

Christchurch Central City: Land Demand Estimate and Business Capacity Assessment

April 2022

Compiled by:

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1. Introduction

ChristchurchNZ commissioned a study to estimate the land demand and business capacity for the Central City of Christchurch. This study builds on work that was completed in 2021 for the Christchurch City Council on a city-wide level to quantify land demand for the next 30 years. The demand for land is estimated for five land uses namely, retail, office, industrial, warehousing and short-stay accommodation for the Central City study area.

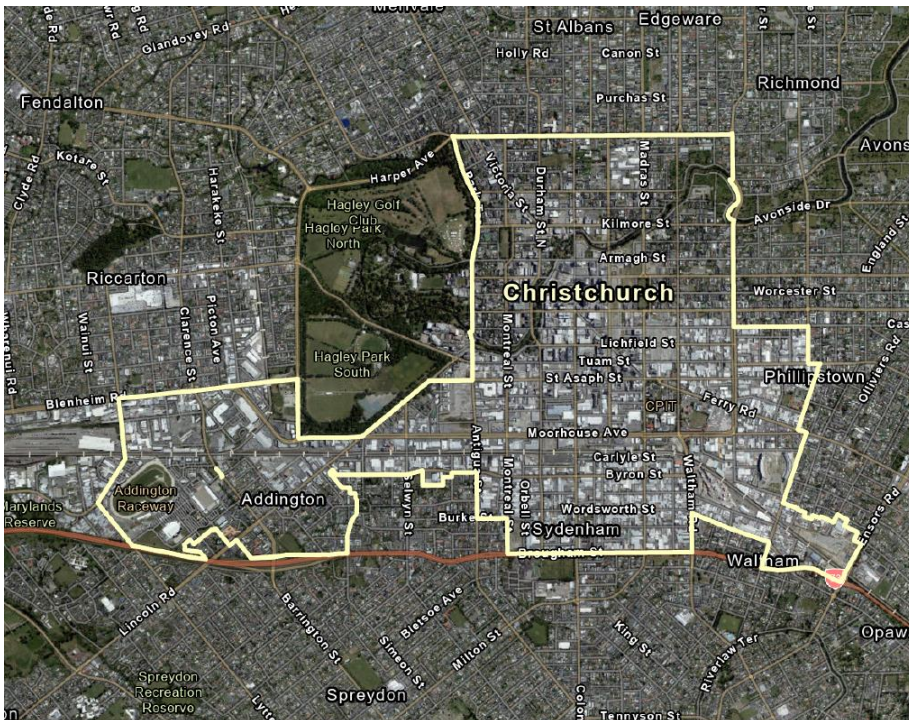
A few adjustments, related to locational attributes for the study area, within the model, are required. As a result, an analysis of various assumptions is undertaken which is the primary purpose of this report.

The following assumptions are assessed for the study area:

- Floor area ratio
- Complimentary uses of land
- Current vacancy rates

Map 1 provides an overview of the study area.

Map 1: Study Area



2. Floor Area Ratio (FAR)

The floor area ratio is used as an indicator of land-use intensity. In other words, how much of the land is utilised beyond its physical limitations, by increasing density. The ratio is derived from Valuation Hub data provided by the Christchurch City Council and it is possible to distinguish the FAR for different activities based on the District Planning Zones. The results revealed the following ratios within the study area (see Table 1) for the five land uses assessed.

Table 1: Floor Area Ratio per land use in the study area, 2020 data

Land use / zoning	FAR
Office	1.34
Accommodation	1.27
Retail	0.63
Warehousing	0.66
Industrial	0.55

The results reveal relatively low levels of use intensity, likely driven by existing vacant land in the study area as well as density differences resulting from planning rules for the various central city planning zones. To improve the results, further in-depth assessment on district plan zoning level took place.

