Housing Capacity Assessment update

Dunedin City

October 2023

Note Figure 2 replaced on 19 January 2024 to correct an error.

DUNEDIN CITY COUNCIL | kaunihera a-rohe o Ōtepoti

EXECUTIVE SUMMARY

Context

Dunedin's population growth has been volatile in recent years, with a growth period peaking at 1.4% for the year to June 2016 before slowly dropping to 0.5% for the year to June 2020 and then switching to a net population decline for the following two years, in part due to Covid-19 travel restrictions. Recent signs point to population growth increasing rapidly again over the last year (2022-23).

There have also been significant changes in Dunedin's housing market, with a shift towards development of attached housing typologies (such as duplexes and townhouses) through intensification of existing urban areas. Economic trends, including construction costs and house prices, have also fluctuated in recent years. This report aims to bring together the latest data on these factors to enable decision-making that reflects the most up-to-date information available.

Dunedin is a Tier 2 urban environment and Dunedin City Council is consequently required to ensure that there is sufficient development capacity to meet expected demand for housing over the next 30 years. To demonstrate compliance, a Housing and Business Development Capacity Assessment must be prepared every 3 years, in time to inform each long-term plan. This current report is an update to Dunedin City Housing Capacity Assessment 2021. The scope of the update is limited to an assessment of:

- Recent growth and development trends (section 2)
- Infrastructure servicing (section 3)
- Projected growth and demand for dwellings (section 4)
- Supply of development capacity (section 5)
- Sufficiency of development capacity to meet demand (section 6)

The next full housing capacity assessment will be completed in 2025 to inform the 2027 10 year plan.

Demand for housing

Dunedin's population is expected to grow at a relatively high rate between 2024 and 2034, before slowing to a low growth rate between 2034 and 2054. This results in a relatively high number of new homes being required in the short and medium-term, followed by a low number over the following 20 years. Demand by dwelling type and location is affected by the composition of growth, including an aging demographic.

Table 1 below outlines the adopted demand projection "High-Medium growth scenario" for dwellings within Dunedin.

Table 1: Demand for new dwellings

	High-Medium growth scenario	
Timeframe	**New dwellings required**	**Capacity required (units)[1]**
Short-term (2024-27)	1,350	1,620
Medium-term (2024-34)	4,270	5,120
Long-term (2024-54)	5,510	6,550

The projected levels of demand for new homes are inherently uncertain, particularly due to the unpredictability of migration trends and the economic factors behind housing development, such as house prices, interest rates, and construction costs. This report takes a conservative approach by following the high growth scenario released by Statistics New Zealand in December 2022 for the short and medium-term. This reflects the risks associated with undersupplying development capacity.

Residential capacity

A GIS-based model has been developed to assess the development capacity of each property in the Dunedin urban environment. It is a three-step model that evaluates capacity enabled under the Second Generation District Plan (2GP), the commercial feasibility of delivering that enabled capacity, and the likely take-up of the feasible development capacity.

The model is based on property data from April-August 2023. Development capacity was defined using the NPS-UD criteria of being 'plan-enabled, infrastructure-ready, and feasible and reasonably expected to be realised'. The modelling has been undertaken using conservative input assumptions, which means that the resulting estimate of housing capacity is likely to underestimate supply within the urban environment.

As shown in Table 2, results from the updated assessment suggest that there is sufficient housing capacity over all timeframes.

Dunedin's long-term growth rate (over 2034-54) is projected to be lower than the recent growth period, however there is significant uncertainty about the rate of change over that period. To address this uncertainty and the potential risks of providing insufficient capacity, this assessment has also looked at the potential impact of a high growth scenario. Under a high-growth scenario, there would still be sufficient development capacity over all timeframes.

Ongoing monitoring of growth and capacity take-up will be undertaken and incorporated into subsequent updates.

Table 2: Sufficiency of housing capacity

Timeframe	**2024-27**	**2024-34**	**2024-54**
Capacity required[2]	1,620	5,120	6,550
Development capacity[3] (surplus/deficit)	2,200 (+580)	5,550 (+430)	22,870 (+16,320)

[1] This reflects the projected new dwellings required plus the market competitiveness margins of 15-20% required by the NPS-UD.
[2] Incorporating 20% competitiveness margin over 2024-34 and 15% over 2034-2054, as required by the NPS-UD.
[3] Reflecting capacity that is plan-enabled, feasible, infrastructure-ready, and reasonably expected to be realised.

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1 INTRODUCTION

1.1 Purpose

This assessment has been prepared to meet requirements under the NPS-UD, particularly the housing components of subpart 5. It seeks to:

- Estimate the demand for dwellings in Dunedin
- Estimate the supply of development capacity in Dunedin
- Assess the sufficiency of development capacity to meet demand in the short-term (3 years), medium-term (10 years) and long-term (30 years). This includes the sufficiency of dwellings by dwelling type, development type, and broad location.

This assessment provides an evidence base that will help inform decision-making, particularly for the Second Generation District Plan (2GP), Future Development Strategy (FDS), and Long Term Plans.

This assessment is an intermediary assessment between the three-yearly updates required under the NPS-UD. As such, it is focused on housing demand and capacity due to the changes to the planning framework and underlying datasets. The scope of the assessment does not cover clause 3.23 of the NPS-UD, which requires an analysis of the housing market and the impact of planning. This analysis will be undertaken as part of the next Housing Capacity Assessment.

1.2 Report structure

Section 2 of this report provides some background to the current work including an outline of Dunedin's recent growth, NPS-UD requirements, and how the 2GP enables residential growth. Section 3 outlines the capacity for infrastructure networks to absorb future growth.

Section 4 focuses on the demand for housing, including outlining how this has been assessed and key findings. Section 5 focuses on the capacity for housing enabled by the 2GP.

Section 6 brings together these assessments and discusses the sufficiency of the identified capacity and next steps.

2 GROWTH AND DEVELOPMENT TRENDS

2.1 Recent growth

Dunedin has historically had modest population growth which generally follows national trends but has consistently been below the national average rate. Dunedin recently experienced a high growth rate (compared to historic rates), which peaked at 1.4% (1,800) in 2016. The growth rate gradually dropped to 0.5% (+700) over the year to June 2020. Since then, Dunedin's population has been in decline, dropping by 1.5% (-2,000) and 0.3% (-400) in the years ending 30 June 2021 and 2022 respectively. This is likely due to the effects of Covid-19 on international migration controls and where in New Zealand people chose to live. Data on Dunedin's growth in the year to June 2023 has not yet been released, however national population data shows a significant rebound in growth resulting from a high net migration of non-New Zealand citizens.

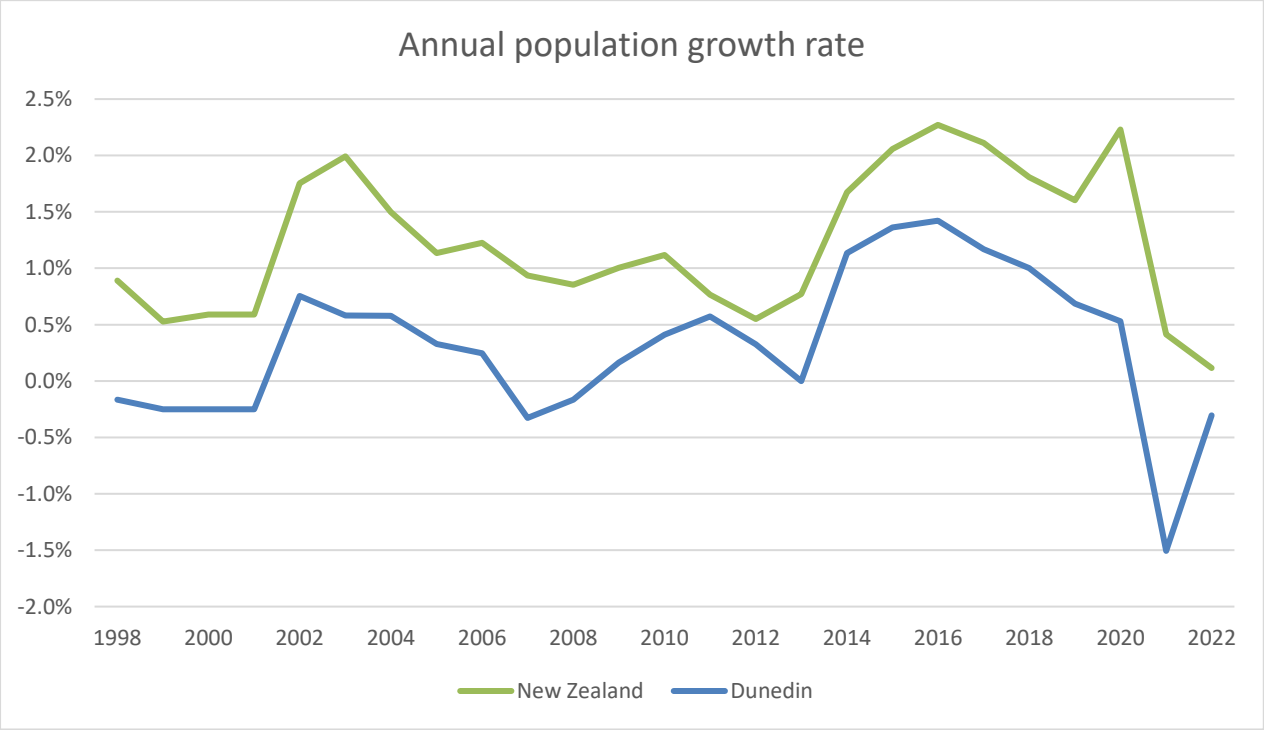

Figure 1: Population growth 1998-2022[4]

The number of homes consented in Dunedin has risen in recent years, peaking at 641 in the year ending June 2022. While these have been decreasing since then, the current level of 467 homes consented in the year to June 2023 is still higher than the long-term historic average. While the number of consented homes rose significantly, the number of homes constructed did not follow the same trend. Constructed homes peaked at 419 over the year to September 2022, far below consented rates. This suggests that constraints in the construction industry had a more significant impact on housing supply than planning decisions.

[4] Statistics New Zealand population estimates

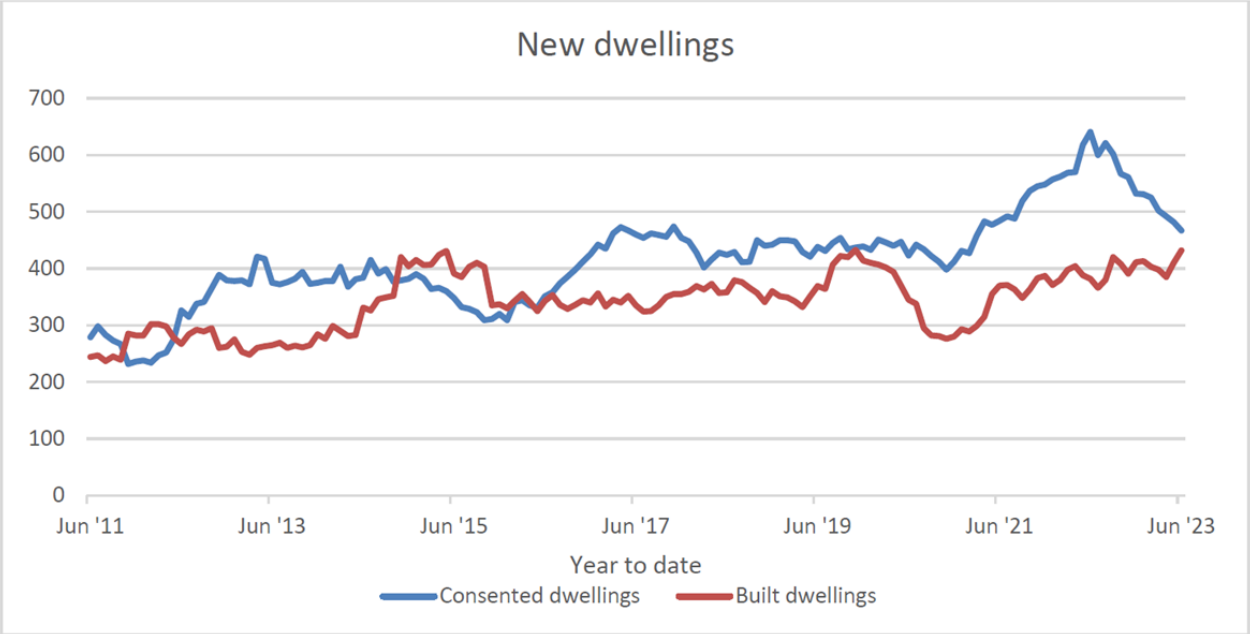

Figure 2: Trends in homes consented and constructed

In addition to an increase in the number of homes consented, there have been major changes to the types and locations of housing being consented. As outlined in Table 3, this includes the proportion of homes consented within a medium or high density zone, close to a high frequency bus stop, or close to the CBD or a centre.

Table 3: Consented dwellings by spatial factor

Consented dwellings	2020	2022
Within medium / high density zones	27%	55%
Within 500m of a high frequency bus stop	27%	50%
Within 500m of a CBD or centre	40%	55%

For the first time on record, more attached homes (such as duplexes, townhouses, and apartments) are being consented than standalone homes. This is likely driven by a combination of market forces and changes to the planning framework that are more enabling of these housing types. This trend has also been observed in the other large cities in New Zealand, with attached homes now making up more than half of the new dwellings consents at the national level.

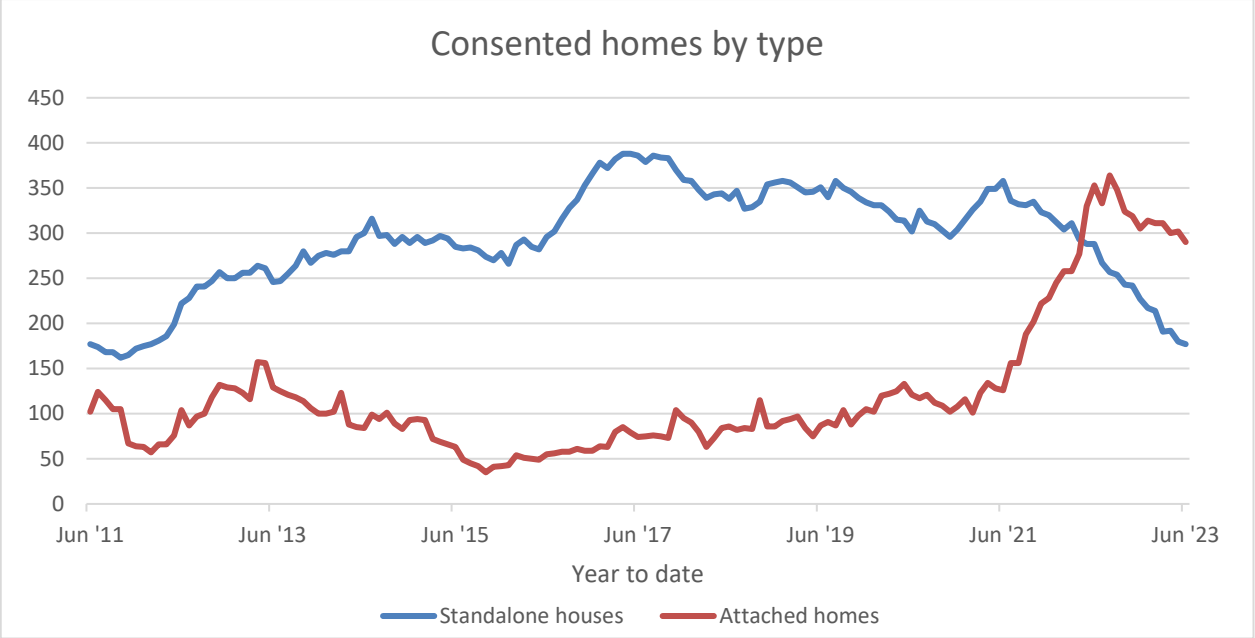

Figure 3: Consented dwellings by type

2.2 Second Generation District Plan (2GP)

The main planning document governing land use and development in Dunedin is the Second Generation District Plan (2GP). Development of the 2GP started in 2012, when Dunedin's population growth rate was low and projected to remain low over the life of the Plan and the capacity provided in the plan reflected that growth rate. Decisions on the 2GP were notified in November 2018. Most appeals have been resolved, however there are some outstanding.

One of the underlying strategic directions of the 2GP is that "there is a range of housing choices in Dunedin that provides for the community's needs and supports social well-being." To achieve this goal (and despite the low growth rate at the time of development), the 2GP facilitates a range of residential growth options.

Within the CBD and town centres, residential activities are permitted as of right, provided certain performance standards are met. This allows for apartment-style living options, either through construction of new buildings or conversion of existing buildings.

Several new or expanded medium density zones were included surrounding the CBD and larger centres, which provide for multi-unit development, such as townhouses and duplexes. In these areas, the maximum density is capped based on the number of habitable rooms (bedrooms) rather than the number of residential units, to encourage smaller dwellings and flats/apartments. New medium density areas were identified to cater for the predicted growth in demand for townhouses and duplexes. This included parts of Opoho, Roslyn, Belleknowes, Andersons Bay, Waverley and Caversham.

Within existing residential areas, amendments to provisions were made to increase the ability to develop a wider range of housing. These include specific provisions for ancillary residential units (previous known as family flats) and more permissive provisions for 'supported living facilities', which include retirement villages, rest homes and student hostels.

Minimum carpark requirements for residential activities have been taken out of the 2GP in compliance with the NPS-UD and is expected to further increase plan enabled and feasible development capacity by way of increased flexibility and more efficient use of land.

New residential zoned areas ('greenfield' areas) adjacent to existing residential zones were also added through the 2GP. The 2GP includes 190 hectares of land that was rezoned to residential from other zonings under the previous District Plan (pink areas in Figure 4 below). Key sites were in Corstorphine (28 ha), Halfway Bush (11 ha), Abbotsford (7 ha), Pine Hill (6 ha) and Ocean Grove (6 ha).

An additional 132 hectares was identified as Residential Transition Overlay Zones (RTZs). RTZs are a form of deferred zoning, where a new residential zone is identified but is deferred until any required 3 waters infrastructure upgrades have been undertaken and transport agreements are in place. Some areas have been recently assessed as unconstrained for 3 waters, while the necessary infrastructure upgrades for others are expected to take between 10 and 20 years.[5]

Transition overlay zones are located near the urban/rural fringe throughout the city. Key areas include Corstorphine (47 ha), Pine Hill/North East Valley (34 ha) and Kaikorai Valley (32 ha).

