IN THE MATTER of the Resource Management Act 1991(RMA)

AND

IN THE MATTER of Private Plan Change 100 - Riverhead to the Auckland Unitary Plan

JOINT WITNESS STATEMENT (JWS) IN RELATION TO:

Topic: WATER & WASTEWATER and PLANNING (3)

Date 14 August 2025

Expert Conferencing Held on: 14 August 2025

Venue: Auckland Council Offices (135 Albert Street, Auckland Central) and Online

Independent Facilitator: Marlene Oliver

Admin Support: Kasey Zhai

1 Attendance:

1.1 The list of participants is included in the schedule at the end of this Statement.

1.2 Declarations – the participants expertise and roles are set out in the schedule. This JWS should be read having regard to those relationships.

2 Basis of Attendance and Environment Court Practice Note 2023

2.1 **All participants agree to the following:**

(a) The Environment Court Practice Note 2023 provides relevant guidance and protocols for the expert conferencing session;
(b) They will comply with the relevant provisions of the Environment Court Practice Note 2023;
(c) They will make themselves available to appear before the Panel;
(d) This statement is to be filed with the Panel and posted on the Council's website.

3 Matters considered at Conferencing – Agenda and Outcomes

3.1 HP6 What is the RER for Riverhead?

3.1.1 TH and SE consider the RER for the Riverhead, Kumeū, Huapai area is between 638 and 735 dwellings, over a 30-year period, and the RER for Riverhead itself is 128 dwellings. TH and SE note that this assessment is not a forecast of what will be built, but rather an estimate of what could be (feasibly and realistically) developed within the existing zoned areas, based on current market conditions.

3.1.2 Supporting documentation to the statement in 3.1.1 are:

- Feasibility Modelling Outputs dated 5 August 2025 (Attachment 1); and
- Plan Enabled Capacity Modelling Methodology dated 7 August 2025 (Attachment 2).

3.2 HP7 What water /wastewater capacity needs to be left for the RER in Kumeū and Huapai?

3.2.1 TH and SE note the RER in Kumeū and Huapai is 607 dwellings (735-128).

3.2.2 RW considers that:

- The RER numbers provided by TH and SE are lower than the current capacity available in both the Water and Wastewater networks in the short and medium term, providing further confidence on the future servicing ability of PC100;
- There are a number of feasible solutions available, when required, to provide appropriate servicing outcomes to the PC100 area above the current capacity within the existing bulk infrastructure; and
- As development occurs in stages, the specific engineering details to construct a feasible solution to service a stage of development are appropriately dealt with through the standard Resource Consent / Engineering Plan Approval process.

3.2.3 Watercare's experts consider that a higher number than the RER needs to be considered when assessing wastewater and water network capacity, noting that Watercare do not reserve capacity for specific areas. The factors considered as part of the higher number are PEC, risk, population growth projections and national legislation changes and priorities.

3.2.4 All planning experts agree to consider in the planning expert conference whether appropriate planning provisions have been included in PC100 to address the matters in 3.2.

Wastewater

3.3 HP1A What is the infrastructure capacity (DUEs) that is currently available for Riverhead?

3.3.1 RW and AD consider that 500 DUE is currently available without further upgrades, noting that this is for the wider Kumeū, Huapai, and Riverhead areas.

3.4 HP11A What interim solutions are available and appropriate to service PC100?

3.4.1 RW and AD consider that capacity for an additional 500 DUEs for Wastewater for the wider Kumeū, Huapai, and Riverhead areas is created following the planned abandonment of the Whenuapai Village Pump Station, which is currently scheduled for 2028. Note: This additional capacity is beyond that currently available to service 500 DUEs without further upgrades needed – see response to HP1.

3.4.2 RW and AD consider that beyond this existing capacity available for 1,000 DUE, there are a number of feasible options available that could provide additional capacity on a permanent basis (see Attachment 1 of Water & Wastewater and Planning JWS (1)). Rather than being interim solutions, these options can be staged or implemented progressively to integrate with the wider network, as appropriate.

3.5 **HP12A Can PC100 advance relying on the interim solutions on a staged basis? If so, what would this involve?**

3.5.1 RW considers that PC100 can advance based on:

- The capacity to service 500 DUEs for Wastewater in the Riverhead catchment without further upgrades needed.
- The capacity for an additional 500 DUEs for Wastewater in the Riverhead catchment created following the planned abandonment of the Whenuapai Village Pump Station; and
- The solutions presented in Attachment 1 of Water & Wastewater and Planning JWS (1).

3.5.2 RW considers that the solutions presented in Attachment 1 of Water & Wastewater and Planning JWS (1) are technically feasible options that can be aligned with progressive development within the PC100 area, rather than considering them as interim solutions. The appropriateness, and detail of the option for each part of the progressive development on the PC100 area is best determined at resource consent / Engineering Plan Approval (EPA) stage.

3.5.3 AD agrees with RW's statements in 3.5.1 and 3.5.2 above. AD agrees that the solutions in Attachment 1 of Water & Wastewater and Planning JWS (1) align with Watercare's longer term planning, including the Riverhead Wastewater Separation Project, and are therefore feasible solutions. AD notes that timing, related funding, and resource availability are relevant factors.

3.5.4 KC considers that PC100 can advance in reliance on the existing capacity and the solutions in Attachment 1 of Water & Wastewater and Planning JWS (1), with the precinct provisions (KC Rebuttal Version dated 12 May 2025), specifically Table IX.4.1 Activity table(A3), IX.8.1. Matters of discretion(2)(e) and (3)(c), IX.8.2. Assessment criteria (2)(r)-(u), and Information Requirements IX.9(5A) and IX.9(5), being sufficiently robust and the most efficient and effective way to ensure that the subdivision and development within the PC100 area is coordinated with the provision of infrastructure.

3.5.5 DW and RD consider that if the solutions identified in Attachment 1 of Water & Wastewater and Planning JWS (1) are not achievable within the timeframe of the PC100 buildout, then the Plan Change is not sufficiently integrated with the provision and funding of infrastructure. In coming to this view, DW and RD rely on the technical evidence from Watercare's experts.

3.5.6 AS, KB, and RP consider that funding agreements can, and are more appropriate to occur once detailed design has been agreed to between the applicant and Watercare as part of the resource consenting process and prior to construction.

3.5.7 RD, DW, and LA note that a funding agreement in principle can also occur prior to approval of a plan change.

3.5.8 LA retains the position set out in evidence dated 1 May 2025.

3.5.9 All planning experts agree to consider in the planning expert conference whether appropriate planning provisions have been included in PC100 to address the matters in 3.5.

3.6 **HP8A What bulk and local wastewater infrastructure upgrades are required to service PC100?**

<u>Local Wastewater Infrastructure</u>

3.6.1 RW and AD consider that no local wastewater infrastructure upgrades are required to service PC100 initially. However, a new wastewater network will be constructed as part of development within PC100, the details of which are required under precinct provision IX.9(5) (KC Rebuttal Evidence version, dated 12 May 2025) and will be determined at resource consent / Engineering Plan Approval stage.

<u>Bulk Wastewater Infrastructure</u>

3.6.2 RW considers that for the first 500 DUEs within PC100, no bulk infrastructure upgrades are required.

3.6.3 RW considers that to service an additional 500 DUEs, the abandonment of the Tamiro / Whenuapai WWPS is required. This is a planned project by Watercare, and the current understanding is that this is programmed for completion in 2028.

