Selwyn District Residential Feasibility 2018

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m.e consulting

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Executive Summary

This report provides economic research on the financial feasibility of residential land and building developments in the Selwyn District. A requirement of the National Policy Statement on Urban Development Capacity (NPSUDC) is that local authorities that have a high-growth urban area within their district must undertake research of residential demand and supply. One aspect of this research is to establish the extent and nature of residential supply that is financially feasible over the coming three decades.

During the research for the NPSUDC, Greater Christchurch Partners elected to apply the MBIE feasibility tools.[1] The results from the MBIE feasibility tools indicated that a very small amount of capacity in the partnership area was feasible (Scenario 1 of Greater Christchurch Partners report).[2] As was noted in the GCP report there were short comings in the assessment and further work would be required to develop a robust understanding of feasibility.

The Greater Christchurch Partners are now moving into the development and planning phase of the Future Development Strategy – which is intended to provide sufficient capacity to meet the demands of the community. As a result, Selwyn District Council has commissioned this study to provide robust understanding of feasibility in the district.

For this research M.E have developed two models M.E Land Development Model (LDM) and M.E Build Development Model (BDM). These models are an improvement on the previous MBIE feasibility tool – especially with respect to the models' base line performance (i.e. the ability to correctly pick current developments are feasible). The detail of the modelling and the key differences from MBIE tool are discussed in the body of the report.

In summary, the results from the LDM and BDM models show that most of the residential development capacity in the district's zoned 'greenfield priority areas' are likely to become feasible within the coming 30 years.

There is sufficient supply of feasible dwellings for most of the coming decade (short term and much of the medium term), however at the end of the decade and in the long term capacity may be exhausted at a point between 2030 and 2031. The results show,

- Short Term – 3,100 dwellings required and up to 4,900 feasible capacity, which shows that there is sufficient supply.
- Medium Term – 8,600 dwellings required and up to 6,100 feasible capacity which shows that there is insufficient supply (by -2,500).
- Long Term – 23,800 dwellings required and up to 9,200 feasible capacity which shows that there is insufficient supply (by -14,600).

[1] MBIE (2017) NSP-UDC Development Feasibility Tool.xlsx

[2] Greater Christchurch Partnership (2018) Housing Development Capacity Assessment.

The feasibility assessment has been deliberately conservative, especially in regard to future growth in dwelling prices during a period of relatively strong household growth. This means the level of feasible capacity may be substantially greater than indicated, especially in the medium term.

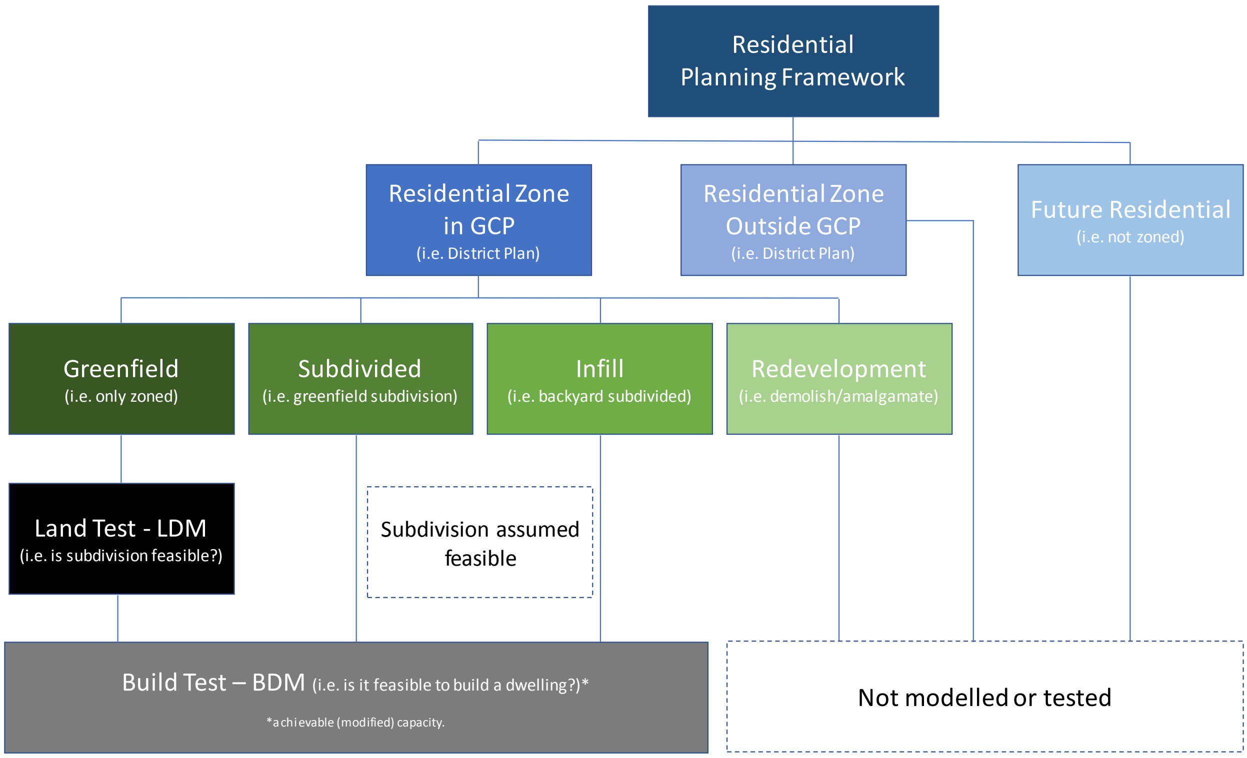
It is also important to note that the feasibility models do not account for all dwelling construction. There are other development routes that cannot be validated in the feasibility models – which includes retirement providers, social/community housing, self-builds and KiwiBuild. Also that there may be constraints on supply and demand which means that some feasible capacity may or may not be developed. Of particular importance is the infill capacity, which is predicted to be feasible in the model, there may be constraints on demand and supply which means that this capacity is not developed in the period.

While the other development potential, supply side and demand constraints described above are beyond the scope of this study, they are likely to be important factors that influence whether feasible capacity is in fact developed. Given that markets change over time it is important that council continues to monitor this closely as an area of potential inconsistency with the NPSUDC requirement and that further detailed research could be required.

While in theory there may be a supply-demand issue in the long term if no further land were zoned for urban activity, we expect there would be two or three District Plan reviews and ten Housing Development Capacity Assessments during the next 30 years, which would provide plenty of opportunity to zone additional land and to re-evaluate housing sufficiency.

The following figure outlines the coverage of the feasibility testing in this study. The Land Development Model tests the feasibility of subdivided land that is, currently zoned, in the GCP part of the District and not yet subdivided (called Greenfield in the figure below). The Build Development model tests the feasibility of building a dwelling on infill, subdivided land and greenfield land. The models do not test feasibility in residential land outside of GCP area or unzoned residential areas “Future Residential”. The models do not assess redevelopment potential.

Figure 0.1: Flow Chart of Residential Land in Planning Framework and Feasibility Models



MBIE/MFE has recently released an updated guidance on feasibility (September 24th,2018). This sets out that councils are required to report a base scenario that calculates feasibility using only current prices, without allowance for price changes (this is the "frozen market" assumption). That guidance applies a literal interpretation of the NPSUDC, that the "base scenario" must only assess feasibility by assuming there are no future price changes, with prices and costs frozen or locked at current market conditions. Given that guidance, in this report we are required to examine – as one of the scenarios considered - feasibility using current prices, thus applying that single point in time to growth over the coming three decades.

Unsurprisingly, this analysis assuming no change in prices for three decades suggests that there is insufficient supply of feasible capacity in the district (short, medium and long term). To be clear we do not support or see the relevance of the "Base scenario – frozen market". It is not possible for a market to be frozen for short, medium or long term, so this scenario does not provide reliable information about how the housing market may perform in the future. In our opinion, the "Base scenario – frozen market" results are not helpful for planning for future growth.

1 Introduction

This report provides economic research on the financial feasibility of residential land and building developments in the Selwyn District. Part of the District that borders with Christchurch City Council has been defined as a 'high-growth urban area' in the National Policy Statement on Urban Development Capacity ('**NPSUDC**'). A requirement of the NPSUDC is that local authorities that have a high-growth urban area within their district must undertake research of residential demand and supply. One aspect of this research is to establish the extent and nature of residential supply that is financially feasible over the coming three decades.

Market Economics ('**M.E**') has been commissioned by Selwyn District Council ('**SDC**') to produce this report. The focus of this report is on the estimation of financial feasibility of residential supply, in terms of developable lots and dwellings. The method employed in this report has also been applied to Waimakariri District.[3]

1.1 Background

It is important to note that SDC and Greater Christchurch Partnership ('**GCP**') have undertaken a significant amount of work which is directly relevant to this study. Most of this work was developed to meet the requirements of the NPSUDC, however some had begun before the NPSUDC came into effect. We briefly highlight some of the key work that is either utilised directly in the modelling or is indirectly relevant to this study.

1.1.1 Residential Demand

The District and GCP area has experienced high growth in the past and this trend is expected to continue. The District population is one of the fastest growing in New Zealand (2nd)[4] and Statistics New Zealand ('**SNZ**') projections[5] suggest that it will continue to be in the top three districts in terms of growth over the coming decades. This strong growth prompted the Council to commission research for the District Plan Review. The recent introduction of the NPSUDC has created an additional requirement to understand the demand for residential capacity in the District.

First, it is important to understand that the Statistics New Zealand population projections have consistently under estimated the growth in the District. As a consequence, in 2016 the Council commissioned an expert demographer to review the SNZ projection methods.[6] The findings of the report suggest that the SNZ methods do not apply well to the District, which is likely to result in consistent under estimation of growth. As a result, the Council and GCP agreed that for the District it is prudent to plan for growth at a level above the medium projection. The Council and GCP have adopted a mid-point between the SNZ medium and high growth projections (called medium-high). In summary the projections suggest population could

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[3] Market Economics (2018) Waimakariri District Residential Feasibility 2018.

[4] Statistics New Zealand (2018) Sub-national Population Estimates 1996-2017.

[5] Statistics New Zealand (2018) Sub-national Population Projections 2013-2043.

[6] Jackson, N.O. (2017) Selwyn – Review of Demographics Report (Part A) and (Part B).

growth by 2% per annum over the coming three decades which is equivalent to an increase in population of 49,000 in the GCP area of the District.[7]

Second, the District is unlike most high-growth urban areas. The community in the District is predominately located in low-medium density development patterns, rural towns, rural living and greenfield developments. There is almost no high density development with the occasional retirement facility being the only relatively dense development. Therefore, the bulk of dwellings in the District are single level standalone houses on a freehold site. There are a small number of attached houses, which are mainly single level units and some double level townhouses. There are no multilevel apartment blocks in the District. This is important as it shows that the types and nature of development which has been demanded in the past. For the NPSUDC, the GCP commissioned a study that converted the population projections into dwelling demand.[8] This study estimated the types of households and housing preferences. In summary, the results from this study suggest a demand for 20,700 new dwellings over the coming three decades.[9] The NPSUDC requires a buffer of 15% over the long term, which means that a capacity of 23,800 is needed.[10]

1.1.2 Residential Supply

The residential supply in any district is heavily dependent on council plans and rules which define the nature and scale of development that can occur. The Selwyn District Plan is the key document that defines potential supply in the District, along with Chapter 6 of the Canterbury Regional Policy Statement that sets the policy framework for housing and business development within the Greater Christchurch Area of the district.[11] Council has consistently maintained data on the capacity of greenfield areas to accommodate residential dwellings.

In 2017, M.E was commissioned to provide an updated record of capacity in existing urban areas (infill) and greenfield capacity.[12] This work provided a robust understanding of the total quantum of supply, both plan enabled[13] and market achievable[14] capacity. The results of the study show that there was capacity for 12,100 dwellings ('plan enabled' supply) under the current planning rules. However, if the market builds only to current achieved densities then there is capacity for 9,700 dwellings ('modified' supply).[15]

One of the new research requirements in the NSPUDC was to assess the financial feasibility of the dwelling capacity. During the research for the NPSUDC, GCP elected to apply the MBIE feasibility tools.[16] The results

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[7] Greater Christchurch Partnership (2018) Housing and Business Development Capacity Assessment.