2.3 Variation 2

Variation 2 ('Additional Housing Capacity') to the 2GP was notified on 3 February 2021. It contained a suite of changes to the Plan intended to create more housing capacity. It also included changes to better manage subdivision of greenfield sites. Decisions were released on 31 May 2022 (for changes to provisions and intensification rezonings) and 8 February 2023 (for greenfield rezonings). Appeals have been received (by landowners) on two decisions to rezone properties and apply other requirements, as well as on twelve decisions not to rezone areas.

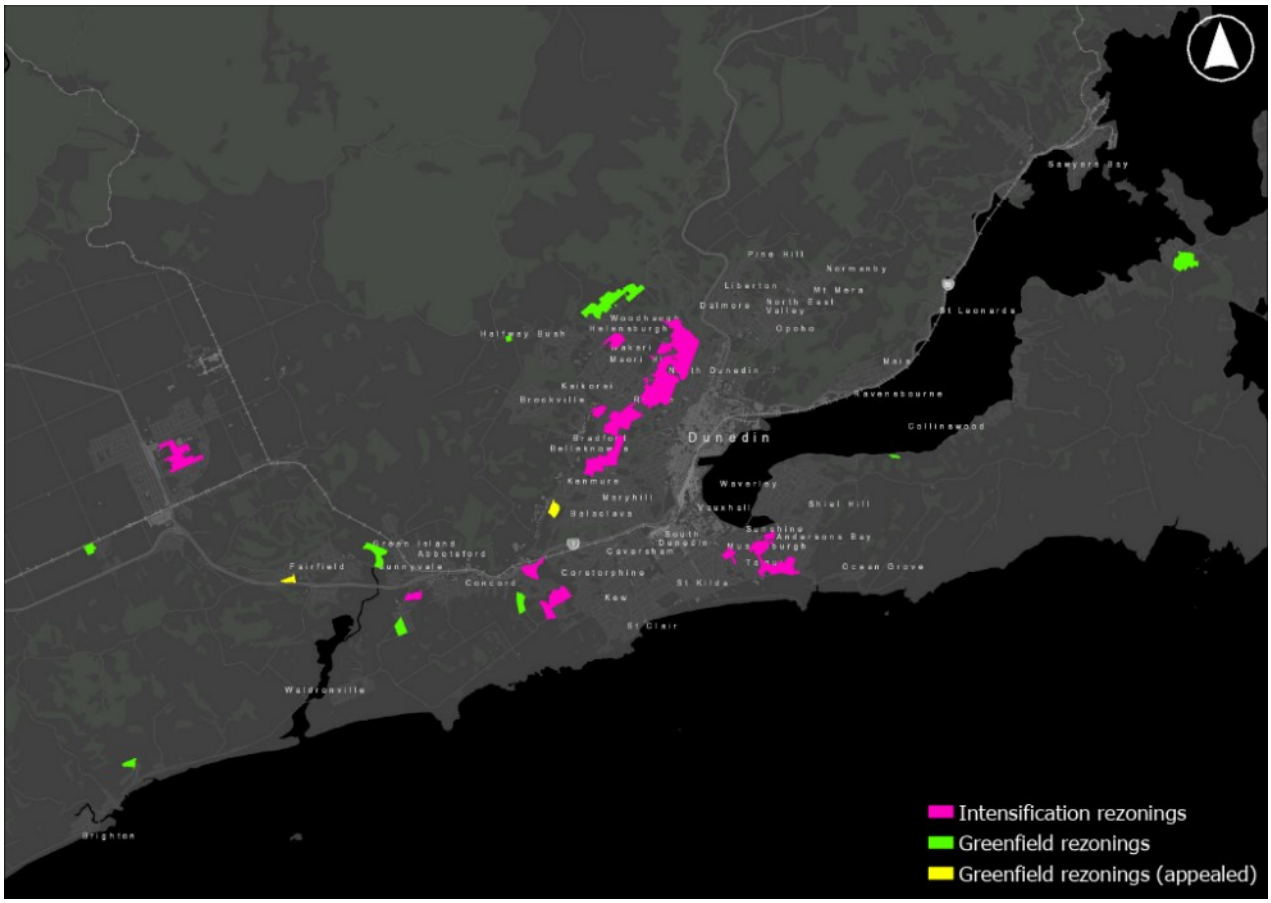

Figure 4: Variation 2 rezonings

[5] As RTZ areas cannot be developed immediately, for the purposes of the NPS-UD they are identified for future urban use and counted as capacity for the long term. To avoid any doubt, capacity from RTZ areas is not included in the short or medium-term results in the following assessment.

Significance changes to rules that set density requirements were also made by Variation 2, including:

- Allowing a duplex to be built on all properties over 500m^2 within General Residential 1 and reticulated Township and Settlement areas.
- Changes to minimum site sizes for subdivision and development down to 400m^2 from 500m^2 in General Residential 1 and reticulated Township and Settlement areas.
- Changes to make the minimum site size for subdivision and development consistent and to allow access legs to be included for sites under 1,200m^2.

These rule changes effectively allow a duplex with two units per 500m^2 of land or one standalone unit per 400m^2. Both avenues allow for an increased density compared to the previous limit of one unit per 500m^2.

2.4 Appeals on the 2GP

Recent appeals that have been resolved and resulted in residential rezoning include:

- 27 Inglis Street and Part 58 Ayr Street, Mosgiel (~650 dwellings)
- 636 North Road, North East Valley (~270 dwellings)
- 41 Soper Road and 20-21 Henderson Street, Wingatui (~120 dwellings)
- The area zoned Taieri Plain Rural bounded by Hagart-Alexander Drive, Gladstone Rd North, Wingatui Rd (~760 dwellings)
- 135/145 Doctors Point Road, Waitati (33 dwellings)

These are all greenfield sites and have collectively added significant additional development capacity.

3 INFRASTRUCTURE SERVICING

3.1 Overview

This section has been derived from the 2021 Housing Capacity Assessment without update. The content is still considered valid, particularly in conjunction with the ongoing collaboration between DCC departments, and between DCC and other organisations, on planning for and servicing growth.

DCC's Transport and 3 Waters teams have advised that all sites with a standard density residential zoning[6] in the District Plan are deemed to be serviceable unless they fall outside of the scheme boundaries provided in the Dunedin City Water Bylaw or have an overlay applied in the District Plan (e.g. 'no DCC wastewater mapped area') which indicates that servicing is not available in that location. However, even in serviced areas, some localised upgrade or extension work may be required at the time of subdivision.

Key infrastructure network issues that DCC is currently looking to address include:

- Lack of capacity within wastewater networks during rainfall events due to inflow and infiltration. This includes cross-connections from the stormwater network and pipes (private and public) in poor condition allowing groundwater and stormwater to enter the wastewater network. This can result in wastewater overflows to the environment and is a particular issue in Kaikorai Valley, North East Valley and South Dunedin.
- The age and poor condition of the wastewater network leading into Tahuna wastewater treatment plant (WWTP), particularly in Kaikorai Valley, North East Valley and South Dunedin
- Lack of capacity in the wastewater connection between Mosgiel WWTP and Green Island WWTP. This can result in overflow of partially treated wastewater into the Silverstream in significant rainfall events.
- The condition of the Mosgiel wastewater network and lack of capacity in the stormwater and wastewater network causing flooding
- Lack of capacity in the stormwater network causing flooding in South Dunedin in significant rainfall events
- The capacity of the water supply feeding Mosgiel, the Peninsula, Port Chalmers, Waitati, Warrington and Seacliff.

The capital expenditure (capex) budget in the 2021-31 10 year plan includes a significant increase in infrastructure upgrades, with over $1b proposed to be spent on transport and 3 waters capex projects over the next 10 years. This is an increase from the $678m identified in the previous 10 year plan. Of the 3 waters capex, $77m will be spent on projects to service growth, up from $16.8m in the previous 10 year plan.

Further information on the condition of DCC infrastructure and planned upgrades is provided in the 2021 Infrastructure Strategy (part of the 2021-31 10 year plan).

In addition to requirements around development infrastructure, clause 3.5 of the NPS-UD states that 'local authorities must be satisfied that the additional infrastructure to service the development capacity is likely to be available'. Advice from DCC infrastructure departments and external infrastructure providers has been that the development capacity provided by the 2GP is serviceable. Further information on this consultation is provided in section 3.7. The impact of proposed Variation 2 changes has also been discussed with infrastructure providers and is outlined in section 5.1.6.

[6] This excludes the two large lot residential zones

3.2 Wastewater

There are three key wastewater networks within Dunedin's urban area: Tahuna, Green Island and Mosgiel. The Tahuna Wastewater Treatment Plant (WWTP) is in good condition and has sufficient capacity for the foreseeable future, however much of the network feeding the plant is in poor condition due to the age of the pipes. As the pipes deteriorate, the joints allow groundwater to infiltrate the network, reducing capacity of the network to transport wastewater and reducing efficiency of the plant. Around the city many private properties have cross connections of stormwater flows into the wastewater networks. Private wastewater pipes are also in poor condition, allowing further groundwater to infiltrate into the network. As a result of these issues, the capacity of the wastewater network is often exceeding during heavy rainfall events. This in turn triggers constructed wastewater overflows[7] into Kaikorai Stream and the South Dunedin stormwater network, resulting in wastewater flooding in both networks. To alleviate these overflows, strategic planning is currently underway to identify long-term optimal solutions by looking holistically at the entire system from the private pipes through the DCC pipe network and treatment plants to final discharge.

There are plans for significant wastewater network renewals in Kaikorai Valley and North East Valley. These will allow for additional growth, as well as reduce inflow and infiltration in the wastewater network. This work is likely to take 5-10 years for Kaikorai Valley and 10-20 years for North East Valley. The Second Generation District Plan identified new greenfield areas that have infrastructure constraints as Residential Transition Overlay Zones. These require DCC to confirm that infrastructure capacity is sufficient to accommodate growth before development can occur.

Within the Mosgiel network, there are issues with high levels of inflow and infiltration resulting in overflows to roads, homes, and properties during heavy rainfall events. The strategic planning mentioned above will seek to address these issues.

While there is sufficient capacity within the Mosgiel WWTP for dry weather flows, the pipeline that transfers partially treated wastewater from the Mosgiel WWTP for final treatment at the Green Island WWTP reaches capacity during heavy rainfall events, creating a bottleneck at the treatment plant. The most appropriate long-term solution is being investigated.

3.3 Stormwater

The Infrastructure Strategy identifies issues for stormwater networks servicing Mosgiel and South Dunedin, resulting in flooding during heavy rainfall events. In South Dunedin and Mosgiel this is thought to be exacerbated by high groundwater, particularly around high tide for South Dunedin and during high stream flow events in Mosgiel. Significant capital works are proposed to reduce the future likelihood and impact of flooding in these areas.

The Mosgiel stormwater catchment faces some challenges, as the area is a flood plain for the Taieri River, Silverstream and Owhiro Stream. The DCC stormwater network discharges into the Silverstream and other tributaries, which are scheduled flood and drainage schemes managed by the ORC. When those waterways are high, stormwater discharge is impeded. As a result, Mosgiel can frequently experience catchment-wide nuisance flooding in moderate rainfall events. Capital works are taking place to improve two terminal stormwater pumping stations and strategic planning is also underway to identify long-term optimal solutions by looking holistically at the entire DCC stormwater system. Capital works will address the current low level of service and enable capacity for growth, based on current District Plan zoning, proposed Variation 2 changes, potential appeal changes, and growth projections.

[7] Constructed overflows are designed overflow points in the wastewater network that help prevent overflows onto private properties and protect public health

3.4 Water supply

In December 2017, Mosgiel's water supply was switched from local bore water to reticulated water from the Mount Grand Water Treatment Plant due to concerns over water quality and contamination risks. Since then, capacity issues have arisen within the supply pipe and pump station due to the increased volume of water being carried. This is addressed in the 2021-31 10 year plan, with strategic planning underway to identify long-term optimal solutions by looking holistically at the entire water supply including Outram, West Taieri the Northern Schemes (Waitati, Warrington and Seacliff), Port Chalmers and the Peninsula.

3.5 Transport

The level of investment in transport renewals and maintenance across the city aims to maintain existing levels of service but does assume some transport mode shift associated with growth occurs to mitigate traffic congestion. There are several projects in the 2021–31 capital programme, including the Shaping Dunedin Future Transport programme, that aim to respond to the hospital rebuild and growth in the city. In addition to DCC's investment, ORC is investing in additional bus hubs and improved public transport and Waka Kotahi is investing in enhancing the state highway, intersections, and other cycleways as part of the Shaping Dunedin Future Transport programme.

Key projects identified in DCC's 2021-31 capital programme include:

- Harbour arterial improvements: The harbour arterial route would run along Wharf St and Thomas Burns St to provide an alternative route bypassing the city centre, avoiding the new hospital during and after construction.
- Park and Ride facilities at Mosgiel and Burnside: Parking areas, where people can leave their car and catch a citybound express bus service.
- Central city parking management: Implementation of a plan to improve the parking experience, wayfinding of parking and a review of the pricing structure of parking.
- Strategic cycleway network: To fill the gaps and expand the existing cycling network across the city to provide a safe and connected cycle network.
- Central City bike hubs: Hubs where cyclists can lock their bikes in sheltered lockers and other facilities, such as repair and charging services, in North Dunedin, Central City and South Dunedin/Oval.
- Bus priority measures and safety improvements: Providing infrastructure to prioritise buses and safety improvements for pedestrians in and around the CBD.

Dunedin has recently seen an increase in traffic to and from the south of the CBD. This is believed to have stemmed from population growth along Otago Peninsula and on the Taieri Plain and has resulted in a corresponding deterioration in network performance on these strategic corridors during peak periods.

Transport planning and provision in the past has been strongly oriented towards providing infrastructure for private motor vehicles. This has encouraged travel behaviour that has resulted in more vehicles travelling into the central city area, causing congestion and increasing demand for car parking. DCC is currently identifying opportunities to rebalance street space allocation toward more sustainable modes of transport, promote place making, and facilitate more effective use of existing infrastructure.

If the actions from DCC's plans and strategies[8] are completed and the local impacts of developments are adequately managed, the transport network will be able to service the development capacity identified in the 2GP and Variation 2.

[8] Dunedin City 10 year plan, 2013 DCC Integrated Transport Strategy and DCC Central City Plan

3.6 Parks and open space

Dunedin has 33.6 hectares of park land per 1000 residents, 10 hectares more than its peer group average (peer group includes: Invercargill, Timaru, and Tauranga). Dunedin also has a greater area of sports parks per person than its peer group average, although this has been in steady decline over the last eight years. The current ratio is 2.3 hectares of sports parks per 1000 residents. Dunedin has 5.5 playgrounds per 1000 children under the age of 14, which is similar to its peer group average.

Based on the analysis summarised above, Dunedin currently has a sufficient supply of sport parks, grass fields, playgrounds, and park land. Investment in the open space network has been incorporated into the 2021-31 10 year plan to reflect the way Dunedin is expected to grow. The impacts of increases in urban density will be carefully considered to maintain the current open space ratios noted above. Intensification may reduce the space available for private backyards, which will put greater emphasis on the provision of public open space for health, social and environmental benefits.

The existing open space area is established and generally well distributed. However, recently smaller open spaces have been created through subdivisions, particularly in Mosgiel. These smaller spaces scattered across urban expansion areas do not always provide optimal outcomes, as their size constrains how they can be used. DCC is aiming to provide larger open spaces that would enable active sport, recreational activities, passive recreation, and quiet reflection.

The DCC is currently developing an Open Spaces Plan. The purpose of this will be to provide an overarching framework and strategic direction for public parks and open space for the next 10+ years. One of the focuses for future investment will be to connect new and existing open space networks and develop a plan for how to manage open spaces in response to climate change. Climate change poses a growing challenge for the ongoing provision of open space areas. Increasing temperatures, sea level rise and changes in rainfall patterns may lead to changes in the existing locations and distribution of open space. Climate change may also exacerbate existing erosion processes, which may mean the loss of some current open spaces. DCC is aiming to maintain an open space network that is at least the same as, if not greater than, our existing ratios and that considers housing density, growing demands for recreation space, changes in population demographics, and improving environmental and ecological values in response to climate change.

3.7 Other infrastructure

As Dunedin's school-aged population is projected to decline, the school network is not expected to be a constraint. The Ministry of Education has suggested that the spatial distribution of school-aged children in Dunedin is a more significant factor than total growth in student numbers. Engagement with the Ministry of Education is ongoing to assess any specific locational constraints within the existing school network. The Ministry has indicated that the changes proposed in Variation 2 may have an impact on the school network within the Green Island catchment.

The land purchases associated with the hospital rebuild project will provide sufficient ability to service the health requirements of foreseeable population growth and demographic changes. The Ministry of Health has advised that the planning for the hospital rebuild was based on demand modelling for the entire Otago and Southland regions out to 2043.

Waka Kotahi has advised that, based on the information available to them, they are not aware of any constraints in the state highway or wider transport network that would be likely to impact on Dunedin's development capacity. However, Waka Kotahi has suggested that some growth areas identified in Variation 2 may require specific development controls (such as access restrictions) or result in the need for significant infrastructure upgrades, particularly for downstream intersections.

There has been ongoing engagement with Aurora around comparing growth plans and the local electricity network. Aurora have advised that they do not envisage any capacity issues to accommodating growth in the areas identified since the first Housing Capacity Assessment (2019).

There are no other known issues with the ability of other infrastructure providers to service projected growth.

4 HOUSING DEMAND

This section outlines the methodology and results of an assessment of housing demand. It builds on existing information (such as population projections and housing preferences) to set out how many new dwellings are needed in the Dunedin urban area. This includes assessing the locations and types of housing required to meet future housing needs.

4.1 Methodology

4.1.1 Housing catchments

For the purposes of assessing demand for different housing markets, Dunedin was split into six housing catchments (Figure 5). These catchments were developed by aggregating Statistical Area 2 blocks[9]. There is likely to be significant overlap between the outlined markets and the categorisation is a relatively simplistic method to allow for an estimate of housing demand by broad location.

Areas on the urban edge were treated as being within the adjacent urban catchment for the purposes of calculating capacity and housing costs.