3.6.4 RW considers that no other bulk infrastructure upgrades are required to service PC100 and that the options outlined in Attachment 1 of Water & Wastewater and Planning JWS (1) are appropriate solutions to create additional capacity as development occurs within the PC100 area.

3.6.5 AD considers that his responses to questions HP1, HP11, and HP12 address HP8A for bulk wastewater infrastructure with the exception of Whenuapai Pump Station/WWPS68 which will have its capacity sufficiently increased following the commissioning of the Whenuapai and Red Hills Package 2 and the Northern Interceptor integration works.

3.7 **HP9A What is required to get the required infrastructure built and in / on the ground?**

3.7.1 RW considers that for the first 500 DUEs, no bulk infrastructure is required to be built in/on the ground. A new local wastewater pressure sewer network will be required to be constructed as part of the land development delivery for any new stage of development.

3.7.2 RW considers that the specific engineering details to construct a feasible solution to service a stage of development are dealt with through the standard Resource Consent / Engineering Plan Approval process. RW notes that an applicant is required to engage with Watercare during these processes.

3.7.3 RW considers that:

- For a new Huapai Terminal Wastewater Pump Station, a standard wastewater pump station with emergency / operational storage tanks would need to be installed, alongside minor pipework modifications to connect it to the existing network.

- For a new pump station on land owned by the RLG, a standard wastewater pump station with emergency / operational storage tanks would need to be installed, alongside pipes (or duplication of the rising main) within the road reserve to connect it to the existing network.

- For a SMART Pressure sewer system, (should a retirement village be consented and developed) this would involve holding back flows during morning and evening peaks to not contribute to peak flows. As such, this would not impact on the capacity of the WWPS and rising main.

3.7.4 AD considers a feasibility study is required in the first instance to determine the specifics of each solution identified in Attachment 1 of Water & Wastewater and Planning JWS (1). This will identify the project specific risks which need to be mitigated. This will include matters such as land ownership, consenting, ground suitability, and constructability.

3.8 **HP10A When do these upgrades need to occur by in order for PC100 to get underway?**

3.8.1 RW considers that no upgrades are needed to get PC100 <u>underway</u> as there is existing capacity for at least 500 DUE in the wastewater network, with a range of solutions (including upgrades) available to meet the infrastructure needs of development as it progresses.

3.8.2 AD considers that work as part of the feasibility study is required to confirm the staging of upgrades for PC100 to get underway having regard to growth across the wider catchment, noting that the RER and development enabled by PC100 exceeds the 1,000 DUE available.

<u>Water Supply</u>

3.9 **HP1B What is the infrastructure capacity (DUEs) that is currently available for Riverhead?**

3.9.1 RW and TS consider that there is capacity in the Riverhead Reservoir to cater for growth of at least 1,550 DUEs and this includes in Riverhead.

3.10 **HP11B What interim solutions are available and appropriate to service PC100?**

3.10.1 RW and TS consider that there are no ‘interim’ solutions necessary for PC100 because all solutions will be permanent.

3.10.2 Refer to HP8, HP9, and HP10 below.

3.11 **HP12B Can PC100 advance relying on the interim solutions on a staged basis? If so, what would this involve?**

3.11.1 RW and TS consider that there are no 'interim' solutions necessary for PC100 because all solutions will be permanent.

3.11.2 TS notes that in order to allow Watercare to sufficiently manage the risk of overallocation, approval of connections in stages may be considered.

3.11.3 All planning experts agree to consider in the planning expert conference whether appropriate planning provisions have been included in PC100 to address the matters in 3.11.

3.12 **HP8B What bulk and local water infrastructure upgrades are required to service PC100?**

Local Water Supply Infrastructure

3.12.1 RW considers that no upgrades are required to service PC100 initially.

3.12.2 RW considers that a local watermain between the Riverhead Reservoir (transmission main) and PC100 will be required after the first approximately 250 DUEs are constructed, based on the data provided by Watercare to date. KB confirms that this watermain will be funded privately by the RLG.

3.12.3 TS notes that the future connection to the transmission main is complex and require significant consideration about integration with the transmission network and that 250 DUEs will need to be confirmed at resource consent stage.

Bulk Water Supply Infrastructure

3.12.4 RW considers that there is sufficient capacity in the Riverhead Reservoir to cater for growth of at least 1,550 DUEs and this includes in Riverhead. TS notes that this capacity is needed to service all growth in the Kumeū Huapai Riverhead area ahead of the new reservoir.

3.12.5 RW considers that, based on information provided by Watercare, the Riverhead Reservoir is supplied by the Kumeū/Riverhead Watermain, which is primarily supplied by the Waitakere 2 Watermain (not NH1 or NH2).

3.12.6 RW considers that at some point NH2 and then a second reservoir may be required to cater for the remaining DUEs in Riverhead-Kumeu-Huapai above the initial DUEs serviced by the existing capacity within the Riverhead Reservoir.

3.12.7 TS notes that NH2 and a second reservoir will be required to meet future demand. The timing of these assets will depend on realised connection rates and projected future connection rates.

3.12.8 RW understands that the current timeline for the complete delivery of NH2 is 2033/2034, based on information provided by Watercare to date. However, as NH2 is likely to be commissioned in stages, the servicing of the Riverhead Reservoir could occur earlier and new development could be timed accordingly.

3.12.9 TS notes that staging scenarios may allow for early capacity benefit of NH2 for growth and resilience, though these are currently unknown.

3.12.10 TS confirmed that the timing of NH2 could significantly impact available capacity. Current projections show capacity will be available before NH2 is built. Several factors (including at least NH2 delayed completion, build out rates exceed projected growth scenarios (AGS), and higher than previously observed peak demand) could influence capacity and would need to be monitored by Watercare. Possible scenarios are allowing more connections sooner, equally, connections may need to be declined.

3.13 **HP9B What is required to get the required infrastructure built and in / on the ground?**

3.13.1 RW considers that a new waterman is required to be constructed within the road reserve between the Riverhead Reservoir (transmission main) and the PC100 area before development exceeds 250 DUEs, based on current Watercare information.

3.13.2 RW and TS consider that the specific engineering details to construct a feasible solution to service each stage of development would be dealt with through the standard Resource Consent / Engineering Plan Approval process. RW notes that an applicant is required to engage with Watercare during these processes.

3.14 **HP10B When do these upgrades need to occur by in order for PC100 to get underway?**

3.14.1 RW considers that as there is existing capacity in the water network and no upgrades are needed to get PC100 underway.

3.14.2 RW considers that there is sufficient capacity in the Riverhead Reservoir to cater for the initial stages of development generated from PC100.

3.14.3 TS notes that connection rates need to align with new infrastructure being ready and available such that current available capacity is not exceeded including Watercare headroom.

4 PARTICIPANTS TO JOINT WITNESS STATEMENT

4.1 **The participants to this Joint Witness Statement, as listed below, confirm that:**

(a) They agree that the basis of their participation and the outcome(s) of the expert conferencing are as recorded in this Joint Witness Statement; and
(b) They have read the Environment Court's Practice Note 2023 and agree to comply with it; and
(c) The matters addressed in this statement are within their area of expertise; and
(d) As this session was held both in-person and online, in the interests of efficiency, it was agreed that each expert would verbally confirm their position in relation to this para 4.1 to the Independent Facilitator and the other experts and this is recorded in the schedule below.