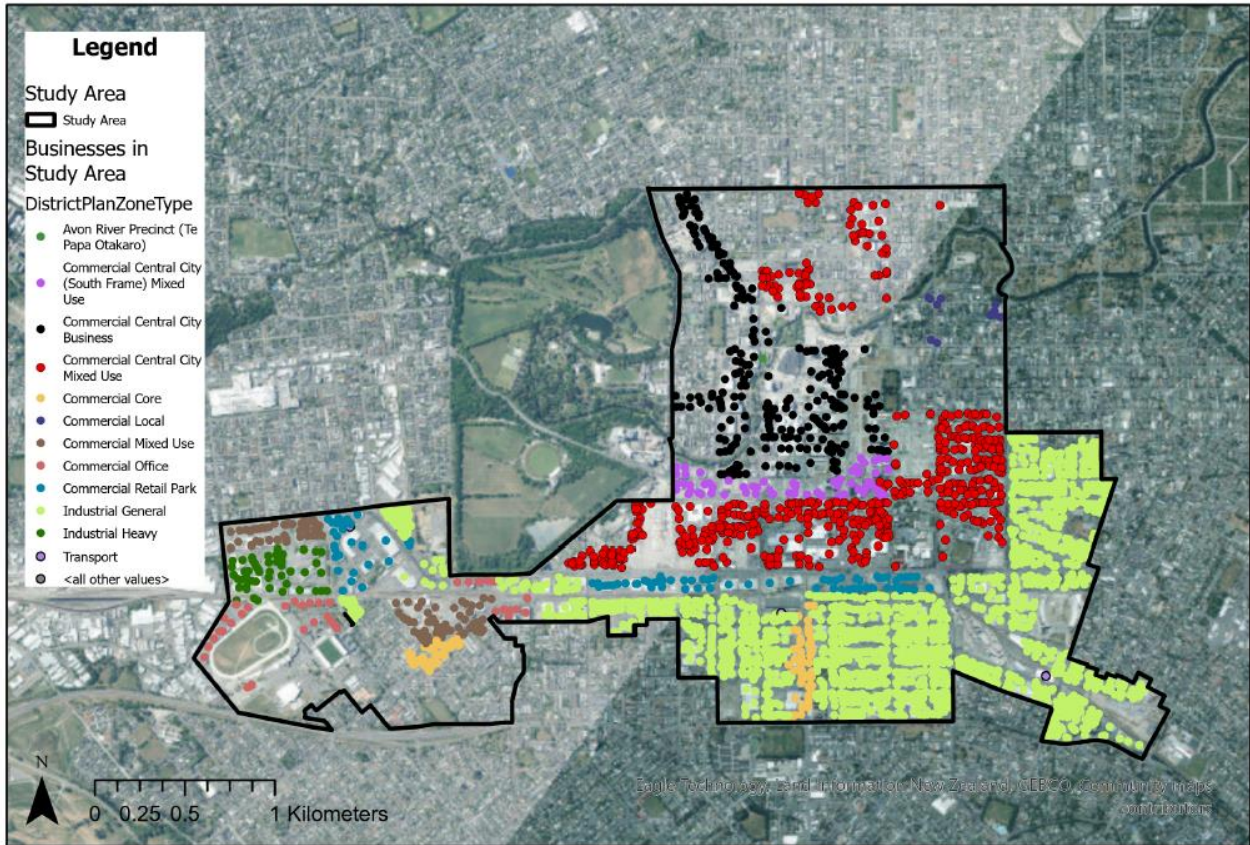
At this level, floor size and site area data for rating units are available per district plan zone, but the location of the business unit could not be verified through the Valuation Hub. Although this verification could improve deeper analysis, the data in its current form provides valuable insight for the assessment. This approach has merit as it considers the planning requirement for the various planning zones in the study area and considers the density of older and recent new developments in the Central City.