[8] Livingston and Associates Limited (2018) Housing Demand in Greater Christchurch.

[9] Greater Christchurch Partnership (2018) Housing and Business Development Capacity Assessment.

[10] Greater Christchurch Partnership (2018) Housing and Business Development Capacity Assessment.

[11] The operative District Plan was developed over a decade ago during a period of relatively moderate growth. There has also been additional rezoning during the last decade. The review process is likely to result in changes in the plan to match the new demands associated with the observed and expected high growth.

[12] Market Economics (2017) Selwyn Capacity for Growth Model.

[13] Based on the operative District Plan zoning rules which generally state a minimum land area per dwelling (i.e. maximum density that is allowed without resource consent).

[14] Contemporary/modified capacity which is the level of density observed in current subdivisions (generally lower density than the plan enabled).

[15] Includes infill that was not reported in the previous iterations of the NPS-UDC housing capacity assessment.

[16] MBIE (2017) NSP-UDC Development Feasibility Tool.xlsx

from the MBIE feasibility tools indicated that a very small amount of capacity in the GCP was feasible (Scenario 1 of GCP report).[17] Of particular importance for the Council, was the finding that none of the capacity enabled in their District Plans was identified as **currently** feasible for development. This result is at odds with the existing and recent development activity which indicates that most greenfield residential development is feasible.

Unfortunately, given the very poor[18] performance of the MBIE feasibility tool there is no robust information on the likely feasibility of capacity. Clearly, the Council cannot rely on the baseline outputs from the MBIE tool, as such they have introduced an assumption instead that all greenfield residential development opportunities are feasible (Scenarios 2-4 of the GCP report).[19] The GCP is now moving into the development and planning phase of the Future Development Strategy (FDS). As all the scenarios presented in the GCP report (either 0% or 100% feasible) are not robust, the Council has a need to produce a robust feasibility model to support planning decisions.

1.2 Objective and Scope

The primary objective of this assessment is to develop a robust understanding of the amount of residential development that is financially feasible in Selwyn District. The results from this project will form a fundamental base of evidence that will support the decisions on completing the Housing Development Capacity Assessment (HDCA), residential zoning in the Future Development Strategy (FDS), review of the District Plans (DP) and possible amendments to the Canterbury Regional Policy Statement (CRPS). These four planning processes are all underway which means that there is urgency around the delivery of the research outputs from this project to provide the degree of certainty needed to inform policy decisions.

M.E has been working with other High Growth councils to develop alternative feasibility models. While initially MBIE disagreed with alternative models (and scenarios) there has been some acceptance by MBIE that the base tool and the NPSUDC assumptions need "tweaks" and "improvements".[20] M.E considers that our model accurately reflects the nature of development feasibility and is "cutting edge".[21]

[17] Greater Christchurch Partnership (2018) Housing Development Capacity Assessment.

[18] The model had a performance rate of 5% - specifically the model only correctly picked feasibility in 5% of the actual completed developments (the MBIE models incorrectly picked that 95% of the actual developments where infeasible). The inputs have been checked by the various PB5 developers and quantity surveyors – they found that results where "difficult to correlate" and "does not stack up".

[19] After the poor performance of the MBIE tool was raised in MBIE offered to provide support. To date MBIE has not provide any feedback on why the MBIE tool has performed so poorly.

[20] MBIE correspondence and workshops 2018.

[21] Discussions with MBIE is ongoing and our paper has been delivered to MBIE

1.3 There has been considerable discussion between high growth councils and MBIE about the issues arising from the current prices position. A Discussion Paper on the matter was prepared by ME on behalf of high growth councils[22]. Notwithstanding those concerns the latest guidance paper reiterates that councils are required to present a "base scenario" and this scenario must hold current market conditions frozen.[23]Report Structure

This report is structured into three subsequent sections, as follows:

- Section Two briefly describes the approach employed to model and estimate the amount of residential capacity in the District.
- Section Three outlines the M.E Land Development Model, which focusses on the key improvements which have been added since the previous study was undertaken for the initial NPSUDC reporting.
- Section Four outlines the M.E Build Development Model, which focusses on the key improvements which have been added since the previous study undertaken for the initial NPSUDC reporting.
- Section Five presents the results from the land development and build development models.
- Section Six provides a summary of the key points of the report, and conclusions.

[22] www.marketeconomics.co.nz/LiteratureRetrieve.aspx?ID=212852.

[23] MBIE/MFE (2018) Further guidance on assessing the feasibility of housing development capacity for housing and business development capacity assessments – September 24th, 2018

2 Approach

The approach applied in this study is entirely consistent with the M.E feasibility models applied for other High Growth councils. However, it is important to understand that Selwyn District is different from larger High Growth councils because it has a relatively high share of development that is low-medium density. The new development in the District will be predominately located in greenfield areas, with limited infill or intensification opportunity available pending district plan changes and other incentives. This is comparable with smaller districts which adjoin larger urban areas (such as Waipa and Waikato districts adjoining Hamilton city), but different from Auckland, Christchurch city and Hamilton city, in particular.

Therefore, while the method applied in the M.E feasibility models is consistent across the High Growth councils, the settings of the model will be different for Selwyn District.

2.1 Feasibility Models

First, this study draws from the previous capacity modelling that was conducted for Council for the NPSUDC. As explained above in the background, that work assessed the operative District Plan which provides capacity for dwellings through planning controls (referred to as 'plan enabled capacity') and the level of supply that could be achieved by the market. This previous modelling is used as the base line capacity from which all feasibility modelling is conducted.

Not all of this plan enabled or market achievable capacity is or will be "currently" commercially feasible or potentially feasible in the future. While planning rules provide for capacity, the financial decision to exercise this development potential may result in the capacity never being developed by the market. Robust estimates of what capacity is feasible to develop in the short, medium and long-term are required under the NPS-UDC. Feasibility modelling is also a core element in understanding the sequencing of outward city expansion into greenfield areas, which has important implications for infrastructure supply and servicing.

M.E's modelling estimates the number of dwellings of each type and price point that are likely to be commercially feasible within each location at each point in time. M.E's commercial feasibility modelling process estimates the share of capacity that is commercially feasible to develop both within the existing urban area (infill) and in areas of greenfield expansion. The model identifies a range of different dwelling types and sizes that can occur on each property parcel. In estimating commercial feasibility for each of these combinations, the model considers:

- the costs of development,
- the likely sale price of the lot of land or constructed dwelling, and
- the required profit margins.
- The level of feasibility is estimated through calculating the margin by which a dwelling may exceed (or be below) the estimated sales price.

The method applied in this report is a similar structure to the MBIE tools. A core difference is the modelling in this report also models feasibility over the coming three decades. This future modelling is an extension beyond the requirements of the NPSUDC minimum assessment.

M.E's Commercial Feasibility models are constructed at the property parcel level and are therefore able to provide outputs of commercial feasibility across aggregations of areas that are most relevant for spatial planning assessments (including other assessments such as infrastructure planning). The models take the results from the plan enabled capacity modelling and estimate which areas are likely to be commercially feasible to develop, as well as which areas of the existing dwelling stock are likely to be commercially feasible to intensify to accommodate a greater number of dwellings (i.e. through infill). The modelling has not assessed redevelopment potential through demolition and/or amalgamation of contiguous parcels of land.

Crucially, the key differences between M.E method and the MBIE tool are as follows:

- rather than applying averages, M.E's models apply the above framework to lots and dwellings of a wider ***range*** of different sizes and typologies on each parcel, better reflecting the individual developer site assessment process;
- M.E's commercial feasibility models are able to produce a range of different feasibility scenarios. They can provide estimates both of the level of capacity which is currently feasible in today's market, as well as the level of capacity which is currently likely to become feasible in the ***future***; and
- project time lines are modelled using ***stages*** which allows for a more accurate representation of the potential timing of costs and revenues.

The modelling has two feasibility tests, the M.E **Land Development model** and the M.E **Build Development model**.

2.2 Calibration of Models

The models were calibrated against existing developments to ensure that the baseline settings correctly reflect the costs, revenues, risk and returns. The purpose of this step is to ensure that the base line model can at least correctly pick feasibility of known developments. Specifically, this calibration of the models takes real world developments (land and build) that have in fact occurred, and tests whether the models accurately pick feasibility.

The M.E Land Development model has been calibrated to existing and recent greenfield land developments.[24] The following two developments have been used to calibrate the model.

- Devon Green (Rolleston), which is also entering the final stages (fewer than 15% of lots remain unsold) and has lots ranging from 360m^2 to 400m^2 which sold for $135,000.

[24] All lot price and house sales figures in this section includes GST.

- Coles Fields (Rolleston East), which is entering the final stages (fewer than 60% of lots remain unsold) and has lots ranging from 2,500m^2 to 7,000m2 which sold for prices of over $350,000.

Similarly, the M.E Build Development model has been calibrated to existing and recent greenfield new builds. The following developments have been used to calibrate the model.

- 16 Broomleigh Drive - lot was purchased for $190,000 in 2017 and then a dwelling of 241m^2 was built and the property with improvement sold for $680,000.
- 23 Tiny Hill Drive - lot was purchased for $199,000 in 2017 and then a dwelling of 243m^2 was built and the property with improvement sold for $650,000.
- 72 Strauss Drive - lot was purchased for $135,000 in 2016 and then a dwelling of 119m^2 was built and the property with improvement sold for $440,000.
- 7 Lawrence Drive - lot was purchased for $182,000 in 2016 and then a dwelling of 150m^2 was built and the property with improvement sold for $450,000.

The final models consider that these developments are feasible which suggests that the new structure of the M.E models has better performance than the previous MBIE tools.

2.3 Situation Runs of Models

As is the case with all feasibility models, the structure of the model utilises multiple runs of development situations that tests the range of outcomes. This method is applied in both the MBIE tool[25] and the M.E feasibility models[26]. This method is important as it is not possible to accurately predict the exact outcome for any given development, particularly across a 30 year planning horizon. The range of situation runs is designed to cover the distribution of outcomes that could occur.

The key improvement that is applied in this study is that M.E models have been run for a wider range of situations. This includes lot size, dwelling typology, project development path, costs inputs, risk outcomes, sale price etc which establishes the range of potential outcomes that could occur over the coming three decades.

2.4 Limitations

This section covers some of the limitations of the model. As with all financial feasibility models they focus on a very specific question – would a commercial developer be able to make a profit from developing the

[25] The MBIE Land development model had five base situation runs which only covered lot size that could be achieved. The MBIE Build development model had six situation runs which only covered dwelling type that could be built. The model could be employed to run other situation runs for input assumptions for the costs or revenues. However, this ability can be replicated manual rather than by design of the MBIE tool.

[26] The M.E Land development model has 60 base situation runs which covers lot size, development path, project risks, lot sale prices, civil works. The M.E Build development model had 160 situation runs which covers dwelling type, build risks, build sale price, build costs and time of build.

land or building. This is a narrow question which focuses solely on the supply side. Feasibility models **should not** be confused with projection of household growth.

The feasibility models merely establish whether under the given conditions that a parcel of land can be subdivided and/or a dwelling constructed for a profit that is sufficient to encourage the private market to develop. There are any number of reasons why the capacity **may be** commercial feasible and yet may not be developed. Conversely, there are any number of reasons why the capacity **may not be** commercial feasible and yet will be developed.

Specifically, the feasibility modelling does not take into account other developers, supply side restrictions or demand side restrictions.

2.4.1 Other Developers

Before we discuss the detail of the feasibility models used in this study, it is important to understand that there are other development methods that cannot be accurately represented in a feasibility model. These other development methods provide substantial share of dwellings constructed.

These include a range of market and non-market developers that utilise different development methods which have different feasibility outcomes. This sub-section briefly covers the other development methods that could be applied in the district, this includes speculative build developers (spec-homes) [27], self-builds (buy-and-builds), retirement providers, community/social housing, proposed KiwiBuild and high density developers[28] (apartments). There may also be owner-developers in the rural areas that can subdivided small parts of their land holdings to sell.