Confirmed: 14 August 2025

EXPERT'S NAME & EXPERTISE	PARTY / ROLE	EXPERT'S CONFIRMATION REFER PARA 4.1
Karl Cook (KC), Planning	RLG (Applicant) Consultant	Yes

EXPERT'S NAME & EXPERTISE	PARTY / ROLE	EXPERT'S CONFIRMATION REFER PARA 4.1
Cam Wallace (CW), Planning	RLG (Applicant) Consultant	HP6 and HP7 only Yes
Tim Heath (TH), Economics	RLG (Applicant) Consultant	HP6 and HP7 only Yes
Stephen Ellis (SE), Economics	RLG (Applicant) Consultant	HP6 and HP7 only Yes
Robert White (RW), Engineer – Water and Wastewater	RLG (Applicant) Consultant	Yes
Kelsey Bergin (KB), Planning	Fletcher Residential Limited (with the applicant) Employee – Development Manager	Yes
Anthony Smith (AS), Surveying	Fletcher Residential Limited (with the applicant) Employee – Head of Development	Yes
David Wren (DW), Planning	Auckland Council (s42A team) Consultant	Yes
Louise Allwood (LA), Planning	Watercare Services Limited Consultant	Online Yes
Chad Hu (CH), Planning	Watercare Services Limited Employee – Strategic Planner	HP6 and HP7 only Yes
Helen Shaw (HS), Engineer – Water and Wastewater	Watercare Services Limited Employee – Head of Strategy and Consenting	HP6 and HP7 only Yes
Tim Scheirlinck (TS), Engineer – Water Supply	Watercare Services Limited Employee – Head of Water Planning	Yes

EXPERT'S NAME & EXPERTISE	PARTY / ROLE	EXPERT'S CONFIRMATION REFER PARA 4.1
Andrew Deutschle (AD), Engineer – Wastewater	Watercare Services Limited Employee – Head of Wastewater Planning	Yes
Rachel Dimery (RD), Planning	Auckland Council (submitter) Consultant	Yes
Ryan Pitkethley (RP), Engineer – Water and Wastewater	Good Planet Landholder Submitter Group Consultant	Yes

5 August 2025 DIGITALLY DELIVERED

ECONOMIC MEMORANDUM

To: Karl Cook
Director
Barker Associates
Email: KarlC@barker.co.nz

RE: RIVERHEAD-HUAPAI-KUMEU - FEASIBIITY MODELLING OUTPUTS

INTRODUCTION

The Riverhead Landowner Group has engaged Property Economics to assess the economic outcomes of their Proposed Plan Change 100, which seeks to rezone land for approximately 1,800 additional homes. This memorandum provides a high-level overview of the results of the housing capacity modelling assessment undertaken for Riverhead, Huapai, and Kumeū, Auckland.

Watercare has opposed this plan change on the grounds that there is an insufficient infrastructure capacity to support the proposal. The purpose of this work, therefore, is to provide an evidence-based estimate of the development potential within the existing zoned urban areas.

Property Economics has assessed this development potential by modelling the Feasible and Realisable Capacity based on the Theoretical Capacity assessment undertaken by Barker and Associates. The methodology Property Economics has utilised has been designed to meet the requirements of a Housing Capacity Assessment under the National Policy Statement on Urban Development (NPS-UD). In this manner, it has been tested and accepted through multiple Council hearings and has been adopted by a range of Tier 1, 2 and 3 territorial authorities, as well as central government agencies.

It should be noted that this assessment is focused on assessing the capacity of the Residential Zone to provide a like-for-like comparison with the Watercare Evidence. There is potentially additional capacity within the Commercial Zones which has not been assessed.

Over the last 10 years of undertaking feasible capacity modelling for private and public sector clients, under the NPS-UD framework (previously NPS-UDC) there has never been a challenge by, or in, the Environment Court about the methodology, assumptions and approach incorporated in the Property Economics model.

1.1. GLOSSARY

- Theoretical Yield / Plan Enabled Capacity – The total number of properties that could be developed according to the current Auckland Unitary Plan provisions, irrelevant of market conditions.

- Comprehensive Redevelopment – Development option that assumes the removal of all existing buildings to develop across the entire site with less restrictions.
- Infill - Development option that assumes the existing building is retained, and the new residential houses are developed on balance of the site (i.e. the backyard).
- Standalone House – Single detached dwelling.
- Terraced – Dwelling that is attached horizontally to other dwellings but not vertically. Is always built to the ground floor (i.e. does not include homes built above retail stores).
- Apartments – Dwelling that is attached vertically and potentially horizontally. both horizontally and vertically.
- Total Yield- The number of dwellings constructed.
- Net Yield – The number of dwellings constructed net of any existing dwellings removed. For infill, the total yield is equal to the net yield while for Comprehensive, the net yield is equal to the total yield less the existing dwellings.

RESIDENTIAL FEASIBILITY MODELLING

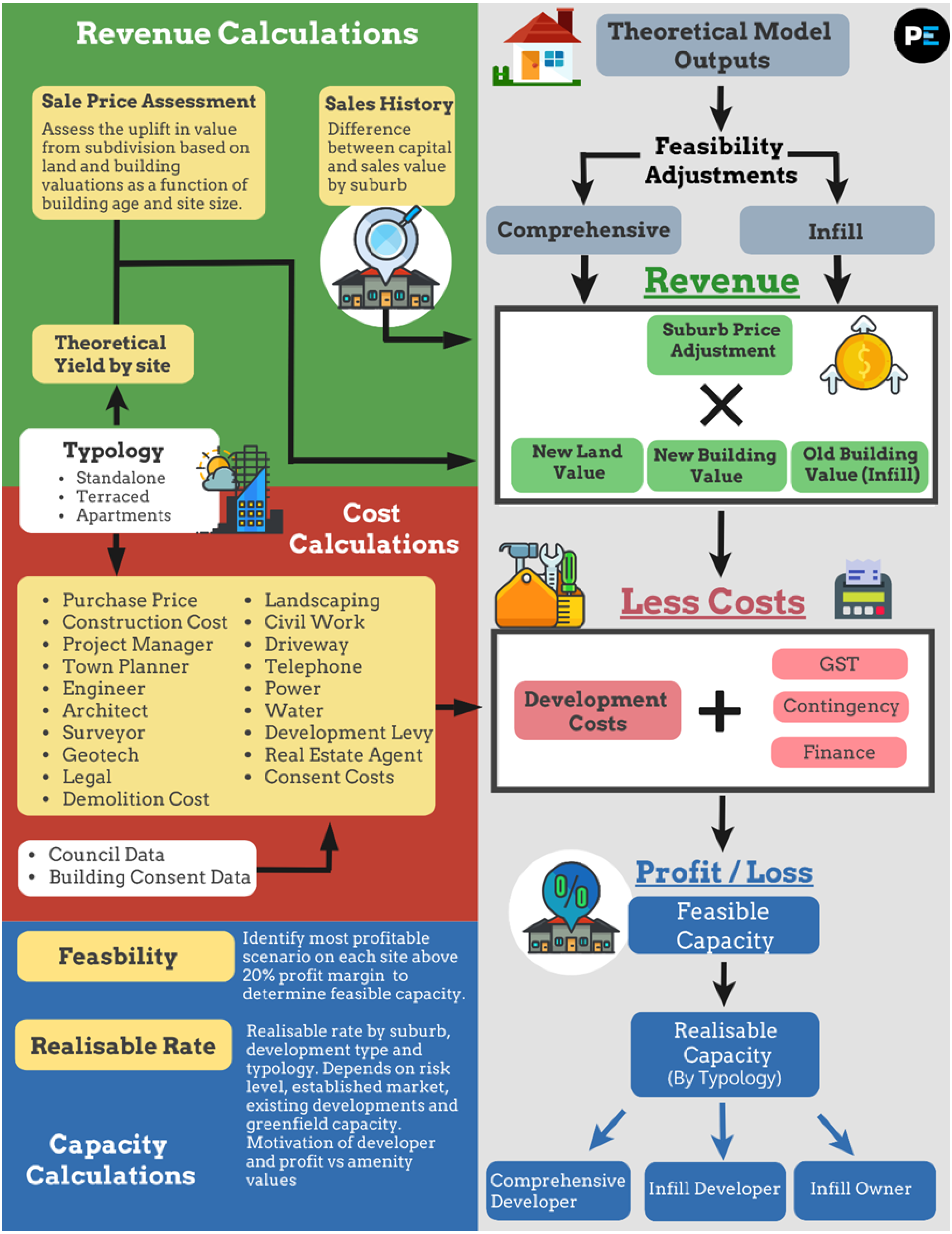
Property Economics' base capacity model can be adapted through the application of policy levers to test various zoning provisions and development scenarios. The model functions as a living framework, enabling the assessment of the impact of planning interventions on development outcomes.