This approach does pose a risk, as current levels of occupation could not be verified with the Valuation Hub data. It is expected that the district plan rules will continue to support higher density development in the study area driven by:

- *The current plan change is to implement government direction to increase enabled heights and densities. The government intends to support more up than out.*
- *Council has removed any requirement for minimum car parking. In the past, this may have influenced site coverage and it does appear that more buildings are developed now without a lot of surface car parking i.e. using more of a site for buildings.*
- *The current district plan has a maximum allowable area of parking in the central city (no more than 50% of the site can be car parking).*
- *Council is currently planning on introducing a minimum building height requirement of 2 stories.*

Map 2 provides the location of business units within each of the District Plan Zones.

Map 2: Business units and District Plan Zones, 2021 data



By applying the Valuation Hub data to the district zone type, it is possible to estimate the FAR for each land use per zone. Table 2 reveals the results for the four larger zones in the study area.

Table 2: Floor area ratio per zone and land use in the study area, 2020 data

District Plan Zoning Area	Floor Area Ratio (FAR)				Study area
	Commercial Central City Business	Commercial Central City Mixed Use	Central City South Frame	Industrial General Zone	
Office	2.69	0.73	2.25	0.70	
Retail	2.09	0.52	1.00	0.37	0.63
Accommodation	4.26	0.85	-	0.68	
Warehouse	0.87	0.68	1.96	0.66	
Industrial	-	0.53	0.32	0.62	

The results reveal significant changes to the density and use of land depending on the location and the current zoning plan. The Commercial Central City Business Zone reveals the highest FAR for office, retail and accommodation, a good representation of what is observed within this area with new property developments. The industrial general zone situated to the east and southern area reveals a lower density for warehousing and industrial activity, with larger sites.

The volume of each land use within each district plan zone is illustrated in Figure 1. The results, indicative only, show that the majority of industrial and warehouse activity is taking place in the General Industrial zone, while office activity tends to be more concentrated in the Central City Business and Central City Mixed Uses zones. Some retail and office activity is evident in Industrial General zone.

Figure 1: Land use volume (total m²) per district plan zone

Land Use	Commercial Central City Business	Commercial Central City Mixed Use	Central City South Frame	Industrial General Zone
Office/commercial				
Retail				
Accommodation				
Warehouse				
Industrial				

The following FAR values are applied to the land demand model:

Office: 2.69

Retail: 0.63 (retail takes place mainly on the ground floor, see next section)

Industrial: 0.62

Warehouse: 0.66

Short-Stay Accommodation: 4.26

3. Complimentary uses

Property development often comprises of more than one use complementing one another. Examples are evident throughout the study area, where buildings often have a retail component on the ground floor, while the floors higher up are used for office activity. An analysis of complimentary uses implies that the development of a building can be divided into primary and secondary use which will then affect the demand for land and space. To assess this, examples of buildings within the study area are used. Table 3 illustrates various buildings throughout the study area and how their floor space is utilised for various activities. The data is sourced from the CCC Vertical Land Use Survey, 2021. It is not the intention to show the activity within all the buildings of the study area, rather, to provide an overview of observable trends in recent new developments.

The following is evident from the assessment.

- Higher density development is associated with a more diverse use in the activity.
- Higher density development is predominantly evident for office and accommodation activity (accommodation is not shown here).
- Retail is mainly on the ground floor while office activity is above ground.
- Where retail is the main use of the building, it tends to have a lower building height (retail is seldom on floors above ground level).
- In buildings where retail is the main activity, there seems to be limited other activity, apart from small scale offices and parking.
- Where the office is the main activity of a building, the ground floor is often used for retail, as a supplementary use.
- Industrial and warehouse activity tends to take place on ground level, while office or other commercial services would take place on floors above ground level (if there are).

