HCC Industrial Land Projections

Draft Final Report

Prepared for Hamilton City Council

26 June 2025

Formative

Dr Michael Gordon
michael@formative.co.nz
021 053 6287

Rodney Yeoman
rodney@formative.co.nz
021 118 8002

Contents

Figures

1 Introduction

Hamilton City Council ("HCC", or "Council") is responsible for planning to accommodate growth in Hamilton, to support the current and future needs of the population and businesses of Hamilton and surrounding areas. To support this planning, Council and its Future Proof partners has commissioned research to understand how much growth is anticipated and when it is likely to arrive, and has adopted a number of growth plans and strategies to ensure that growth will have an appropriate home in Hamilton, and surrounding areas.

As the population grows, so too will the economy, and new business areas will be required to accommodate Hamilton's future business activity. Important among this business activity is that which is undertaken in Hamilton's industrial zones. Industrial zoned land is often less valuable than residential and commercial zoned land, and comes under pressure for occupation by non-industrial uses, which can place pressure on industrial land supply, and make it difficult for councils to ensure there is sufficient industrial land supply to meet demand.

Formative was commissioned by HCC to prepare economic projections to inform HCC's evidence base about future industrial land demand. Earlier work (Market Economics, 2024) adopted a business as usual (BAU) approach, assuming existing demand and supply patterns persist. Hamilton's industrial landscape, however, is changing: significant tracts of land may be rezoned under the Fast-Track and Emerging Areas frameworks. In addition, new infrastructure upgrades and limited supply of land in Auckland and Tauranga (Auckland Council, 2023; Smart Growth, 2023) is likely to result in transfer of potential demand to Hamilton (spillovers). Finally, the development of the Ruakura Inland Port and Superhub is expected to bring between 6000 and 12,000 new warehousing, freight and logistics jobs to the city (*Ruakura Inland Port*, 2025; Tainui Group Holdings, 2024).

Accordingly, Council requires industrial-land demand projections that move beyond the business-as-usual (BAU) scenario and capture demand under a range of dynamic, uncertain futures.

This report sets out the methodology and assumptions for both the BAU and further dynamic growth overlay (non-BAU) scenarios as well as the subsequent land demand and employment results.

2 Methodology

2.1 Business as Usual projections

2.1.1 Employment Projections

The industrial employment and land projections used in the HEIAM are produced from Formative's proprietary economic projections. The projections provide future estimates of economic indicators such as GDP and employment by industrial activity. The approach applies a two-stage process, involving economic and statistical modelling in stage 1, with Input-Output modelling based on the ELM in stage 2 (see appendices for further details).

For stage 1, real world historical data and industry insights are used to forecast the expected future demand for goods and services at both an economic sector and regional level. This includes demand from households, central and local government, exports (including tourism) and business investment in capital. Forecasts for each of these demand factors are developed using statistical modelling, and data from Statistics NZ, the Ministry of Business, Innovation and Employment, and the Ministry for Primary Industries. Notably, these projections include forecasts as available for specific market sectors, and for large exporters such as dairy, tourism and forestry. In addition, we also apply region-specific adjustments such as factoring in the development of an inland port in the region.

For stage 2, the demand forecasts are fed through the ELM. Using the forecast demand from stage 1 we can then measure the future economic activity that can be expected to occur within the economy because of changes in demand. The output of this process is a projection of how much economic activity (measured in both employment and GDP) will be required to meet future household, government, and export demands.

While the employment projections are largely a business as usual (BAU) model, they do include a self-sufficiency factor – as local and regional economies grow, they rely less on regional trade (imports and exports) and greater shares of household spend remain in the region. Increased self-sufficiency is calculated every 5 years (2023, 2028, 2033 etc. out to 2053).

The industrial employment projections for HCC are allocated to District Plan industrial zones within Hamilton based on the current distribution of industries as shown in the base 2023 economic data. As an example, the base economic data shows that most industrial employment is currently located in industrial zoned areas of HCC. This revealed preference is used to allocate future growth, which assumes that this underlying preference remains constant in the future.

2.1.2 Land Demand Projections

Employment projections to calculate land demand projections, based on two key ratios: the workspace ratio (WSR) and the floor area ratio (FAR).

The WSR represents the amount of workspace area (m^2) allocated per employee, and is a measure of workplace density such that a lower WSR indicates a higher density of employees. The WSRs included in the model are taken from the 2023 BDCA (Market Economics, 2024), and which are different for each industry.

The FAR is a critical metric in urban planning that defines the relationship between the floor area of a building (usually gross floor area or GFA, measured in m^2) and the total area of the plot on which it stands. A higher FAR signifies a higher building density, allowing for more floorspace within the land area. The FAR ratios are based on actual site coverage achieved by market calculated via consent data provided by HCC.