Each site within the study area is geospatially mapped and analysed using location-specific variables to test development feasibility. All relevant market and site-specific inputs are sourced from reliable and up-to-date datasets, including:

- LINZ (title and parcel data)
- Core Logic (sales and rental market data)
- Statistics NZ (household structures, preferences, and population projections)
- Local authority zoning provisions and geospatial data
- Council rating databases
- Council resource consent data, including consented but unbuilt dwellings

A simplified overview of the feasibility modelling process is illustrated in Figure 1. In essence, the model takes in a range of development scenarios for each site, calculates the expected sale price of those dwellings, and the costs of the development (including site preparation and construction), resulting in a calculation of net profit or loss.

FIGURE 1: PROPERTY ECONOMICS RESIDENTIAL FEASIBILITY MODEL OVERVIEW



Source: Property Economics

Revenue Calculation

Using the ratings database, the land value per sqm and improvement value per sqm is calculated. This is then summarised by suburb, size and typology to give the average per sqm value for various types of dwellings.

By splitting the valuation into land and improvement value, it accounts for variations of both sizes e.g., a large dwelling on a small piece of land compared to the same size dwelling on a larger piece of land.

Values are not the same across each suburb (due to differing structures and quality), and thus it is required to give the per sqm value for each suburb individually. Also, the per sqm rate for land and improvement value is shown not to be consistent across all sizes. For example, a larger dwelling has on average, a lower per sqm improvement value than a smaller one. This inverse relationship between size and per sqm value is the same for both land value per sqm and building value per sqm.

This relationship is used to determine the quality, value and cost of building a home in different suburbs across a district. More expensive areas, demand higher quality homes, which cost more to build but also demand a higher price.

Ultimately, subdivision primarily makes its profit through an increase in land value, rather than buildings and the way in which the model approaches this is demonstrated in Table 1 below. Note that this is a generic example (i.e., does not represent a specific site) that is simply included for demonstration purposes.

TABLE 1: EXAMPLE OF HOW BUILDING VALUE AND LAND VALUE CAN VARY BETWEEN STANDALONE AND TERRACED DEVELOPMENT OPTIONS

Development Option on 500sqm site	Building Value per dwelling	Site Size per dwelling	Land Value per dwelling	Sale Price per dwelling	Land Value Per SQM	Total Land Value
One 100sqm Standalone	$ 400,000	500	$ 500,000	$ 900,000	$ 1,000	$ 500,000
Two 100sqm Standalone	$ 400,000	250	$ 400,000	$ 800,000	$ 1,600	$ 800,000
Three 100sqm Terraces	$ 400,000	167	$ 360,000	$ 760,000	$ 2,160	$ 1,080,000

Source: Property Economics,

As this table shows, the value of each individual 100sqm building does not change. Rather the value in building terraces is inherent in the increase in land value from $1,600 per sqm to $2,160 per sqm, which is the result of being able to build more homes on the same site.

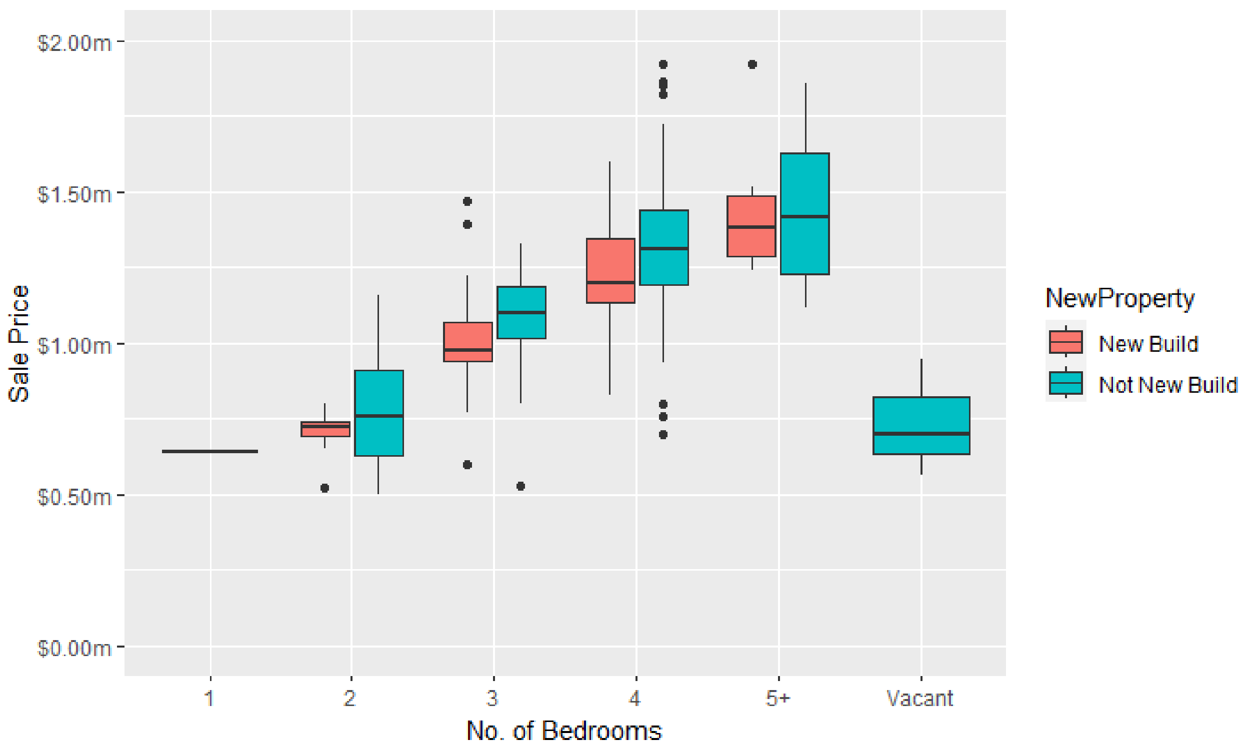
If building terraces did not result in a greater yield (i.e., only two terraces or two standalone options), then the Feasible Capacity Model results would likely show the standalone to be the preferred option.