Table 3: Assessing complementary uses

<p>Building 1 8,850m² Salisbury Street</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Office</th> <th>Other</th> <th>Retail</th> <th>Vacant</th> </tr> </thead> <tbody> <tr> <td>Ground Floor</td> <td>0</td> <td>0</td> <td>1,750</td> <td>0</td> </tr> <tr> <td>Level 1</td> <td>0</td> <td>1,750</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 2</td> <td>1,750</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 3</td> <td>1,750</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 4</td> <td>1,750</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Level	Office	Other	Retail	Vacant	Ground Floor	0	0	1,750	0	Level 1	0	1,750	0	0	Level 2	1,750	0	0	0	Level 3	1,750	0	0	0	Level 4	1,750	0	0	0	<p>Building 2 1,528m² Victoria Street</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Office</th> <th>Other</th> <th>Retail</th> <th>Vacant</th> </tr> </thead> <tbody> <tr> <td>Ground Floor</td> <td>0</td> <td>0</td> <td>380</td> <td>0</td> </tr> <tr> <td>Level 1</td> <td>0</td> <td>0</td> <td>0</td> <td>380</td> </tr> <tr> <td>Level 2</td> <td>380</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 3</td> <td>380</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Level	Office	Other	Retail	Vacant	Ground Floor	0	0	380	0	Level 1	0	0	0	380	Level 2	380	0	0	0	Level 3	380	0	0	0	<p>Building 3 7,525m² Hereford Street</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Office</th> <th>Other</th> <th>Retail</th> <th>Vacant</th> </tr> </thead> <tbody> <tr> <td>Ground Floor</td> <td>0</td> <td>0</td> <td>1,500</td> <td>0</td> </tr> <tr> <td>Level 1</td> <td>1,500</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 2</td> <td>1,500</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 3</td> <td>1,500</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 4</td> <td>1,500</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Level	Office	Other	Retail	Vacant	Ground Floor	0	0	1,500	0	Level 1	1,500	0	0	0	Level 2	1,500	0	0	0	Level 3	1,500	0	0	0	Level 4	1,500	0	0	0
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<p>Building 4 11,934m² Lichfield Street</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Office</th> <th>Other</th> <th>Retail</th> <th>Vacant</th> <th>Commercial Services</th> </tr> </thead> <tbody> <tr> <td>Ground Floor</td> <td>0</td> <td>0</td> <td>3,500</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 1</td> <td>1,000</td> <td>1,000</td> <td>1,500</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 2</td> <td>2,000</td> <td>2,000</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Level	Office	Other	Retail	Vacant	Commercial Services	Ground Floor	0	0	3,500	0	0	Level 1	1,000	1,000	1,500	0	0	Level 2	2,000	2,000	0	0	0	<p>Building 4 6,395m² Colombo Street</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Office</th> <th>Other</th> <th>Retail</th> <th>Vacant</th> <th>Commercial Services</th> </tr> </thead> <tbody> <tr> <td>Basement</td> <td>0</td> <td>1,200</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Ground Floor</td> <td>0</td> <td>0</td> <td>1,000</td> <td>0</td> <td>300</td> </tr> <tr> <td>Level 1</td> <td>1,200</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 2</td> <td>1,200</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 3</td> <td>1,200</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Level	Office	Other	Retail	Vacant	Commercial Services	Basement	0	1,200	0	0	0	Ground Floor	0	0	1,000	0	300	Level 1	1,200	0	0	0	0	Level 2	1,200	0	0	0	0	Level 3	1,200	0	0	0	0	<p>Building 5 14,178m² Moorhouse Avenue</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Office</th> <th>Other</th> <th>Retail</th> <th>Vacant</th> </tr> </thead> <tbody> <tr> <td>Ground Floor</td> <td>0</td> <td>0</td> <td>8,000</td> <td>0</td> </tr> <tr> <td>Level 1</td> <td>1,000</td> <td>0</td> <td>4,500</td> <td>0</td> </tr> </tbody> </table>	Level	Office	Other	Retail	Vacant	Ground Floor	0	0	8,000	0	Level 1	1,000	0	4,500	0										
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<p>Building 6 5,436m² Moorhouse Avenue</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Office</th> <th>Other</th> <th>Retail</th> </tr> </thead> <tbody> <tr> <td>Ground Floor</td> <td>0</td> <td>0</td> <td>5,436</td> </tr> </tbody> </table>	Level	Office	Other	Retail	Ground Floor	0	0	5,436	<p>Building 7 7,644m² Colombo Street</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Office</th> <th>Other</th> <th>Retail</th> <th>Vacant</th> </tr> </thead> <tbody> <tr> <td>Ground Floor</td> <td>0</td> <td>0</td> <td>3,000</td> <td>700</td> </tr> <tr> <td>Level 1</td> <td>0</td> <td>3,800</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Level	Office	Other	Retail	Vacant	Ground Floor	0	0	3,000	700	Level 1	0	3,800	0	0	<p>Building 8 16,765m² Cashel Street</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Office</th> <th>Other</th> <th>Retail</th> <th>Vacant</th> <th>Commercial Services</th> </tr> </thead> <tbody> <tr> <td>Ground Floor</td> <td>0</td> <td>0</td> <td>2,000</td> <td>0</td> <td>1,000</td> </tr> <tr> <td>Level 1</td> <td>3,300</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 2</td> <td>3,300</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 3</td> <td>3,300</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Level 4</td> <td>3,300</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Level	Office	Other	Retail	Vacant	Commercial Services	Ground Floor	0	0	2,000	0	1,000	Level 1	3,300	0	0	0	0	Level 2	3,300	0	0	0	0	Level 3	3,300	0	0	0	0	Level 4	3,300	0	0	0	0																										
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The results from the complimentary assessment are not expected to change the demand for land dramatically as estimated in the land demand model. This is due to the FAR which has already incorporated the relationships for complementary use. For example, an office building that includes retail activity on the ground floor has a higher FAR rate as a result which accounts for and includes the retail activity. For all practical reasons, the increased FAR incorporates the complementary activity of the property's main use.