By integrating these two ratios, the model estimates future land demand by:

- Floorspace: total floorspace area needed by applying the WSR.
- Estimating Land Area Needs: The model then uses the FAR to translate the total workspace area into the land demand (in hectares).

In addition to typical 'industrial' activities such as manufacturing, warehousing and transport, industrial zones also contain auxiliary activities such as petrol stations, bakeries or eateries and engineering outfits. These activities are classed as fuel retailing, food and beverage services, and scientific, architectural, and engineering services[1] but their presence in industrial zones represents a level of demand which needs to be accounted for.

2.2 Dynamic Growth Overlay

The dynamic growth overlay represents the scenarios of growth driven by changes in the Hamilton Economy and its changing role within the Golden Triangle. These scenarios are labelled overlays as they are additive with the business-as-usual projections, and can be combined for a 'total' projection set.

The dynamic growth overlay is based on specific changes and forces within Hamilton and the Upper Northland Island; New industrial land zoned in Hamilton city through fast track and emerging areas,

[1] As classified under the 109 input output industries from Statistics New Zealand national accounts.

Ruakura Inland Port and its role in freight and warehousing in the golden triangle, and spillover demand from Auckland and Tauranga. Each force and its potential effects are described below.

While projecting BAU employment based on past trends and the existing state of the economy is relatively straightforward, forecasting non-BAU growth is significantly more complex due to the vast range of potential future outcomes and uncertainties. In addition, industrial activities operate in a fluid environment where the relocation or expansion of just a few large industrial firms can substantially alter projections. In order to mitigate the uncertainty, we have provided multiple scenario's under the dynamic growth overlay, however the model is inherently assumption based its accuracy ultimately hinges on how closely those assumptions match real-world outcomes.

2.2.1 Spillover

Spillover demand refers to industrial activity that relocates (or would have located) from one region to another because of constraints in the origin region—most commonly land shortages, higher prices, or infrastructure bottlenecks. When these pressures intensify, firms either relocate outright or expand at a satellite site. The receiving area (in this case, Hamilton) gains jobs and floor area that would otherwise have stayed in the origin region.

To assess spillovers we needed to estimate the dynamics of employment change in Auckland, Tauranga and Hamilton. Shift-share analysis allows us to decompose each region's net employment change into three intuitive parts: (1) the national-growth effect—jobs the region would have gained had it simply followed national growth; (2) the industry-mix effect—expected gains or losses that stem from industry specific growth rates; and (3) the competitive effect—the residual change that cannot be attributed to nationwide or industry-specific trends and therefore reflects the region's own competitive advantage or disadvantage. By isolating this competitive effect for Auckland, Tauranga, and Hamilton in every year, we obtain a direct indicator of whether jobs are shifting between regions. A persistent negative competitive effect in Auckland coupled with a positive effect in Hamilton, for example, implies that firms displaced from Auckland are re-locating to Hamilton—the very definition of a spill-over.

Exploratory analysis demonstrated that manufacturing industries presented the greatest potential for spill overs based on the competitive effects (from the shift-share analysis). Competitive effects were calculated for 5 time periods between 2019 and 2023[2] for 23 different manufacturing industries in Hamilton, Tauranga and Auckland. These competitive effects are summarised in the below figure.

[2] 2018-2019, 2019-2020, 2020-2021, 2021-2022,2022-2023

Figure 2-1: Summarised manufacturing Competitive Effects in Golden Triangle

	5-year average	3-year average
Hamilton City	420	447
Tauranga City	358	438
Auckland	- 705	- 1,454

The figures show that Hamilton's manufacturing sector is performing above national and industry trends and—crucially—its competitive edge is strengthening. Over the past five years Hamilton recorded an average competitive effect (CE) of +420 jobs per year; narrowing the lens to the most recent three years, the average rises to +447. That incremental increase indicates the city is attracting an even larger share of manufacturing activity than it did earlier in the decade. Auckland tells the opposite story. Its competitive effect is negative in both time windows and deteriorating rapidly: an average of –705 jobs over the last five years collapses to –1,454 jobs in the most recent three-year period. This widening deficit signals that Auckland is increasingly losing ground relative to the rest of the country, consistent with land shortages and rising costs (Auckland Council, 2023). The simultaneous decline in Auckland and gains in Hamilton (and, to a lesser extent, Tauranga) provides some support for a spillover dynamic in which constrained firms relocate or expand southward, boosting Hamilton's demand for industrial land.

To test whether this relationship is systematic and statistically significant, we ran an ordinary-least-squares model:

$$Hamilton\ CE_t = \alpha + \beta \times Auckland\ CE_t + \varepsilon_t$$

The results of which included a significant negative relationship: $\beta = –0.0848$ ($p = 0.03$). This can be interpreted as every 100 manufacturing jobs Auckland "loses" relative to national trends is associated with an 8- to 9-job gain in Hamilton. A model applied to Tauranga data did not find any similar relationship.

