land was deemed potentially suitable for urban use based on preliminary desktop based geotechnical assessments. Following the earthquakes, the CCC gave greater weighting to geotechnical issues, leaving land identified as GPA but unable to meet the anticipated yield due to constraints. The District Plan Review process refined these areas and amended the expectations of yield.

Intensification areas

Whilst intensification is enabled across all of the city's existing urban area, the focus of this density analysis has been on those which enable as a permitted activity multi-unit development. A GIS spatial analysis was undertaken by CCC using Stats NZ Statistical Area 2 and zone boundaries to define spatial areas and the household yield calculated (based upon household proxies/address points). These average (mean and median) yields only include residential zoned land and exclude all open space, roads and other infrastructure; the latter being located within non-residential zones.

The current yields are not reflective of total household capacity. As a minimum, the intensification areas are required to yield 50hh/h within the Residential Central City Zone (RCCZ) and 30hh/ha in the Residential Medium Density Zone (RMDZ). There is no minimum density requirement for the Residential Suburban Density Transitional Zone (RSDTZ). For information on the household capacity for intensification areas refer to the Greater Christchurch Housing Capacity Assessments[149].

[149] Greater-Christchurch-Housing-Capacity-Assessment-reports-1-4.pdf

DENSITY UPTAKE METHODOLOGY AND LIMITATIONS - SELWYN DISTRICT COUNCIL

SDC identified particular areas based on ownership, zoning, or designation. For example, stormwater land was identified by being owned by the council and vested for that purpose. Other community services were identified where there is a designation in place. There is always potential errors or omissions in the data.

For calculating the percentage complete, large areas of either existing dwellings or future stages of subdivision were excluded. This potentially lowers the current density.

Further work is required to provide a more complete picture in regard to meeting the CRPS and this work will, in the future, help inform the Selwyn Growth Model's inputs.

DENSITY UPTAKE METHODOLOGY AND LIMITATIONS - WAIMAKARIRI DISTRICT COUNCIL

WDC noted that developed residential sections were counted via GIS analysis capturing sections with a certain improvement value / rating assessment valuation, and or building consent category. Undeveloped, subdivided residential sections were manually counted via aerials. Undeveloped, not yet subdivided residential sections were manually counted via approved subdivision consent scheme plans.

The '% complete' was calculated as the number of residential lots created so far (either developed or undeveloped but subdivided) compared to the total number of lots planned for that development (often taken from the master plans).

For partially developed areas where land was in different stages of development (i.e. some stages developed, some with approved subdivision consent), these stages were then added together to give a combined total.

The 'net density' was calculated using the following formula:

> Net density (hh/ha) = (Total number of residential sections) / (Net area (m^2)) * 10,000
> Density uptake in the GCP GPA.

APPENDIX 11
HG DENSITY OUTCOMES ANALYSIS - METHODOLOGY AND LIMITATIONS

MEASURING DENSITY OUTCOMES ACROSS VARYING SCALES

The techniques used to measure the density outcomes varies depending on the type and scale of the issues being assessed. The representative sites were selected to ensure there was a variation in the design and the developers and consultant teams who prepared the masterplans and subdivision schemes.

The following outcomes are deemed to be more relevant when assessing changes at the **regional, township and suburb-scale**:

- *Urban form*, which includes maintaining a consolidated settlement pattern.
- *Land use*, which includes avoiding locational constraints (such as natural hazards, highly productive land, or sensitive sites) and optimising the use of available 'greenfield' land (including through positive environmental, social, and cultural outcomes).
- *Infrastructure*, which includes ensuring 'greenfield' locations can be efficiently serviced.
- *Strategic transport networks*, which requires land development to be integrated with transport planning to ensure there is sufficient network capacity.

These are more applicable when evaluating outcomes where the location of 'greenfield' areas has already been determined but may also be relevant when formulating spatial plan strategies for establishing the appropriateness of future urban growth areas across the identified scales.

The following outcomes are considered to be more relevant when assessing changes at the **neighbourhood, block, and site scales**:

- *Liveability*, which includes the following sub-categories: that generally correspond with the outcomes listed in CRPS Chapter 6 Policy 6.3.2.
    - (Healthy, safe, high quality living environments incorporating good urban design and a range of densities.
    - Connectivity within development areas to provide safe high quality, barrier free, multimodal connections to surrounding areas, and to local facilities and services.
    - Choice and diversity to ensure developments provide choice and diversity in their layout, built form, land use housing type and density.
    - Integration of land uses that recognise the need for well-integrated places, infrastructure, movement routes and networks, spaces, land uses and the natural and built environment.
    - Tūrangawaewae and 'placemaking' that recognises and incorporates the identity of the area through context and site analysis to improve the sense of place and belonging.