First, the MBIE tool applies a spec-home builder perspective (i.e. buy land, build and then sell to customer). Spec-home builder companies will have different cost and profit structures. Specifically, they tend to have higher capital requirements, may have greater build costs, higher holding costs, higher risk and therefore larger required margins which will mean that some developments will not be feasible for them. As is discussed above, the MBIE tool performed very poorly for the district. In the following modelling we have chosen to model feasibility for group home builders[29].

There are also self-builds, where a private individual buys land themselves and then contracts a builder to produce a custom-built house ("Buy-and-Build"). Mostly self-builds are designed for the specific requirements of customer, rather than focusing on a requirement for a profit. This means that buy-and-builds can have widely varying cost structures, making it very difficult to model feasibility based on representative costings.

[27] "Spec" or speculator building is where a dwelling is constructed without an identified purchaser, and the builder takes on the risk and financial commitment, in the expectation that a purchaser will be found for the completed land and dwelling package, either on completion or during the construction process.

[28] Note that there are also large scale apartment developers which are not discussed in this study as they are not active in the district. They will be another important developer group for higher density urban areas in Christchurch. These developers will have very different development structures than the groups discussed in this report.

[29] Group home builders develop sell "Home-and-Land" or "Design-and-build"

Also of relevance is the retirement providers which account for a significant proportion of dwellings. There has been a recent expansion of the retirement developments in New Zealand and Christchurch.[30] This growth has become more evident nationally and in the district as the population ages. Very few retirement units were built in the two decades from 1995 to 2014 (less than 0.1% of all builds[31]) but this has increased between 2015 and 2018. Again this industry has a quite different development perspective from other market developers.

Finally, there are also non-market developers (social and community organisations) that construct significant proportions of dwellings in New Zealand (around 4-5%). This includes Housing New Zealand Corporation, Central Government agencies (defence, education, justice etc), local government, iwi, religious and charity groups. Obviously, these groups have very different development perspectives to the market, as such feasibility modelling cannot be applied.

There is also the Government's KiwiBuild initiative that is expected to be a mix of commercially contracted and public-private construction, and the targets (100,000 nationally, 50,000 outside of Auckland) suggest that around one-third of additional dwellings during the 2020s will come via this route. Since KiwiBuild is expected to be focused on the higher growth areas, such as greater Christchurch, this may see a substantial KiwiBuild component in Selwyn's dwelling growth during the next decade (the NPS-UDC medium term).

Importantly for this study, these matters suggest that a substantial share of dwellings constructed will not be provided by the commercial market, under the model that applies to group home builders.

The other actors in the development of houses have different requirements, in regard to profits and returns, and this means that they may be able to build dwellings that would not be feasible to a group home builder. There will also be some as yet unknown effect from KiwiBuild, which may be substantial. The spec-builds may also account for a material proportion of developments.

Therefore, we consider that a substantial share of dwellings constructed will be supplied under different conditions than is modelled in this study,

- retirement approx. 5-6%,
- social approx. 4-5%,
- self-build potentially[32] 5-10%, and
- KiwiBuild yet to be defined, but maybe 10-25%.

This is important as the NPSUDC requires councils to provide enough feasible development potential to meet the **entire needs** of the community over three decades. This requirement ignores the fact that a **substantial share** of dwellings will be constructed via other developers that cannot be accounted for in a feasibility model. These aspects of the market are beyond the scope of this study or the modelling.

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30 Building consents show retirement units have expanded from around 3% of building between 1995-2014. The industry has almost doubled to 6% in the last five years.

31 The SNZ build consent data shows commercial or village style retirement units, though it does not capture private developments, such as the addition of a "granny flat".

32 We have been unable to source any reliable figures on either the self-build or the spec-build components of the market.

2.4.2 Supply Side Constraints

We note that there may be constraints on the supply side that mean that feasible supply may not be developed. Briefly, construction of dwellings or subdivision of development lots may be limited by,

- Labour supply (enough construction workers),
- Capital supply (availability of finance to fund projects),
- Hold outs (people who won't sell),
- Infrastructure (there may be other infrastructure constraints),
- Building regulations (future changes may impact on feasibility),
- Hazards (such as global warming or other natural events that impact on development),
- Land bankers or limited land holders (there may be incentives to hold land and not develop),
- Etc.

This study has not assessed any other supply side restrictions. However, they are likely to have impacts on the timing of development within the District. These aspects of the market are beyond the scope of this study or the modelling. Given that markets change over time it is important that council continues to monitor this closely as an area of potential inconsistency with the NPSUDC requirement and that further detail research could be required.

2.4.3 Demand Side Constraints

We also consider that demand side constraints may also impact on the timing of development. Briefly, construction of dwellings or subdivision of development lots may be limited by,

- Household preferences (specifically important for infill not demanded),
- Household incomes (affordability),
- Etc.

This study has not assessed any demand side restrictions. However, they are likely to have impacts on the timing of development within the District. These aspects of the market are beyond the scope of this study or the modelling. Given that markets change over time it is important that council continues to monitor this closely as an area of potential inconsistency with the NPSUDC requirement and that further detail research could be required.

3 Land Development Model

The Land Development Model (LDM) assesses the feasibility of developing existing zoned residential greenfield areas to produce "build-ready" lots. The broad structure of the LDM is similar to the MBIE feasibility tool – i.e. it tests whether a commercial land developer could purchase the land, invest money subdividing the land and then on sell build ready lots at a profit. The nature of this process is the same as for most financial feasibility models – i.e. simple accounting of costs and revenues to establish returns.

However, the LDM differs in some of the detailed calculations. The key differences between the M.E LDM and the MBIE feasibility tool are the inclusion of staging, risk factors and future feasibility scenarios. The methods employed are discussed below in the following sub-sections.

Twelve existing greenfield area have been tested – five in Rolleston ODP[33] (4, 10, 13, 39 and 40), five in Lincoln ODP (1, 5, 6, 7 and 8), Prebbleton ODP4 and Tai Tapu ODP48. The other greenfield areas in the District have not been tested in the LDM. These other areas are assumed to be financially feasible because they are already well advanced in the subdivision process, or are already selling lots.

The Land Development model calculates feasibility by incorporating the following data sets,

1. Existing Council Data – land area, zone rules, non-developable areas, 224c data, Development Contributions;
2. Corelogic data – land value, capital value, last sale value and lot price data;
3. Harrison Grierson – cost input data; and
4. Other information – collected from developers and PB5 stakeholders.

These data sets are combined in a financial model to develop a set of results for each greenfield area that represent a potential future development trajectory.

3.1 Project Development Path

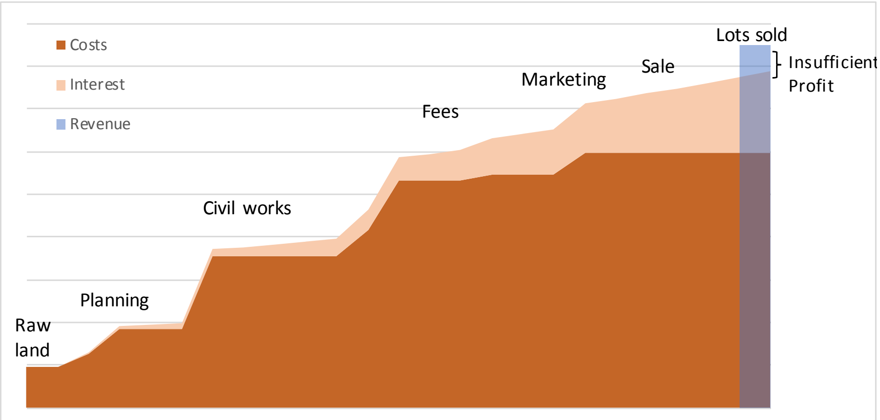
The project timing and staging of the developments will have important implications for the developments' feasibility. The MBIE tool models a static one-shot development – which assumes no staging. This effectively front-loads the costs (early in the sequence) while the revenues are back-loaded (occurring late in the sequence). Specifically, the MBIE tool assumes that all of the cost occurs at one point in time – e.g. all of the civil cost occurs at the start of the project, while all of the revenues accrue at the end of the project – i.e. sell development ready lots. This assumed development path results in significant timing mismatch between costs and revenue that results in the model - incorrectly in our view - estimating large holding costs (i.e. interest on the costs). The net result is that the MBIE tool tends to overestimate costs,

[33] ODP – Outline Development Plan areas apply to the 'greenfield priority areas' in Map A of the CRPS and zoned in the District Plan. The locations that have been tested are either undeveloped or a small portion of the land has been developed

and therefore underestimate development feasibility. This is particularly relevant in the Selwyn district context given that the land developer model contributes a high proportion of the capacity and supply.

Figure 3.1 shows a stylised depiction of the MBIE static one-shot development model in terms of costs expended and interest charges accumulated through the development project (orange) along with the revenue collected from the sales (blue). It shows that in the one-shot model, costs occur early in the development path (orange area) which means that significant interest costs accrue (light orange) before the sale of lots occurs at the end of the project. The interest costs can become a significant proportion of overall costs because there is assumed to be a long lag between the costs being incurred, and the revenue from sale being realised. The implication is that the model can incorrectly predict that a development will not produce enough profit (or even a loss) – i.e. it will not be financially feasible.

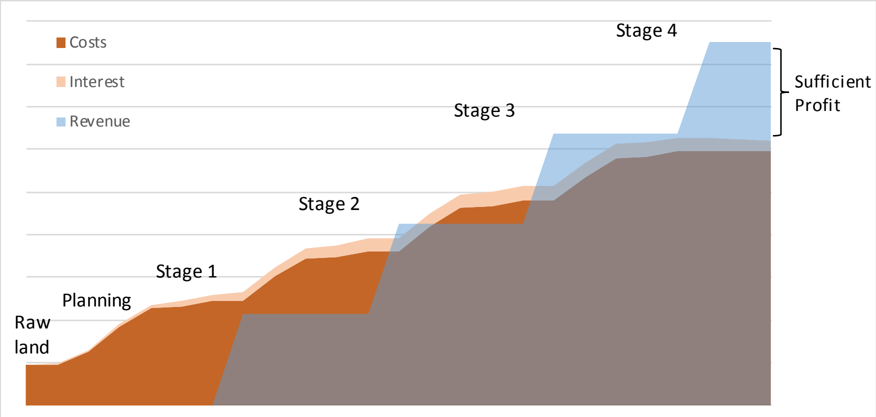
Figure 3.1: Project Development – Static one-shot development



Typically land developers use a staging process to minimise the timing difference between costs and revenues. To do this a developer will often divide the "super-lot" of raw rural land into multiple smaller lots for staging. The common process is to start developing one part of the total development, and progressively sell lots during the development phase which reduces the overall holding costs.

Figure 3.2 shows a stylised depiction of the staged development model. This applies the same information as in the previous example (i.e. same costs, revenue etc), however the timing is split over four stages. The result is a cost curve that more closely aligns to the revenue curve. The closer match of costs and revenue results in lower holding costs (i.e. the interest cost is much smaller). This means that the difference between revenue and costs at the end of the development is considerably larger than if there were no staging, which generates sufficient profits – i.e. is financially feasible. In some cases, the development feasibility can be improved by increasing the number of stages which smooths out and better matches the outgoing costs and incoming revenues over the life of the project.

Figure 3.2: Project Development – Staged development



A key difference in the M.E feasibility model is that the LDM assesses the timing of the costs[34] and revenues to establish whether there is a staging development path which will result in sufficient profit to produce a feasible outcome.

The results presented in the body of this report tests each greenfield area with 5 stages. Our experience with developments across New Zealand indicates it is rare for a development to have more than 10 stages. The sensitivity analysis in Appendix B has been developed by assessing staging ranging from 3 to ten years.

3.2 Project Risks

Also of importance is the risk factors in the model. There are a number of inputs in the model that relate to risk – primarily contingencies, interest and the return requirement. All of these inputs are included to account for risk and uncertainty in the land development process, and are listed as costs. However, the nature of these costs means that in most situations they will not be fully utilised or required.

For example, a developer may have a development contingency that amounts to around 15% of total costs (as is the case in the Harrison Grierson data for the District). However, it is likely that the developer won't need to expend the total contingency.