When developing scenarios to apply these figures we make two assumptions: the manufacturing competitive effect in Auckland in the short-medium and long terms, and the spillover effects (β in the above equation).

This incremental competitive-effect term was added to Hamilton's business-as-usual employment forecast and then converted to land demand using standard workspace-ratio and floor-area-ratio assumptions.

2.2.2 Induced Demand

Hamilton is set to experience large supply shocks over the coming decades. Up to 475ha of land (in total) is set to be zoned industrial in the next 30 years through a number of areas across the city.

Figure 2-2: New Industrial Land: Base Scenario

Name	Timing (years)	Industrial
Southern Links 1 (SL1) FT	~10	52ha
Ruakura Growth Cell (R2) FT	~10	45ha
Fonterra PC	~10	91ha
Tuumata FT & PC	~10	-
Ruakura East FDS	~10	85ha
Wallace Road (WA) FT	~10	-
Northern Precinct	~10	136ha
R2 Balance FDS	~10-20	28ha
Tamahere General Rural Zone	~30	4ha
Tabby Tiger (FDS Sub 18)	~10-30	18ha
Balance SL1	~10-20	16ha

Source: Hamilton City Council

Property value research has shown that the Fastrack/emerging areas will have an average lower price per sqm than what market is currently achieving for vacant industrial land (The Property Group, 2024). Using current estimates of price per sqm for vacant industrial land (sourced from corelogic) in Hamilton and forecasted prices for new areas, we can estimate the change of average price for industrial land in the medium (next 10 years) and long term (next 30 years). As the Industrial land Value Analysis research (The Property Group, 2024) only covers emerging areas, we estimated the Fastrack projects prices based on the most similar emerging area. We also assumed (conservatively) that existing vacant land (over 340ha (Market Economics, 2024)) would not also fall in price, however some price changes are likely across the entire industrial land market in Hamilton (and surrounding areas). We estimate that under the base scenario (Figure 2-2) prices will decrease by 12.84% in the medium term and 10.75% in the long term.

A literature review of price elasticity of demand revealed a lack of research specifically into price elasticity of industrial land. In the New Zealand context, RBNZ notes industrial rents have stayed "relatively strong as supply continues to be constrained by land availability"[3] indicating inelastic behaviour (at least in the short term). However, no specific NZ elasticity coefficient was found in literature, so international estimates are used for modelling. An economic analysis in the USA (Von Nessen, 2023) to assume price elasticity of demand for commercial space in the range -0.41 to -0.80

[3] https://www.rbnz.govt.nz/hub/publications/financial-stability-report/2024/august-special-topic/commercial-property-in-new-zealand

for office space, and -0.85 to -1.50 for industrial space. Studies out of the UK non-residential elasticities (not industrial specific) range from 0.07 to -1.05 (Stevenson, 2007). Finally, the Environmental Protection Agency recommends a price elasticity of -0.2 (United States Environmental Protection Agency, 2009).

Given the lack of New Zealand specific research, and a single source for industrial land, we adopted a default elasticity of -0.2 in the long run (as per the EPAs guidelines). We also found that elasticities change over time – they roughly double between the initial and full long-run adjustments (Deaton & Lawley, 2022; Gyourko & Voith, 2000; Hanushek & Quigley, 1980; Harvey, 1989). Therefore, we assume an elasticity of -0.1 in the medium term.

2.2.3 Ruakura – Inland Port and Superhub

The Ruakura Inland Port and Superhub is set to change the freight landscape in the upper North Island. Anchored on the Hamilton rail spur and straddling the Waikato Expressway, the 30-hectare inland port will give importers and exporters a direct rail gateway to Tauranga and Auckland seaports, cutting line-haul costs and diverting heavy trucks off SH1. Around it, a 610-hectare logistics and industrial estate will release more than 260 hectares of serviced land—space Auckland and Tauranga can no longer provide—allowing large distribution centres, cold-stores and light manufacturing to cluster together. Early tenants include Kmart, PBT and Big Chill. As Ruakura grows, its presence will rebalance freight flows across the "Golden Triangle", and ease pressure on congested ports and industrial zones in Auckland and Tauranga.

By its very nature, the development at Ruakura is a shock to the economy which disrupts 'business-as-usual' for transport, warehousing and logistics industries. Therefore we include its demands on industrial land in the dynamic growth overlay.

The Ruakura Superhub spans about 610 hectares, anchored by a 30-ha inland. In Stage 1 (opened 2022) approximately 92 ha were developed – including 9 ha of port, 35 ha of logistics park, 25 ha of industrial space (plus 10 ha wetlands and roads). This leaves roughly 518 ha remaining for later stages (610 – 92). Of the 263ha zoned for logistics/industrial use, 25 ha have been leased in Stage 1[4].