4. Vacancy

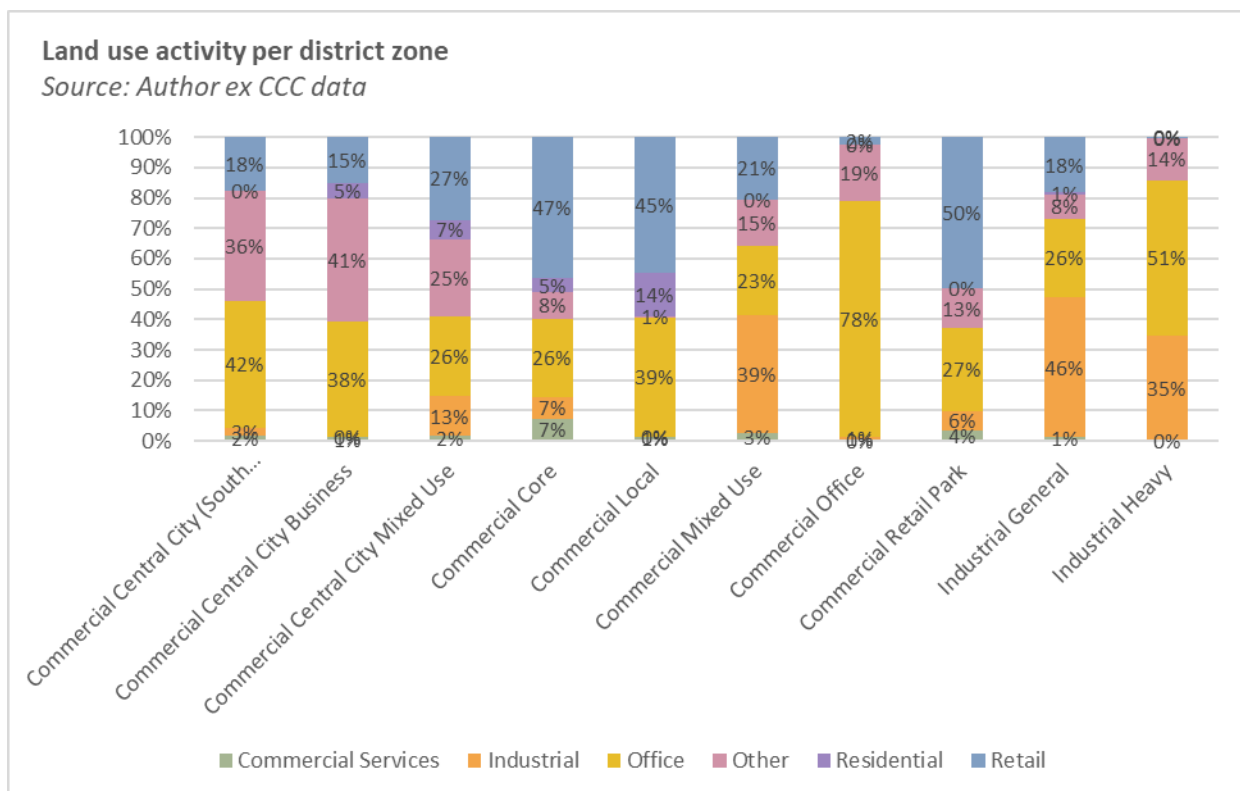
Both building vacancy and land vacancy will be assessed. The building vacancy coupled with the land vacancy represents the potential supply to absorb the new demand for space.