In the MBIE feasibility tool the risks are "loaded" as costs that are applied cumulatively, and therefore could overstate the actual risk and costs, and potentially under-state development feasibility. For example, the MBIE tool:

- Adds two project contingencies expressed as a percentage of total costs (risk factor 1);
- Then "loads" on top an interest cost (risk factor 2) which applies to expected real costs and also to the project contingencies; and

[34] Raw land and planning costs still occur early in the development. The civil, fees and sales costs occur according to each stage. It is assumed that each greenfield development is split into even stages – i.e. a four stage development has 25% of development in each stage.

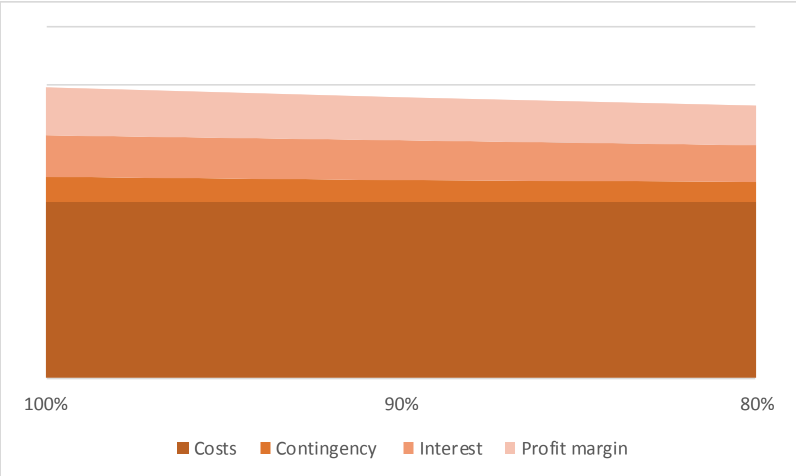
- Finally, "loads" on top a profit margin requirement (risk factor 3) which is on the basis that the contingency costs and the interest costs have been or will be incurred.

This loading compounds the impact of the risk and uncertainty. It means that provision for risk and uncertainty can account for approximately 30% of the total costs.

Figure 3.3 shows an example of a land development project with various risk outcomes which represent the spectrum of results that could eventuate, with between 100% and 80% of those risks eventuating. The figure shows the total revenue required for the project to be feasible under different risk outcomes – i.e. project costs compounded by contingency compounded by interest compounded by profit margin.

The left side of the graph shows the resulting project outcome if 100% of the risks eventuate, while the right side of the graph shows the resulting project outcome if 80% of the risks eventuate. In this example, the sale revenue required if 80% of risks eventuate during the project would be 7% lower than if 100% of the risks eventuate (i.e. approximately half of the profit required). Therefore, the modelling of risk can have a significant impact on the overall ability of a model to correctly estimate feasibility of a development.

Figure 3.3: Project Outcome - Risk Loading



The methods used for risks and contingency estimation are generally divided into deterministic and probabilistic classes.[35] The deterministic method results in a single-figure prediction of estimated risk which implies a degree of certainty that is not justified. This exposes the model to the problem of overcompensating for risks. In effect the model is assuming a worst possible outcome, rather than reflecting the real market which has a spectrum of outcomes, which have different probabilities of occurring.

To account for this uncertainty and avoid cost loading, we have applied a spectrum of risk outcomes which reflects more accurately the true nature of these costs, and the outcomes to reflect the probability of them occurring (a probabilistic approach). This type of assessment is commonly referred to as an Expected Value

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[35] The MBIE tool is a deterministic method which is a simple percentage contingency based upon the estimate of project costs, financing costs and profit margins.

method. This method is still **conservative**, which provides a more real world understanding of the spectrum of outcomes that could occur between extreme and high risk outcomes.

Table 3.1 shows the range of risk factors applied in the results presented in the body of this report , from extreme case of 100% of risks eventuating to high case with 80% of risks eventuating for one of the greenfield areas (Lincoln ODP1). We reiterate that this range has been set conservatively, there will be many cases where less than 50% of the contingency is used or even some cases where 0% of the contingency is used. Note that the range presented in each of the figures in section 5.1 is driven by the proportion of contingency utilised (between Extreme and High).

Table 3.1: Project Risk Factors – example Lincoln ODP1

Risk Factors	100%*	90%	80%
Contingencies			
Civil Works	25.0%	22.5%	20.0%
Fees and Charges	16.0%	14.4%	12.8%

**Harrison Grierson (2018) Project Costs data for GCP Greenfeild areas.*

In this study the results presented in the body of this report applied the standard 20% profit requirement, as is set in the base MBIE tool and other feasibility tools applied by M.E. This is based on the Statistics New Zealand Business Performance Benchmarker data which shows that businesses in the "Land Development and Subdivision" have made profits of around 20% on average over the last three years.[36] However, we note that this level of profit reflects the type of risk involved in this type of business. Specifically, the long time periods and uncertainties around lot sale prices means that this industry requires a much higher return than other businesses in the construction industry.

The sensitivity analysis in Appendix B has been developed by assessing ranging of contingency down to 50% and profit margins of 10% and 30%.

3.3 Project Future Feasibility

Another key assumption in the MBIE tool is that the lot sale price and costs of development remain constant for the coming three decades. This assumption reflects MBIE and MFE interpretation of the definitions in the NPSUDC which refers to the test of feasibility being conducted under "current likely" conditions (costs, sale price and profit margins).

There has been significant debate with MBIE and MFE on whether "current likely" in the NPSUDC should be interpreted "literally" or "practically". MBIE and MFE to date consider that the wording of NPSUDC should be interpreted in the literal sense or as a lay person would read the NPSUDC – i.e. "current likely" means the assessment should apply only today's conditions (a locked or frozen market).

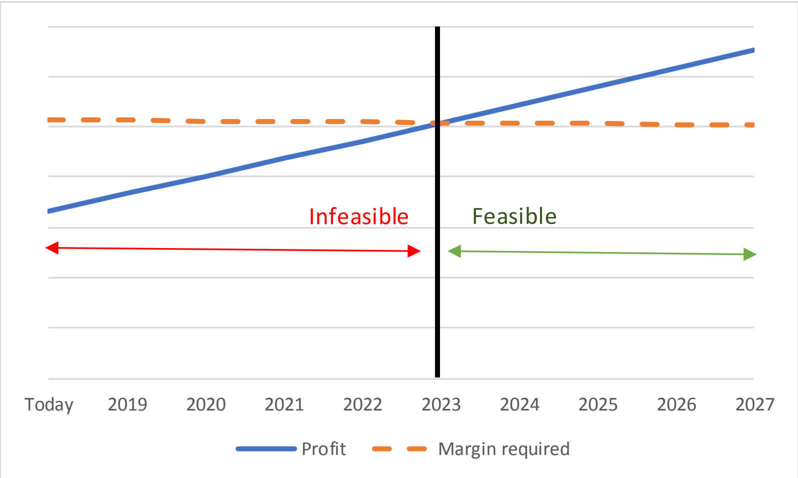
However, following discussions with the high growth councils and reviews of M.E's feasibility models, MBIE and MFE have now acknowledged that it is valuable to present other alternative scenarios. These

[36] Statistics New Zealand (2018) Business Performance Benchmarker 2015-2017. "Land Development and Subdivisions" ANZSIC06.

alternative scenarios are based on a practical interpretation, or as an economist would read the NPSUDC. In summary, it is considered impossible that a market will be frozen or locked in place for short, medium or long term. There is a weight of history and economic theory that suggests that the only reasonable method for understanding feasibility over time is to acknowledge the fact that there are natural processes that will not stop. The M.E view is that economists must model the real nature of the economy and that the frozen or locked market condition has no basis in economic theory or reality. A full discussion of this issue is outlined in the M.E discussion paper that was delivered to MBIE and MFE on behalf of the high growth councils.[37]

Figure 3.4 shows how a project may be considered to be infeasible under today's conditions (MBIE and MFE frozen or locked market) while becoming feasible in the near future if lot sale prices grow slowly (M.E future feasibility position). This example shows how a small (1% per annum) real growth in lot sale price can increase the profit achieved from the project to a point where the project becomes feasible. In this case the project becomes feasible in 2023, when the profit received (blue line) exceeds the margin required (orange dotted line). At this point in the future, a developer would consider undertaking the project.

Figure 3.4: Project Temporal Feasibility



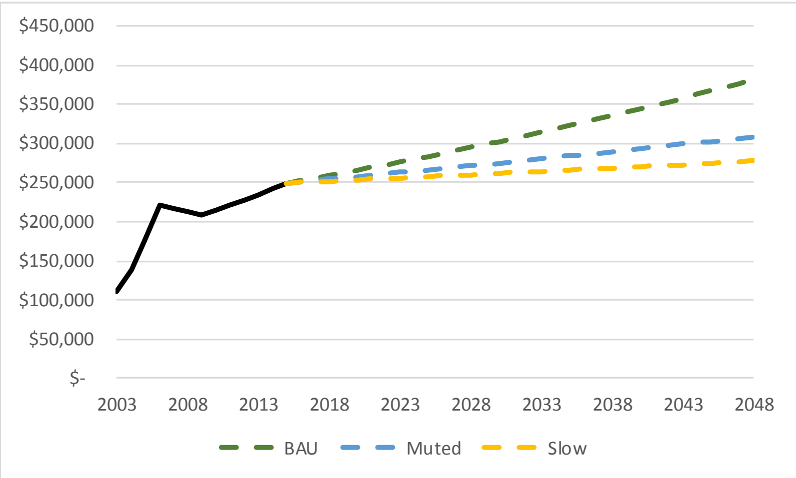
Therefore, the M.E feasibility model assesses the trends in lot sale price, rural land prices and land development costs to estimate feasibility under future conditions. The future assessment in this study was conducted using three scenarios - Business-as-Usual or BAU, Muted change and Minimal change.

These three scenarios show that even under very conservative muted or minimal change assumptions, development feasibility can be expected to improve markedly over the medium term (decade) and long term (three decades) periods required in the NPSUDC. The model has not been run for an elevated change scenario, there may well be a situation where change occurs more rapidly. In an elevated change future capacity would become feasible more quickly. We consider that that existing central government commitments on Kiwibuild are likely to reduce the potential for an elevated change outcome to occur. We also consider that Councils should adopt a more conservative approach by enabling capacity to match the BAU.

[37] Market Economics (2018) NPS-UDC: Current Feasibility Provisions – Discussion Paper.

Figure 3.5 shows the average lot prices in the District between 2003 and 2016 in real terms (adjusted for inflation) and the three price scenarios (BAU, Muted and Slow).[38] Historically in real terms the lot prices have increased from $110,000 in 2003 to $250,000 in 2016, which is a growth rate of 7% per annum. However, over the past decade (2006 to 2016) the lot price has increased by 1.3% per annum. In the this study the BAU line projects lot price using the growth rate from the past decade, which results in a lot price of $382,000 by 2048. The Muted and Slow reach $308,000 (annual % change is half the historic trends) and $278,000 (annual % change is a quarter of the historic trends) by 2048. The real growth in lot prices under all of these scenarios will have substantial impact on the feasibility of a development.[39]

Figure 3.5: District Average Lot Price (Base 2016 $)



The key concern of MBIE and MFE is that price growth will result in lots becoming unaffordable. We note that the rate of growth in lot prices suggested in the three scenarios is well below background economic growth and/or real wage growth. This means even under these scenarios the affordability of lots actually increases over time. Specifically, comparing current incomes to lot prices would show a less affordable outcome currently than the outcomes used in this study in 2048.