This updated assessment is based on the Dunedin urban environment. The NPS-UD defines an urban environment as:

> *any area of land (regardless of size, and irrespective of local authority or statistical boundaries) that*
>
> *a. is, or is intended to be, predominantly urban in character; and*
> *b. is, or is intended to be, part of a housing and labour market of at least 10,000 people*

The Dunedin urban environment has been defined as the areas within Dunedin that have an urban zoning[10] and are within a 30 minute drive from the CBD or Campus zone. This latter criterion removes Middlemarch, Hyde, and Berwick, but retains all other urban zones.

Both capacity and demand outside of the urban environment has been removed from the analysis in this report. Capacity has been limited by only processing properties within the urban environment. Demand within the urban environment has been assessed at the catchment level based on the proportion of new homes consented over the last ten years that were within the defined urban environment.

[9] 'Statistical Area 2' blocks are defined by Statistics New Zealand as part of their statistical standard for geographic areas 2018.
[10] Urban zoning comprises Residential, Commercial and Mixed Use, Industrial, and Major Facility (except Invermay and Hercus zone).

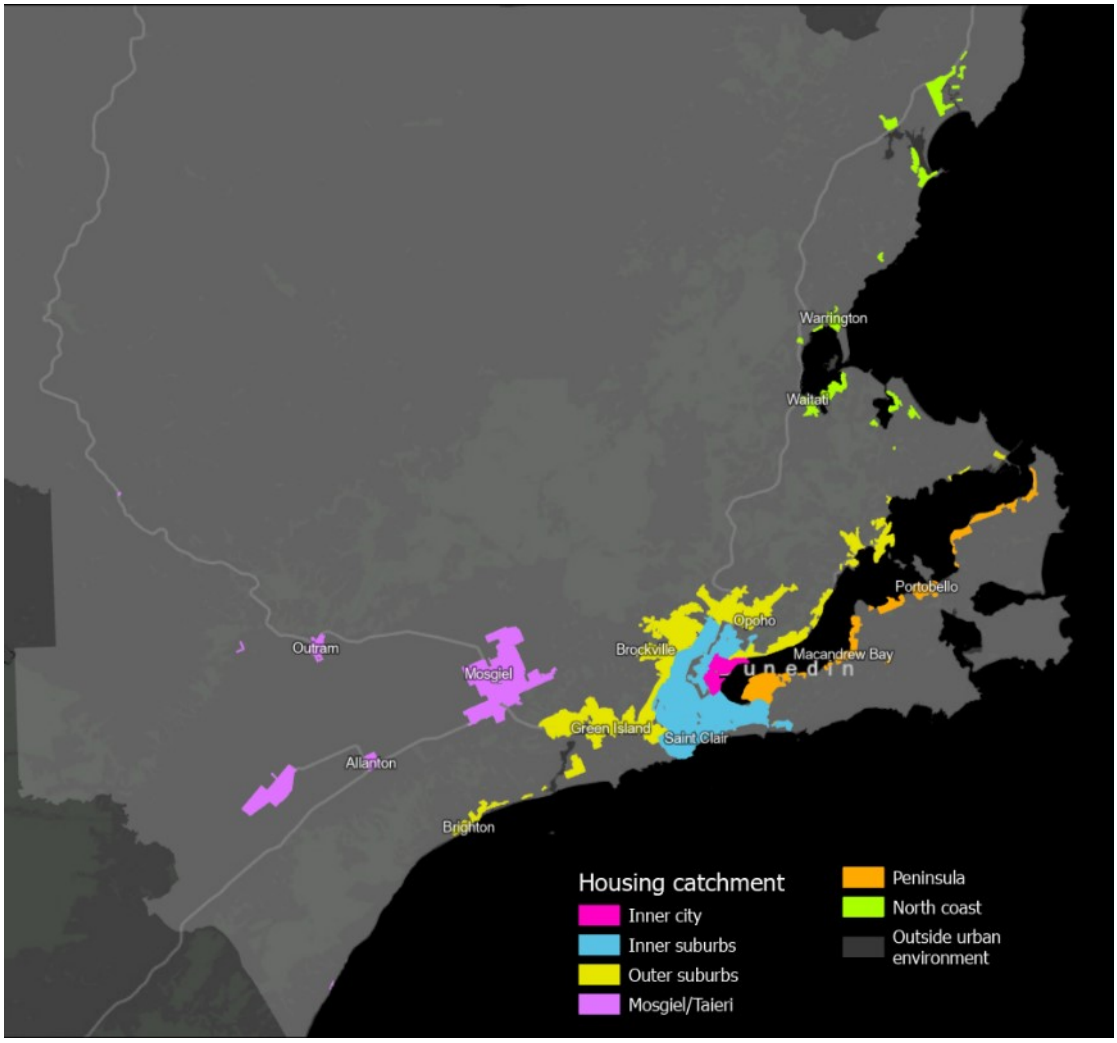

Figure 5: Spatial scope of assessment

4.1.2 Growth projections

Calculations of housing demand are based primarily on population projections released by Statistics New Zealand in December 2022.

The medium growth scenario projection is based on net migration to New Zealand returning to the long-term median migration rate of 25,000 per year from 2026 onward. It also assumes that natural growth (births - deaths) continues to decline and that trends towards an aging population (caused by low birth rates and increasing life expectancies) continues. The medium growth scenario is based on the national median projection, which is evaluated as the growth trajectory with an estimated 50% chance that the actual value will be lower and a 50% chance that the actual value will be higher. The medium growth rates are significantly lower than previously projected.

Since the Statistics New Zealand projections were released, New Zealand has had much higher migration rates than expected. To reflect this, and the risks of underestimating growth, a composite high-medium growth scenario has been developed and used. This presumes that Dunedin's growth rate follows the high growth scenario over the short and medium term (2024-34) and the growth rates from the medium growth scenario in the long-term (2034-54).

The composite high-medium growth scenario has been adopted as it is considered to be the most likely scenario, reflects the most up-to-date information available, and is a reasonable assumption based on current information.

4.1.3 Housing preferences survey

A housing preferences study ('The Housing We'd Choose') was commissioned in 2019 to estimate current and future levels of demand for different dwelling typologies and locations. Research First were commissioned and surveyed a representative sample of 770 respondents between 9 September and 23 October 2019, with quotas set to ensure age, gender, and geographic coverage.

The survey had two key components. The first was a series of questions about the features that respondents would like if looking for a new home and the level of importance they placed on these features as part of the purchasing decision.

The second component was based on the trade-offs that households would make when faced with budget constraints. Based on their financial situation (household income, debts, and assets), respondents were presented with a series of dwelling options that matched their affordability profile, living arrangements and housing preferences. At each stage the respondent was shown four options and they were asked to select their preference. At the end of four rounds, respondents were shown their four selected options to make a final selection. The purpose of the study was to determine the types of new housing needed in Dunedin in order to inform policy settings, so only options for new builds were shown to respondents.

Survey results were presented by household type and age so that they could be combined with population and demographic trends to calculate future housing preferences.

4.1.4 Projected demand for dwellings

The methodology for assessing demand for housing involved combining census information, projected household changes, dwelling projections, and housing preferences information[11]. This is summarised in Figure 6 below.

[11] Both stated preferences from the survey conducted in "The Housing We'd Choose" research and revealed preferences observed in the recent outcomes in the market.

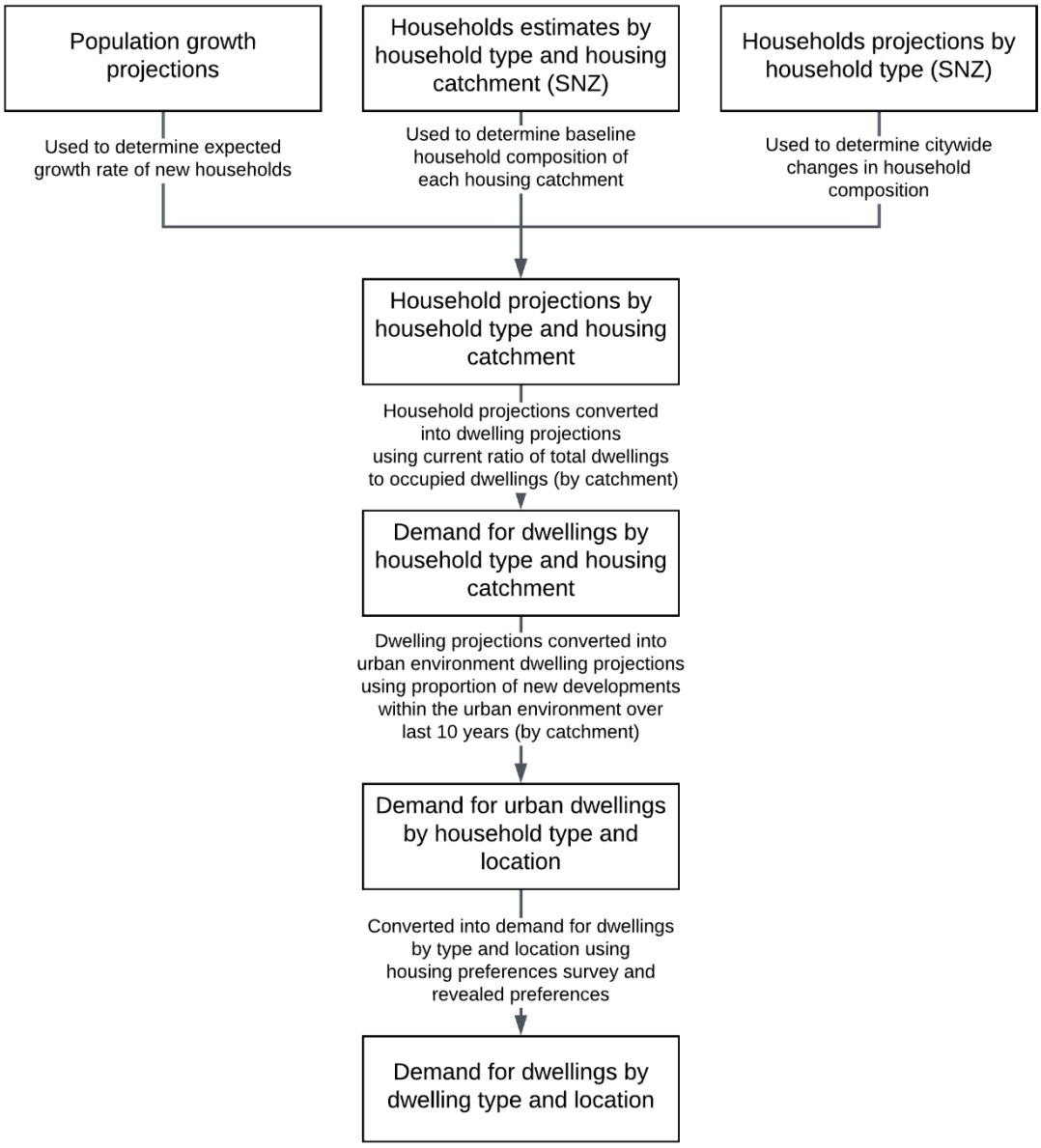

Figure 6: Summary of residential demand methodology

At the time of writing, Statistics New Zealand's projected population growth has not been converted into a projected household growth. To address this, a further analysis has been undertaken as part of this Housing Capacity Assessment to derive new household projections. This is based on applying the differences between current and previous population projections to the previous household projections.

Previously, an estimate of Dunedin's housing shortfall has been incorporated into calculations of housing demand. However, current data suggests that a surplus of homes have been constructed compared to housing demand from population growth. This is the result of population growth revisions made by Statistics New Zealand and the construction of homes continuing at a relatively high rate despite population growth declining to a low rate. Due to this change, no adjustment has been made to housing demand as a result of any outstanding housing shortfall/surplus.

4.2 Population and household growth projections

Dunedin's population is expected to grow at a relatively high rate between 2024 and 2034, before slowing to a low growth rate between 2034 and 2054. However, growth projections inherently have a significant degree of uncertainty, particularly due to the unpredictability of migration

trends. Migration patterns are strongly influenced by the relative economic performance of New Zealand and a range of potential origin/destination countries, particularly Australia, due to the potential for differences in wages and job growth.

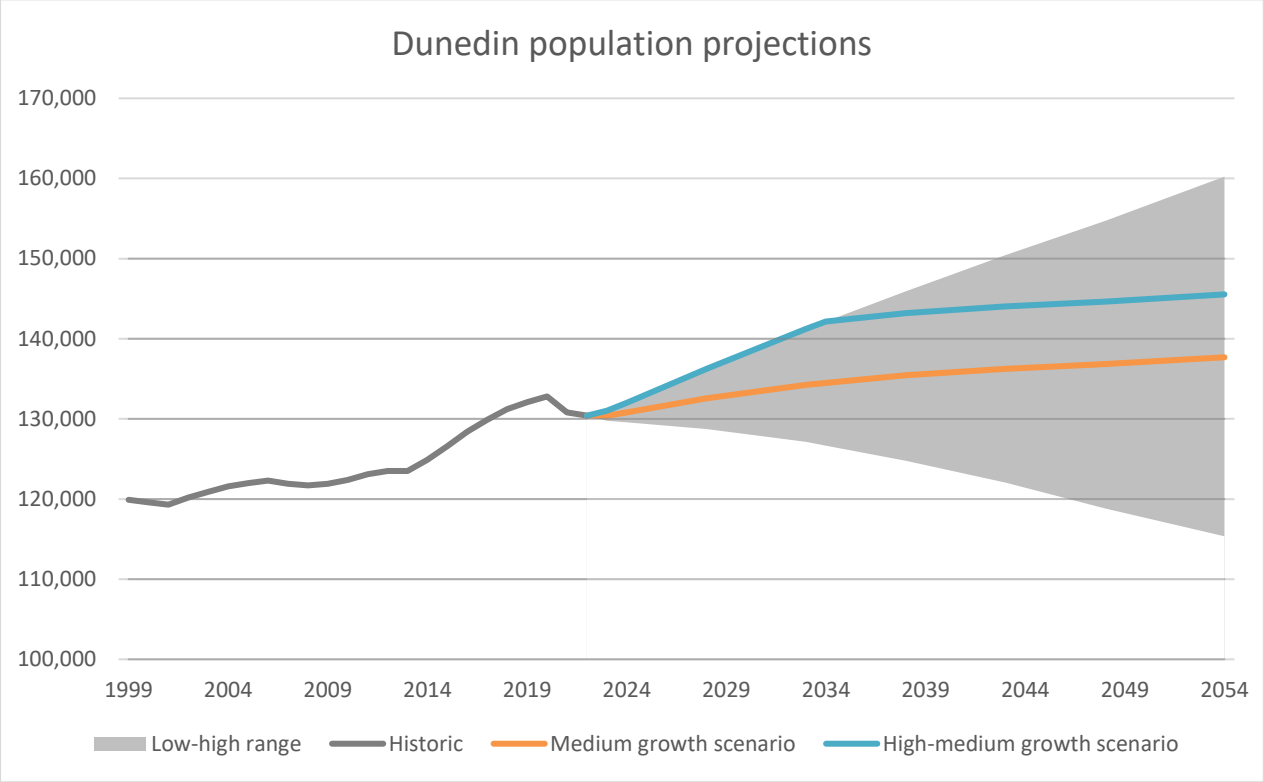

Figure 7: Projected population growth

In Dunedin, the number of births currently outweighs deaths by a slim margin. However, the number of deaths is expected to increase over the next 30 years due to an increase in the number of people in older age groups with a comparatively higher mortality rate. As a result, the current net natural increase is expected to turn into a net natural decrease sometime between 2028 and 2048.

The overall impact of modelled population trends for Dunedin is an average annual growth of 1,054 people per year over 2024-27, decreasing to a growth of 169 people per year between 2034 and 2054.

Table 4: Projected Dunedin City population 2024-54

Timeframe	Starting population	Concluding population	Change	Change per year	Change per year (%)
Short-term (2024-27)	132,029	135,191	+3,162	+1,054	+0.8%
Medium-term (2027-34)	135,191	142,165	+6,974	+996	+0.7%
Long-term (2034-54)	142,165	145,537	+3,372	+169	+0.1%

The composition of Dunedin's projected population growth is strongly influenced by the aging population. Over the next 30 years, only the 75+ age group is expected to have significant growth.