The number of employees estimated to locate onsite in Ruakura is estimated be between 6,000 and 12,000 (Castalia, 2013; Tainui Group Holdings, 2024). One source estimated employment to be 11,000 which includes direct and indirect employment, and also noted that 3000 of these jobs would occur regardless, meaning only 8,000 jobs were net additional (Board of Inquiry, 2014). We have assumed

[4] https://www.ruakurainlandport.co.nz/news-insights/opening-of-ruakura-superhub-a-landmark-juncture-for-waikato-tainui-and-region/ ; https://www.ruakurainlandport.co.nz/

that the inland port and superhub would reach capacity 2061 and growth would be linear between now and then.

3 Results

Hamilton's future industrial land demand has been projected under two conditions: a Business-as-Usual (BAU) baseline and a dynamic growth overlay (non-BAU) that captures additional growth drivers. The BAU scenario assumes existing economic and land use trends continue unchanged. In contrast, the dynamic growth overlay introduces several new demand factors – notably the rezoning of significant new industrial land (Fast-Track and emerging areas), inter-regional spillover of industry from Auckland/Tauranga, and the development of the Ruakura Inland Port and logistics superhub. These non-BAU factors reflect Hamilton's changing industrial landscape: for example, Ruakura alone is expected to bring thousands of new freight, warehousing and logistics jobs to the city. The dynamic overlay scenarios were modelled at three levels (Medium, High, Very High), representing increasing intensity of these growth drivers. This section presents the projected industrial land demand in hectares for the year 2032 (medium-term, ~10-year horizon from 2022 base year to be consistent with previous projections provided for Hamilton City Council under the HBA) and 2052 (long-term, ~30-year horizon) under BAU and dynamic scenarios

3.1 Interpretation of dynamic overlays

The Very High scenario is retained to illustrate an upper-bound stress test, a case where all upside drivers (rapid Ruakura uptake, strong induced demand, and sustained spillovers) eventuate simultaneously. Owing to the highly optimistic assumptions required, we recommend that planners treat the Very High case as a contingency envelope rather than the default planning trajectory. The Medium and High scenarios provide progressively stronger but more realistic demand paths and should anchor core land-supply decisions.

3.2 Land Demand

3.2.1 Medium Term Projections

Under the BAU scenario, Hamilton's industrial growth is projected to require 198.8 hectares of additional industrial-zoned land by 2032. This represents the baseline demand if current trends and local growth continue without any extraordinary changes. The BAU projection is driven by anticipated employment growth in Hamilton's industrial sectors (manufacturing, logistics, construction, etc.) and the associated need for workspace and land. It already factors in gradual improvements in local economic self-sufficiency and underlying market growth. The BAU demand (~200 ha) serves as the foundation for all scenarios in 2032.

When the dynamic growth overlay is applied, industrial land demand rises substantially above the BAU level by 2032. In the Medium overlay scenario, non-BAU factors contribute an extra 51 hectares on top of the BAU demand, bringing the total 2032 land demand to roughly 250 ha. Under the High overlay, the additional demand is larger (137.6 ha above BAU), for a total of 337 ha. In the Very High overlay (representing an aggressive growth case), non-BAU drivers add roughly 235 ha beyond BAU, yielding a total demand of 434 ha by 2032. These figures are summarised in Figure 3-1. Notably, in the Very High scenario the dynamic drivers account for over half (54%) of the land demand in 2032 (235 of 434 ha), whereas in the Medium scenario they account for only 20% (51 of 250 ha).

Figure 3-1: Industrial Land Demand – Medium Term

Growth Overlay	Growth Overlay Sources			Growth Overlay Total	BAU Total	BAU +Growth Overlay Total
	Induced Demand	Ruakura	Spill Over			
Medium	18	20	13	51	199	250
High	36	46	55	138	199	337
Very High	73	108	55	235	199	434