The liveability outcomes have been quantified and measured across the six case studies.

LIMITATIONS

A limitation of this study is that representative blocks have been chosen within the seven subdivisions, four within Greater Christchurch and one in each of the three 'high growth' areas. Three of our team discussed and selected each of the blocks to ensure a consistent approach was applied and general consensus reached that the block was generally representative of the subdivision. In some cases, more than one block was evaluated, with a conclusion then being made on which one was the most "typical".

It is also important to note that the liveability outcomes are representative of what is occurring within a selected number of neighbourhoods, blocks, and sections across seven locations, which is not a particularly large sample size. The limitations relating to the sample size and methodology include:

- Extending the analysis to multiple blocks within each neighbourhood, and to increase the number of case studies, would improve the observations and trends that are able to be drawn.
- We have not researched suburb-related outcomes such as what the thresholds are for provision of schools, sports parks, or public transport routes. These thresholds are critical to understanding some of the positive outcomes of increasing density across a suburb and are typically determined through comprehensive spatial planning.
- The observations made across the seven case study areas provide an indicative baseline that are representative of the outcomes likely to be occurring across the 10hh/ha to 15hh/ha spectrum in different locations across New Zealand. Further case studies would increase the accuracy of our conclusions.
- There are dozens of outcomes that have been identified as part of cases study liveability attributes analysis have not been measured because they are of less relevance as they are only indirectly related to density, or difficult to measure spatially. The application of a wider range of attributes would also increase the accuracy of our conclusions.

THE METHODOLOGY FOR SELECTING THE CASE STUDY LOCATIONS

Selection of the GCP case study locations

The liveability attributes have been applied to four developed 'greenfield' areas in Greater Christchurch.

The Halswell West GPA has been chosen because: (a) It is a large subdivision where section take up has been proportionality strong compared to other GPA in Christchurch City, signalling that there are few locational, servicing or market constraints; (b) Uptake has been at 14.5hh/ha, which is at the upper end of spectrum of the densities that this report is evaluating; (c) It is a high growth area in Christchurch City, which ensures there is coverage of all three of the GCP territorial authorities; and (d) There are a range of housing typologies that are generally representative of the housing that is available within the GPA of Halswell and the Greater Christchurch Area of Christchurch City.

An additional 'greenfield' area was included in Christchurch City, the Spring Grove subdivision in East Belfast, because it is an example of where housing has been developed at densities just above the 15hh/ha threshold within Greater Christchurch. The application of the liveability attributes to this case study area has enabled conclusions to be established on whether outcomes are likely to be varied at densities in the 15hh/ha to 17hh/ha range.

The Faringdon GPA has been chosen because: (a) It is a large subdivision where section take up has been strong, signalling that there are few locational, servicing or market constraints; (b) Uptake has been at 12hh/ha, which is close to the middle of the spectrum of the densities that this report is evaluating; (c) It is a high growth area in Selwyn District, which ensures there is coverage of all three of the GCP territorial authorities; and (d) There are a range of housing typologies that are generally representative of the housing that is available within the 'GPC of Rolleston and the Greater Christchurch Area of Selwyn District.

This case study location (Sovereign Palms) has been chosen because: (a) It is a large subdivision where sections have been fully taken up, signalling that there are few locational, servicing or market constraints; (b) Uptake has been at 10.5hh/ha, which is at the lower spectrum of the densities that this report is evaluating; (c) It is a high growth area in Waimakariri District, which ensures there is coverage of all three of the GCP territorial authorities; and (d) There are a range of housing typologies that are generally representative of the housing that is available within the GPA of Kaiapoi and the Greater Christchurch Area of Waimakariri District.

Selection of the 'high growth' area case study locations

The three 'high growth' area case study locations were selected because they:

- Are 'greenfield' urban growth locations identified in sub regional spatial plans and Regional Policy Statements.
- Do not have significant constraints or attributes that set them apart.
- Have been developed recently (and/or are still developing) consistent with accepted design standards.
- Are of a size that is substantial enough to ensure patterns of land use and development can be clearly observed at the neighbourhood scale.
- Have similar planning frameworks in place that determine site development controls, design-based assessment criteria.
- Have a measurable minimum net density. Three density ranges have been identified, being 10hh/ha, 12hh/ha, and 15hh/ha, with one case study selected at each to enable comparison of the liveability outcomes which may occur at various densities.
- The aim has been to select 'greenfield' areas that are similar in nature to neutralise the impact of location-specific policies or site context.