Sales Price

Figure 2 presents recent sales data for Riverhead, Kumeū, and Huapai, categorised by number of bedrooms and whether the dwelling is newly built (defined as constructed post-2020). This data is used to calibrate the model's revenue assumptions, helping to ensure that the output reflects current market pricing and remains grounded in real-world sales evidence.

The data indicates that residential sale prices in the area range from approximately $750,000 for two-bedroom dwellings to over $1.5 million for homes with five or more bedrooms. Notably, newly built homes have a lower average sale price than those constructed prior to 2020. On closer examination, this difference is primarily attributable to the fact that older homes tend to sit on significantly larger sites than their newer counterparts.

FIGURE 2: SALE PRICE BY NUMBER OF BEDROOMS AND DWELLING AGE



Source: Property Economics, Cotality

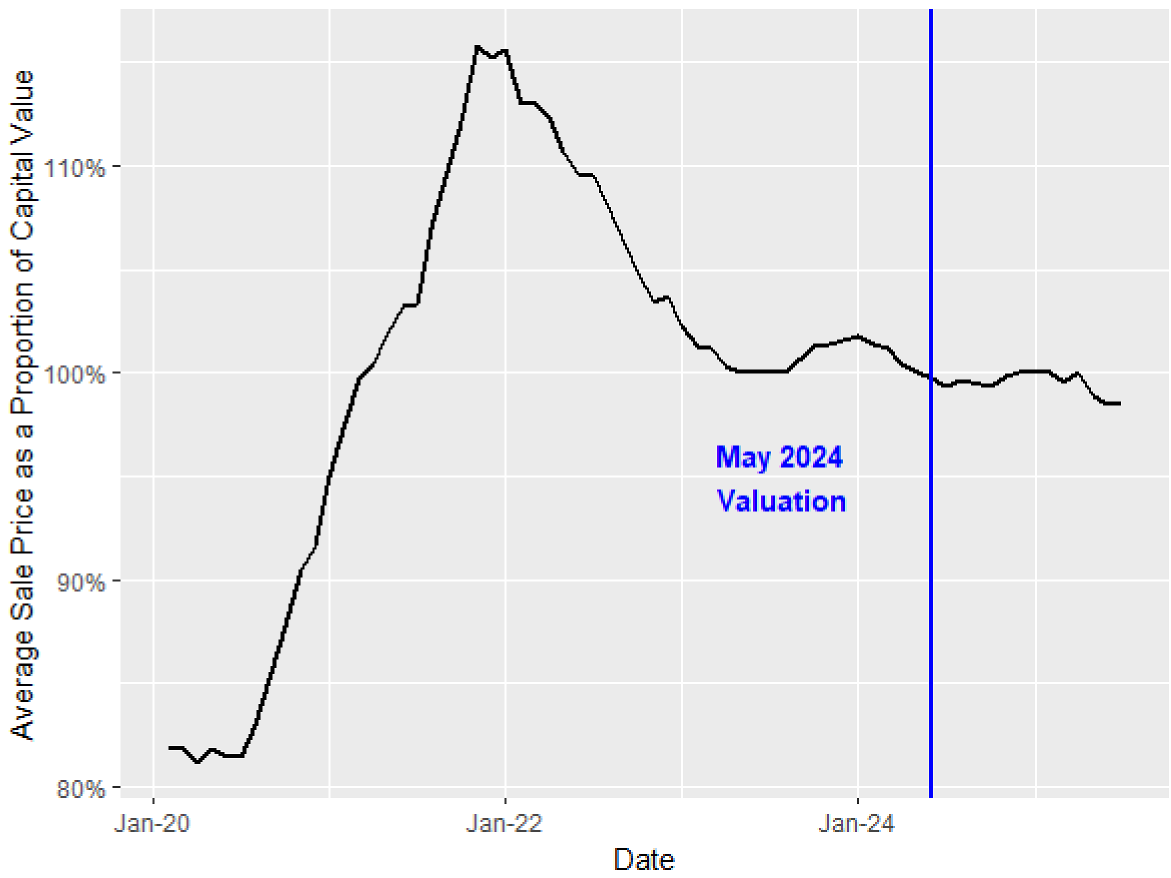
Change in Sales Price

Figure 3 shows the changes in the price level between January 2020 and June 2025 based on their relativity to the May 2024 valuations. This enables us to highly the changes in market conditions since the Council's capacity assessment and, more importantly, assess any adjustments that may need to be made to the council valuations.

Although the HBA does not define exactly what market conditions Council's capacity assessment was based on, as Figure 3 shows, the prices between about 2021 and 2023 were considerably higher than the current price level. At its peak in early 2022, homes in this area were selling for a 16%

premium over their current valuations. Consequently, there is a high likelihood that the current market conditions represent a considerably more subdued sale price potential.

FIGURE 3: ROLLING AVERAGE RATIO OF SALES PRICE TO CAPITAL VALUE BETWEEN JANUARY 2020 AND JUNE 2025



Source: Property Economics, Cotality

Since Auckland's latest valuations in May, the average price level has remained largely static with a small decline in recent months. Based on the sales data above, homes in the area appear to be trading at about 2% below the valuation price level. As a point of comparison, according to QV[1], the average sales price within the Rodney District decreased by just over 2% since the valuation.

Costs Calculation

Figure 1 outlines the different development costs which are considered in calculating each development scenario's feasibility. These costs can vary considerably depending on the specific characteristics of each development site—particularly the typology (e.g. townhouse, apartment, detached house), scale, location, and underlying site conditions. Key cost components include:

[1] QV House Price Index

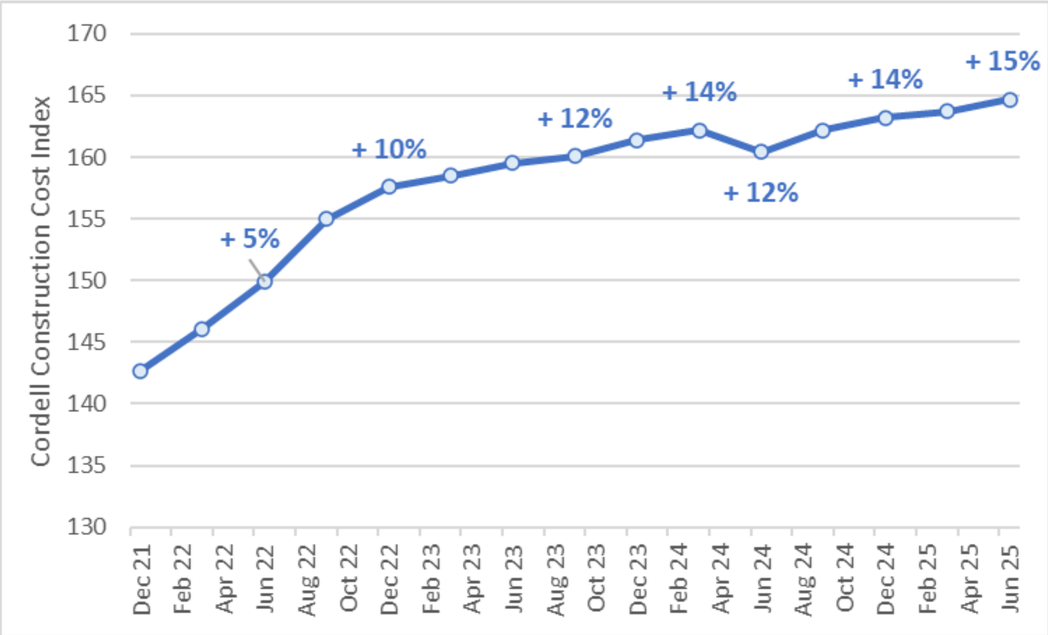
- Demolition of Existing Dwellings (where applicable): For Comprehensive Redevelopment of sites with an existing building, there are costs associated with removing existing structures before any new development can occur.
- Construction Costs: These are influenced by the intended housing typology (e.g. single-level dwellings versus multi-storey apartments), overall floor area, and the quality of materials and finishes. More complex or higher density builds typically require a greater investment in structural engineering, fire compliance, and vertical circulation (e.g., lifts and stairwells).
- Site-Specific Constraints and Mitigation Requirements: Site development may be influenced by overlays or constraints identified in the district plan, such as flooding risk, geotechnical stability, or noise protection.
- Pre- and Post-Development Services: These include costs for connecting to or upgrading essential infrastructure networks—such as water, wastewater, stormwater, electricity, gas, and telecommunications.
- Site Preparation Costs: This includes the installation of accessways, retaining structures, or bulk infrastructure.
- Development Contributions and Consenting Costs: As set out by the Council's Development Contributions Policy. In Auckland, the size and typology of the home affects the required Development Contributions as a portion of an Equivalent Household Unit (EHU).
- Financing and Contingency: Borrowing costs (interest on development loans) are included, as they often comprise a significant proportion of overall outlays, particularly in longer or more complex projects. A contingency allowance is also built in to cover cost escalations, unexpected ground conditions, or regulatory delays.
- Professional Fees: These encompass the cost of engaging a project team, which typically includes planners, surveyors, architects, engineers, project managers, legal advisors, and quantity surveyors. This is calculated as a percentage of construction costs with adjustments made for economies of scale on larger developments.

Collectively, these cost components inform the feasibility model and ensure that it reflects the practical financial considerations faced by developers. By incorporating cost assumptions that respond to differences in typology and location, the model is able to compare a variety of different development scenarios for each site.

Changes in Construction Cost

Figure 4 below highlights that over the same period that Auckland's housing market has decrease, Construction Costs have continued to rise. Since the end of 2021 for example, Construction Costs have risen by an average of 15% across the board. This tightening between the revenue potential of housing developments and their costs has serious consequences for the relative feasibility of housing developments.

FIGURE 4: CHANGES IN CONSTRUCTION COST



Source: Property Economics, Cotality

PROPERTY ECONOMICS MODEL CAPACITY RESULTS

Feasible Capacity Outputs

Property Economics has assessed the variables outlined above in the Riverhead, Kumeu and Huapai (RKH) market and run feasible capacity models across the range of locations, land values, improvement values, and land value changes. A key component of the market's willingness to develop infill is the relationship between a site's land value, fixed subdivision costs and the identifiable 'uptake' in value (sqm) through subdivision.

Table 2 shows the total feasible capacity number of potential sections on sites where the ratios meet a profit level suitable to meet market expectations (20% profit for the purpose of this analysis) for the Auckland Unitary Plan.

The tables represent the subdivision undertaken by either an owner occupier or a developer, with the capacity representing the most profitable. This is an important difference as motivations and capital outlay are often different. These figures have removed all 'double ups' i.e., where multiple instances were tested on a specific site and represent the most profitable scenario for that site.

TABLE 2: AUP THEORETICAL (PLAN ENABLED) AND FEASIBLE CAPACITY WITHIN RKH CATCHMENT

Feasible (Max Profit)	Theoretical	Standalone	Terraced	Total	% of Theoretical
Huapai MHS	934	0	619	619	66%
Riverhead SHZ	264	130	0	130	49%
Huapai SHZ	324	202	0	202	62%
Huapai Triangle	94	94	0	94	100%
Kumeu Precinct	12	12	0	12	100%
Total	**1,628**	**438**	**619**	**1,057**	**65%**

Source: Property Economics

If developments were to be undertaken by either a developer or owner occupier, then there is the potential for 1,057 additional units within the RKH market, including both urban and greenfield sites.

As all development options have been considered in Table 2, this represents the total feasible capacity in the market. This level of feasible capacity represents a 65% feasibility rate on the theoretical capacity. It should be noted that the yield in the Huapai Triangle Precinct is controlled by the Precinct Cap and the development within the Kumeu Precinct includes land within the Town Centre Zone (i.e. a non-residential zone).

Reasonably Expected to be Realised (RER) - Property Economics

On top of the feasible capacity modelling, practical considerations must be taken into account as to what is likely to be developed in the real world. While this section is separated from the sensitivities above the realisation rates essentially provide for 'development chance' given the propensity for development variances.

These considerations are based on:

- Dwelling typology
- Development option
- Greenfield competition

The identification of these variables not only provides for sensitivities but also addresses the relativity between typologies. While all three typologies may be feasible, the development model identifies the site scenario with the highest profit margin. However, practically while the model assesses the standard 20% profit margin, there is greater risk in some typologies. The assessment below endeavours to consider these risks and motivation differentials.

Risk has been accounted for developments undertaken by developers by increasing the required profit level for a development to be classified as 'realisable', on top of being feasible. Additionally, consideration has been given to local market demand context relative to the wider Auckland market.

Table 3 below shows the profit levels required for each combination of typology and development options to be considered realisable by the model.

TABLE 3 – DEVELOPER REALISABLE PROFIT RATES

	Comprehensive Developer	Infill Developer	Infill Owner
Standalone	20%	17%	25%
Terraced	25%	22%	28%

Source: Property Economics

This reflects the market practicality that developments taken on by a developer have relatively lower risk if they are an infill development, rather than a comprehensive development. It also shows the increasing risk of development as the typology increases in scale from standalone dwellings, through to terraced product, and finally apartments (albeit apartments are not included in this model).

For an owner occupier, the model considers the profit level of the development relative to the capital value of the existing dwelling(s). This is because motivations for an owner to subdivide their property are inherently linked with the relative profit they can achieve against the value of their own home e.g., a $100,000 profit on a $1,000,000 site will be less likely to be developed by the owner, compared to a $100,000 profit on a $500,000 site, assuming similar fixed costs. Therefore, as a methodology for this, the model considers that the lowest quartile of feasible infill developments in terms of the relative profit / CV ratio will not be realised by the market.

Taking these market practicalities into consideration, Table 4 shows a summary of the realisable capacity within the RKH market under the AUP. For the most part, this change primarily affects the Huapai MHS, as this is the only location with multiple development options considered. In the SHZ, the minimum site size is 600 sqm, so only Standalone typologies are considered.