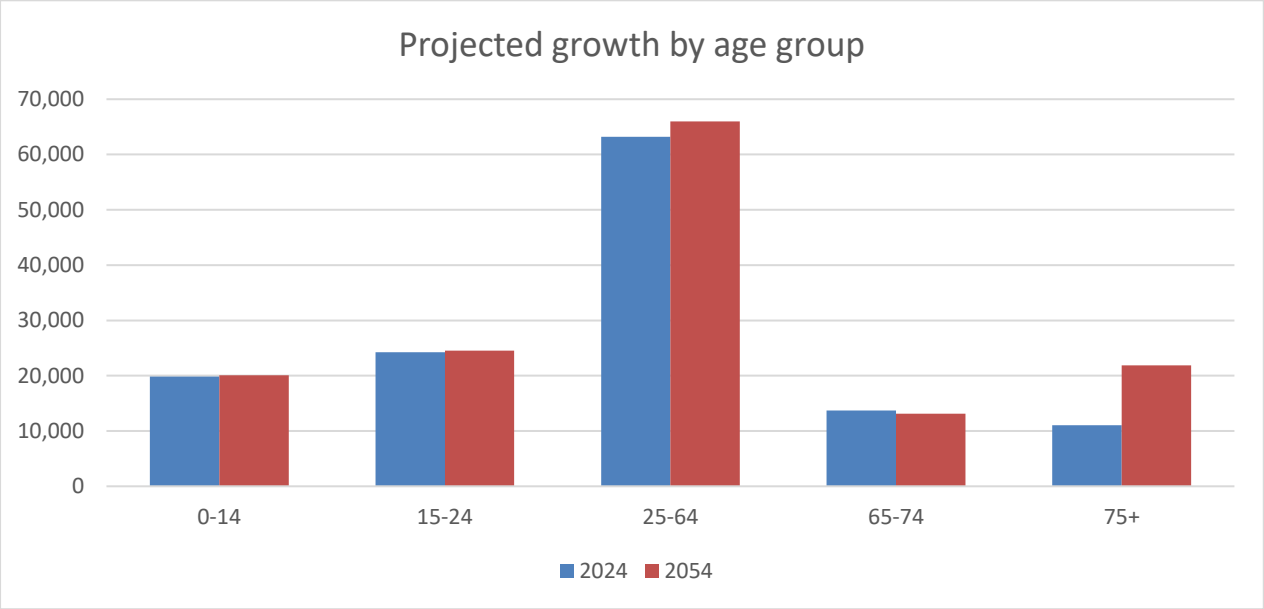

Figure 8: Population growth projections by age group 2024-2054

Previous household projections by Statistics New Zealand indicated that growth would be concentrated in one and two-person households due to an increase in 'empty nester' households. However, newer projections suggests that most growth will be families with children. There are a number of components within this trend:

- A decrease in one person households aged 15-69 offsetting a significant rise in one person households aged 70+
- A decrease in couple-only households aged 15-64 offsetting a significant rise in couple-only households aged 65+
- An increase in families with children where the children are adults aged 20-59 and looking after older parents
- An increase in people aged 15-24 staying at home rather than moving out

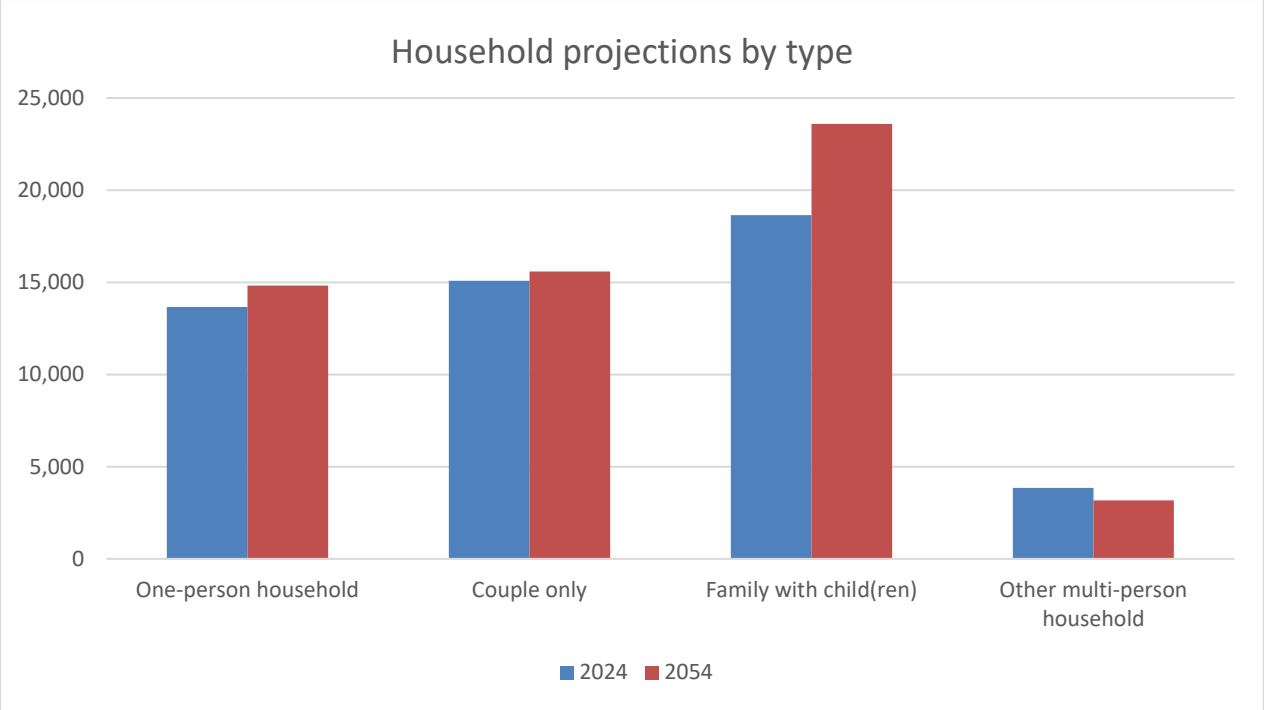

Figure 9: Projected changes in household composition

4.3 Housing preferences

Results of the housing preferences study suggest that there is still a predisposition towards standalone housing, particularly in younger couples and households with children. However, over 40% of older people living alone or with a partner would choose to live in an attached dwelling, such as a duplex, townhouse, or apartment. As these demographic groups are projected to increase, it is predicted to have a significant impact on future housing demand. Further work is required to assess housing demand by households with adults living with their elderly parents.

A comparison of preferred housing with Dunedin's existing housing stock shows that even before considering future growth and demographic trends, there are more standalone houses and less attached homes than needed to align with the preferences of Dunedin's current population. This is corroborated by recent development trends showing that most of the consented housing is for attached dwellings.

Table 5: Housing type preferences by household type

Catchment	One person households (aged <65)	One person households (aged 65+)	Couple without children (aged <65)	Couple without children (aged 65+)	Parent(s) or caregiver(s) with children	Other multi-person household	All households
Apartment	11%	7%	5%	9%	1%	3%	4%
Terraced house	23%	16%	6%	9%	13%	16%	13%
Duplex (aka semi-detached)	18%	20%	10%	27%	9%	13%	12%
Total attached	**52%**	**42%**	**21%**	**45%**	**23%**	**31%**	**30%**

Standalone house: 500m^2 section	45%	49%	51%	39%	49%	55%	49%
Standalone house: 2,000m^2 section	2%	9%	21%	9%	25%	11%	18%
Standalone house: 2ha section	2%	0%	6%	6%	3%	3%	3%
Total standalone	**48%**	**58%**	**79%**	**55%**	**77%**	**69%**	**70%**

The Housing We'd Choose survey showed that 31% of total households would choose to live in a two bedroom dwelling, 37% in a three bedroom dwelling, and 24% in a four bedroom dwelling. One and five bedroom dwellings were rarely chosen (3% and 6% respectively). However, anecdotally two bedroom dwellings make up a low proportion of Dunedin's current housing stock, reflecting the importance of enabling development of smaller dwellings.

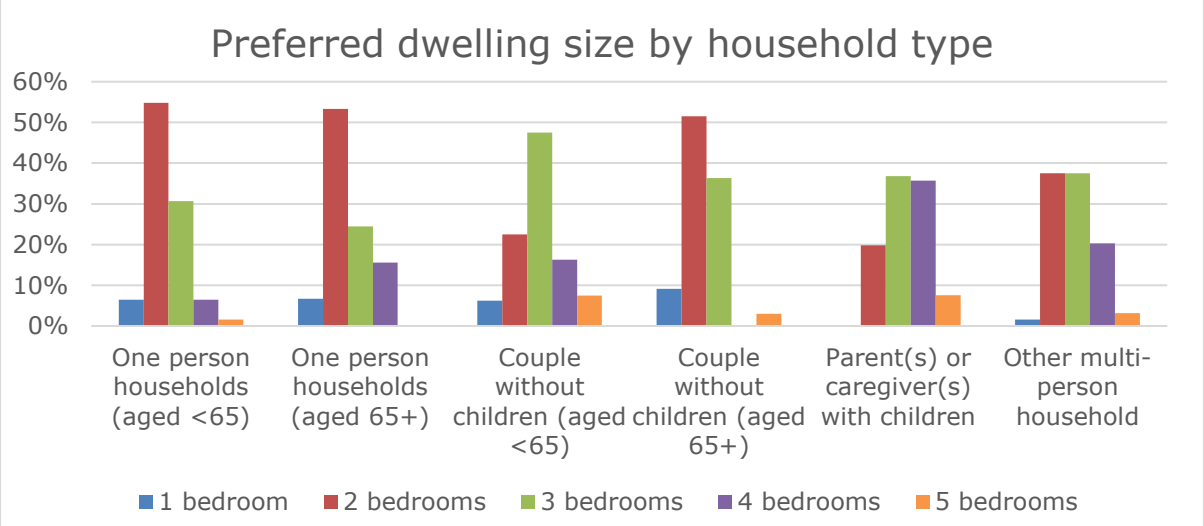

Figure 10: Preferred dwelling size by household type

The Housing We'd Choose study also revealed the preferred home locations of respondents. This showed a strong preference for inner suburbs (located close to the CBD) and outer suburbs, however there is significant variation between household types. Households aged 65+ are more likely (compared to the general population) to want to live in the inner city, South Dunedin, or Mosgiel. All three of these locations have good accessibility to services and amenities and are relatively flat, all of which are likely attractors to aging households.

Table 6: Housing location preferences by household type

Catchment	One person households (aged <65)	One person households (aged 65+)	Couple without children (aged <65)	Couple without children (aged 65+)	Parent(s) or caregiver(s) with children	Other multi-person household	All households
Inner city	11%	11%	3%	6%	4%	5%	6%
Inner suburbs	35%	33%	31%	24%	33%	38%	33%
South Dunedin	8%	7%	1%	12%	5%	8%	6%
Outer suburbs	34%	24%	34%	21%	34%	34%	33%
Mosgiel	10%	22%	21%	27%	12%	9%	14%
Outer urban area	2%	2%	10%	9%	12%	6%	9%
Total	***100%***	***100%***	***100%***	***100%***	***100%***	***100%***	***100%***

As outlined in section 2.1, there has been a significant shift in the composition of new homes since the Housing We'd Choose survey. While the survey suggested that 31% of total demand would be for attached homes, 66% of recently consented homes in the urban environment have been attached typologies, up from 24% in 2019. To reflect this trend, adjustments have been made to the composition of expected demand. The final approach balances the need to reflect current market conditions and a need to avoid putting too much weight on short-term trends. It achieves this by using the halfway point between the Housing We'd Choose findings (31% attached) and the current composition of building consents (66% attached). This equates to 49% of demand being for attached homes across the urban environment.

Household growth is converted into demand for different dwelling types using results of the housing preferences survey. For example, between 2028 and 2038, there is projected to be an increase of 815 one-person households aged 65+. The housing preferences survey estimated that 42% of these households would choose to live in an attached dwelling and 58% would prefer a standalone house. After applying the amendments outlined above to reflect changes in preferences since the survey, these rates would change to 60% attached and 40% standalone. Based on these proportions, the increase in one-person households aged 65+ translates to a demand for an additional 326 standalone houses and 489 attached dwellings. This process is repeated for each household type.

4.4 Results

4.4.1 Outline

The projected demand and need for new dwellings were calculated by combining projected growth and demographic trends with housing preferences data. Table 7 below outlines the overall assessed level of net dwelling demand over the short, medium, and long-term. This incorporates the required NPS-UD competitiveness margins of 20% of dwelling demand over the short and medium term and 15% over the long term. Sections 4.4.2-4.4.4 below provide further information on projected demand by housing type, location, and growth scenario.

Table 7: Growth in demand for dwellings

	2024-27	2024-34	2024-54
Additional demand	1,350	4,270	5,510
Additional demand + competitiveness margin	1,620	5,120	6,550

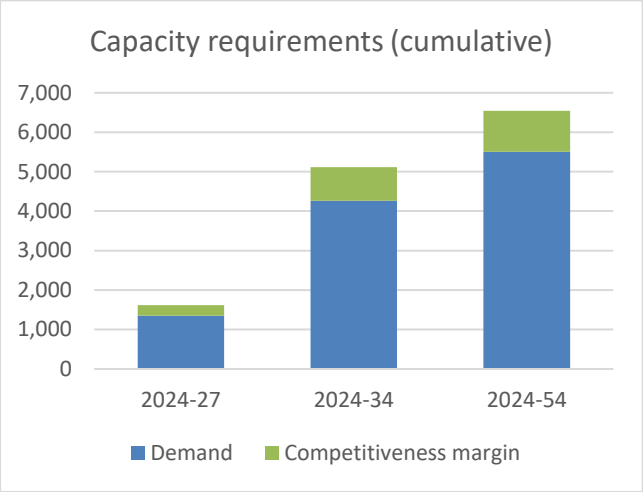

Figure 12: Capacity requirements (cumulative)

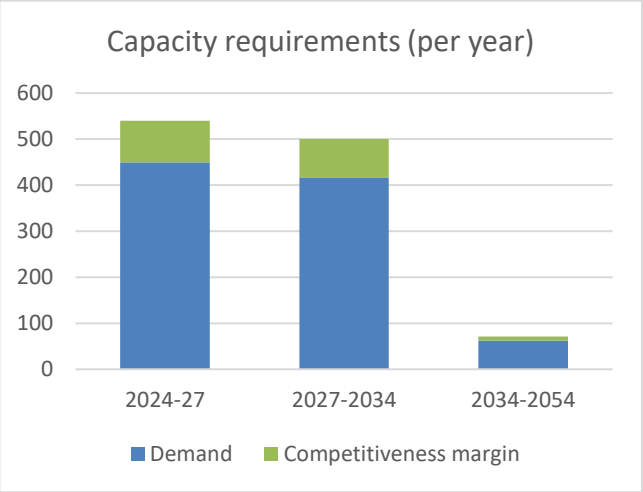

Figure 11: Capacity requirements (per year)

4.4.2 Demand by housing type

Demand for new dwellings is roughly evenly split between standalone (51%) and attached (49%) typologies. This is heavily influenced by the demographics of Dunedin's growth projections, although the growth in older single person and couple households aged 65+ is counterbalanced by an increase in intergenerational family households. This is a recent shift in projections of household composition and is being further explored by Council in a separate project.

Table 8: Projected net additional dwelling capacity required[12]

Dwelling type	2024-27	2024-34	2024-54
Standalone house	830	2,630	3,370
Attached units	790	2,490	3,180
Total	***1,620***	***5,120***	***6,550***

4.4.3 Demand by location

The projected geographic spread of long-term demand (Table 9) is reasonably broad, with high levels of demand in the inner suburbs, outer suburbs, and Mosgiel / Taieri. Conversely, projected absolute demand for the inner-city area is low. However, the growth in the inner city is expected to be the highest relative to the number of existing homes due to the low baseline.

[12] Including existing shortfall and NPS-UD competitiveness margins (15-20%)

Table 9: Projected capacity required by urban catchment

Catchment	Current dwellings	Additional capacity required (2024-54)
Inner city	800	420 (+53%)
Inner suburbs	21,310	2,170 (+10%)
Outer suburbs	14,930	1,850 (+12%)
Mosgiel / Taieri	6,810	1,440 (+21%)
Peninsula	3,130	360 (+12%)
North coast	1,320	300 (+23%)
Total	***48,300***	***6,550 (+14%)***

As discussed in Section 4.1.1, there is also significant overlap in demand between the urban catchments and spatial projections of demand should be seen as a guide rather than requiring any particular spatial pattern of growth.

4.4.4 Demand by growth scenario

Dunedin's growth over 2024-54 is projected to be low but there is significant uncertainty about the rate of change over that period. As shown in Figure 13, there is significant scope for Dunedin's growth to be considerably lower or higher than the adopted high-medium growth scenario. If growth is lower than expected, this can impact on the take-up of infrastructure upgrades and extensions, causing revenue and debt issues for Council. However, if growth is higher than expected, this can cause strain on Dunedin's housing stock, increase house/land prices, and impact on levels of service from DCC infrastructure. The impact of housing stresses would be most felt by lower income households and households who are currently renting and are less able to get into property ownership or meet their housing needs.

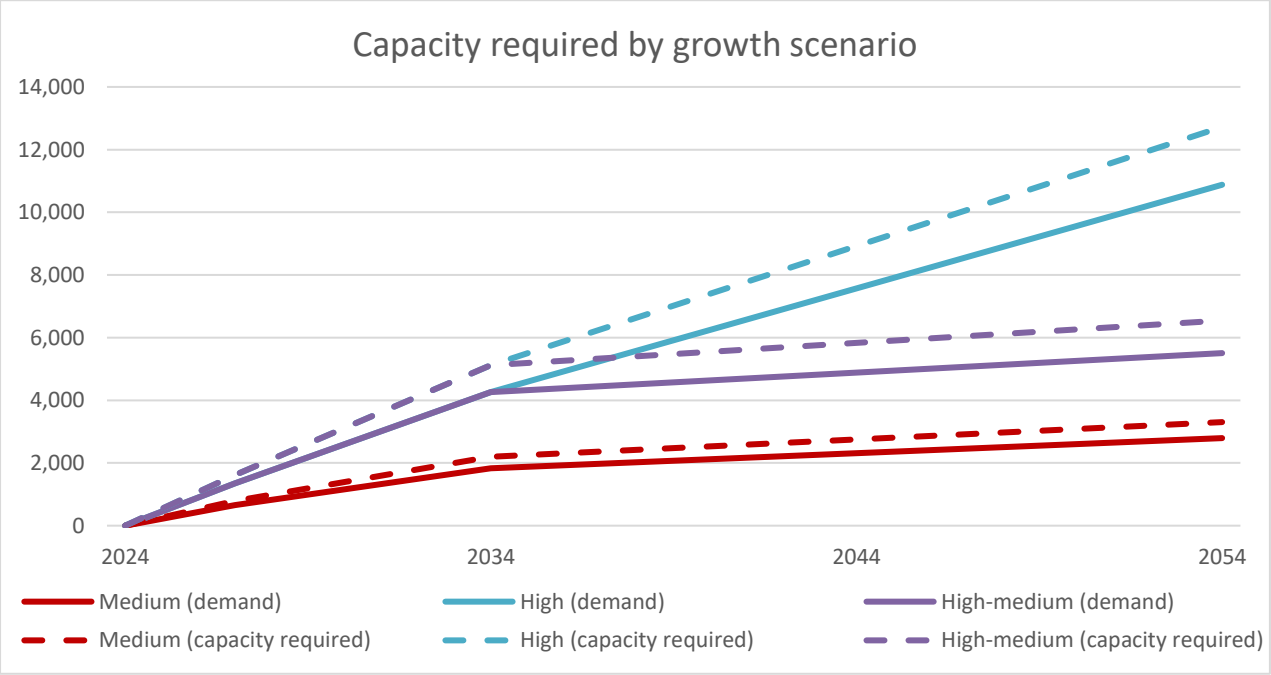

Figure 13: Capacity required by growth scenario

5 HOUSING CAPACITY

This section outlines the methodology and results of an assessment of housing capacity. This is compared in section 6 to the estimated housing demand to assess the sufficiency of modelled development capacity.

5.1 Methodology

5.1.1 Overview

Table 10 outlines the NPS-UD requirements for development capacity to be considered sufficient to meet expected demand for housing. This assessment undertakes these tests to determine development capacity.