Changes in housing density within the 10hh/ha to 15hh/ha range are very observable at the scale of neighbourhoods and blocks.

Case study areas have been assessed by measuring them in relation to a wide array of spatial attributes. These attributes have been identified by HG and the GCP as being particularly relevant to liveability outcomes. They are purposely defined in an objective manner so that subjectivity and personal preferences or biases are avoided.

DEFINING HOW TO MEASURE LIVEABILITY OUTCOMES

Liveability indicators have been divided into two categories – those measured at the site and block scale, and those measured at the neighbourhood scale.

Neighbourhood scale outcomes are measured across the entire case study area that typically range between 30ha to 80 ha in size. The neighbourhood scale attributes focus on observations at the urban block, street pattern and dwelling distribution and types, and include:

- Density of Dwellings.
- Population density (as compared to household density).
- Range of lot sizes.
- Range of residential housing typologies.
- Amount of land occupied by residential lots.
- Amount of land occupied by neighbourhood parks.
- Amount of land occupied by streets.
- Communal recreational open space per dwelling.
- Street trees.
- Housing affordability and price range.
- Block permeability & connectivity.

Site and block scales outcome are measured by observations made at one 'typical' urban block comprising of approximately 25 dwellings.

These outcomes focus more on the relationship between dwellings and the street, and each other, and include:

- Range of household sizes.
- Numbers of Bedrooms per dwelling (and range of bedroom sizes).
- Building coverage.
- Street frontage.
- Building intensity (the scale and compactness of the built form).
- Residents ability to grow vegetables.
- Quantity and quality of private outdoor living space.
- Dominance of garage doors along the streetscape environment.
- Design for solar orientation (good solar access to living rooms and outdoor spaces).

There is a definite limitation to observations made at this scale due to the small sample size (one block per neighbourhood study area) which has been selected as a 'representative' block. The outcomes assessment at this scale is intended to inform decisions about the effect of policy on the 'typical' liveability outcome. Our study at the block scale excludes factors such as multi-unit/integrated consents (which are subject to myriad policies and criteria).

Dwelling scale outcomes, such architectural style, building materials or landscaping quality, are not measured within this case study analysis. This is because these outcomes are influenced primarily by home buyers, architect/urban designer, building companies and developer preferences, rather than by density policies, rules, or methods.

Comparing outcomes and drawing conclusions about the positive and negative effects of increases in density

The case studies observations have been summarised onto one illustrated "dashboard"-style sheet for ease of comparison. These are presented in **Section 5.3.2**.

Information gathered for each case study area has been used to make a comparison and show whether or not there is a trend in any particular outcome. Conclusions are made through a combination of statistical and subjective analysis against the following 'liveability' themes:

Healthy, safe, high quality living environments incorporating good urban design and a range of densities.

Connectivity within development areas to provide safe high quality, barrier free, multimodal connections to surrounding areas, and to local facilities and services.

Choice and diversity to ensure developments provide choice and diversity in their layout, built form, land use housing type and density.

Integration of land uses that recognise the need for well-integrated places, infrastructure, movement routes and networks, spaces, land uses and the natural and built environment.

Tūrangawaewae and 'placemaking' that recognises and incorporates the identity of the area through context and site analysis to improve the sense of place and belonging.

FACTORS THAT MIGHT INFLUENCE DEVELOPMENT DENSITY

Planning Rules

We have identified a range of planning policies and rules that are likely to influence density:

- Minimum Households Per Hectare.
- Maximum households/hectare.
- Average households/hectare.
- Minimum Lot Size (vacant Lot)
- Maximum Lot Size (vacant lot).
- Lot Shape Factor.
- Building Coverage rule
- Landscaped Area Rule.
- Impervious Coverage rule.
- Maximum Height rule.
- Height in Relation to Boundary Setback/recession plane.
- Front Yard Setback rule.
- Rear and Side yard Setback and Outdoor Space Dimension rule.
- Minimum car park numbers (off street) per dwelling.
- If the development was delivered through a Masterplan or Structure Plan.
- Requirement to deliver housing typology diversity.
- Affordability/social housing requirement.
- A guiding Urban Design framework, guidelines, or formal review process.
- Landscape design criteria.
- Developer-led property covenants that may influence density (such as a minimum GFA for houses).