TABLE 4: AUCKLAND UNITARY PLAN REALISABLE CAPACITY

Realisable	Theoretical	Standalone	Terraced	Total	% of Theoretical
Huapai MHS	934	100	199	299	32%
Riverhead SHZ	264	128	0	128	48%
Huapai SHZ	324	202	0	202	62%
Huapai Triangle	94	94	0	94	100%
Kumeu Precinct	12	12	0	12	100%
Total	**1,628**	**536**	**199**	**735**	**45%**

Source: Property Economics

Table 4 shows that under these modelling assumptions, the realisable capacity across the RKH area is 735 new dwellings, representing a 45% realisation rate on the Theoretical Maximum Capacity. In essence, this represents a 70% realisation rate of the already calculated feasible capacity outlined in Table 2. It is important to emphasise that this assessment is not a forecast of what will be built, but rather an estimate of what could be (feasibly and realistically) developed within the existing zoned areas, based on current market conditions.

Realisable Capacity (Council HBA Methodology)

Alternatively, the Auckland HBA takes a different approach to assessing realisable capacity. In their model, they assume a fixed percentage of Feasible and Infrastructure Ready capacity is realisable over the Short, Medium and Long Terms. These percentages are as follows:

- 50% over Short Term (3 Years)
- 55% over Medium Term (10 Years)
- 60% over Long Term (30 Years)

Applying these percentages to Property Economics feasible capacity gives us the following results:

TABLE 5: RKH RER CAPACITY APPLYING COUNCIL HBA METHODOLOGY

Capacity	Short Term	Medium Term	Long Term
Theoretical Capacity		1,634	
Feasible Capacity		1,063	
Realisable Capacity	532	585	638

Source: Property Economics

Similar to Property Economics' RER assessment, the Council's methodology does not aim to predict actual development outcomes, but rather to provide an estimate of realistic development potential. It is also important to note that the Realisable Capacity figures presented are not cumulative across time periods. The moderate increase in capacity over time reflects evolving landowner intentions and a growing willingness to redevelop sites.

Property Economics' Feasible and Realisable Capacity model is designed to assess development potential over a 30-year horizon. As such, the most appropriate point of comparison for the 735 dwellings identified as Reasonably Expected to be Realised (RER) in Table 4 is the Long-Term RER figure of 638 dwellings.

If you have any queries, please give me a call.

Kind Regards

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Memorandum

To: Karl Cook – Barker & Associates

From: Cam Wallace – Barker & Associates Limited

Date: 7 August 2025

Re: PC100 - Water & Wastewater and Planning Expert Conferencing - Kumeu Huapai and Riverhead Plan Enabled Capacity Modelling Methodology

Introduction

With reference to the JWS Water & Wastewater and Planning (2), 21 July 2025, (in particular paragraph 3.3.2), this memorandum provides a high-level overview of the Plan Enabled Capacity (PEC) modelling methodology as a preliminary input into Property Economics Feasible Capacity and RER modelling for residential zones in the Kumeu, Huapai and Riverhead Area (KHR).

This methodology has been informed by a number of factors and professional experience advising both local government and private developers since 2018, including:

- My involvement in similar PEC assessments across New Zealand for the development of Future Development Strategies including in Nelson-Tasman, Rotorua, Gisborne, and Napier-Hastings;
- My involvement in the spatial analysis and masterplanning of the Wesley and Mangere neighbourhoods as part of Kāinga Ora's Auckland Housing Programme. This included a particular focus on identifying and understanding potential housing yields obtainable through both infill and comprehensive redevelopment of Kāinga Ora's landholdings in these locations;
- Bulk and Massing exercises I have undertaken for private clients to inform valuation and feasibility exercises. This has included constructing 3D models of theoretical building envelopes on specific sites based on application of underlaying Auckland Unitary Plan (AUP) provisions to estimate total ground floor areas under both commercial and residential development scenarios;
- My involvement, as an urban designer, in a range of both greenfield and brownfield residential development projects across Auckland which have involved application of the AUP provisions. This has included gaining an understanding of how particular provisions are interpreted and applied (e.g. through s92 requests or direct recommendations to amend schemes) in practice by Auckland Council through the resource consent process; and
- A review of the "Housing and business development capacity assessment for the Auckland region 2023 – Appendix 3: Supply inputs, assumptions and methodology" and associated residential capacity geospatial data for the Rodney Local Board area.[1]

With regard to the above, the methodology is designed to reflect both theoretical and practical / real world outcomes associated with the application of various planning provisions under the AUP.

[1] https://www.knowledgeauckland.org.nz/publications/auckland-council-capacity-for-growth-study-20222023-data-residential-capacity-part-2/

Housing & Business Development Capacity Assessment 2023

Appendix 3 of Housing and business development capacity assessment for the Auckland region (HBA) sets out the process undertaken for calculating residential PEC across Auckland. Of particular importance is move away from direct control over density or the number of dwellings towards "envelope controls" that enable floorspace rather than a specific number of dwellings per se. To an extent this is correct for some residential zones (e.g. THAB), however density limits and / or restrictions on enabled dwellings remain for the SHZ (1 per 600m2) and the MHS/ MHU (3 dwellings per site). Notwithstanding the permitted dwellings provisions of the MHS / MHU zones, I agree that utilising a "building envelope" approach for assessing PEC across these two zones, consistent with what would be required in the THAB zone (and business zones) is an appropriate approach due to the enabling framework of the zone provisions. However, it is observed that the HBA (at least in the KHR area) does not include consideration of precinct or overlay rules which would impact on PEC. This includes both lowering the capacity available on any given site (e.g. by the imposition of density controls or setting aside land to accommodate an overland flow path) or preventing redevelopment entirely (e.g. significant flood risks). In this regard it is observed that the PEC presented in the HBA does not accurately represent what is actually enabled by the AUP, resulting in estimates potentially overstating future development capacity.

For larger sites greater than 1 ha, the HBA adopts development adopts a simplified 'density controlled' subdivision approach which takes the gross area off a site, allocates 25% to non-residential uses (e.g. roads) and then divides the remainder of the land by a pre-determined density ratio (which varies depending on zone). Again, I consider this to be an appropriate approach for determining PEC. However, the assumption of only 25% of land being set aside for non-residential uses is not in line with my experience of development where increasing requirements around road / JOAL widths, stormwater management and open space provision typically means at least 30-40% of larger sites are required to be set aside for supporting infrastructure and access. A review of larger sites in KHR including the Huapi 2 Precinct identifies that only 65% of the site was available for development while the McIndoe Road subdivision identifies that only 60% of the site was available for development (due to impacts associated with overland flow, streams and flooding in addition to access). As such, the HBA is likely to overstate PEC on sites larger than 1 ha.

KHR Modelling

Two separate processes were used for determining PEC across the SHZ and MHS. No modelling of the MHU was considered necessary for this work as the extent of this zone is limited to the Kumeu Precinct where a resource consent for a comprehensive mixed-use development has already been obtained for approximately 300 dwellings as part of the "Kumeu Central" project. It is observed that a number of terraced houses have already been constructed or are under construction.