Table 10: NPS-UD requirements for development capacity

Requirement	Description
Plan-enabled *NPS-UD 3.4*	Development capacity is plan-enabled for housing or for business land if: • in relation to the short term, it is on land that is zoned for housing or for business use (as applicable) in an operative district plan • in relation to the medium term, either paragraph (a) applies, or it is on land that is zoned for housing or for business use (as applicable) in a proposed district plan • in relation to the long term, either paragraph (b) applies, or it is on land identified by the local authority for future urban use or urban intensification in an FDS or, if the local authority is not required to have an FDS, any other relevant plan or strategy. … land is zoned for housing or for business use (as applicable) only if the housing or business use is a permitted, controlled, or restricted discretionary activity on that land…
Infrastructure-ready *NPS-UD 3.4(3)*	Development capacity is infrastructure-ready if: • in relation to the short term, there is adequate existing development infrastructure to support the development of the land • in relation to the medium term, either paragraph (a) applies, or funding for adequate infrastructure to support development of the land is identified in a long-term plan • in relation to the long term, either paragraph (b) applies, or the development infrastructure to support the development capacity is identified in the local authority's infrastructure strategy (as required as part of its long-term plan).
Feasible and reasonably expected to be realised *NPS-UD 3.26(1)*	For the purpose of estimating the amount of development capacity that is reasonably expected to be realised, or that is both feasible and reasonably expected to be realised, local authorities: • may use any appropriate method; but • must outline and justify the methods, inputs, and assumptions used to arrive at the estimates.
Meet the expected demand plus the appropriate competitiveness margin *NPS-UD 3.22(2)*	Specified competitive margins are 20% for the short and medium term, 15% for the long term

A GIS model has been developed to assess the capacity of each residentially zoned property in the Dunedin urban environment. This model allows for analysis to be easily repeated with different inputs to allow for scenario testing, sensitivity testing, and regular updating of results.

It is a three-part model that firstly evaluates plan-enabled capacity, then the economic feasibility of those plan enabled developments, and finally estimates likely take-up over time of the plan enabled, commercially feasible developments.

Property data is combined with other datasets to form the main input into the model (section 5.1.2). The plan-enabled capacity model assesses what can be built after site constraints and District Plan restrictions are taken into account and allows consideration of up to 42 development options per site with a range of unit sizes, yields, and development types (section 5.1.3). The second part of the model assesses the costs and revenue associated with each development option and determines the most profitable for properties in residential zones (section 5.1.4). Those that would give a developer an acceptable rate of return are counted as feasible development capacity. A range of property-level and city-level take-up assumptions are then applied to ensure the overall assessed capacity for residential zones is reasonably expected to be realised (section 5.1.5).

For properties in Commercial and Mixed Use (CMU) zones, a 'contemporary development scenario' approach is used, similar to what has been done elsewhere in New Zealand (section 5.1.6). Under this approach, existing nearby developments are used to assess what is economically feasible due to their previously proven developability. This is considered more appropriate than assessing the costs and revenues associated with mixed-use developments, as these can be diverse and difficult to accurately assess. This approach is also relatively conservative, as it implicitly assumes that likely scale of development would not substantially change over time in those environments.

Where upcoming developments are known, these have been manually incorporated into the model. This includes updating profitability where there are strong indications that landowners will develop, updating yield where draft development plans have been communicated to DCC, and updating the probability of take-up where developments are reasonably expected to come on-stream in the near future.

5.1.2 Preparation of property data

Two parcel layers are used in the model, both based on an existing GIS layer of rating valuation parcels. Additional spatial information is added to the parcels, such as the relevant development contribution catchments, statistical areas, District Plan zones and overlays, mean slope, and aspect.

Where adjacent properties are owned by the same owner/s and have the same zoning, the properties are merged. This allows for a better assessment of comprehensive redevelopment capacity, which can be more feasible when sites are amalgamated. This method relies on the ownership being under the same name and may not capture all properties, for instance where they are held by different companies which share the same ownership or parent company.

Parcels that are smaller than 100m^2 or have complex ownership arrangements (such as cross-leases and unit titles) are removed. While the latter make up a significant portion of CBD properties, these generally have multiple owners, making redevelopment relatively unlikely, at least in the short-medium term.

Where zone boundaries (or transitional zone overlays) diverge from property boundaries, parcels are split at the zone boundaries and treated as separate sites. This is consistent with the 2GP definition of 'site'.

Portions of sites with a slope of 30° or greater are removed from the analysis due to the difficulties associated with developing steep land. This was informed by a review of consents for new housing, which showed that only a small number of homes were consented on land over 30°.

Once this data is collated, a property layer is created for testing infill developments. This layer removes parts of properties than contain buildings or structures larger than 50m^2. Parcels (or areas of parcels) that would subsequently be too small (less than 100m^2) or too thin (less than 10m wide) to develop are removed.

5.1.3 Plan-enabled capacity

Assessment of District Plan restrictions

District Plan provisions have been incorporated into the model where they are likely to impact on the likelihood or potential scale of development. Sites that are within a transition overlay zone are modelled according to their potential future zoning but separated out at the end of model to match the NPS-UD reporting requirements.

Sites are classed as undevelopable if they are:

- subject to a District Plan designation
- used for purposes that are unlikely to change (utility services, community services or recreation)
- not zoned for residential uses (only parcels zoned Residential or certain Commercial and Mixed Use zones are assessed).

The model presumes that there will be no demolition of protected heritage buildings or structures. Infill capacity is still tested for these sites.

Parts of sites are deemed to be undevelopable where they are within:

- scheduled heritage sites
- national electricity grid setbacks
- high risk hazard areas (Hazard 1 overlays, mapped swales, and mapped dune systems)
- the approximate driplines of scheduled trees.

District Plan standards relating to development and land use density are applied to each site. These include:

- maximum site coverage
- maximum number of units and bedrooms
- maximum height and number of floors.

Setbacks from road and parcel boundaries are also removed from the area of sites deemed to be developable. Sites that are larger than 5,000 m^2 are classed as greenfield sites. It is presumed that, if subdivided, 30% of these sites would be required for roading, stormwater mitigation, and landscaping.

Finally, parts of potential building footprints that are too thin to be built on (less than 8m wide) are removed, along with any building footprints less than 70m^2.

The output of this stage is a spatial layer that represents areas within sites that could contain buildings and carries a range of attributes for the next modelling step, including the maximum floorspace that could potentially be developed on each site.

Residential zone development assumptions

After assessing the maximum floorspace for each residentially zoned site, the model converts this into a range of development options. A 'standard' development option is created using the median

floorspace of recent new dwellings within the same suburb[13] and analysing how many dwellings of that size would fit within the developable floorspace and be permitted under District Plan density standards. The model then creates a range of alternative development scenarios using different yields and dwelling sizes. Dwelling size options range from 50% to 150% of the standard size and yield options include 25%, 50%, 75%, or 100% of total permitted yield (with lower yields including larger section sizes). A development option that utilises the maximum permitted floorspace is also tested.

Once the different development options have been created, the model categorises the developments as either standalone or attached housing. Developments are classified as attached housing if:

- The land is zoned Commercial and Mixed Use
- Subdivision relies on duplex developments (i.e. goes down to 1 lot per 250m^2 in General Residential 1 or reticulated Township and Settlement areas)
- Multiple units are being developed and there is less than 200m^2 of land per unit
- Multiple units are being developed, have less than 80m^2 of floorspace, and there is less than 400m^2 of land per unit
- There are at least 20% more dwellings than parcels being developed

The undeveloped site area for each development option is assessed to ensure that there is adequate space for carparking and outdoor living space. While minimum carparking requirements have been removed from the 2GP (to comply with NPS-UD requirements), most developments are still providing carparks to meet market demand.

Yield validation

Modelled yields were compared to recent subdivisions to assess the accuracy of the model. For each development, the ratio of modelled yield to subdivided yield was calculated. For instance, if the model suggested a site would be developed with 10 lots and a subdivision was received for 7 lots, it would have a ratio of 1.41 (10 divided by 7). In other words, the model would have overestimated capacity by 41%. Across all subdivisions granted between June 2022 and February 2023 with corresponding model data, the median modelled-subdivided ratio was 1.1[14]. This is shown in Figure 14 below.

[13] For the purposes of the model, suburbs are defined using Statistics New Zealand's 2018 Statistical Area 2 classification.

[14] This excludes developments where less than 20% of the modelled yield was subdivided, as these are likely to be precursors to full subdivision.

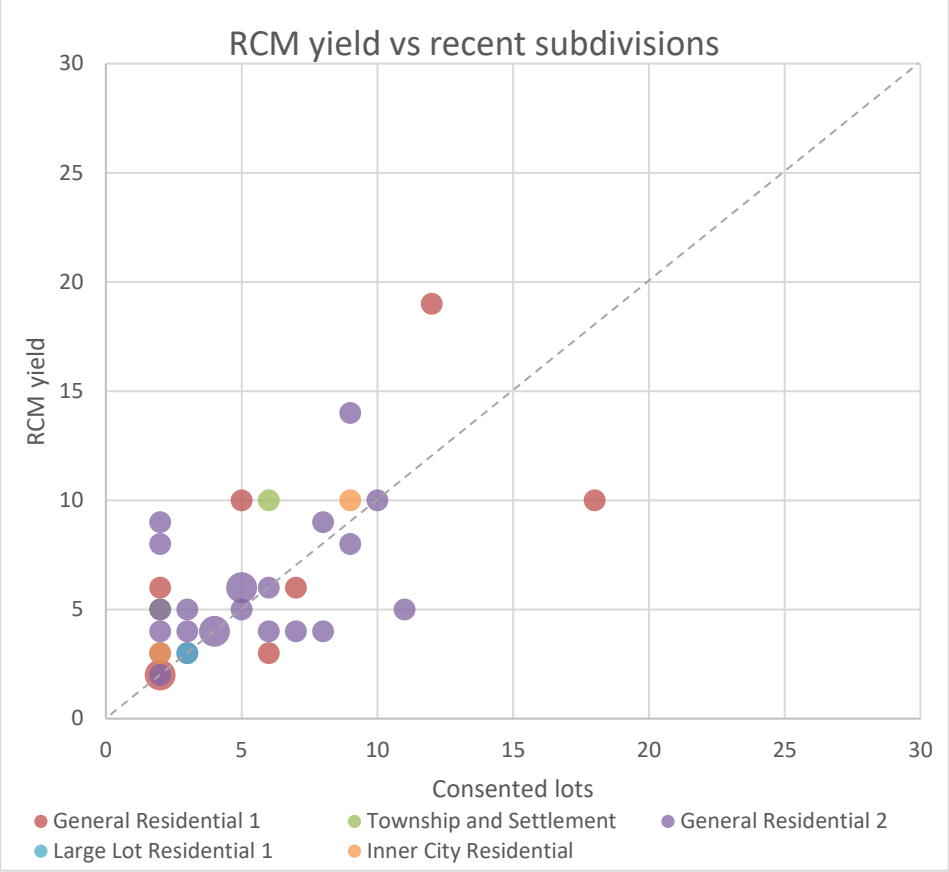

Figure 14: RCM modelled yield vs recent subdivisions[15]

Further to this assessment, a comparison has been undertaken for large subdivisions for which consent has recently been lodged, a pre-application meeting has been held, or preliminary information is available. The largest six developments of these are anticipated to have a total yield of 1,110 lots. The residential capacity model results for these six sites show an anticipated yield of 996 lots, representing a 10% underestimate of capacity. This is considered to be a relatively close comparison with an appropriate level of conservatism built into the model results.

5.1.4 Development feasibility for residential zones

Revenue

For sites zoned Residential, the potential revenue of each modelled development option is calculated based on the number of dwellings and estimated sale price of each new dwelling. For infill developments, it also includes the value of the existing dwellings. The sale price of new dwellings is estimated by separately calculating the land value and improvement value associated with the modelled dwellings.

Modelled land value is based on valuation data of existing dwellings in Dunedin, combining information on the particular suburb, slope, aspect, and property size. This involves:

- Applying a logarithmic equation to calculate the value of the land based on the total land area (Figure 15)
- Applying a multiplier based on the difference between the median land value of flat 400-1,000m^2 sites within the relevant suburb compared to the citywide median

[15] Two developments fall outside the graph boundaries. One had a modelled yield of 71 homes and a subdivided yield of 52 homes, while the other had a modelled yield of 199 homes and a subdivided yield of 14 homes. However, the subdivision for this latter site only related to a small proportion of the total site, with the remainder containing further subdivision potential.

- Applying a multiplier based on the median land value of sites with a similar slope/aspect combination relative to flat north-facing sections

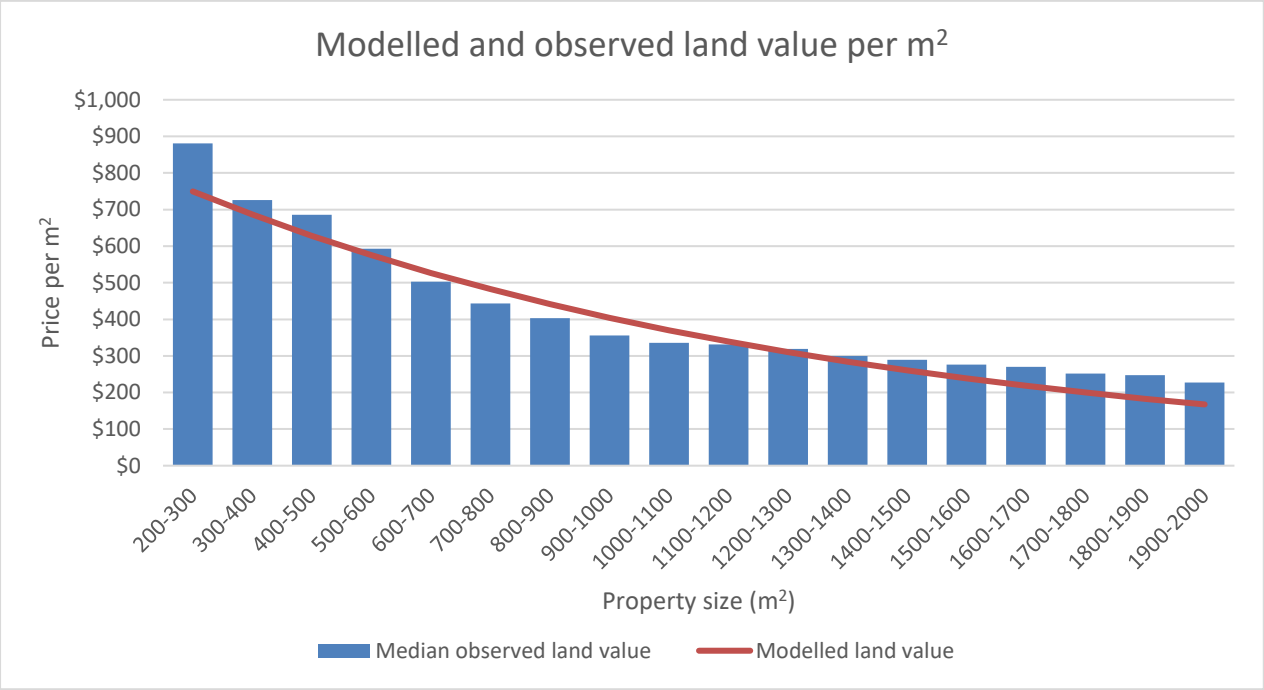

Figure 15: Modelled and observed land value per m2

The modelled improvement value is based on rateable values of similar dwellings in Dunedin, taking account of the total floorspace. A multiplier is also applied to reflect the current difference between rateable values and sale values.

Purchase price

The modelled purchase price of sites is based on their capital value multiplied by the current average difference between residential sale prices and capital values. This data comes from QV sales data from the last three months[16]. Where parcels are split by zone or transitional zone overlays, the model estimates the value of each portion based on the zoning and size.

Development costs

Construction costs are based on a rate per square metre. This rate varies between small and large developers to take economies of scale into account. Construction costs were derived from building consent data for new homes over 2021-22.

Other development costs incorporated into the model include subdivision costs, site preparation, and professional fees. The costings were predominantly developed by Flanders Marlow, a local quantity surveying company, for the Dunedin City Housing Capacity Assessment 2019. They were then refined through discussions with developers and analysis of recent developments. To incorporate changes in development costs since 2019, these costs were increased by 9.17% per annum. This reflects the increased construction costs observed in building consent applications, as there is no direct data on changes to related development costs. Increasing them using the change in construction costs is considered a conservative approach in comparison with the alternative of using the more general inflation rate measured by the consumer price index.

The cost of financing is incorporated for each development cost based on the timing that the cost is incurred. For instance, it is assumed that roading costs are incurred 25% of the way through greenfield projects. For large greenfield projects with an assumed three year development

[16] https://www.qv.co.nz/property-trends/residential-sales-prices

process, this would mean that the cost is incurred nine months into the project and financing is required for the remaining 27 months (until properties are sold). It is assumed that 50% of costs are covered by financing and the remainder is covered by existing capital. Contingency costs are built into the assumptions for each individual cost.

To check whether the final modelled development costs were appropriate, the costs for a range of sites were compared to an alternative approach developed by the Ministry of Building, Innovation and Employment and Ministry for the Environment for the price-cost ratios under the NPS-UDC. This alternative approach is based on using building consent data to estimate construction costs and incorporating a 30% buffer to reflect additional costs not covered by building consent estimates, such as consultant and legal costs. The costs estimated in the residential capacity model (RCM) approach almost always exceeded the costs under the building consent approach. The RCM approach was consequently retained as a conservative approach to estimating development costs.

Once the revenue and costs are calculated, the model assesses the overall profitability of the development option. For most developments, a 20% return on investment is deemed to be the threshold for a development to be economically feasible. This is the rate that many financers require developments to demonstrate when applying for finance, to provide a safety buffer against failed developments. However, developments of single unit dwellings are considered feasible if revenue outweighs cost, regardless of profit margin. An assessment of Dunedin building consents and discussions with developers have highlighted that these developments are usually done by either owner/occupiers or 'one-man-band' type builders whose profit is included in the construction costs.