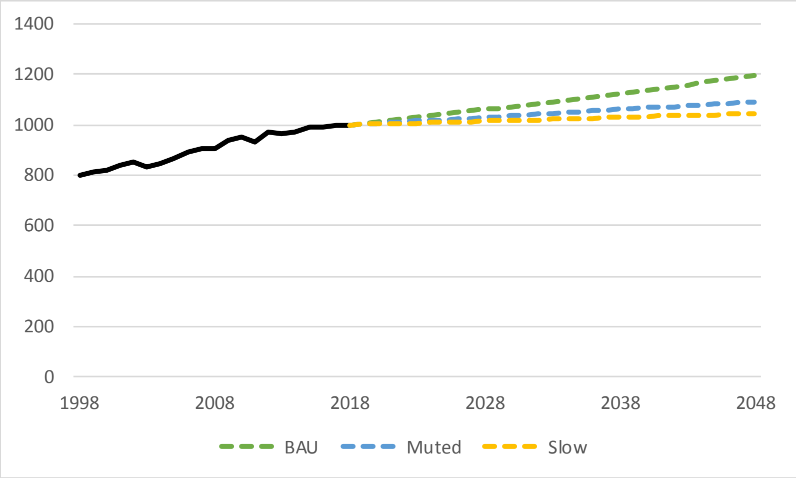
Figure 3.6 shows the civil construction costs index between 1998 and 2018 in real terms (adjusted for inflation) and the three price scenarios (BAU, Muted and Slow).[40] Historically in real terms the civil costs have increased by 0.6% per annum. The BAU line projects the historic growth over the coming three decades, which results in civil cost increasing by 19% between 2018 and 2048. The Muted and Slow reach 9% (half the historic trends) and 5% (quarter of the historic trends) by 2048. The real growth in civil works under all of these scenarios is likely to have impacts on the feasibility of a development.

[38] In this study we have analysed new lot data from Quoteable Value and current advertised sales prices (as was applied in the previous study of feasibility for the GCP). This data was used to establish base line current prices in 2018. The model has twenty-seven lot sales prices for different land sized lots for GCP area of Selwyn.

[39] The input cost of the raw development land is assumed to grow at the same rate as the lot price. The raw land excludes the existing dwellings (i.e. farm house or rural residential houses), which is the associated improvement value and a small lot of land (assuming 30% site coverage).

[40] Statistics New Zealand (2018) Price Index by Group of Capital Goods – Civil Construction.

Figure 3.6: Civil Construction Costs Index (Base 2018 $)



The results presented in the body of this report tests each greenfield area with the three future scenarios described above (BAU, Muted and Slow). Note that the each of the figures in section 5.1 is represents one of the change scenarios. The sensitivity analysis in Appendix B has been developed by assessing two other scenarios – no change (current situation) and medium change (about 50% faster than the BAU).

4 Build Development Model

The M.E Build Development Model (BDM) assesses the feasibility of developing existing zoned residential lots to a final dwelling. The BDM tests feasibility of both infill and greenfield lots, to establish which building developments are feasible. Conceptually, the model tests whether the revenues will exceed the costs by sufficient margin for the development to be considered feasible. However, the types of costs, and the inputs for both costs and revenue are different from those applied in the previous MBIE tool.

The broad structure of the BDM is similar to the MBIE feasibility tool – i.e. it tests whether a commercial builder could purchase, invest money to build a house and sell to a customer at a profit. The nature of this process is the same as for most financial feasibility models – i.e. simple accounting of costs and revenues to establish returns.

However, the key differences between the M.E BDM and the MBIE feasibility tool are the treatment of builders, typologies of dwellings, risk factors and future feasibility. The model has also been calibrated to existing developments to improve the accuracy. The methods employed are discussed below in the following sub-sections.

The BDM tests 9,300 existing lots in greenfield areas and 400 infill lots tested;

The BDM calculates feasibility by incorporating the following data sets;

1. Existing Council Data – land area and zone rules;
2. Corelogic data – land value, capital value, lot price data and new build sale price;
3. WTP – cost input data; and
4. Cost Builder data – M.E has a database of build costs from other work.

4.1 Group Home Builders

Many of the new builds in the district are constructed by group home builders, which operate using very different development strategies than speculative build developers (spec-homes), self-builds (buy-and-builds), retirement, community/social housing and the proposed KiwiBuild. Importantly, group home builders use "Home-and-Land" or "Design-and-Build" packages as their key development methods.

These packages provide five key benefits to the group home builders:

- <u>Minimises capital requirement</u>. Generally, a Home-and-Land package contract is signed with a customer before the lot of land is purchased and/or the build plan is completed (i.e. not off the plans). While in the Design-and-Build package the customer purchases their own land independently of the group home builder. Therefore, in most cases the cost of buying the land is financed by the customer which means that the group home builder does not need to put substantial amounts of their own capital (money) at risk.

- A stream of guaranteed instalments. The group home builders are able to collect part-payments as the build process occurs. There are commonly instalments as a land title issued[41], deposit, completion of foundation, roof, weather proof, completion and then final code of compliance. The instalments mean that the group home builders are able to limit the amount of money that they need to borrow. This reduces the holding costs, which are effectively transferred to the customer who covers them via their bank finance.

- Reduces build costs. The group home builders are able to spread fixed costs across many customers and subdivisions which reduces the overall build cost. For example, group home builders tend to have a portfolio of standardised architectural designs and materials which are applied over many builds due to standardised designs, and in some cases prefabrication. This spreads the cost of the design across many customers which creates costs savings via economies of scale.

- Shorter build time. The group home builders are able to complete construction more rapidly than custom built houses. This results in less holding costs, quicker regulatory consents, other costs and reduces risks.

- Lower risks. The group home builders have lower risks because they have much more certainty about the revenue that they will receive and the timing of the revenue.

In summary, group home builders are generally able to build more cheaply, at a lower risk, more quickly and with less capital than some other residential developers. In the following modelling we applied a group home builder perspective – which has lower upfront capital investment[42], holding costs are lower[43], lower build costs[44], shorter time period[45] and lower profit margins to cover risks[46].

The results presented in the body of this report tests each build ready lot using a group home builder. The group home builder does not purchase the land before a customer is found, their costs are lower (see Table 4.1 and discussion in the following sub-section) and profit margin of 10%. The sensitivity analysis in Appendix B has been developed by assessing a spec builder[47] and an own build[48].

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[41] This instalment only applies to House-and-Land packages.

[42] The customer is assumed to buy the lot of land which reduces the return requirements of the group home builder.

[43] The holding costs are reduced as instalments of money from the customer minimises the amount of borrowings by the group home builder.

[44] See next section for discussion.

[45] It is assumed that the group home builder can complete construction within 9 months.

[46] Statistics New Zealand (2018) Business Performance Benchmarker 2015-2017. "House Construction" ANZSIC06. Shows an average margin of less than 6%, in the model 10% is applied.

[47] Spec Builder (similar to MBIE tool), which buys and holds the land, has higher build costs (WTP), and higher profit margin required (20%).

[48] Own Build), has lower build costs (unpaid labour, no real estate fees) and lower profit margin required (0%).

4.2 Build Type

The Build Development model tests three broad dwelling typologies – detached, attached and terraced. We do not consider that there is any value in testing apartments, given the current and likely future market conditions in the District.

For each dwelling typology, the model applies three sizes of dwelling, small, medium and large. The sizes of the dwellings were set by assessing current development patterns,[49] in order to establish the Small (lower quartile), Medium (median) and Large (upper quartile) that is currently being built in the District. There was insufficient data for terraced dwellings to establish the range of sizes in the District.[50]

Also, for each dwelling typology and size the model assessed three build qualities, budget, medium and premium. The build quality was set using QV Cost Builder and WTP data to establish lowest (budget), average (medium) and highest (premium) build costs that can be expected under today's conditions. The build cost ranges from as low as $155,000 (budget small terraced dwelling) to as high as $426,000 (premium large detached).

Table 4.1: Build Types – Typology, Size and Qualities (excl gst)

Type	Detached	Attached	Terraced*
Size (m^2)			
Small	160	120	110
Medium	200	140	120
Large	230	170	140
Quality (\$ per m^2)**			
Budget	$ 1,407	$ 1,429	$ 1,480
Average	$ 1,667	$ 1,602	$ 1,740
Premium	$ 1,853	$ 1,797	$ 2,143

**There is insffucient data on the size distribution of terraced dwellings.*

***WTP 2017 and QV Cost builder 2018*

Other costs have been updated as follows,

- **Garages:** have been included in the model, with double garage for dwellings over 170m² and a single garage for dwellings under 170m². The garage costs of $700 per m² are applied to 36m² for a double garage and 24m² for a single garage.[51]
- **Design/Architect:** The premium dwellings are assumed to be custom designed, which is equivalent WTP design costs. The average dwellings are assumed to be standard pre-designed from a group home builder with some customisation, which is set at three quarters of the WTP

[49] Quotable Value (2018) Sales data for 2016 and 2017.

[50] In this study large terraced dwelling was set at the median attached dwelling (130m²) and the medium terraced was set at the small attached dwelling (130m²). The small terraced dwelling was set at the 5th percentile of the attached dwellings (110m²).

[51] QV (2018) Cost Builder – Residential Garage Christchurch. Ranges between $500 to $950 per m².

design costs. While the budget dwellings are assumed to be a standard pre-design from a group home builder with no (minimal) customisation, which is set at half of the WTP design costs.

The results presented in the body of this report tests each build ready lot using the information presented above. As discussed in the previous subsection, the sensitivity analysis in Appendix B has been developed by assessing a costs that are higher (WTP base data) and lower (approximately 30% lower) than presented above.

4.3 Build Risks

Similar to the land development, there are a number of inputs in the model that relate to risk – contingencies, interest and return requirement. All of these inputs are included to account for risk and uncertainty in the build process. However, the nature of these costs means that in most situations they will not be fully utilised or required.

In the MBIE feasibility tool these risks are "loaded" costs that are applied cumulatively, and therefore could overstate the actual risk and potentially under-state feasibility. In particular, the MBIE tool:

- Adds three build contingencies in terms of a percentage of total costs (risk factor 1),
- then "loads" on top an interest cost (risk factor 2) which is applied to these contingency "costs", and
- finally, "loads" on top a profit margin requirement (risk factor 3) which is applied to the contingency "costs" and interest.

This loading in the MBIE formula acts to compound the impacts of the risk and uncertainty. The loading effect is significant, and can account for approximately 10% of the total costs. To account for this uncertainty and avoid cost loading, we have applied a spectrum of risk outcomes which reflects the true nature of these costs (probabilistic). Table 4.2 shows the range of risk factors applied in the results presented in the body of this report, from extreme case of 100% of risks eventuating to high case with 80% of risks eventuating. Note that the range presented in section 5.2 is driven by the proportion of contingency utilised (between Extreme and High).

Table 4.2: Build Risk Factors

Risk Cases and Factors	Extreme 100%*	90%	High 80%
Contingencies			
Preparation	25.0%	22.5%	20.0%
Build Costs	7.0%	6.3%	5.6%
Anciliary	5.0%	4.5%	4.0%

**WTP (2018) Build Costs data for GCP.*

For example, the left side of the table shows the resulting outcome if 100% of the risks fully eventuate during the build, while the right side of the table shows the resulting outcome if 80% of the risks eventuate. The revenue required if 80% of risks eventuate during the project would be approximately 10% lower than if 100% of the risks eventuate. Therefore, the modelling of risk can have a significant impact on the overall ability of a model to correctly estimate feasibility of a build.

The sensitivity analysis in Appendix B has been developed by assessing ranging of contingency down to 50%.

4.4 Build Future Feasibility

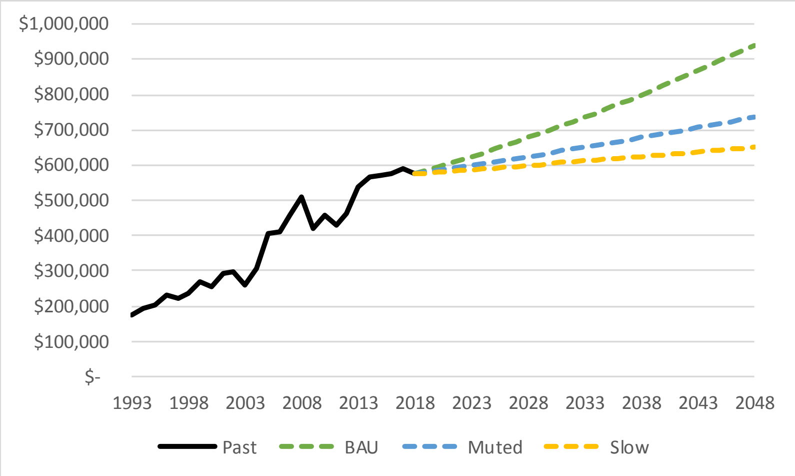
Similar to the land development model, there has been significant debate with MBIE and MFE on whether "current likely" in the NPSUDC should be interpreted "literally" (todays condition) or "practically" (future conditions). Refer to subsection 3.3 or M.E discussion paper. In summary, the BDM applies three scenarios which show the range of potential feasibility in the future – which are alternative scenarios to the NPSUDC. The M.E feasibility model assesses the past trends. This includes the sales price that could be expected under today's conditions, and in future conditions. The price achieved was assessed in terms of dwelling typology, size and quality.[52]

The future assessment in this study was again conducted using Business-as-Usual, Muted change and Minimal change scenarios. These three scenarios show that even under very conservative muted or minimal change in prices, development feasibility can be expected to improve markedly over the medium (decade) and long term (three decades) periods required in the NPSUDC. The model has not been run for an elevated change scenario, there may well be a situation where change occurs more rapidly. In an elevated change future capacity would become feasible more quickly. We consider that that existing central government commitments on Kiwibuild are likely to reduce the potential for an elevated change outcome to occur. We also consider that Councils should adopt a more conservative approach by enabling capacity to match the BAU.