4.1 Building Vacancy

To determine the current business capacity for the study area, the vacancy level in existing buildings needs to be added to the land demand results for each land use. This allows an assessment of effective capacity within the market. The vacancy is calculated from the Vertical Land Use survey, completed in 2021.

The vacancy rate for each land use is derived from the vacancy for each district plan zone. The share of current activity for each district plan zone is used to apportion the vacancy level per land-use type (see Figure 2).

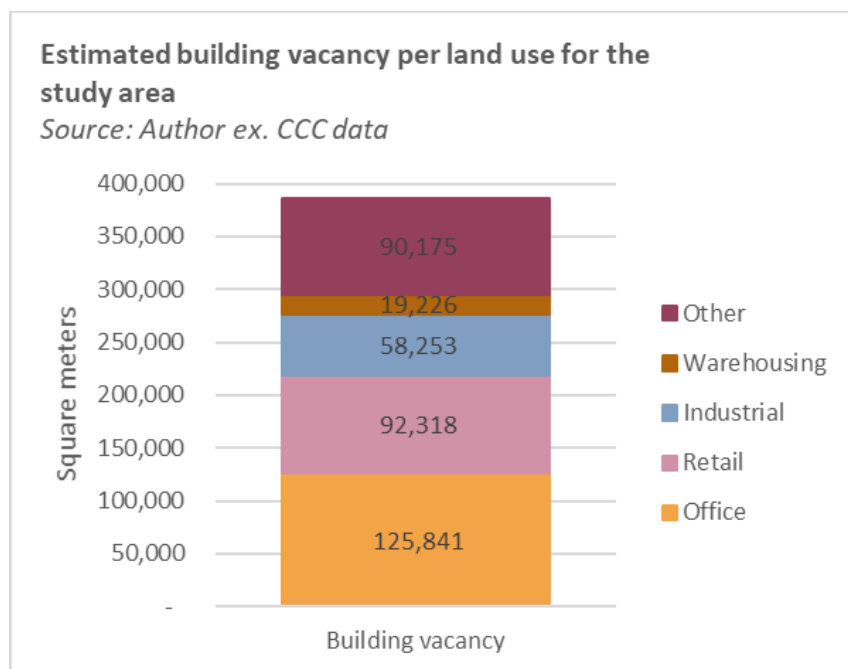
Figure 2: Share of land use per District Zone, 2021 values



Unfortunately, the Vertical Land Use survey does not specify the ideal activity for the vacant spaces captured, and as a result, apportionment of current land-use patterns is seen as the most appropriate approach.

Figure 3 illustrates the vacancy within buildings for the study area, per land use.

Figure 3: Building vacancy per land use for the study area, 2021 values



Total vacancy within buildings amounts to 385,813m².