Under these growth scenarios in 2032, the additional land demand comes from three principal sources built into the model: "Induced" demand, Ruakura-driven demand, and spillover demand. Induced demand represents the extra uptake of industrial land stimulated by an increased land supply and lower land prices (relative to BAU). Ruakura demand reflects the new logistics and distribution activities attracted by the Ruakura Inland Port/Superhub development, beyond what BAU would have captured. Spillover demand represents industrial activities (especially in manufacturing) relocating to Hamilton from Auckland or Bay of Plenty due to those regions' land constraints. In the 2032 Medium scenario, induced and Ruakura effects are modest (each contributing around 20 ha) and a smaller spillover effect (13 ha) is assumed (Figure 3-1). The High scenario envisions stronger spillovers and Ruakura growth: by 2032, 55 ha of the land demand is attributed to incoming firms from Auckland/Tauranga (manufacturing relocations, etc.), 46 ha to Ruakura-related logistics growth, and 36 ha to price-induced demand. The Very High overlay assumes an even greater surge in Ruakura uptake and overall investment: induced demand roughly doubles relative to High (73 ha), and Ruakura-driven land demand more than doubles (108 ha). The spillover component in 2032 is capped at 55 ha even in the Very High scenario – as maximum plausible manufacturing relocation to Hamilton was reached under the High scenario assumptions, and further growth in the Very High scenario comes from higher local uptake and Ruakura expansion rather than additional spillover. Overall, by 2032 the dynamic overlay scenarios imply that non-BAU factors could increase land demand by approximately +26% (Medium) to +119% (Very High) relative to the 199 ha BAU baseline.

3.2.2 Long-Term Projections

By 2052, industrial growth is far greater in absolute terms, and the land demand expands significantly across all growth scenarios. In the BAU case, the projected land requirement in 2052 is about 527.3 ha, which reflects nearly three decades of cumulative growth in Hamilton's industrial employment and floor space needs. This is around 2.65 times the 2032 BAU demand, indicating sustained long-run expansion of industrial activity even without extra stimulus. Such growth under BAU is due to continued population and economic increase in Hamilton, with most of the demand coming from core industrial sectors (e.g. manufacturing, warehousing, construction, utilities and services located in industrial zones).

When dynamic growth overlays are included, 2052 land demand rises significantly above the BAU baseline (Figure 3-2). Under the Medium scenario, total demand is projected at 627 ha, about 100 ha higher than BAU. The High overlay yields 751 ha total demand, and the Very High overlay scenario reaches 1022 ha of industrial land needed by 2052. In other words, in the most aggressive growth scenario Hamilton could require over 1,000 hectares of industrial land by 2052 – nearly double the BAU requirement. However, it is noteworthy that the non-BAU share of total demand is generally smaller in 2052 than in 2032 for equivalent scenarios. For instance, in the High case 494 ha out of 1022 ha (48%) is due to dynamic overlay sources, whereas in 2032 it was 54%. In the Medium case, 224 ha of 751 ha (30%) is non-BAU (41% in 2032). This trend occurs because the BAU component accumulates substantially over time, narrowing the proportionate impact of the overlay – even though the absolute additional hectares from the overlay scenarios do increase from 2032 to 2052 in each scenario.

In terms of breakdown by source for 2052, the dynamic drivers exhibit some shifts compared to 2032. The spillover effect is effectively zero by 2052 in all three overlay scenarios. The model assumes that the wave of manufacturing relocations occurs in the short-to-medium term and does not continue adding further jobs beyond the 2030s. Thus, spillover contributes 0 ha of new demand by 2052. The reasoning behind this is that land constraints in Auckland and Tauranga and likely to be addressed by the city councils long term plans and other planning instruments.

The Ruakura-driven component of demand, on the other hand, grows substantially by 2052. In the Medium scenario, 63 ha of the 100 ha non-BAU demand comes from Ruakura (e.g. gradual uptake of logistics land at the inland port), with the remaining 37 ha from induced effects. Under the High scenario, Ruakura accounts for 150 ha of the extra demand by 2052 (roughly two-thirds of the 224 ha overlay), and induced demand 74 ha. Under the Very High scenario, Ruakura's impact is large – on the order of 347 ha of land demand – comprising 70% of the total non-BAU increment by 2052. Induced demand contributes 148 ha in that case, while spillover remains nil. In summary, Ruakura-related growth becomes the dominant driver of additional industrial land needs in the long term, particularly under the high-growth assumptions. This reflects the model's assumption that Hamilton absorbs a large share of regional freight/logistics growth in the coming decades if capacity allows, whereas manufacturing spillovers are largely a one-off influx earlier on while land constraints are present in Auckland and Tauranga.

The induced-demand effect (from expanded land supply and lower prices citywide) provides a steady additive increase across scenarios, in the range of 14–28% of the total dynamic overlay demand in 2052.

Figure 3-2: Industrial Land Demand – Long term

Growth Overlay	Growth Overlay Sources			Growth Overlay Total	BAU Total	BAU +Growth Overlay Total
	Induced Demand	Ruakura	Spill Over			
Medium	37	63	-	100	527	627
High	74	150	-	224	527	751
Very High	148	347	-	494	527	1,022

These projections highlight the range of potential industrial land needs that Hamilton may face, depending on how growth unfolds. The BAU scenario can be seen as the minimum demand outlook – about 200 ha by 2032 and 527 ha by 2052 – reflecting organic growth based on historical patterns. On top of this baseline, the dynamic overlay scenarios demonstrate the impact of Hamilton's evolving role in the regional economy. If even moderate dynamic growth occurs (Medium scenario), Hamilton's industrial land demand would be on the order of 250 ha in 2032 and 627 ha in 2052, necessitating significantly more zoned land than BAU alone. The Very High scenario illustrates an aggressive upper bound: demand more than doubles versus BAU in the medium term, and nearly doubles by 2052, driven by major logistics expansion and fully-realized competitive gains.