At a high level, the modelling process is set out below:

1. Identify development parcels using LINZ parcel / title data;
2. Identify relevant AUP provisions that apply to each site. In addition to zones, this includes precincts and overlays (SEAs, national grid corridor, schedule trees, flood plains and designations);
3. Exclude sites that are subject to significant development constraints (e.g. flooding) or have been recently redeveloped or subdivided (such that redevelopment over and above what has already occurred is unlikely over the modelling horizon);

a. Determining whether a site had been recently redeveloped was based on visual observations / comparisons between 2017 and 2024/25 Aerial Photography sourced from Auckland Council's GeoMaps service as well as a review of dates that titles were issued;

b. For currently vacant sites that have been subdivided, Auckland Council's GeoMaps 'Underground Services' layer was investigated to determine whether water / wastewater connections had been provided to the site boundary. Where this occurred, no additional PEC was assumed.

c. SHA and MHS sites within identified flood plains and flood prone areas were also excluded from consideration of PEC. Whilst this only triggers a Restricted Discretionary Activity Assessment,

    i. The impacts of flooding on each site require detailed stormwater analysis and an understanding of existing and future ground levels which are not practical to assess across a wide area. In some instances, the extent of land modification required to address flooding (e.g. through raised floor levels) can effectively reduce permitted building heights to a single storey meaning that any capacity calculations would be unreliable;

    ii. Provisions under Chapters E36 and E38 seek to restrict development within flood plains generally. Recent experience dealing with Auckland Council and Healthy Waters has also highlighted a reluctance to accept development in flood plains even if appropriate mitigations can be developed due to concerns around increased risk generated by an increased resident population and issues around evacuation during flood events. For vacant lot subdivision, E38 also requires building platforms to be clear from identified flood plains.

    iii. This exclusion also partly reflects the extent of recorded flooding in Kumeu / Huapai following 2023 where flood depths of over 2m were recorded on some sites identified in the HBA as contributing to PEC.

4. For sites within the SHZ, a simple density calculation assuming a minimum net site area of 600m^2 would be required. As such, any sites with an area less than 1200m^2 could not contribute to additional PEC. I note that 2,441 parcels within KHR fall within the SHZ, of which 251 have an unconstrained area of greater than 1200m^2;

    a. For the 251 sites which were over 1200m^2, future PEC was only identified where a site of at least 600m^2 could be created around existing buildings on site. All 251 sites were individually assessed and measured to determine if this was possible.

    b. For sites greater than 1ha, it was assumed that 34% of the site would be required to accommodate access/ roading and stormwater infrastructure. As such, PEC was calculated using the following formula: **PEC = (Site Area x 0.66) / 600.**

5. For sites within the MHS, those that fell within either the Huapai Triangle or Huapai 2 Precincts were separated. A total of 1,182 parcels fall within the MHS zone. Of these, 779 are located within the Huapai Triangle Precinct and 229 are located within the Huapai 2 Precinct. This leaves a total of 174 parcels within the MHS that are unconstrained by strict density standards.

    a. The Huapai Triangle Precinct has a dwelling cap of 1200. As such, PEC modelling involved identifying how many dwellings had already been constructed, where consented and under construction or where consented and construction had to commence. This include a review of property files for larger vacant sites within the Precinct. This process identified that 1104 homes had already been constructed or consented within the precinct.

b. For the Huapai 2 precinct, a maximum of 1 dwelling per site is allowed. Only 1 site remains vacant but already s features a water / wastewater connection. As such, no additional PEC could be achieved within the Huapai 2 precinct.

c. For the remaining MHS sites outside of the precincts and significant development constraints, the total floor area available was calculated based on the application of building coverage, height (assuming 2-storeys and a total building height of 6.5m as measured from the ground to the top of a side wall), HiRB and yard controls. This included separate floor areas at ground floor and an upper floor which were combined to give a total floor area.

    i. In addition to these standards, outlook and open space standards of the MHS zone also have an impact on site layout but are dependant on a specific floor plan. To overcome this issue, developments have been assumed to adopt a "sausage flat" configuration where a single building runs perpendicular to the street to maximise development potential available within an overall building coverage of 40%.

    ii. Where application of HIRB has resulted in an upper-level portion of a building having a dimension of less than 4.5m, this was removed for the total floor area available to reflect a realistic building envelope which could accommodate a functional internal space.

AUP Provisions Modelled

As with the HBA modelling, PEC modelling for KHR as it relates to the MHS zone necessarily involves a simplification of the complex and discretionary planning system that applies under the AUP. This contrasts with the SHZ where strict density controls remain in place. This requires simplification to determine which plan provisions are 'essential', which rules are able to be ignored (because they do not materially affect yield – this may relate to exterior appearance or interior requirements), and what rules can be converted to numerical or spatial formats which allows the utilisation of mathematical or spatial calculations to quantify enabled development capacity.

Based on the above, the PEC modelling has taken into account the following AUP provisions:

MHS Core Standards

- H4.6.4 – Height Limit of 8m. This effectively limits development to 2-storeys in height.
- H4.6.5 – HiRB 2.5m+45^0. Note: the AHiRB not appropriate to use as this triggers an additional matter of consent which requires a highly specialised assessment of impacts on neighbouring sites and is dependent on site orientated and the layout / configuration of adjacent sites.
- H4.6.7 – Yards 3m, 1m, 10m
- H4.6.9 – Building Coverage 40%
- H4.6.11 – Outlook Space – notably the requirement for a 6m X 4m from a principal living room becomes a binding constraint, although not a standard to be complied, for more intensive

developments – particularly for those sites which run perpendicular to the street. However, this is challenging to model in practice as it is specific to the actual design of a site.

- H4.6.13 – Outdoor Living Space is relevant to an extent as it requires a 20m^2 space (with a minimum dimension of 4m). In practice this effectively creates a de-facto 4m side yard for terraced typologies looking to max out theoretical development potential.

Precinct Standards

Huapai Triangle

- 5.62(2)(1) sets a maximum of 1200 dwellings across the entire precinct, with a non-complying activity.
- 5.62(2)(1) also sets a limit of 1 dwelling per 400m^2 net site area. 755 existing parcels within the Precinct are less than 800m^2 in size, meaning that there is no additional PEC on these parcels (putting aside the overall 1200m cap).

Huapai 2

- 5.63(2.1) - The number of dwellings on a site within the Huapai 2 precinct must not exceed one dwelling per site.

Auckland Wide

- D26.4.1 (A9) Any building or structure unless it is otherwise provided for in the National Grid Yard
- D26.4.1 (A22/ A23) Creation of lots involving a new building platform in the National Grid Yard for activities sensitive to the National Grid
- E36.4.1(A37) All other new structures and buildings (and external alterations to existing buildings) within the 1 per cent annual exceedance probability (AEP) floodplain
- E36.4.1 (A38) Use of new buildings to accommodate more vulnerable activities, and changes of use to accommodate more vulnerable activities within existing buildings located within the 1 per cent annual exceedance probability (AEP) floodplain;
- E36.4.1 (A41 and A42) - Diverting the entry or exit point, piping or reducing the capacity of any part of an overland flow path; or Any buildings or other structures, including retaining walls located within or over an overland flow path;
- E38.4.2 (A11) Subdivision of land within the 1 per cent annual exceedance probability floodplain; coastal storm inundation 1 per cent annual exceedance probability (AEP); or coastal erosion hazard area.
- E38.4.2 (A23) Subdivision involving indigenous vegetation scheduled in the Significant Ecological Areas Overlay not complying with Standard E38.8.2.5 – Note: Requires any lots to be outside of the SEA.