Figure 4.1 shows the average dwelling sale prices in the District between 1993 and 2017 in real terms (adjusted for inflation) and the three price scenarios (BAU, Muted and Slow). Historically in real terms the sale prices have increased from $198,000 in 1993 to $453,000 in 2017, which is a growth rate of 4.8% per annum. The BAU line projects lower growth based on recent growth of 1.7% per annum, which results in a sale price of $940,000 by 2048. In the Muted and Slow projections, sale prices reach $737,000 and $651,000 by 2048. The real growth in lot prices under all of these scenarios could have substantial impact on the feasibility of a development.

[52] In this study we have studied new build sales data from Quoteable Value and current advertised sales prices (as was applied in the previous study of feasibility for the GCP). This data was used to establish base line current prices in 2018. The model has sales price for 27 types of dwelling, 10 different land sized lots and three markets (Rolleston, Lincoln, Prebbleton/West Melton) which gives a total of nearly 1,000 different sales prices.

Figure 4.1: District Average Sale Price – (base 2018 $)



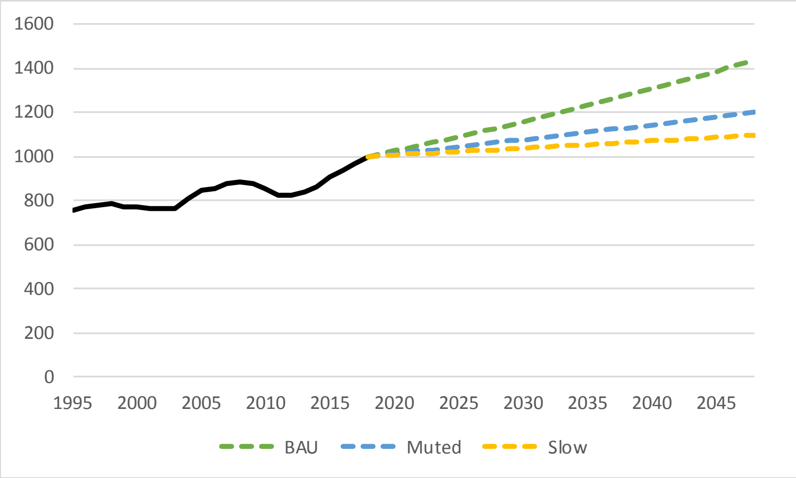
As noted, a key concern of MBIE and MFE is that price growth will result in lots becoming unaffordable – i.e. they are concerned with a normative position of a policy objective rather trying to model the real outcome using standard positive economic position.

Notwithstanding this issue, we note that the rate of growth in dwelling prices suggested in the three scenarios is well below background economic growth and/or real wage growth. This means even under these scenarios the affordable of dwellings will actually increase over time. Specifically, comparing current incomes to sale prices would show a less affordable outcome than the outcomes used in this study in 2048.

We have also assessed building cost inflation from the past to establish a set of scenarios that will be used to project build costs in the future. The build costs have grown by 1.2% per annum in real terms (adjusted for background inflation).[53] Figure 4.2 shows the residential building construction costs index between 1995 and 2018 in real terms (adjusted for inflation) and the three price scenarios (BAU, Muted and Slow). The BAU line projects the historic growth over the coming three decades, which results in residential building cost increasing by 44% between 2018 and 2048. The Muted and Slow reach 20% (half the historic trends) and 10% (quarter of the historic trends) by 2048. The real growth in residential building works under all of these scenarios will have impacts on the feasibility of a development.

[53] Statistics New Zealand (2018) Price Index by Group of Capital Goods – Residential Buildings.

Figure 4.2: Residential Building Construction Costs Index (base 2018 $)



The results presented in the body of this report tests each build ready lot with the three future scenarios described above (BAU, Muted and Slow). The sensitivity analysis in Appendix B has been developed by assessing two other scenarios – no change (current situation) and medium change (about 50% faster than the BAU).

Finally, we note that MBIE/MFE recently released a guidance[54] on how feasibility can be calculated and how the results should be presented. The guidance reiterates the MBIE/MFE position, that the base line scenario should be calculated using current market conditions. The guidance does note that it may be useful to generate additional scenarios for decision makers ("One way of doing this is to explore the impact of changing prices over time").

Notwithstanding the value of these alternative scenarios, the guidance states that they "should not be presented as the base scenario or be used to conceal estimates of feasibility based on current costs and prices".

On that basis, we are compelled to present a "Base scenario – frozen market" which is the feasibility models run with no changes in price or build cost. We note that the results from the "Base scenario – frozen market" only provide information about one point in time (today) and applying an assumption of nil change throughout the next 30 years does not concord with standard economic methods. It is not possible for a market to be frozen for the short, medium or long term. As a consequence, this frozen market scenario provides no reliable information about how the housing market may perform in the future, and the "Base scenario – frozen market" results are not reliable for planning for future growth. To be clear M.E do not support the use of or see the relevance of the "Base scenario – frozen market".

[54] MBIE/MFE (2018) Further guidance on assessing the feasibility of housing development capacity for housing and business development capacity assessments – September 24th, 2018

5 Feasibility Outputs

The feasibility outputs from this study are discussed in two parts, supply of land (LDM) that is feasible in the District and the supply of feasible dwelling builds (BDM), by time. The results are presented in a summary table, the models have too many output results to be presented visually.

5.1 Land Feasibility Outputs

The land feasibility outputs from the LDM shows that most of the greenfield developments are expected to become feasible within the NPSUDC timeframes (three decades).

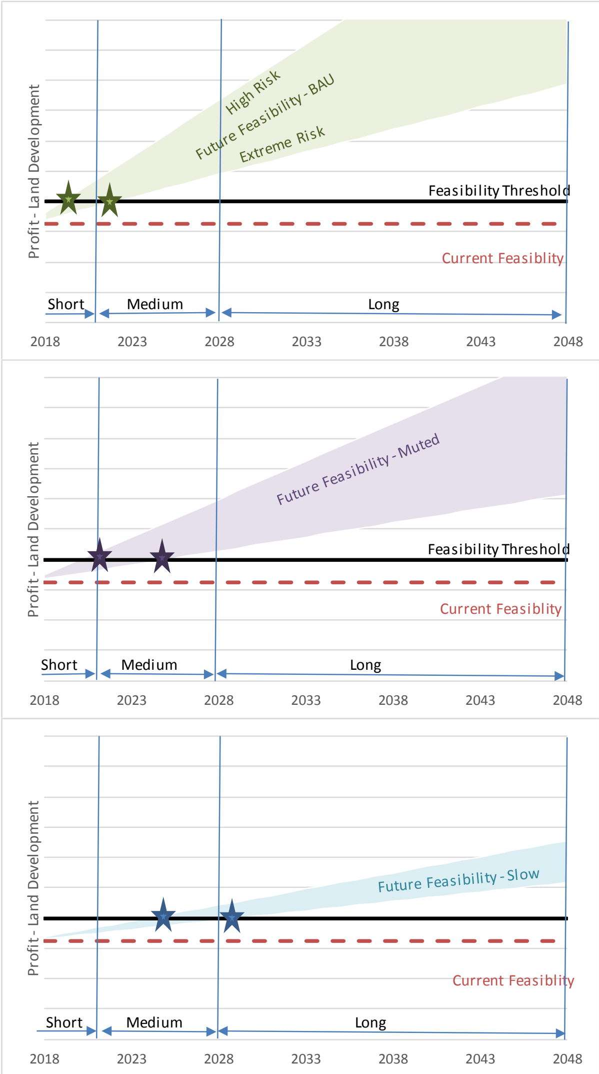
First, the model suggests that five of the greenfield areas are currently feasible (Rolleston ODP 4, 39, 40, Lincoln ODP 5 and Prebbleton ODP 4) – i.e. they could be developed under todays conditions. This suggests that around 700 lots can be supplied from these greenfield areas. The model also suggests that no other areas will become feasible within the short run. This gives a total short term supply of around of 700 during the period 2018 to 2021.

Second, the model suggests that one more of the greenfield areas will become feasible in the medium term – Lincoln ODP1. The following three graphs for each development shows the feasibility threshold (black horizontal line) and the NPSUDC short, medium and long term periods (blue vertical lines). The graphs show that the developments are not feasible under the current prices and costs – i.e. red dotted line is below the feasibility threshold. However, under some of the future scenarios the development will become feasible.

The BAU scenario (first set of graphs) results suggest that the development may become feasible in the future between 2021 and 2028, when the green shaded area exceeds the feasibility threshold (medium term). In summary Rolleston OPD39 becomes feasible first, then followed by Rolleston ODP40 and later by Lincoln ODP1.

Muted scenario (second set of graphs) results suggest that the developments may become feasible by between 2025 and 2040 (long term). Also, the Slow scenario (third set of graphs) results suggest that the development may not become feasible in the any of the periods assessed.

Figure 5.1: Greenfield Areas - Medium Term

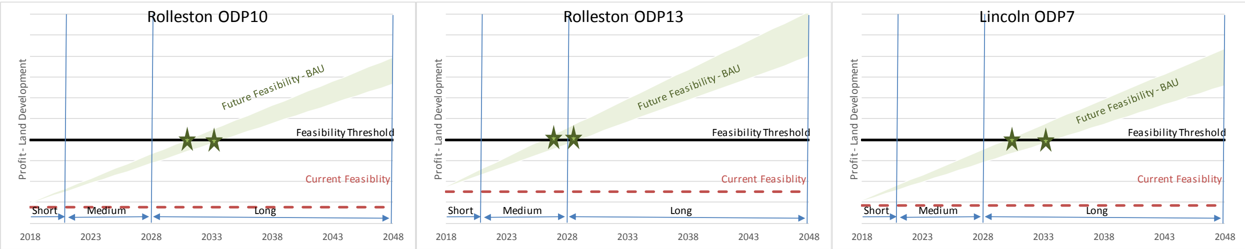


We consider that it is very likely that these three developments (Lincoln ODP1) will become feasible within the medium term. In total there will be supply in the medium term of around 1,400 lots.

Third, the model suggests that three more of the greenfield areas will become feasible in the long term – Rolleston ODP 10 and 13, and Lincoln ODP7. The BAU scenario results suggest that the developments may become feasible in the future between 2028 and 2035, when the green shaded area exceeds the feasibility threshold (medium term). In summary Rolleston ODP10 becomes feasible first, then followed by Rolleston ODP13 and later by Lincoln ODP7.

Current price results, Muted scenario and Slow scenario suggest that the developments may not become feasible in the long term. These resulting graphs are not displayed in this report.

Figure 5.2: Greenfield Areas - Long Term



We consider that it is very likely that these three developments (Rolleston ODP 10 and 13, and Lincoln ODP7) will become feasible within the long term. In total there will be supply in the long term of around 2,200 lots.

Finally, the model suggests that three of the greenfield areas are not feasible under all scenarios and all time periods tested (Lincoln ODP 6 and 8, and Tai Tapu ODP48) – i.e. they may not be developed under future conditions with the coming three decades. This suggests that around 100 lots in greenfield areas that are currently zoned may not be financially feasible.

5.2 Supply of feasible dwelling builds

In this section, we first present business-as-usual results and the two contingency runs of the BDM model (i.e. extreme risk and high risk). Almost 100% of capacity in the district becomes feasible within the NPSUDC periods under the Business-as-usual scenario. We then provide a brief discussion of the results from the other future scenarios (muted and slow) and base scenario (frozen market).