The distribution of vacant space based on the current use of the land suggest that the majority of this vacant space could be used for office (125,841m²) followed by retail (92,318m²), 'other' which include amongst other things parking and short-stay accommodation (90,175m²) and finally industrial (58,253m²) and warehousing (19,226m²).

A note on the vacancies.

Property vacancies in buildings are driven by several aspects:

- Business cycles
- Old and unusable stock
- Changing market preferences
- Property management issues

The vacancy numbers observed in the Vertical Land Use survey are affected by these and other factors, and explaining these or identifying the reasons for current vacancy levels are beyond the scope of this report. For example, it is evident from the analysis there is a high vacancy in buildings in the General Industrial zone that could be used for office activity, but these are likely to be at a low quality/grade and do not realistically represent the highest and best use of the site.

Although this vacancy exists in the market it is not likely to be ideally suited to capture new office demand. The demand from the market is more likely to be for better quality offices such as Grade A and A+. As a result, the lower quality office buildings are likely to take longer to lease if better quality and competitively priced Grade A office space is available in optimal locations. This example is true of other land uses as well.

4.2 Vacant Land

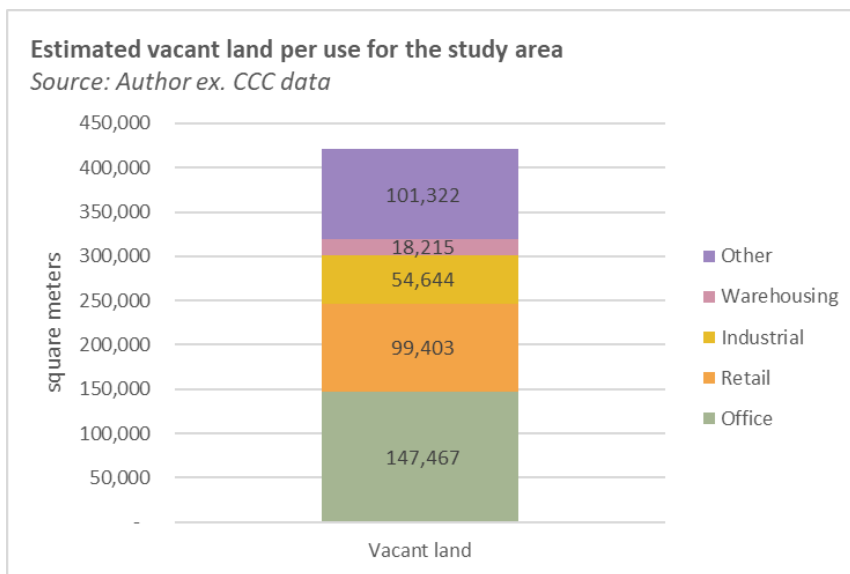
The vacant land register (2022) is used to quantify the available land for future development within the study area. The vacant land register does not stipulate or indicate the highest and best use of the site and the highest and best use of the vacant site could likely change over time, even if vacant.

Allocating land-use to vacant sites is, at this stage, a best guess. It could be argued that if the volume of vacant land outstrips new demand for land as estimated in the land demand model, then supply is sufficient. However, there are currently planning requirements based on the district zones and as a result, the new demand is likely to be impacted by these requirements. Due to the planning requirements and the dynamic nature of the property market with the highest and best use changing over time, assessing the potential use of the vacant land is, for now, assumed to reflect current use patterns.

For this reason, it is assumed that the highest and best use of vacant land will reflect the current share of land use activity in each district plan zone (see Figure 2). This assumption was also applied in the vacant building estimate to ensure alignment of assumptions in estimating building and land vacancy.

Figure 4 reveals the likely use of vacant land within the study area.

Figure 4: Vacant land per land use for the study area, 2022 values



The total vacant land amounts to 436,102m² in 2022.

It is highly likely that the distribution estimate for land use of vacant land does not end up as illustrated in Figure 4. The development of vacant land for industrial and warehousing within the central city is likely an overestimate compared to the demand model revealing no new demand.