3.3 Employment Projections

The demand for land presented in the previous section is driven by new and expanding businesses and employment within the city. Hamilton's total employment is projected to grow substantially under all growth scenarios, with higher growth assumptions yielding higher job counts in both the medium term (2032) and long term (2052).

Figure 3-3: Employment Projections – Citywide Totals

Scenario	Growth Overlay	BAU	Total
Medium Term			
Medium	1,448	141,204	142,652
High	3,691	141,204	144,895
Very High	6,532	141,204	147,736
Long Term			
Medium	2,153	174,299	176,452
High	4,868	174,299	179,167
Very High	10,866	174,299	185,166

In the medium term, total employment across the city is expected to reach 142,650 under the Medium scenario, 144,900 under High, and 147,740 under the Very High scenario (Figure 3-3). Of these citywide jobs, an estimated 58,120 (Medium scenario) up to 63,200 (Very High scenario) would be located on land zoned for industrial use (and thus contribute to industrial land demand, see Figure 3-4). By the long term (2052), citywide employment is projected to increase to about 176,450 (Medium), 179,170 (High), and 185,170 (Very High) total jobs. Correspondingly, the number of jobs locating within industrial zones is anticipated to rise to 70,760 under the Medium scenario, up to around 79,480 under the Very High scenario by 2052 with the High scenario falling in between, with 73,480 industrial-zone jobs in 2052. These projections distinguish between citywide employment and employment in industrial zones. Citywide figures represent all jobs in Hamilton, whereas the industrial zone employment figures count only jobs located on land designated for industrial use. It is important to note that the industrial zones accommodate not only core industrial activities but also certain ancillary commercial uses – for example some offices, service industries, and retail outlets are permitted within industrial-zoned areas

Figure 3-4: Employment Projections – Industrial Zones

Scenario	Growth Overlay	BAU	Total
Medium Term			
Medium	1,448	56,670	58,119
High	3,691	56,670	60,361
Very High	6,532	56,670	63,202
Long Term			
Medium	2,153	68,610	70,763
High	4,868	68,610	73,478
Very High	10,866	68,610	79,477

Consequently, the employment located "in industrial zones" includes some non-industrial jobs that happen to occupy industrial land. At the same time, this metric excludes any industrial-sector jobs that occur outside the designated industrial zones (for instance, an industrial business operating in a commercial or rural area would not be counted in the industrial zone employment total). In summary, while a significant share of Hamilton's jobs are concentrated in its industrial zones under all scenarios, the industrial zone employment figures are a subset of the total and reflect the zoning-based location of jobs rather than strictly their industry type.

4 Bibliography

Auckland Council. (2023). *Housing and business development capacity assessment for the Auckland region*.

Board of Inquiry. (2014). *FINAL DECISION AND REPORT - Proposed Ruakura Development Plan Change*.

Castalia. (2013). *National Signifcance of the Ruakura Intermodel Terminal*.

Deaton, B. J., & Lawley, C. (2022). A survey of literature examining farmland prices: A Canadian focus. *Canadian Journal of Agricultural Economics/Revue Canadienne d'agroeconomie*, *70*(2), 95–121. https://doi.org/10.1111/cjag.12307

Gyourko, J., & Voith, R. (2000). *The Price Elasticity of the Demand for Residential Land*.

Hanushek, E. A., & Quigley, J. M. (1980). What is the Price Elasticity of Housing Demand? *The Review of Economics and Statistics*, *62*(3), 449. https://doi.org/10.2307/1927113

Harvey, D., R. (1989). *The Economics of the Farmland Market*.

Market Economics. (2024). *Business Development Capacity Assessment 2023*.

Ruakura Inland Port. (2025). https://www.ruakurainlandport.co.nz/

Smart Growth. (2023). *Housing and Business Capacity Assessment 2022*.

Stevenson, S. (2007). Exploring the Intra-Metropolitan Dynamics of the London Office Market. *Journal of Real Estate Portfolio Management*, *13*(2), 93–98. https://doi.org/10.1080/10835547.2007.12089774

Tainui Group Holdings. (2024). Ruakura Inland Port on Track. *New Zealand Infrastructure Review*.

The Property Group. (2024, July 17). *Hamilton City Council Merging Areas Project—Industrial Land Value Analysis*.

United States Environmental Protection Agency. (2009). *Economic Analysis of Final Effluent Limitation Guidelines and Standards for the Construction and Development Industry*.