The table shows that there is approximately 1,200 to 4,900 dwellings that are feasible in the short term. The feasibility increases in the medium term to 5,900 to 6,100. Much of the remaining dwellings become feasible in the long term. There are a small number of dwellings that are not feasible, these are mainly in the larger lot zones (rural residential).

Table 5.1: Supply of Feasible Dwellings 2018-2048

Business-as-usual	Short 2018-21		Medium 2018-2028		Long 2018-2048	
Contingency	100%	80%	100%	80%	100%	80%
Rolleston	1,170	4,870	5,230	5,230	5,370	5,370
Lincoln	-	-	-	140	2,920	2,920
*Prebbleton**	20	20	620	620	790	790
Small Settlements	-	-	70	70	70	70
Total SDC UDS	1,190	4,890	5,920	6,060	9,150	9,150

**Prebelton and West Melton*

Key findings,

- The results from the model show that almost all of the capacity becomes feasible within the time period governed by the NPSUDC. This is important as it aligns closely with scenarios 2-4 in the NPSUDC reports.

- We consider that if the council moves to zone some of the land identified for future development (i.e. areas on the Proposed Infrastructure Boundary), then much of that capacity would also be feasible within the time period governed by the NPSUDC.
- Also of interest is that in most cases the dwelling types that become feasible first are the detached and then attached. The terraced housing takes much longer to become feasible. The terraced and smaller dwellings are less viable. This is unsurprising as denser dwelling typologies do not generally become viable until sales prices become very high (which may not occur until beyond 2048). However, as noted in the limitation section above there may be greater demand for these types of dwellings in the future which could generate faster growth in prices and feasibility of this dwelling typology.
- We note that the results indicate that much of the capacity in Lincoln is not feasible in the short and medium term. There is anecdote evidence that developments have been feasible in these areas. This highlights an area for future investigation and monitoring (potentially with PB5 input).[55]

The BDM model was also run for muted growth[56] and slow growth[57] scenarios. The results from these alternative future scenarios show limited feasible dwelling supply. The Base Scenario – Frozen Market results show that there are fewer than 1,200 dwellings feasible under current prices. The majority of the supply is in Rolleston and some in West Melton.

5.3 Sufficiency of Supply to meet Demand

Comparing the growth in households and the NPSUDC buffer to the supply we are able to assess whether there is sufficient supply to meet demand. In the following discussion we compare the demand (households) and the NPSUDC buffer to the amount of feasible supply in each time period (applying the BAU scenario). The Sufficiency in the tables is calculated by subtracting the NPSUDC Buffer from the Feasible Supply to establish whether there is sufficient supply.

In the short term there is expected to be 2,600 new households in the District which require a dwelling. The NPSUDC requires the council to have a buffer of 20% which results in a need for 3,100 dwellings. The results of the modelling indicate that there is likely to be sufficient supply in the short term to accommodate the households and provide for a buffer (1,800 remaining).

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[55] The BDM results for this area show that capacity becomes feasible in 2029 – i.e. on the cusp of being feasible in the medium term. On closer inspection the input data on the size of subdivided lots (Contemporary/Modified capacity) may be too high for Lincoln Living Z zone. We consider that that the council should monitor this area in the future, the density achieved may be higher and capacity may become feasible earlier than is estimated in this study.

[56] In the Muted growth scenario, the supply of feasible builds is not sufficient to meet the household demand or the NPSUDC buffer in any time period. The results show a short term supply of fewer than 1,200, while the medium term supply increases to 1,900 and long term supply of 6,000.

[57] In the Slow growth scenario, the supply of feasible builds is not sufficient to meet the household demand or the NPSUDC buffer in any time period. The results show a short term supply of fewer than 1,200, while the medium term supply increases to 1,200 and long term supply of 6,100.

Table 5.2: Sufficiency of Feasible Supply to Meet Demand 2018-2048 – Future Scenario

Period	Households*	NPSUDC Buffer**	Feasible Supply***	Sufficiency
Short term (2018-21)	2,600	3,100	1200 - 4900	Yes (-1900 to 1800)
Medium Term (2018-28)	7,200	8,600	5900 - 6100	No (-2700 to -2500)
Long term (2018-48)	20,700	23,800	9,200	No (-14600 to -14600)

**Greater Christchurch Partnership (2018) Housing and Business Development Capacity Assessment. Table 1*

***NPSUDC reqires 20% buffer in Short term and Medium term, while 15% in the Long term.*

****BDM outputs for Business-as-usual scenario, modified capacity that is feasible in GCP area.*

In the medium term there is expected to be 7,200 new households in the District which require a dwelling. The NPSUDC requires the council to have a buffer of 20% which indicates a need for 8,600 dwellings. The results of the modelling indicate that there is insufficient supply in the medium term to accommodate the households or allow for a buffer. This suggests the NPSUDC requirements may be breached by the end of the decade (around 2026), meaning an additional capacity of 2,500 may be needed to meet projected demand through to 2028.

However, if the price growth in the medium term is faster than the low rates of increase assumed in the BAU scenario, then the feasible supply would be higher than indicated, and the NPSUDC requirements for the medium term would be achieved. Given that markets change over time it is important that council continues to monitor this closely as an area of potential inconsistency with the NPSUDC requirement.

In the long term there is expected to be 20,700 new households in the District which require a dwelling. The NPSUDC requires the council to have a buffer of 15% which results in a need for 23,800 dwellings. The results of the modelling indicate that there is likely to be insufficient supply in the long term to accommodate the households or the buffer. The supply may be exhausted by 2031, however the buffer requirement could be breached in 2030, meaning an additional capacity of 14,600 is needed to meet projected demand through to 2048.

This may arise if no further land were zoned for urban activity. We expect there would be two or three District Plan Reviews and ten Housing Development Capacity Assessments during the next 30 years, which would provide opportunity to zone additional land and re-evaluate housing sufficiency.

The Base Scenario Frozen Market indicates that only a small proportion of existing capacity is currently feasible under today's condition (12% of the capacity). This amount of feasible capacity is equivalent to less than two years of supply – i.e. insufficient supply for the short term, medium term and long term. If feasible supply was indeed this low, then we would expect to see significant growth in house prices in the district. Recent house price changes in the district indicates that there is no shortage which suggests that the Base scenario of nil change has little relevance to the FDS planning.[58]

[58] MBIE (2018) Market Indicators – house prices in the District have stabilised over the last 12 months.

Table 5.3: Sufficiency of Feasible Supply to Meet Demand 2018-2048 – Base Scenario

Period	Households*	NPSUDC Buffer**	Feasible Supply***	Sufficiency
Short term (2018-21)	2,600	3,100	1,200	No (-1900)
Medium Term (2018-28)	7,200	8,600	1,200	No (-7400)
Long term (2018-48)	20,700	23,800	1,200	No (-22600)

**Greater Christchurch Partnership (2018) Housing and Business Development Capacity Assessment. Table 1*

***NPSUDC reqires 20% buffer in Short term and Medium term, while 15% in the Long term.*

****BDM outputs for Base scenario Frozen Market, modified capacity that is feasible in GCP area.*

6 Conclusion

This report provides economic research on the financial feasibility of residential land and building developments in the Selwyn District. A requirement of the National Policy Statement on Urban Development Capacity is that local authorities that have a high-growth urban area within their district must undertake research of residential demand and supply. One aspect of this research is to establish the extent and nature of residential supply that is financially feasible over the coming three decades.

During the research for the NPSUDC, Greater Christchurch Partners elected to apply the MBIE feasibility tools.[59] The results from the MBIE feasibility tools indicated that a very small amount of capacity in the partnership area was feasible (Scenario 1 of Greater Christchurch Partners report).[60] As was noted in the GCP report there were short comings in the assessment and further work would be required to develop a robust understanding of feasibility.

The Greater Christchurch Partners are now moving into the development and planning phase of the Future Development Strategy – which is intended to provide sufficient capacity to meet the demands of the community. As a result, Selwyn District Council has commissioned this study to provide robust understanding of feasibility in the district.

For this research M.E have developed two models M.E Land Development Model (LDM) and M.E Build Development Model (BDM). These models are an improvement on the previous MBIE feasibility tool – especially with respect to the models' base line performance (i.e. the ability to correctly pick current developments are feasible). The detail of the modelling and the key differences from MBIE tool are discussed in the body of the report.

In summary, the results from the LDM and BDM models show that most of the residential development capacity in the district's zoned 'greenfield priority areas' are likely to become feasible within the coming 30 years.

There is sufficient supply of feasible dwellings for most of the coming decade (short term and much of the medium term), however at the end of the decade and in the long term capacity may be exhausted at a point between 2030 and 2031. The results show,

- Short Term – 3,100 dwellings required and up to 4,900 feasible capacity, which shows that there is sufficient supply.
- Medium Term – 8,600 dwellings required and up to 6,100 feasible capacity which shows that there is insufficient supply (by -2,500).
- Long Term – 23,800 dwellings required and up to 9,200 feasible capacity which shows that there is insufficient supply (by -14,600).

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[59] MBIE (2017) NSP-UDC Development Feasibility Tool.xlsx

[60] Greater Christchurch Partnership (2018) Housing Development Capacity Assessment.

The feasibility assessment has been deliberately conservative, especially in regard to future growth in dwelling prices during a period of relatively strong household growth. This means the level of feasible capacity may be substantially greater than indicated, especially in the medium term.

It is also important to note that the feasibility models do not account for all dwelling construction. There are other development routes that cannot be validated in the feasibility models – which includes retirement providers, social/community housing, self-builds and KiwiBuild. Also that there may be constraints on supply and demand which means that some feasible capacity may or may not be developed. Of particular importance is the infill capacity, which is predicted to be feasible in the model, there may be constraints on demand and supply which means that this capacity is not developed in the period.

While the other development potential, supply side and demand constraints described above are beyond the scope of this study, they are likely to be important factors that influence whether feasible capacity is in fact developed. Given that markets change over time it is important that council continues to monitor this closely as an area of potential inconsistency with the NPSUDC requirement and that further detail research could be required.

While in theory there may be a supply-demand issue in the long term if no further land were zoned for urban activity, we expect there would be two or three District Plan reviews and ten Housing Development Capacity Assessments during the next 30 years, which would provide plenty of opportunity to zone additional land and re-evaluate housing sufficiency.

MBIE/MFE has recently released an updated guidance on feasibility (September 24th,2018). The guidance is that councils are required to report a base scenario that calculates feasibility using only current prices, without allowance for price changes (this is the "frozen market" assumption). That guidance applies a literal interpretation of the NPSUDC, that the "base scenario" must only assess feasibility by assuming there are no future price changes, with prices and costs frozen or locked at current market conditions. Given that guidance, in this report we have been required to examine – as one of the scenarios considered - feasibility using current prices. Thus, prices from a single point in time are applied to the future market to assess feasibility over the next three decades.

Unsurprisingly, this analysis assuming no change in prices for three decades suggests that there is insufficient supply of feasible capacity in the district (short, medium and long term). To be clear, M.E do not support or see the relevance of the "Base scenario – frozen market". It is not possible for a market to be frozen for short, medium or long term, so this scenario does not provide reliable information about how the housing market may perform in the future. In our view, the "Base scenario – frozen market" results are not helpful for planning for future growth.