To more accurately reflect their different economic drivers compared to other developers and home builders, specific economic feasibility tests are applied for existing landowners developing infill sites. The approach is modelled on the methodology developed by Property Economics for Wellington City Council[17] and uses existing property values to determine the profit margin for these developments instead of total development costs. It also excludes the existing property value from the development costs since the property does not need to be purchased. However, the impact of the development on the value of the existing dwelling is factored into the assessment. Where the profit is at least 20% of the value of the original property, the development is deemed to be feasible. For example, if a property was worth $500,000 and had infill potential, the development of that infill potential would be considered feasible if it resulted in a profit of at least $100,000. This test of economic feasibility is not intended to factor in whether households would take up infill capacity, only whether they would make sufficient money for it to be financially attractive. While there is overlap between the amount of potential profit and the likelihood that households would develop available land, there are also other non-financial factors that are incorporated through the take-up rates, as discussed in section 5.1.5.

The final stage of the model compares the profitability of all development options per site and removes all except the most profitable option. Where the model indicates that there is a citywide surplus of feasible capacity for a certain housing type (standalone/attached) and a deficit in the other, the less profitable alternative may be chosen to reflect overall market demand, presuming that the alternative meets the overall profitability tests (for instance a 20% profit margin).

Future feasibility

The economic feasibility of developments can be very sensitive to changes in development costs and sales revenue. The key factors have different long-term trends which, when combined, generally make developments more feasible over time. In particular, land values usually increase faster than construction costs over long timeframes. In addition, the land value of existing built sites generally increases faster than improvement value. Both trends make development and/or

[17] Wellington City Commercially Feasible Residential Capacity Assessment, Property Economics (May 2019)

redevelopment of sites increasingly feasible over time. While the NPS-UD requires feasibility for short and medium term capacity to be based on the current relationship between costs and revenue, it allows for 'any reasonable adjustment to that relationship' for assessing long-term feasibility. The reasoning behind adjusting land value and other cost and revenue assumptions is outlined in a Market Economics commentary on previous NPS-UDC requirements[18].

The capacity methodology applies long-term economic trends from 1995-2022. This reflects a 27 year period that includes multiple property cycles. The long-term trends used in the model were:

- 8.0% average annual increase in land values[19]
- 5.0% average annual increase in existing property improvement values[20]
- 6.2% average annual increase in new property improvement values[21]
- 5.1% average annual increase in construction and development costs[22]

Sensitivity analysis was also undertaken to test the impact of removing these long-term assumptions.

5.1.5 Rate of uptake for residential zones

Context

The amount of feasible capacity that is reasonably expected to be realised (i.e. actually developed) over a particular timeframe is a subset of total feasible capacity. There are many factors that impact on whether capacity will be taken up, such as personal attachment to land, developer preferences, access to credit, level of demand, and propensity for risk. Take-up will also include some capacity that is identified as infeasible in the RCM, due to developer behaviour differing from the modelled assumptions, non-market developments, or the high-level nature of the model.

Take-up rates were previously incorporated into the initial housing capacity assessment by applying a 20% buffer to short and medium-term demand and a 15% buffer to long-term demand. However, the NPS-UD has changed the purpose of those buffers to reflect the benefits of an over-supply of feasible capacity on allowing for choice and competitiveness in housing markets and being resilient to potential demand shocks. The NPS-UD requires take-up to be incorporated separately.

Options

After discussions with other local and central government staff involved in residential capacity modelling and a review of NPS-UD provisions, four potential approaches to incorporating take-up rates were considered:

1. Assess historic take-up rates and project these into the future at a city-wide level.

   Example: There has been an average net increase of 133 dwellings per year from brownfield developments, so that could be projected forward over the long-term.

   Benefits: Relatively simple to calculate and communicate.

   Costs: Doesn't consider whether there is sufficient development capacity for the historic rate to be sustained. Does not account for changes in regulatory settings or demand. Doesn't consider connection between demand and supply.

[18] NPS-UDC: Current Feasibility Provisions Discussion Paper, Market Economics (July 2018)
[19] The compound annual growth rate over 1995-2022, based on DCC rating valuation data
[20] The compound annual growth rate over 1995-2022, based on DCC rating valuation data
[21] Provided by Formative as part of peer review
[22] The average rate of increase over 1995-2022, based on building consent data

2. Assess the probability that feasible developments will be taken up and apply that probability to feasible capacity on an individual development basis.

   Example: Presume that each potential feasible development has a 10% chance of being taken up in any given year.

   Benefits: Links into the amount of feasible capacity available.

   Costs: Significant assumptions required to determine appropriate take-up rates. Doesn't account for the impact of total capacity on the development probability for individual properties.

3. Use assumptions in the assessment of plan-enabled and feasible capacity that reflect actual developer behaviour rather than what's enabled.

   Example: Presume that new subdivisions are undertaken at the same density as recent subdivisions in their respective area, regardless of whether a greater yield could be achieved.

   Benefits: May produce more realistic results over the short-term.

   Costs: Can't be used to assess the likelihood that landowners may choose to not sell or develop their land. Presumes that developers will continue to operate in the same way they have in the past, regardless of changes to planning provisions, market forces, etc.

4. Contact owners of land with development capacity to enquire about their intentions.

   Benefits: Provides relatively accurate data for individual developments.

   Costs: Works well for larger greenfield sites but would be too resource-intensive to apply to the large amount of smaller development opportunities. Assumes respondents are willing to share plans with Council.

Adopted approach

Take-up rates have been incorporated into the updated RCM using aspects of all four methods described above. The RCM uses observed development behaviour instead of maximum standards in areas where these diverge (e.g. the height of new developments in the CBD). As development behaviour changes over time, these assumptions will be reviewed regularly so that capacity modelling can be updated as changes occur. The RCM also incorporates knowledge of development intentions where these are known. Calibration of model results was undertaken by comparing recent developments with the modelled yields and feasibility results for the same sites.

While large greenfield developments could theoretically build to a net density of 40 dwellings per hectare (250m^2 per site) under the proposed rule changes, this is considered unlikely to occur in a wholesale manner. Lower yields are likely due to site/layout constraints, risk aversion, and access to capital. To factor these in, the capacity model presumes that no more than half the lots in greenfield developments would have duplexes. Lower yields are also assessed to determine the most profitable development scenario, rather than the model presuming that the option with the highest yield is chosen by developers.

To reflect that not all feasible developments will be taken up, development probabilities are applied to the feasible capacity. The net additional number of consented homes from January 2019 to December 2022 within each development type (greenfield, brownfield) was compared to the feasible capacity identified for each respective year. This roughly identifies the proportion of development capacity that can be expected to be developed in any given year. This results in an average annual take-up rate of 3.4% for brownfield capacity and 3.7% for greenfield capacity. This equates to a 29-31% chance that a feasible development would proceed in a 10 year period.

The recent change in development potential that has been enabled by 2GP may well result in higher take-up rates than observed in the last decade. The new planning framework allows

greater intensity in both greenfield and brownfield areas, which may increase the benefits that accrue to landholders and encourage a higher take-up rate in the future.

Ideally, a longer period of data would be used to assess take-up to ensure the rates are not significantly impacted by market and development fluctuations. However, decisions on the 2GP were only released in November 2018 and previous capacity modelling did not include feasibility. This makes any assessment of historic take-up rates incomparable with current model results.

The take-up rates identified apply for the relationship between demand and feasible capacity during the related time period. If the amount of feasible capacity increased or decreased, it would be reasonable to assume that the take-up rate would change accordingly. For instance, a ten-fold increase in feasible capacity would be unlikely to result in a ten-fold increase in homes being built, due to demand limits, construction sector constraints, etc. Ideally this would be incorporated into the model; however, there is no applicable empirical data that could be used to assess how take-up rates would change. To address this issue, future take-up will continue to be monitored and used to update the assumptions in the RCM.

It is assumed that non-vacant properties that are zoned Township and Settlement or General Residential 1 and smaller than 2,000m^2 would not be subject to multi-unit developments. This is a new assumption based on monitoring of development trends. Monitoring will continue as the density changes made through Variation 2 bed in and the assumption will be reviewed in the next housing capacity assessment.

5.1.6 Commercial and mixed-use zone development assumptions

For the commercial and mixed use (CMU) zones, capacity is assessed based on development of vacant or mostly vacant[23] sites and the full redevelopment of sites with existing buildings. No assessment of capacity is undertaken for undeveloped space on properties with existing buildings. Most of this space is used for car parking and other activities related to the functioning of the built component. However, these activities may be temporary or represent an underutilisation of the land, in which case development is likely to occur at some point. As such, the approach taken in this model is conservative and may underestimate total capacity.

To ensure that modelled developments reflect realistic possibilities within specific areas, site coverage and building height are limited to the upper quartiles of existing buildings within the same zone. The model then allocates floorspace based on percentages of expected land uses, as shown in Table 11 below. These percentages estimate the zone-wide distribution of floorspace rather than the allocation of floorspace for individual buildings. The ratios were developed through an assessment of District Plan policies and existing land uses recorded in the DCC rating database.

While the CMU assumptions reflect a realistic view of capacity in the short-medium term, the likely scale and nature of development is less certain over the longer term and they may result in a conservative assessment of long-term capacity. These assumptions will be reviewed with each subsequent review of the Housing Capacity Assessment.

Table 11: New development floor use allocation by CMU zone

Zone	Ground floor				Upper floors			
	Residential	Office	Industrial	Retail / other commercial	Residential	Office	Industrial	Retail / other commercial
CBD		20%		80%	50%	50%		

[23] 'Mostly vacant' is defined as having buildings covering less than 10% of site area.

Zone	Ground floor				Upper floors			
	Residential	Office	Industrial	Retail / other commercial	Residential	Office	Industrial	Retail / other commercial
Warehouse precinct		40%		60%	50%	50%		
Princes, Parry and Harrow Street	50%		50%		100%			
Smith Street and York Place	50%			50%	100%			
Harbourside Edge			50%	50%	80%	20%		
Trade related			50%	50%				
CBD Edge Commercial			25%	75%				
Centres		10%		90%	50%	50%		

Once developments have been modelled, high-level feasibility tests are applied. Comprehensive redevelopment[24] of sites is only deemed feasible where the improvement ratio is 0.34 or lower and the value of improvements is less than $1m. These values were derived from past redevelopments in Dunedin's commercial zones[25]. The improvement ratio reflects the value of improvements relative to the total value of a property and is a common indicator of underutilisation of land. All developments on vacant sites are assumed to be feasible if the vacant site is held under an existing standalone legal parcel (i.e. is not legally attached to another property).

The assessment of CMU zones includes both residential and business capacity, however only the residential portion of results is discussed in this report. Business capacity will be discussed in the Business Land Capacity Assessment.

5.1.7 Development sector input

Dunedin City Council regularly engages with people with expertise and experience in the development sector through various planning processes. In addition to feedback received from that ongoing engagement, this assessment has been informed by engagement undertaken over May-June 2023 with planners, surveyors, and developers. Key areas of feedback from this engagement included:

- A common view that Dunedin is likely to experience an upturn in development activity around the end of 2023 as confidence in the housing market returns.
- Agreement that considering the Taieri Plain separately to the rest of the previous 'Outer Urban Area' catchment would be worthwhile. However, there were conflicting views on whether Mosgiel should be included in the Taieri catchment. One surveyor felt that the greenfield land surrounding Mosgiel would be within the same market as land in Outram or Allanton.

[24] 'Comprehensive redevelopment' refers to the demolition of existing buildings and redevelopment of the resulting vacant site.
[25] Properties which were redeveloped had a median improvement ratio of 0.33 immediately prior to development occurring.

However, others felt there were arguments both ways and that some people would prefer Outram/Allanton/Momona due to the heightened isolation from urban Dunedin and greater proximity to workplaces in the surrounding rural area or Clutha District.

- There were various views around consideration of slope, including:
  - The removal of land greater than 30° being appropriate
  - Land greater than 30° being sometimes developable and feasible but less likely to be taken up
  - A consensus that incorporating the impact of slope on development costs and revenues is important
  - A view that the model should include reduced yields for steeper sites.
- A common view that the 2GP standards incorporated into the model (particularly bulk and location, setbacks, and density standards) are the key ones for determining development capacity. However, it was pointed out that building recession planes in the Inner Residential zone are occasionally constraining development opportunities. The requirement for houses that have an upstairs living space to have a 15m^2 deck was also identified as problematic.
- A common view that the current high levels of attached development may be due to a backlog of these housing options and may reduce or change over time. Certain aspects of the attached home market may be reaching saturation (such as one bedroom houses in Mosgiel and attached homes aimed at investors) but others may continue to increase (particularly attached homes aimed at first home buyers).
- Concerns were raised around accessibility issues for multi-storey townhouses for elderly residents, however floor designs often allow for lift retrofitting and some high-end developments in St Clair and Māori Hill are being specifically aimed at downsizers.
- A consensus that the model is correct to remove 30% of greenfield land for roading, stormwater management, and landscaping.
- A common view that there will soon be more duplexes being developed as part of greenfield subdivisions as well as in existing suburbs, particularly existing 1,000-1,500m^2 sites.
- A common view that Dunedin's suburbs often contain small properties that are difficult to develop. Buying and amalgamating adjacent sites is helpful, but not always possible. One developer stated that they generally attempt to do so, but do not rely on it to make developments feasible.
- A consensus that infrastructure provision is a key constraint and (often unknown) cost when looking at developing sites. This is mostly relevant for three waters infrastructure, but also true for transport and electricity infrastructure.
- A consensus that carparking is still usually in demand and being provided despite removal of the carparking standards. An exception is on sites where carparking and access is unable to meet 2GP standards (particularly for steep Inner Residential sites), where carparking may be foregone despite the impact on sale prices.
- A view that Brockville would be likely to get a large amount of medium density development in the $500-600k range if rezoned to General Residential 2.
- A consensus that the 20% profit margin test used to determine feasibility is correct, as it is the rate that banks require for funding.
- For medium density developments, one developer calculated feasibility based on whether a 5% rental yield could be accomplished, working back from there.
- A view that there is significant demand for 75-85m^2 homes.
- A common view that finance is often a large hurdle for some developers, particularly those who have recently started out. However, there is a significant variation between developers due to differences in capital availability and approaches to financing.
- A consensus that the development costs used in the model seem generally appropriate.

- A total cost per m^2 of floorspace, incorporating all costs, was provided for medium density developments. This was tested for model outputs and matched up very closely with model results.
- A greenfield developer provided example costs for land and development costs per unit from their developments. These were compared with model outputs and matched up very closely.
- A consensus that two standalone units on a $500m^2$ site would be preferable to a single duplex, as two standalones would allow for better design for solar access, sell for a higher price (with similar costs) and still leave plenty of outdoor space under 2GP standards.
- A common view that covenants are often an issue that restricts good development.
- A view that land-banking of large greenfield sites is an emerging problem for the Dunedin market.
- A view that increasing development costs, decreasing sale prices, and steady land purchase prices means that profit margins are dropping, but developments are still feasible. Profit margins were much higher in recent years than required for developments to be feasible.
- A view that developments that include space for elderly parents are becoming more prevalent. This includes both detached family flats and larger homes that include semi-independent spaces for parents. These may include two kitchens and laundries and are effectively duplexes. As such, they require a fire wall, which increases costs and needs to be factored into design.

5.2 Results

5.2.1 Overall housing capacity

The results from the model show an estimated capacity for an additional 5,550 feasible dwellings that are reasonably expected to be taken up over the next 10 years (Table 12).

Table 12 below outlines Dunedin's development capacity broken down by assessment step. This shows that a relatively small proportion of plan and infrastructure-enabled capacity is feasible to develop, with a smaller amount being reasonably expected to be realised. All other results in this section reflect capacity that is plan-enabled, infrastructure-enabled, feasible, and reasonably expected to be realised. Results are rounded to the nearest 10, which may result in totals not matching.

Table 12: Residential capacity results

Type	Short-term (2024-27)	Medium-term (2024-34)	Long-term (2024-54)
Plan-enabled capacity	108,050	108,050	109,990
Plan-enabled and infrastructure-enabled capacity	108,050	108,050	109,990
Plan-enabled, infrastructure-enabled, and feasible capacity	15,150	15,150	53,520
Plan-enabled, infrastructure-enabled, feasible, and reasonably expected to be realised capacity	2,200	5,550	22,870

As outlined in section 5.1.4, the long-term capacity results incorporate an assumption that long-term economic trends (changes to construction costs, house prices, etc.) will continue. If these trends are disregarded, there would be capacity for 10,290 homes over 2024-54.

Figure 16 shows the areas of medium-density zoning (General Residential 2 and Inner City Residential) and high-density zoning (Commercial and Mixed Use). Figure 17 shows areas above 1 hectare with greenfield capacity.