Development opportunities and constraints

The level of cost or risk that a developer may bare. Higher cost or higher risk developments would likely drive simpler and quicker development (the more popular or generic lot size might be preferred to achieve quicker sales to a wider pool of buyers, or by eliminating items such as landscaping implementation or architectural guidelines).

- Distribution of landowners.
- Neighbours and wider stakeholders.
- Cost of infrastructure provision.
- Land set aside for conservation or stormwater purposes.

Context and locational attributes:

The following items are likely influential in determining development outcomes, and they are typically accounted for in the **value** of the land:

- Location (proximity to town).
- Developer Preference.

- Market Preferences.
- Locational amenities - open space, retail and commerce, access to employment, community facilities, education, recreation, crime, aesthetics.

Market, designer, and developer preferences:

For a wide variety of reasons including those listed above, the market in a particular area may favour one product type, for example in Tauranga there is general resistance to the idea of a two-storey dwelling, partially because a significant sector of their market is the over-55 age bracket.

Developers also have their own preferences which can be very strong in determining density outcomes, for example house builders who inform the development will want lot sizes that accommodate their existing catalogue of homes.

Developers and their design teams, and the teams working within Council that may influence the design, will also impact the layout in certain ways, for example a neighbourhood may be developed with curvilinear roads rather than a regular grid pattern, simply because curves look better to the designer.

Outcomes that might be influenced by density

We have identified a wide range of outcomes that might be influenced by density. These have been grouped according to the GCP Outcomes Criteria. The most important of these (i.e. those having the most direct or significant influence on density and relevant to the neighbourhood and block scales) are highlighted below in yellow.

The highlighted items are the outcomes that have been measured as part of our case study research. Other items listed are relevant but are either related to the suburb & regional scales or are less-directly-related to density policy.

Land Use

- Presence of ecological constraints
- Quantum of streets vs parks vs residential land
- Does the area have an "X factor" score (attractive location due to coastal, views, streams, etc, or unattractive e.g. flight paths or landfills). Ideally, we want this to be neutral.
- Provision of Places of worship
- Provision of ECE facilities
- Employment within neighbourhoods
- Access to sports clubs
- Access to and supply of education
- Fresh water collection
- Wastewater quality
- Stormwater management of high flows and flooding
- Stormwater permeability/groundwater recharge
- Infrastructure provision per hectare
- Revenue - Development contribution/ Rates revenue
- Resilience to the impacts of natural hazards

Liveability

- Relative price point in the context of the city/sub-urban area
- Section Sale Price
- House Price (house and land)
- Impact on values of neighbouring properties

- Numbers of Bedrooms per dwelling (and range of bedroom sizes)
- Proximity to CBD (or Metropolitan Centre)
- Proximity to local retail
- Proximity to Frequent public transport route
- Access to horticultural land
- Architectural quality
- Construction cost per dwelling
- Quantity and quality of private outdoor living space
- Incidents of Crime
- Perception of crime/degree of personal safety (pedestrian. Homeowner)
- Public Perception/acceptance of new development
- Access (connectivity) with public open space
- Noise and public disturbances
- Perception of overcrowding or over intensification (lack of spaciousness or nature)

Urban Form

- Dwelling Size relationship to Lot size
- Proximity to High school
- Street frontage length per dwelling
- Degree of passive surveillance
- Vitality of streets (streetscape activation)
- Building intensity (the scale and compactness of the built form)
- Intensity of the street environment
- Dominance of built form (rooftops) compared with nature (trees)

Transport

- Dominance of garage doors along the streetscape environment
- Provision of cycle facilities
- Pedestrian and Cyclist connectivity
- Block permeability & Connectivity (by vehicles)
- Access (connectivity) with high frequency public transport routes

Infrastructure:

- Development model: Were properties developed by corporates, small builders, or open to individuals?
- Development model: Were houses Comprehensively designed (subdivision and house designs together) or vacant lot? (subdivision for generic housing or super lots)?
- Market attractiveness (was there reasonable demand for properties or did the sales languish.)
- Topography/Development Attractiveness
- Road and block layout
- Public transport efficiency
- Neighbourhood-level transport efficiency