Von Nessen, J. C. (2023, September). *An Assessment of Real Estate Impact Fees and the Economic Consequences for Horry County*.

5 Appendices

5.1 Economic Linkages Model

The ELM is a proprietary model that has been developed to quantify and measure the economic activity and relationships within the New Zealand economy. In summary, the ELM measures the flows of money and goods through the economy, at a sector and subnational level.

The ELM records the interactions and relationships between actors in the economy, including businesses, households, government, exporters, and importers. The interactions in the ELM describe how each industry responds to changes in the economy, which ripple out to influence a range of other outcomes (e.g. household decisions).

The ELM measures the economy using a range of standard economic metrics, which includes gross output[5], GDP[6], value added, employment[7], incomes[8], consumption[9], tax[10], and trade. The model uses a subnational Input-Output Table that has been regionalised by Formative. This subsection outlines the nature of the Input-Output table, the underlying assumptions within the ELM and the key modelling steps.

The Subnational Input-Output Table (SIOT) has been developed by Formative to provide detail on the economic linkages between sectors and geographies within New Zealand. The table has been defined to include 109 economic sectors and 40 geographies.

The 109 'sectors' have been defined using New Zealand's standard industry classification (ANZSIC06), with each sector being defined by a grouping of industries based on cluster analysis of their supply chains and economic rationale. The 40 'geographies' have been defined according to either territorial or regional authority boundaries, with more disaggregation provided where there is more economic activity (e.g. upper North Island) and aggregation where there is less economic activity (e.g. West Coast of the South Island). The ELM used in the HEIAM has previously been provided to HCC, as part of a separate workstream. That version of the ELM is specified as follows:

- The SIOT has a base year of 2023.
- All transactions in the table are in 2023 dollars, and all economic impacts (for instance GDP, gross output, consumption, taxes) are also in 2023 dollars.

---

[5] Similar to company revenue.

[6] There is a key difference between GDP and value added. The value added of a sector is measured net of taxes (for instance GST) and subsidies on products. In the GDP in the national accounts for New Zealand product taxes (minus subsidies) are recorded for the economy as a whole and includes as part of the value added.

[7] Formative uses BED measure of Total Employment Count (TEC) which includes both employment count and working proprietors.

[8] Includes salaries, wages and profits.

[9] Including household and government.

[10] Including income taxes, GST, government transfers and subsidies.

- The SIOT is based on a national level 2020 Input-Output table released by Statistics New Zealand which has been converted to 2023 based on Statistics New Zealand national account data for 2023.[11]

The national level table has been regionalised using a hybrid approach. The hybrid approach of combining survey and non-survey (i.e. modelled) methods to regionalise an IO table which is considered the gold standard when an official SIOT is not available. The survey data sources used in generation of the SIOT include a range of customised datasets that Formative have purchased and developed:

- **Total employment**: Formative maintains a detailed database of employment, by geographies and industry (Business Employment Database, BED), which records the total employment in each of 506 ANZISC06 industry classes and for Statistics New Zealand's Statistical Areas, including both employees and working proprietors.[12]
- **Electronic Card Transactions**: Formative has purchased detailed electronic card transaction data from Marketview, which records the origin and destination of four retail and services spend types by the 40 geographies. [13]
- **Subnational Economic Data**: a range of information that provides valuable insight into the scale of economic activity that is located within each geography. This includes regional GDP, Gross Output and household income.

The above datasets have been combined along with non-survey regionalisation techniques to allocate the national economic activity into each of the geographies. The key method used to accomplish this is the Industry-Specific Flegg's Location Quotient (SFLQ)[14]. This method employs location quotients (LQ) to understand the specialisations and structure of regional economies compared to the national economy. The use of LQs has been known to understate the amount of regional trade, however the SFLQ approach combats this by allowing for industry specific rates of cross hauling (where regions both import and export a product or service).

This approach has been shown to create accurate estimations of regional multipliers and outperform other non-survey approaches.[15] The SFLQ method was supplemented by a gravity model to help inform regional flows. The SIOT has been calibrated to better match the relationships in the national Input-Output table and has been balanced using an iterative proportional fitting procedure to ensure

---

[11] This includes gross output by sector, and national subsidies, exports, imports, change in inventories, gross fixed capital formation, consumption spending (includes households, local and central government and non-profit expenditure), compensation of employees, taxes, consumption of fixed capital and operating surplus.

[12] Formative (2021) Business and Employment Database – Employment Count, Working Proprietors, Total Employment.

[13] Marketview (2021) Card transaction data – four spend types and 39 geographies for the 2019 calendar year.

[14] Julia Kowalewksi (2015) Regionalization of National Input–Output Tables: Empirical Evidence on the Use of the FLQ Formula, Regional Studies, 49:2, 240-250.