Appendix A: Input Assumptions

Land Development Model Baseline Input Assumptions

	Item	Unit	Rolleston ODP4		Rolleston ODP10		Rolleston ODP13		Rolleston ODP39 Holmes Block		Rolleston ODP40 Skellerup Block		Lincoln ODP1 Lincoln Land Development	
			Unit Cost	Rates / ha	Unit Cost	Rates / ha	Unit Cost	Rates / ha	Unit Cost	Rates / ha	Unit Cost	Rates / ha	Unit Cost	Rates / ha
Civil Works Cost Inputs	Subdivision costs	per new lot	?		?		?		?		?		?	
	Existing Land Clearance	per ha raw land	$15,000		$21,000		$21,000		$7,000		$9,000		$9,000	
	Earthworks & Site Preparation	per m3 raw land moved	$15	3000	$18	5000	$18	5000	$15	1000	$15	1000	$23	10000
	Roading	per m2 road res	$145		$160		$160		$115		$115		$175	
	Water supply	per lin m of pipe	$190	300	$160	300	$160	300	$160	300	$160	300	$160	300
	Wastewater	per lin m of pipe	$450	250	$450	250	$450	250	$450	250	$450	250	$675	250
	Landscaping	per lin m of road	$0		$0		$0		$0		$0		$0	
	Civil works contingency	% of civil costs	25%		25%		25%		25%		25%		25%	
Fees & Charges Inputs	Resource Consent Fees	per dwelling	$600		$650		$650		$650		$600		$700	
	Council Development and Financial Contributions	per dwelling	$30,715		$30,715		$30,715		$30,715		$30,715		$35,625	
	Legal - Real Estate Agent	% of sales price	2%		2%		2%		2%		2%		2%	
	Electricity Connection	per dwelling	N/A		N/A		N/A		N/A		N/A		N/A	
	Telecoms Connnection	per dwelling	N/A		N/A		N/A		N/A		N/A		N/A	
	Gas Connection	per dwelling	N/A		N/A		N/A		N/A		N/A		N/A	
	Site/Project Management	% of Civil Costs	4%		4%		4%		4%		4%		4%	
	Consultant Fees	% of Civil Costs	7%		8%		8%		8%		7%		10%	
	Accounting, Quantity Surveying?	% of sales price	2%		2%		2%		2%		2%		2%	
	Sales and Marketing	% of sales price	3%		3%		3%		3%		3%		3%	
	Fees and charges costs contingency	% of Total Fees and Charges	12%		13%		13%		13%		12%		16%	

	Item	Unit	Lincoln ODP5 Denwood Trustees		Lincoln ODP6 Vegie Block		Lincoln ODP7 Te Whariki Neighbourhood Centre		Lincoln ODP8 Denwood Trustees		Prebbleton ODP4		Tai Tapu ODP48 Crofts and Williams	
			Unit Cost	Rates / ha	Unit Cost	Rates / ha	Unit Cost	Rates / ha	Unit Cost	Rates / ha	Unit Cost	Rates / ha	Unit Cost	Rates / ha
Civil Works Cost Inputs	Subdivision costs	per new lot	?		?		?		?		?		?	
	Existing Land Clearance	per ha raw land	$11,000		$9,000		$9,000		$7,000		$13,000		$7,000	
	Earthworks & Site Preparation	per m3 raw land moved	$23	7500	$13	500	$18	5000	$23	7500	$20	4000	$20	5000
	Roading	per m2 road res	$175		$100		$205		$175		$175		$175	
	Water supply	per lin m of pipe	$175	300	$115	300	$160	300	$160	300	$160	300	$160	300
	Wastewater	per lin m of pipe	$675	250	$300	250	$450	250	$600	250	$600	250	$675	250
	Landscaping	per lin m of road	$0		$0		$0		$0		$0		$0	
	Civil works contingency	% of civil costs	25%		25%		25%		25%		25%		25%	
Fees & Charges Inputs	Resource Consent Fees	per dwelling	$700		$650		$750		$700		$700		$700	
	Council Development and Financial Contributions	per dwelling	$35,625		$35,625		$35,625		$35,625		$30,671		$29,425	
	Legal - Real Estate Agent	% of sales price	2%		2%		2%		2%		2%		2%	
	Electricity Connection	per dwelling	N/A		N/A		N/A		N/A		N/A		N/A	
	Telecoms Connnection	per dwelling	N/A		N/A		N/A		N/A		N/A		N/A	
	Gas Connection	per dwelling	N/A		N/A		N/A		N/A		N/A		N/A	
	Site/Project Management	% of Civil Costs	4%		4%		4%		4%		4%		4%	
	Consultant Fees	% of Civil Costs	9%		8%		10%		9%		10%		10%	
	Accounting, Quantity Surveying?	% of sales price	2%		2%		2%		2%		2%		2%	
	Sales and Marketing	% of sales price	3%		3%		3%		3%		3%		3%	
	Fees and charges costs contingency	% of Total Fees and Charges	15%		13%		16%		15%		17%		17%	

Type	Item	Rolleston ODP4	Rolleston ODP10	Rolleston ODP13	Rolleston ODP39 Holmes Block	Rolleston ODP40 Skellerup Block	Lincoln ODP1 Lincoln Land Development	Lincoln ODP5 Denwood Trustees	Lincoln ODP6 Vegie Block	Lincoln ODP7 Te Whariki Neighbourhood Centre	Lincoln ODP8 Denwood Trustees	Prebbleton ODP4	Tai Tapu ODP48 Crofts and Williams
Physical	Gross site area	7.1	31.0	36.0	87.5	72.7	68.0	14.2	0.5	2.7	56.7	25.5	8.1
	Land capital value (CV)	$ 840,000	$ 11,065,426	$ 11,499,037	$ 6,093,989	$ 5,200,000	$ 8,780,000	$ 1,244,000	$ 700,000	$ 1,100,000	$ 4,976,000	$ 1,351,600	$ 945,000
	Road Reserve area	15%	15%	15%	10%	10%	15%	15%	15%	15%	10%	15%	10%
	Landscape Reserve	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
	Wastewater/stormwater Reserve	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
	Other constraints that reduce net site area	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Minimum lot achievable	500	500	500	4000	4000	500	500	500	500	4000	600	3790
	Maximum lot achievable	637	637	637	5000	5000	738	738	738	738	5000	758	5000
	Zone Density	Living Z	Living Z	Living Z	Living 3	Living 3	Living Z	Living Z	Living Z	Living Z	Living 3	Living Z	Living 3

Type	Item	Rate
Financial and tax	Gross profit margin	20%
	GST	15%
	Weighted average cost of capital	10%

Average Lot Price (current price)	Lot size								
	400	500	600	700	800	900	1000	4000	6000
Rolleston	$ 135,000	$ 156,000	$ 164,000	$ 180,000	$ 190,000	$ 210,000	$ 230,000	$ 435,000	$ 650,000
Lincoln	$ 170,000	$ 180,000	$ 200,000	$ 220,000	$ 230,000	$ 250,000	$ 270,000	$ 435,000	$ 650,000
Other GCP	$ 201,000	$ 212,000	$ 237,000	$ 249,000	$ 250,000	$ 295,000	$ 370,000	$ 435,000	$ 650,000

See section 3.3 above for details on definition of the future feasibility testing.

Build Development Model Baseline Input Assumptions

Description	Unit	Detached	Attached	Townhouse
Site / Civil / Landscaping	m2	$26	$26	$26
Preparation contingency	%	25%	25%	25%
Site prep costs - below slab, piling etc		$210	$210	$210
Driveway and parking area costs	$/m2	$100	$100	$100
Build Cost Contingency	%	7%	8%	9%
Resource Consent Fees	per dwelling	$790	$790	$790
Building Consent Fees	per dwelling	$4,000	$4,000	$4,000
Water Connection	per dwelling	$670	$670	$670
Sewerage Connection	per dwelling	$1,000	$1,000	$1,000
Stormwater Connection	per dwelling	$1,000	$1,000	$1,000
Electricity Connection	per dwelling	$1,000	$1,000	$1,000
Telecoms Connection	per dwelling	$1,000	$1,000	$1,000
Gas Connection	per dwelling	$1,000	$1,000	$1,000
Technical (RC Application etc)	% of cons. Costs	0.3%	0.4%	0.4%
Site/Project Management	% of cons. Costs	3.0%	3.0%	3.0%
Sales and Marketing	% of sales price	3.5%	3.5%	3.5%
Legal, Accounting, Surveying	% of sales price	0.2%	0.4%	1.5%
Ancillary costs contingency		5.0%	5.0%	5.0%
Build period	months	9	9	15

See section 4.2 for details on typology size, build costs and garage sizes.

Design/Architect/Building Plans (BC appn)			
Typology	Detached	Attached	Townhouse
Budget	2.5%	3.0%	5.0%
Average	3.8%	4.5%	7.5%
Premium	5.0%	6.0%	10.0%

Selwyn GCP	Detached			Attached			Townhouse		
	Large	Medium	Small	Large	Medium	Small	Large	Medium	Small
Rolleston	$ 858,000	$ 636,000	$ 471,000	$ 706,000	$ 495,000	$ 393,000	$ 581,000	$ 425,000	$ 360,000
Lincoln	$ 844,000	$ 689,000	$ 529,000	$ 694,000	$ 536,000	$ 442,000	$ 572,000	$ 460,000	$ 405,000
Other	$ 919,000	$ 695,000	$ 533,000	$ 756,000	$ 541,000	$ 445,000	$ 622,000	$ 464,000	$ 408,000

Note: this is a selction of prices used in the model, there are many other combinations not shown.

Type	Item	Rate
Financial and tax	Gross profit margin	10%
	GST	15%
	Weighted average cost of capital	10%

See section 4.3 above for details on definition of the future feasibility testing.

Appendix B: Sensitivity Analysis

The following tables provide summary findings form sensitivity analysis. In the tables we present input category, sensitivity, probability that the category could vary and the combined importance of the input (i.e. a sensitivity that is 'High' and 'Very Likely" or "Likely" are the most important.).

For the Land Development Model the most important assumptions are, staging, contingency, profit margin and future scenario. We note that the Land Development Model in this report differs from the MBIE tool for three of these points,

- Staging has been added (MBIE tool has only one development phase),
- Contingency has been modelled using a range of outcomes (MBIE tool has one contingency setting), and
- Future scenario has been added (MBIE tool holds costs and revenues constant).

Land Development Model			
Input Category*	**Sensitivity**	**Probable variance**	**Importance**
Staging	Medium	Very Likely	Important
Civil Works	Low	Likely	
Fees and Charges	Low	Unlikely	
Contingency	High	Very Likely	Important
Profit Margin	High	Likely	Important
Cost of Capital	Medium	Unlikely	
Land Purchase costs	Medium	Likely	
Lot Sale Price	Medium	Likely	
Future Scenarios	High	Very Likely	Important

**There are too many inputs to produce sensitivity for all settings.*

For the Build Development Model the most important assumptions are, Build costs, contingency, profit margin, land purchase, house sale price and future scenario. We note that the Build Development Model in this report differs from the MBIE tool for five of these points,

- Build costs have been set assuming that the developer is a group home builder. This results in lower cost structure than was input into the previous MBIE tool.
- Contingency has been modelled using a range of outcomes (MBIE tool has one contingency setting),
- Profit margin has been set at 10%, which is based on SNZ data for residential build firms which indicates a profit margin of between 3-8% (the MBIE tool assumes the same profit margin for land developers and build developers),
- Land is purchased by the customer rather than the builder in the group home builder model (MBIE tool assumes a speculative builder buys and holds land), and
- Future scenario has been added (MBIE tool holds costs and revenues constant).

Build Development Model			
Input Category*	**Sensitivity**	**Probable variance**	**Importance**
Achievable Lot Size	Low	Likely	
Build Time	Low	Likely	
Typologies	Low	Likely	
Site Preparation	Low	Likely	
Build Costs	High	Very Likely	Important
Fees and Charges	Low	Unlikely	
Contingency	Medium	Likely	Important
Profit Margin	High	Likely	Important
Cost of Capital	Medium	Unlikely	
Land Purchase	High	Likely	Important
House Sale Price	Medium	Likely	Important
Future Scenarios	High	Very Likely	Important

**There are too many inputs to produce sensitivity for all settings.*

Also the input Achievable Lot Size from the Capacity for Growth Model could have impacts on the timing of the feasibility of capacity (in particular Lincoln Living Z zone). While this input assumption was set outside of the BDM, it is likely to be important as it defines the total capacity that is input into the BDM. Currently, the achievable lost size is set according to the level of density achieved in the land development market. In most locations and zones, the land developers have not subdivided land to the maximum density enabled in the plan rules. In the future land developers may subdivided more intensively, which will generate more capacity. So this input assumption has two effects, one it defines the quantum of capacity that is tested and two changes in lot size can improve the commercial feasibility of building within the BDM.

Given that markets change over time it is important that council continues to monitor the build development market closely, as an area of potential inconsistency with the NPSUDC requirement and that further detail research could be required. The focus of the research should be on the five “important” input categories and the Achievable Lot size.