5. Results

This report aims to provide technical details related to the land demand model and capacity assessment for the Christchurch Central City study area. The technical details mainly focus on the assumptions for the land demand model as well as the current supply estimates. Before the results are provided, a recap of the main assumptions is provided for clarity.

Overview:

- **The study area (Central City) model applies the city-wide Land Demand Model** developed for the Christchurch City Council in 2021. Key assumptions related to the drivers of land use and space demand are provided in the technical report of the city-wide model and not repeated in this report. Please refer to the original report for these assumptions.
- Similar to the city-wide model, the Central City model applies the business growth model (or economic model) and estimates the demand for 'work space' that responds to changing economic activity in the study area.

Space Demand Models:

- The intensity of use for land is based on a floor area ratio (FAR), which represents the size of the building to the land size.
- In the retail model, it is assumed that the Central City will continue to attract 25% of the Christchurch City retail spending market and aligns with the current market share of the node.
- The FAR for the retail model is 0.63 which is based on the ratio for retail activity in the study area.
- Two retail models are presented. One is based on CCC population projections and a second is based on StatsNZ medium population projections.
- The FAR for the office model is 2.69 and is based on the current ratio in the Commercial Central City Business zone.
- The FAR for industrial is 0.62 and based on the current ratio found in the Industrial General Zone.
- The FAR for warehousing is 0.66 and is based on the current ratio found in the Industrial General Zone.
- The FAR for short-stay accommodation is 4.26 and is based on the current ratio in the Commercial Central City Business zone.

Land Demand:

- An assumption related to mixed-use or complimentary use of activity is applied as described earlier in the report. This assumption does not significantly change the land demand volume but has been introduced to highlight the recent trends in the market where new development tend to have a main use which is then complemented by another such as retail or parking. The complimentary use will depend on the location of the building taking into consideration the highest and best use of the site.
- The land demand model is a tool to estimate future demand for land, based on historic and recent market trends. **The model has its limitations** as it applies assumptions and sometimes a best guess or opinion of the market. Errors and **deviations from reality are to be expected** and as a result, it would be good practice to update the model as new data becomes available to adjust future forecasts for land demand.

Land Supply:

- The response to new market demand would be either the utilisation of existing available space (building vacancy) or through new stock that could come in the form of redevelopment of existing buildings or new buildings using vacant sites in the central city.
- The limitations and constraints in calculating the supply have been discussed earlier in the report and relate mostly to the concept of highest and best use. The key assumption applied to the supply assessment is that vacant building space and vacant land are assumed to replicate the current land use pattern within the Central City. This assumption is not ideal but applied to align with previous capacity assessments.
- For example, no new demand for industrial use on vacant sites is expected, however, the supply model allocates existing vacancy for such use as it replicates the current land use pattern for the study area.

The results are summarised in Table 4.

Table 4: Summary of results, up to 2051

	Demand (ha)	Supply (Vacancy, ha)		Total Supply (ha)	Gap (ha)
		Building	Land		
Retail	10.9	12.6	14.7	27.3	16.5
Office	14.7	9.2	9.9	19.2	4.5
Industrial	- 1.1	5.8	5.5	11.3	12.4
Warehousing	0.5	1.9	1.8	3.7	3.2
Short-stay	0.6			0.0	- 0.6
Total	25.6			61.5	35.9

The total new demand for land for the Central City is estimated to be 25.6ha by 2051 while the existing supply from both vacant buildings and floors in buildings (29.6ha) and vacant land (32ha) amounts to 61.5 ha. This leaves additional capacity in the market of 35.9 ha.

This result reveals that there is sufficient capacity in either vacant buildings or floors in buildings to capture new demand as well as sufficient vacant land. However, it is highly likely that the current vacancy level in buildings does not represent the highest and best use or ideal quality for tenants and could potentially remain vacant. In this case, the land vacancy represents a better indicator of capacity.

In conclusion, the results reveal that the Central City has the space capacity, but the high rate of building vacancy suggests that the use of the land is not optimised resulting in efficiency losses.