[15] Anthony T. Flegg, Leonardo J. Mastronardi & Carlos A. Romero (2016) Evaluating the FLQ and AFLQ formulae for estimating regional input coefficients: empirical evidence for the province of Córdoba, Argentina, Economic Systems Research, 28:1, 21-37.; Zhao, X., Choi, SG. On the regionalization of input–output tables with an industry-specific location quotient. Ann Reg Sci 54, 901–926 (2015).

that the table reflects regional gross output and input. The resulting SIOT table provides a modelled estimate of the relationships within the economy. This means that the economic linkages between sector-geography combinations as of 2023 are captured in the SIOT.

The ELM uses the SIOT to estimate the potential economic activity that can be expected from changes in the economy. All economic models apply assumptions because economies and communities are too complex to replicate exactly in a mathematical system. The structure of the ELM utilises the following assumptions:

- Leontief production function, which assume linear relationships between the production and inputs. This means change in the output for an industry will translate into a proportional change in demands for inputs.
- No supply constraints, which assumes that businesses can source sufficient resources (labour, capital, land, etc) to meet new demands.
- Constant returns to scale, which means that there are no economics of scale or diminishing returns in the model.
- Static prices, which assumes that prices remain at 2023 values. The model does not account for substitution effect or dynamic feedback from changes in demand and prices.

5.2 Assumptions

5.2.1 Employment Projections

The employment projections are based on the NIDEA High population projection set.

5.2.2 Land Demand Projections

Industry	WSR	FAR
Meat and meat product manufacturing	138	0.310
Seafood processing	138	0.310
Dairy product manufacturing	138	0.310
Fruit, oil, cereal, and other food product manufacturing	138	0.310
Beverage and tobacco product manufacturing	138	0.310
Textile and leather manufacturing	138	0.310
Clothing, knitted products, and footwear manufacturing	138	0.310
Wood product manufacturing	138	0.310
Pulp, paper, and converted paper product manufacturing	138	0.310
Printing	138	0.310
Petroleum and coal product manufacturing	138	0.310
Basic chemical and basic polymer manufacturing	138	0.310

Fertiliser and pesticide manufacturing	138	0.310
Pharmaceutical, cleaning, and other chemical manufacturing	138	0.310
Polymer product and rubber product manufacturing	138	0.310
Non-metallic mineral product manufacturing	138	0.310
Primary metal and metal product manufacturing	138	0.310
Fabricated metal product manufacturing	138	0.310
Transport equipment manufacturing	138	0.310
Electronic and electrical equipment manufacturing	138	0.310
Machinery manufacturing	138	0.310
Furniture manufacturing	138	0.310
Other manufacturing	138	0.310
Electricity generation and on-selling	60	0.312
Electricity transmission and distribution	60	0.312
Gas and water supply	60	0.312
Sewerage and drainage services	60	0.312
Waste collection, treatment, and disposal services	100	0.310
Residential building construction	85	0.310
Non-residential building construction	85	0.310
Heavy and civil engineering construction	85	0.310
Construction services	85	0.310
Basic material wholesaling	167	0.396
Machinery and equipment wholesaling	167	0.396
Motor vehicle wholesaling, including parts	167	0.396
Grocery, liquor, and tobacco product wholesaling	167	0.396
Other goods and commission based wholesaling	167	0.396
Road transport	100	0.310
Rail transport	100	0.310
Water transport	100	0.310
Air and space transport	100	0.310
Other transport	100	0.310
Postal and courier services	100	0.310
Transport support services	100	0.310
Warehousing and storage services	167	0.396
Rental and hiring services (except real estate)	60	0.312
Building cleaning, pest control, and other support services	60	0.312

5.2.3 Spillover

Figure 5-1: Forecasted Annual Competitive Effect in Auckland

Scenario	Short-Medium Term	Long Term
Medium	-705	0
High	-1454	-705
Very High	-1454	-1454

Figure 5-2: Competitive Effect Spill Over Effect

Scenario	Short-Medium Term	Long Term
Medium	-0.042415	0
High	-0.08483	0
Very High	-0.08483	0

5.2.4 Induced Demand

Figure 5-3: Price Elasticity of Demand for Industrial Land

Scenario	Short-Medium Term	Long Term
Medium	-0.1	-0.2
High	-0.2	-0.4
Very High	-0.4	-0.8

5.2.5 Ruakura Inland Port and Superhub

Figure 5-4: Current Occupancy of Ruakura Inland Port and Superhub

Current Occupancy	ha	Estimated Jobs
Inland Port	9	280
Warehousing (logistics)	25	590
General Industrial	25	560

Figure 5-5: Ruakura Capacity Year

Year Ruakura hits capacity (inland port + superhub)	2061