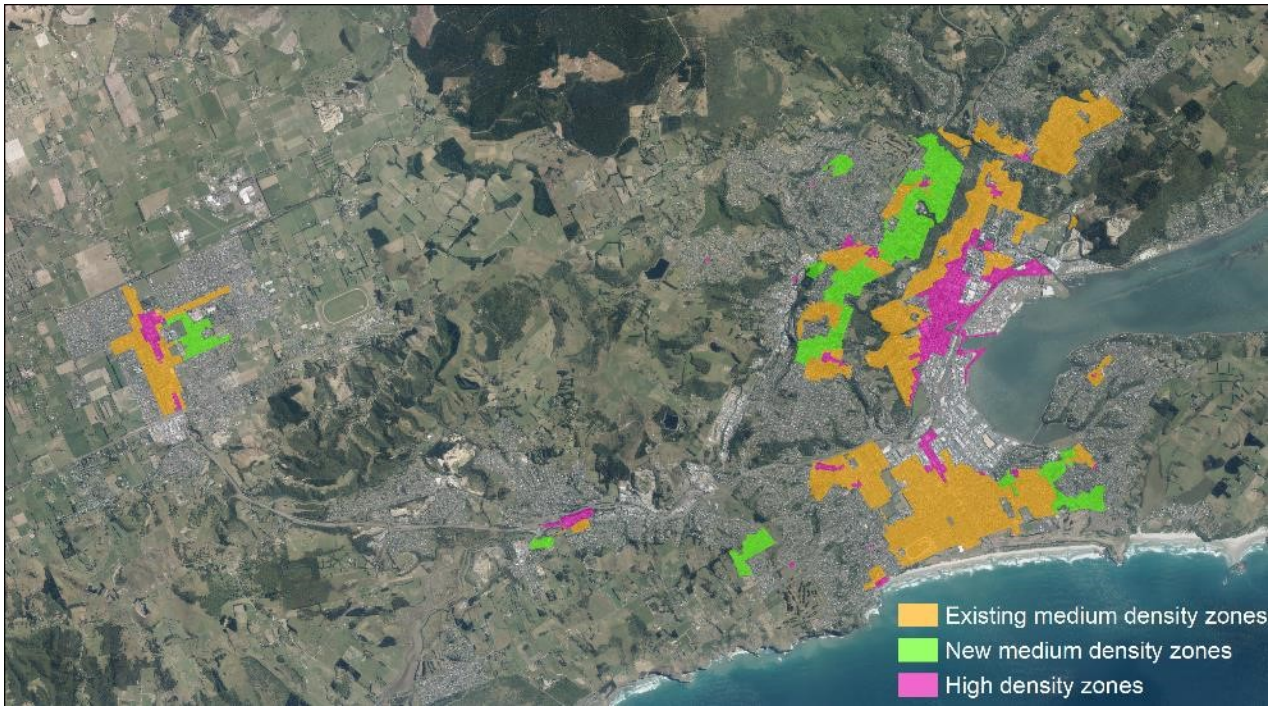

Figure 16: Medium and high density areas

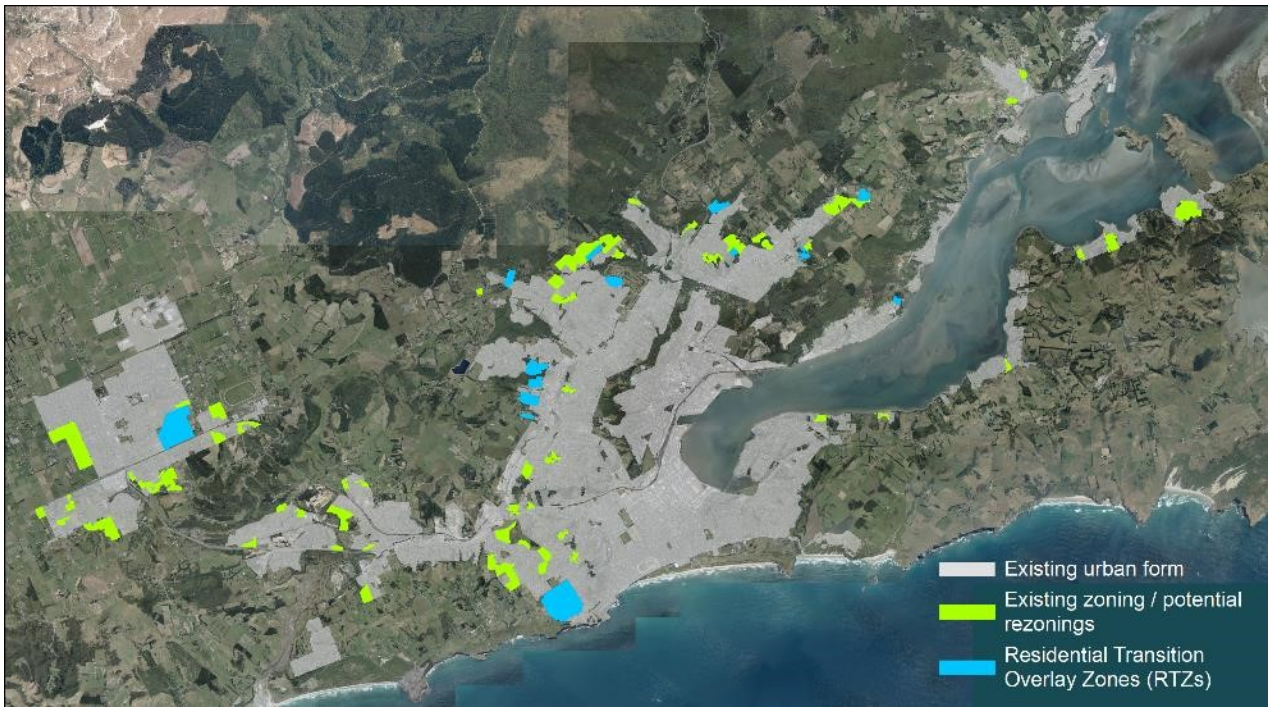

Figure 17: Large greenfield areas

5.2.2 Capacity by location

The distribution of development capacity is spread across Dunedin (Table 13) but is highest in the inner suburbs, outer suburbs and Mosgiel / Taieri.

Table 13: Residential capacity by catchment

Catchment	Short-term (2024-27)	Medium-term (2024-34)	Long-term (2024-54)
Inner city	120	350	850
Inner suburbs	680	1,840	11,620
Outer suburbs	650	1,520	5,360
Mosgiel / Taieri	600	1,440	3,700
Peninsula	60	160	690
North coast	90	250	650
Total	***2,200***	***5,550***	***22,870***

The spatial distribution of modelled development capacity is close to the spatial distribution of recent building consents (Figure 18). This includes key development areas being Mosgiel, South Dunedin, and the CBD. This alignment suggests that modelled development capacity is realistic.

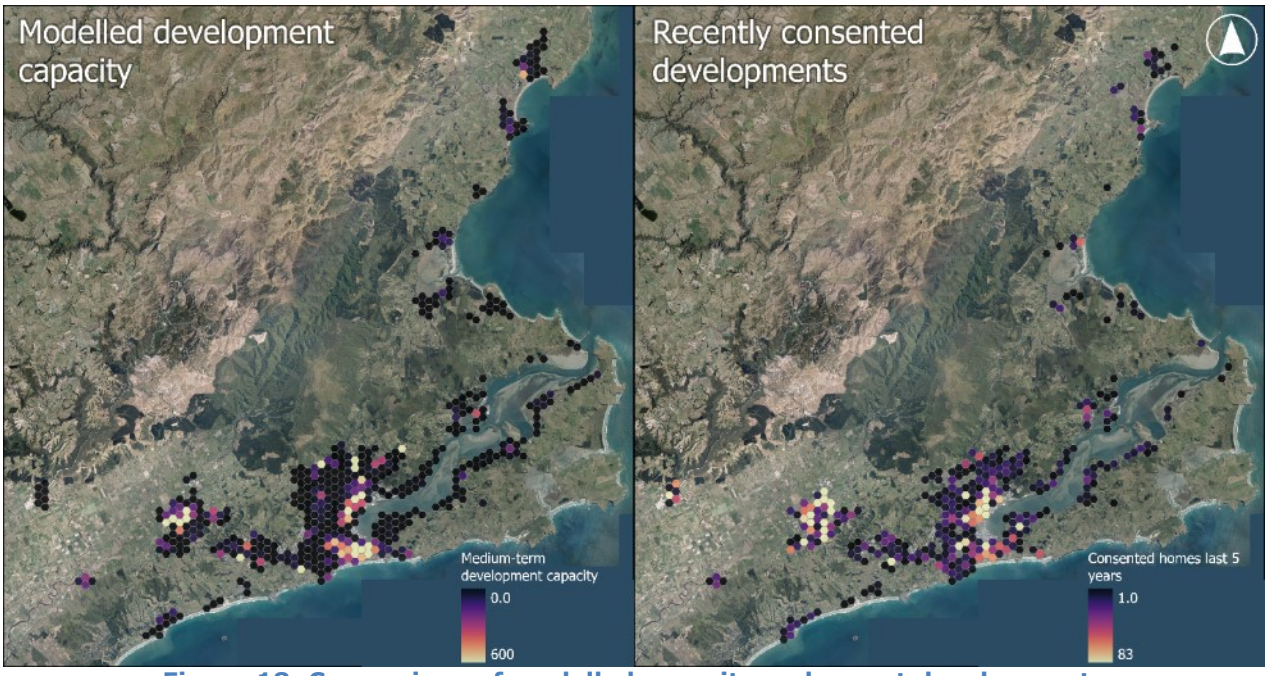

Figure 18: Comparison of modelled capacity and recent developments

5.2.3 Capacity by housing type

In the short-term, 53% of development capacity is for standalone housing (Table 14). However, this declines to 50% in the medium-term and 31% in the long-term, as greenfield development options are taken up and intensification of properties becomes more feasible.

Table 14: Residential capacity by dwelling type

Dwelling type	Short-term (2024-27)	Medium-term (2024-34)	Long-term (2024-54)
Standalone housing	1,160	2,770	7,110
Attached housing	1,040	2,790	15,750
Total	***2,200***	***5,550***	***22,870***

5.2.4 Capacity by development type

Approximately a third of development capacity over the short and medium-term is from greenfield land, with the remainder split between comprehensive redevelopment (where existing buildings are demolished and sites are developed from scratch) and infill development (where development occurs on a site around existing buildings). The proportion of greenfield development drops to 23% of total capacity over the long-term, however this level of capacity would be sufficient to accommodate approximately 79% of the expected demand. While greenfield represents a smaller share of capacity, this is only because of the large amount of potential that is developable in the brownfield areas (either infill or comprehensive).

However, ongoing monitoring of development take-up will be undertaken to assess whether there are any future changes to these trends. The predominance of development capacity from intensification is consistent with recent development trends on consented homes.

Table 15: Residential capacity by development type

Development type	Short-term (2024-27)	Medium-term (2024-34)	Long-term (2024-54)
Comprehensive redevelopment	780	2,180	13,570
Infill	640	1,560	4,130
Greenfield	780	1,810	5,160
Total	***2,200***	***5,550***	***22,860***

6 SUFFICIENCY OF HOUSING CAPACITY

This section compares the capacity analysis results with the estimated demand for housing to outline the sufficiency of Dunedin's development capacity.

All capacity figures in this section reflect capacity that is plan-enabled, infrastructure-enabled, feasible, and reasonably expected to be realised. Results are rounded to the nearest 10, which may result in totals not matching. All demand figures include appropriate competitiveness margins of 20% for short-medium term and 15% for long term.

The results from the model show that housing development capacity under the existing 2GP is sufficient to meet demand over all timeframes (Table 16).

Table 16: Housing capacity results

	Short-term (2024-27)	Medium-term (2024-34)	Long-term (2024-54)
Capacity required	1,620	5,120	6,550
Capacity available	2,200	5,550	22,870
Sufficiency	+580	+430	+16,320

While the high-medium growth projection is considered the most likely scenario, there is a need to consider the potential impacts of other growth scenarios. If Dunedin continued to follow a high growth scenario, development capacity would still be sufficient over all timeframes. Growth trends will continue to be regularly monitored to ensure that a higher growth rate than expected could be proactively managed.

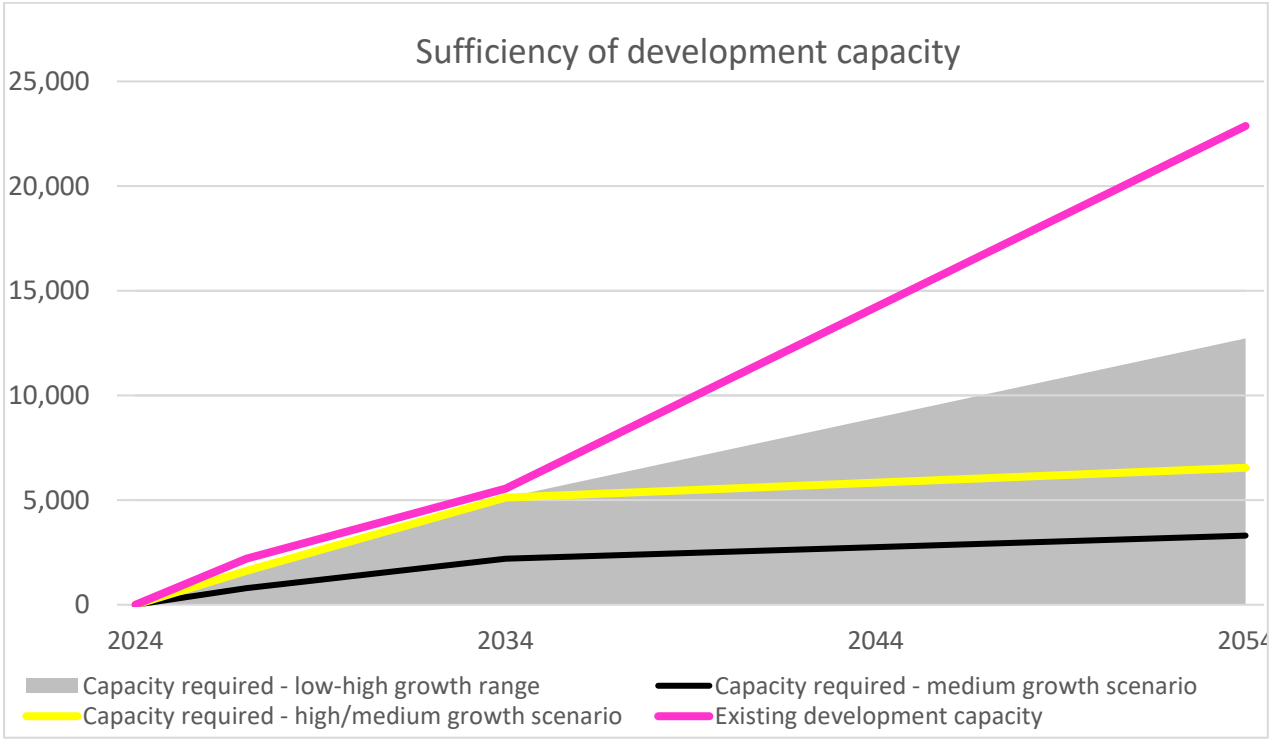

Figure 19: Capacity sufficiency by growth scenario

There is sufficient capacity for both standalone and attached housing typologies across all time periods.

Table 17: Sufficiency by housing typology

Zoning	Short-term (2024-27)		Medium-term (2024-34)		Long-term (2024-54)	
	Capacity required	Capacity	Capacity required	Capacity	Capacity required	Capacity
Attached housing	790	1,040	2,490	2,790	3,180	15,750
Standalone housing	830	1,160	2,630	2,770	3,370	7,110

There is sufficient capacity in all catchments over all timeframes, except in the Peninsula, which has a shortfall in development capacity in the short and medium-term.

Table 18: Sufficiency by catchment

Catchment	Short-term (2024-27)		Medium-term (2024-34)		Long-term (2024-54)	
	Demand	Supply	Demand	Supply	Demand	Supply
Inner city	100	120	330	350	420	850
Inner suburbs	540	680	1,710	1,840	2,170	11,620
Outer suburbs	480	650	1,500	1,520	1,850	5,360
Mosgiel Taieri	340	600	1,090	1,440	1,440	3,700
Peninsula	90	60	300	160	360	690
North coast	60	90	190	250	300	650

While there is sufficient capacity in catchments other than the Peninsula, the medium-term capacity is only just sufficient in the inner city, inner suburbs, and outer suburbs, based on the high-medium growth scenario.

The constrained supply of feasible development capacity in the inner city correlates with a relatively small net increase in new dwellings being consented. This suggests constraints to delivering development to meet existing and future demand in this area. The inner city does not have large greenfield development opportunities like the outer suburbs, relying instead on intensification which require redevelopment or reuse of existing sites and buildings.

Planning provisions in the inner city are liberal and allow for more height than is typically used. There are no carparking minimums for residential activities and no other major planning constraints that are considered to be inhibiting intensification. Discussions with developers have generally revealed building code requirements to be the key constraint to converting existing buildings to residential use. However, the costs and uncertainty involved with planning processes have also been raised as deterring development in the inner city. Finding land for inner-city residential developments was identified as difficult, with multiple small sites often needing to be amalgamated to make a development viable. This can involve long time periods and significant capital requirements, which may limit the number of potential developers interested in these projects.

There are also very few greenfield sites available in the inner suburbs, which is instead largely dependent on intensification. As most sites are already built on, a significant yield is required to make redevelopment feasible. For the high costs of these development to be justified, there needs to be a commensurate increase in returns (through either rental income or sales), which in turn

requires a significant step change in building floorspace and/or quality over the existing conditions.

While the development capacity in the outer suburbs is also only marginally higher than demand under a high-medium growth scenario, some of the capacity in and surrounding Mosgiel would likely be suitable to meet outer suburb demand.

The modelling of both demand and capacity has been undertaken using conservative assumptions. By design, it is likely that the model underestimates the amount of housing that will be developable. Also, the level of demand may not achieve the high-medium growth scenario over the coming decades. However, the application of conservative assumptions within this Housing Capacity Assessment do not change the overall conclusions – which show that the existing planning framework is likely to provide more than sufficient capacity to meet the expected needs of the community in the short, medium and long term.

APPENDIX 1 FEASIBILITY CALCULATIONS

Property information	
Assessment number	From rating database
Formatted address	From rating database
Land use code	From rating database
Land use description	From rating database
Rateable value	From rating database
Site size	From rating database
Property ID	From rating database
VG Number	From rating database
Existing units of use	From rating database
Building footprint per unit	From rating database
Land value	From rating database
Capital value	From rating database
Improvement value	From rating database
Zone	From 2GP data
Subzone	From 2GP data
Future zone	From 2GP data
Urban catchment	From GIS data
SA2	From GIS data
Aspect	From GIS data
Average slope	From GIS data
NonReticulated	From GIS data
Infrastructure constraint mapped area	From GIS data
Greenfield	From GIS data

Development information	
Developed units	From PEC model
Net new units	From PEC model
Development type	From PEC model
Floorspace per unit	From PEC model
Development typology	From PEC model
Land area per unit	From PEC model
Developable site area	From PEC model
Subdividable parcels	From PEC model
Height limit	From PEC model
Max floors	From PEC model
Site coverage limit	From PEC model
Max bedrooms	From PEC model
Max family flats	From PEC model
Max units	From PEC model
Max residential floorspace	From PEC model
Retail floorspace	From PEC model
Office floorspace	From PEC model
Industrial floorspace	From PEC model
Net new non-residential floorspace	From PEC model
Undeveloped land area per unit	From PEC model
Footprint per unit	From PEC model
Manually adjusted	From PEC model
Developer type	From PEC model

Purchase price	
Purchase price	Rateable value * CV multiplier

Greenfield subdivision costs (if applicable)	
Subdivision costs	$1,420 per new lot
Existing land clearance	$7,100 per ha raw land
Earthworks and site preparation	$96,250 per ha raw land
Roading	$320 per m2 road reserve
Water supply	$250 per lin m of pipe (~125m per hectare)
Wastewater	$520 per lin m of pipe (~125m per hectare)
Landscape & stormwater reserves	$85 per m2 reserve
Resource consent fees	$710 per dwelling
Development contributions	From DC policy
Consultant fees	6% of civil costs
Total subdivision costs	Total of above costs

Site preparation costs	
Demolition	Existing building footprint * $140 For comprehensive site redevelopments only
Landscaping	$2,665 * Yield
Civil works	$4,560 * Yield if flat site (less than 1:10) $19,795 * Yield if medium sloping site (between 1:10 and 1:5) $45,660 * Yield if sloping site (greater than 1:5)
Total site preparation costs	All red costs

Construction cost	
Construction cost per square metre	A base cost of $2,240 per m2 for <=3 dwellings and $2,065 per m2 for 4+ dwellings, with an adjustment of -$2.26 per m2 for the difference from a 200m2 dwelling.
Construction cost	Construction cost PSM * Floorspace

Professional costs	
Professional services (e.g. project manager, planner, engineer, architect,	$19,175 * Yield
Real estate agent	Total revenue * 0.03
Building consent charges	Based on DCC charges Single unit: $7,425 + (TotalConstructionCosts / 1000 * $4.28) Multi-unit: ($5,560 * Yield) + (TotalConstructionCosts / 1000 * $4.28)
Development contributions	Based on DCC charges if brownfield.
Total professional costs	All blue costs

Total costs	
Total costs	All above costs

Revenue	
Land value per unit	Based on suburb, property size, slope, and aspect
Improvement value per unit	Based on dwelling type and size
Sale price per dwelling	Land value + improvement value per dwelling
Revenue from existing dwellings	For infill developments
Total revenue	((Sale price per dwelling * Yield) + Revenue from existing dwellings) - GST

Profitability	
Profit	Total revenue - total costs
Profit margin	Profit / total costs
Profitability	0% for one man band 20% for big developers 25% of original property value for landowner infill

APPENDIX 2 EXAMPLE DEVELOPMENTS

Property information	
Assessment number	2108888
Formatted address	100 Connell Street Dunedin
Land use code	21
Land use description	Lifestyle : Single Unit
Rateable value	$3,200,000
Site size	24,399
Property ID	5067131
VG Number	27550-54400
Existing units of use	1
Building footprint per unit	110
Land value	$2,890,000
Capital value	$3,200,000
Improvement value	$310,000
Zone	Residential
Subzone	General Residential 1
Future zone	0
NonReticulated	0
Infrastructure constraint mapped area	0
Greenfield	Yes
Urban catchment	Peninsula
SA2	Shiel Hill
Aspect	South
Average slope	21.06

Development information	
Developed units	30
Net new units	29
Development type	Greenfield
Floorspace per unit	338
Development typology	Standalone housing
Land area per unit	569
Developable site area	17,080
Subdividable parcels	42
Height limit	9
Max floors	2
Site coverage limit	6,832
Max bedrooms	10,000
Max family flats	1
Max units	42
Max residential floorspace	13,663
Retail floorspace	0
Office floorspace	0
Industrial floorspace	0
Net new non-residential floorspace	0
Undeveloped land area per unit	342
Footprint per unit	228
Manually adjusted	0
Developer type	Large developer

Purchase price	
Purchase price	**$4,313,820**
Greenfield subdivision costs (if applicable)	
Subdivision costs	$48,865
Existing land clearance	$19,871
Earthworks and site preparation	$269,306
Roading	$1,746,084
Water supply	$84,879
Wastewater	$176,880
Landscape & stormwater reserves	$223,923
Resource consent fees	$24,433
Development contributions	$471,799
Consultant fees	$251,148
Total subdivision costs	**$3,317,189**
Site preparation costs	
Demolition	$16,349
Landscaping	$81,768
Civil works	$1,401,831
Total site preparation costs	**$1,499,948**

Construction cost	
Construction cost per square metre	$1,753
Construction cost	**$18,168,893**
Professional costs	
Professional services (e.g. project manager, planner, engineer, architect, surveyor, geotech, lawyer)	$587,013
Real estate agent	$1,293,990
Building consent charges	$253,897
Development contributions	$0
Total professional costs	**$2,134,901**
Total costs	
Total costs	**$29,434,750**
Revenue	
Land value per unit	$297,741
Improvement value per unit	$843,017
Sale price per dwelling	$1,140,758
Revenue from existing dwellings	$0
Total revenue	**$29,758,913**
Profitability	
Profit	$324,163
Profit margin	1.1%
Profitability	**No**

Property information	
Assessment number	2068444
Formatted address	87 Selwyn Street Dunedin
Land use code	21
Land use description	Lifestyle : Single Unit
Rateable value	$1,220,000
Site size	48,401
Property ID	5068444
VG Number	26750-46000
Existing units of use	1
Building footprint per unit	118
Land value	$850,000
Capital value	$1,220,000
Improvement value	$370,000
Zone	Residential
Subzone	General Residential 1
Future zone	Residential Transition (General
NonReticulated	0
Infrastructure constraint mapped area	0
Greenfield	Yes
Urban catchment	Outer suburbs
SA2	North East Valley Chingford
Aspect	East
Average slope	20.42

Development information	
Developed units	63
Net new units	62
Development type	Greenfield
Floorspace per unit	124
Development typology	Standalone housing
Land area per unit	538
Developable site area	33,881
Subdividable parcels	84
Height limit	9
Max floors	2
Site coverage limit	13,552
Max bedrooms	10,000
Max family flats	1
Max units	84
Max residential floorspace	27,104
Retail floorspace	0
Office floorspace	0
Industrial floorspace	0
Net new non-residential floorspace	0
Undeveloped land area per unit	414
Footprint per unit	124
Manually adjusted	0
Developer type	Large developer

Purchase price	
Purchase price	**$1,643,683**
Greenfield subdivision costs (if applicable)	
Subdivision costs	$102,617
Existing land clearance	$39,419
Earthworks and site preparation	$534,223
Roading	$3,463,707
Water supply	$168,375
Wastewater	$350,877
Landscape & stormwater reserves	$444,196
Resource consent fees	$51,308
Development contributions	$1,147,496
Consultant fees	$498,759
Total subdivision costs	**$6,800,977**
Site preparation costs	
Demolition	$17,538
Landscaping	$171,713
Civil works	$2,943,846
Total site preparation costs	**$3,133,096**

Construction cost	
Construction cost per square metre	$2,236
Construction cost	**$17,878,130**
Professional costs	
Professional services (e.g. project manager, planner, engineer, architect, surveyor, geotech, lawyer)	$1,232,727
Real estate agent	$1,838,556
Building consent charges	$443,149
Development contributions	$0
Total professional costs	**$3,514,431**
Total costs	
Total costs	**$32,970,318**
Revenue	
Land value per unit	$357,388
Improvement value per unit	$414,440
Sale price per dwelling	$771,827
Revenue from existing dwellings	$0
Total revenue	**$42,282,710**
Profitability	
Profit	$9,312,393
Profit margin	28.2%
Profitability	**Yes**

Property information	
Assessment number	4029819
Formatted address	8 Anscombe Close Wingatui
Land use code	99
Land use description	Residential : Vacant
Rateable value	$310,000
Site size	871
Property ID	5128066
VG Number	27841-17414
Existing units of use	0
Building footprint per unit	0
Land value	$310,000
Capital value	$310,000
Improvement value	$0
Zone	Residential
Subzone	General Residential 1
Future zone	0
NonReticulated	0
Infrastructure constraint mapped area	0
Greenfield	0
Urban catchment	Mosgiel Taieri
SA2	Wingatui
Aspect	Southwest
Average slope	3.94

Development information	
Developed units	2
Net new units	2
Development type	VacantLot
Floorspace per unit	117
Development typology	Attached housing
Land area per unit	436
Developable site area	871
Subdividable parcels	1
Height limit	9
Max floors	2
Site coverage limit	348
Max bedrooms	10,000
Max family flats	1
Max units	3
Max residential floorspace	696
Retail floorspace	0
Office floorspace	0
Industrial floorspace	0
Net new non-residential floorspace	0
Undeveloped land area per unit	319
Footprint per unit	117
Manually adjusted	0
Developer type	Large developer

Purchase price	
Purchase price	**$313,793**

Greenfield subdivision costs (if applicable)	
Subdivision costs	$0
Existing land clearance	$0
Earthworks and site preparation	$0
Roading	$0
Water supply	$0
Wastewater	$0
Landscape & stormwater reserves	$0
Resource consent fees	$0
Development contributions	$0
Consultant fees	$0
Total subdivision costs	**$0**

Site preparation costs	
Demolition	$0
Landscaping	$5,504
Civil works	$9,422
Total site preparation costs	**$14,925**

Construction cost	
Construction cost per square metre	$2,427
Construction cost	**$584,298**

Professional costs	
Professional services (e.g. project manager, planner, engineer, architect, surveyor, geotech, lawyer)	$39,480
Real estate agent	$58,505
Building consent charges	$14,388
Development contributions	$21,650
Total professional costs	**$134,022**

Total costs	
Total costs	**$1,047,039**

Revenue	
Land value per unit	$367,508
Improvement value per unit	$399,384
Sale price per dwelling	$766,892
Revenue from existing dwellings	$0
Total revenue	**$1,333,725**

Profitability	
Profit	$286,686
Profit margin	27.4%
Profitability	**Yes**

Property information	
Assessment number	2027232
Formatted address	26 Russell Street Dunedin
Land use code	91
Land use description	Residential : Single Unit
Rateable value	$770,000
Site size	580
Property ID	5027232
VG Number	27160-60200
Existing units of use	1
Building footprint per unit	140
Land value	$520,000
Capital value	$770,000
Improvement value	$250,000
Zone	Residential
Subzone	Inner City Residential
Future zone	0
NonReticulated	0
Infrastructure constraint mapped area	0
Greenfield	0
Urban catchment	Inner suburbs
SA2	Arthur Street
Aspect	Southeast
Average slope	7.14

Development information	
Developed units	7
Net new units	6
Development type	CompRedev
Floorspace per unit	71
Development typology	Attached housing
Land area per unit	83
Developable site area	580
Subdividable parcels	2
Height limit	12
Max floors	3
Site coverage limit	348
Max bedrooms	12
Max family flats	0
Max units	10,000
Max residential floorspace	1,043
Retail floorspace	0
Office floorspace	0
Industrial floorspace	0
Net new non-residential floorspace	0
Undeveloped land area per unit	33
Footprint per unit	50
Manually adjusted	0
Developer type	Large developer

Purchase price	
Purchase price	**$799,799**
Greenfield subdivision costs (if applicable)	
Subdivision costs	$0
Existing land clearance	$0
Earthworks and site preparation	$0
Roading	$0
Water supply	$0
Wastewater	$0
Landscape & stormwater reserves	$0
Resource consent fees	$0
Development contributions	$0
Consultant fees	$0
Total subdivision costs	**$0**
Site preparation costs	
Demolition	$21,747
Landscaping	$19,478
Civil works	$144,759
Total site preparation costs	**$185,983**

Construction cost	
Construction cost per square metre	$2,357
Construction cost	**$1,215,366**
Professional costs	
Professional services (e.g. project manager, planner, engineer, architect, surveyor, geotech, lawyer)	$139,546
Real estate agent	$128,812
Building consent charges	$47,502
Development contributions	$66,194
Total professional costs	**$382,054**
Total costs	
Total costs	**$2,583,202**
Revenue	
Land value per unit	$170,650
Improvement value per unit	$307,044
Sale price per dwelling	$477,694
Revenue from existing dwellings	$0
Total revenue	**$2,907,701**
Profitability	
Profit	$324,499
Profit margin	12.6%
Profitability	**No**

Property information	
Assessment number	2059447
Formatted address	48 Victoria Road St Kilda
Land use code	91
Land use description	Residential : Single Unit
Rateable value	$670,000
Site size	729
Property ID	5059447
VG Number	27500-53900
Existing units of use	1
Building footprint per unit	152
Land value	$650,000
Capital value	$670,000
Improvement value	$20,000
Zone	Residential
Subzone	General Residential 2
Future zone	0
NonReticulated	0
Infrastructure constraint mapped area	0
Greenfield	0
Urban catchment	Inner suburbs
SA2	St Kilda North
Aspect	Southwest
Average slope	2.32

Development information	
Developed units	5
Net new units	4
Development type	CompRedev
Floorspace per unit	65
Development typology	Attached housing
Land area per unit	146
Developable site area	729
Subdividable parcels	2
Height limit	9
Max floors	2
Site coverage limit	364
Max bedrooms	12
Max family flats	0
Max units	10,000
Max residential floorspace	728
Retail floorspace	0
Office floorspace	0
Industrial floorspace	0
Net new non-residential floorspace	0
Undeveloped land area per unit	81
Footprint per unit	65
Manually adjusted	0
Developer type	Large developer

Purchase price	
Purchase price	**$695,929**
Greenfield subdivision costs (if applicable)	
Subdivision costs	$0
Existing land clearance	$0
Earthworks and site preparation	$0
Roading	$0
Water supply	$0
Wastewater	$0
Landscape & stormwater reserves	$0
Resource consent fees	$0
Development contributions	$0
Consultant fees	$0
Total subdivision costs	**$0**
Site preparation costs	
Demolition	$23,611
Landscaping	$13,913
Civil works	$23,818
Total site preparation costs	**$61,342**

Construction cost	
Construction cost per square metre	$2,370
Construction cost	**$804,616**
Professional costs	
Professional services (e.g. project manager, planner, engineer, architect, surveyor, geotech, lawyer)	$99,676
Real estate agent	$109,840
Building consent charges	$33,638
Development contributions	$29,419
Total professional costs	**$272,573**
Total costs	
Total costs	**$1,834,460**
Revenue	
Land value per unit	$274,268
Improvement value per unit	$296,004
Sale price per dwelling	$570,271
Revenue from existing dwellings	$0
Total revenue	**$2,479,441**
Profitability	
Profit	$644,981
Profit margin	35.2%
Profitability	**Yes**

APPENDIX 3 SITES WITH CAPACITY FOR 50 OR MORE HOMES

ID	Address	Modelled zone	Residential transition overlay zone (RTZ)	Land area (ha)	Development type	Urban catchment	Manually adjusted	Estimated date of infrastructure-readiness	Max units	Developed units	Reassessed Capacity: Medium-term
1	43 Wingatui Road Mosgiel	General Residential 1	Yes - South East Mosgiel	5.9	Greenfield	Mosgiel Taieri	No	2023	165	83	0
2	20 Henderson Street Wingatui	General Residential 1	No	5.0	Greenfield	Mosgiel Taieri	Yes	2023	87	66	20
3	31 Blackhead Road Dunedin	General Residential 1	No	7.0	Greenfield	Outer suburbs	Yes	2023	122	90	87
4	LOT 1 Bush Road Mosgiel	General Residential 1	No	37.2	Vacant site	Mosgiel Taieri	Yes	2023	1,040	625	608
5	636 North Road Dunedin	General Residential 1	No	19.2	Greenfield	Outer suburbs	Yes	2023	335	335	323
6	36 Anzac Avenue Dunedin	Central Business District	No	0.2	Brownfield	Inner city	No	2023	N/A	50	14

ID	Address	Modelled zone	Residential transition overlay zone (RTZ)	Land area (ha)	Development type	Urban catchment	Manually adjusted	Estimated date of infrastructure -readiness	Max units	Developed units	Reassessed Capacity: Medium-term
7	658 Princes Street Dunedin	Princes, Parry and Harrow Street	No	1.0	Brownfield	Inner city	No	2023	N/A	63	18
8	153 Gladstone Road Nth Mosgiel	General Residential 1	Yes - South East Mosgiel	4.5	Greenfield	Mosgiel Taieri	No	2023	77	58	0
9	15 Dunedin-Waitati Road Dunedin	Large Lot Residential 1	No	7.1	Greenfield	Outer suburbs	Yes	2023	24	89	86
10	245 Wakari Road Dunedin	General Residential 1	No	9.4	Greenfield	Outer suburbs	Yes	2023	164	123	38
11	494 Taieri Road Dunedin	General Residential 1	Yes - Taieri Road (Halfway Bush)	4.0	Greenfield	Outer suburbs	No	2023	112	56	0
12	195 Wakari Road Dunedin	General Residential 1	No	5.7	Greenfield	Outer suburbs	Yes	2023	99	75	73

ID	Address	Modelled zone	Residential transition overlay zone (RTZ)	Land area (ha)	Development type	Urban catchment	Manually adjusted	Estimated date of infrastructure -readiness	Max units	Developed units	Reassessed Capacity: Medium-term
13	47 Wingatui Road Mosgiel	General Residential 1	Yes - South East Mosgiel	6.0	Greenfield	Mosgiel Taieri	No	2023	104	78	0
14	137 Kaikorai Valley Road Dunedin	General Residential 2	No	2.9	Greenfield	Inner suburbs	Yes	2023	N/A	76	74
15	84 Filleul Street Dunedin	Central Business District	No	0.4	Brownfield	Inner city	No	2023	N/A	103	29
16	30 Mercer Street Dunedin	General Residential 2	No	4.4	Greenfield	Inner suburbs	Yes	2023	N/A	50	49
17	22 Queens Gardens Dunedin	Central Business District	No	0.3	Brownfield	Inner city	No	2023	N/A	69	19
18	51 Wingatui Road Mosgiel	General Residential 1	Yes - South East Mosgiel	9.7	Greenfield	Mosgiel Taieri	No	2023	169	127	0
19	353 Main South Road	General Residential 1	No	10.6	Greenfield	Outer suburbs	Yes	2023	184	138	42

ID	Address	Modelled zone	Residential transition overlay zone (RTZ)	Land area (ha)	Development type	Urban catchment	Manually adjusted	Estimated date of infrastructure -readiness	Max units	Developed units	Reassessed Capacity: Medium-term
	Green Island										
20	87 Selwyn Street Dunedin	General Residential 1	Yes - Selwyn Street (North East Valley)	4.8	Greenfield	Outer suburbs	No	2038	84	63	0
21	66 Hagart-Alexander Drive Mosgiel	General Residential 1	Yes - South East Mosgiel	10.2	Greenfield	Mosgiel Taieri	No	2023	179	135	0
22	100 Walton Park Avenue Fairfield	General Residential 1	No	13.0	Greenfield	Outer suburbs	Yes	2023	228	209	203
23	11 Centre Road Dunedin	General Residential 1	No	5.4	Greenfield	Inner suburbs	Yes	2023	94	52	50
24	5 Ronay Street Dunedin	General Residential 1	Yes - Glenelg Street (Kaikorai Valley)	4.8	Greenfield	Outer suburbs	Yes	2028	84	84	0