Spatial Plan Development

Mapping Technical Report

23 January 2025

Contents

Glossary

Term	Definition
Greenfield	This refers to undeveloped land, typically in rural or suburban areas, that has not been previously built upon, it can also mean converting rural zoned land to urban.
Brownfield	This refers to developed land, typically in existing urban environments, that has been built upon.
Residential	Areas designated for housing.
Commercial	Areas designated for business activities, including retail stores, offices, and service providers.
Industrial	Areas designated for manufacturing, warehousing, and other industrial activities.
Walkable catchment	A spatial area within a specified walking distance of a key destination.
Yield	Refers to the potential number of households that can be developed on a given piece of land.
Density	Refers to the concentration of people, buildings, or activities within a specific area. Medium and high-density areas typically have more compact development, which can support efficient public transportation, reduce infrastructure costs, and promote walkability.

1 Introduction

The Growth Planning and Placemaking Team presented the finding of the scenario evaluation process to Elected Members on 10 December 2024. Six scenarios were proposed, each offering a different way to accommodate growth. Elected Members agreed to progress with developing a hybrid scenario (D + E) into a draft spatial plan that will be consulted on in March 2025.

The spatial plan for Te Pātukurea is a blueprint that will map out how we manage growth over the long-term in Te Pātukurea and includes:

- maps and diagrams that show the desired spatial distribution of activities and infrastructure, and
- an implementation plan that will detail the policies and strategies, actions and steps that are needed to deliver the plan.

This Technical Report sets out the assumptions and overall process that was used by the Project Team to develop the hybrid scenario further and finalise the maps and diagrams that will form the foundation of the draft spatial plan.

2 Assumptions

2.1 Initial Assumptions | Growth Scenario

The following assumptions were used to identify the areas for growth at a high level in each of the original scenarios. These assumptions and their rationale were presented and endorsed by Elected Members on 30 July 2024.

Table 1: Growth Scenario Assumptions

Matter	Assumption	Comment
Population	Approx. 11,000	Blue-sky scenario[1]
Households	4,690	
Hectare requirements by activity type	99.05 ha	Residential
	18.5 ha	Retail / Commercial
	4.7 ha	Industrial

Of the approximately 11,000 people that will call Kerikeri and Waipapa home, a key assumption was that within the study area, 95% of residential growth will be distributed within new and existing urban areas in any given growth scenario, and the remaining 5% would be rural growth. One hundred percent of commercial and industrial is assumed to be within each scenario (that is, no commercial / industrial growth in rural areas outside the defined boundary of a scenario).

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[1] Note that the demand projection is different from the HBA. This is because the spatial plan represents an ambitious scenario which assumes high population growth combined with Kerikeri/Waipapa capturing a greater share of the district's growth than what historically has been the case. This blue-sky scenario was also endorsed at the same workshop.

In respect to residential growth, the 4,690 households were then further distributed between existing urban (brownfield), and new urban (greenfield) areas as follows:

Table 2: Greenfield / Brownfield splits and lot sizes

Area	Percentage	# Households
Growth in existing urban areas (intensification) [2]	55 - 60%	2,580 - 2,814
Growth outside existing urban areas (greenfield development)	35 - 40%	1,642 - 1,876
Average lot size for intensification in urban areas	$400m^2$	
Average lot size for greenfield housing	$528m^2$	
	This included $400m^2$+ 32% for amenities and infrastructure	

Consistent across the growth scenarios is the assumption that 55-60% of growth will be met via intensification within existing urban boundaries. Intensification allows for more people to live closer to the town centres to maintain and grow their vibrancy while also protecting much of our most productive rural land from urbanisation.

The scenarios differ primarily in the way they distribute greenfield growth. To determine the extent of greenfield area (hectares) required for each scenario, the average lot size for greenfield housing ($528m^2$) was multiplied by the number of dwellings. This was then mapped by the GIS team, with consideration given to Wāhi Toitū and Wāhi Toitū Toiora areas, and areas that were contiguous.

The final scenarios that went out for consultation are presented in the Growth Scenarios Report.

2.2   Refined Assumptions | Draft Spatial Plan

The assumptions used to define the options were high-level and intended to enable the project team to gain a conservative understanding of the overall area needed to accommodate growth. As such, the areas identified in the initial growth scenarios contained more developable area than would ultimately be necessary to accommodate growth. The initial growth scenarios also defined the distribution of growth between existing urban (brownfield) and new urban areas (greenfield) for each scenario. As a hybrid option has been confirmed, the distribution of growth needed to be reconsidered to define the percentage distribution of residential, commercial, and industrial growth between Kerikeri and Waipapa.

2.2.1 Overall Distribution between Kerikeri and Waipapa

When considering the distribution of residential, commercial, and industrial land uses between Kerikeri and Waipapa, the team assumed the following:

(a)   Household growth in Waipapa will be particularly constrained by limitations in the future wastewater network. The standalone (modular) Wastewater Treatment Plant included as part of the infrastructure assessment caps household growth in Waipapa at 1,000 households. With approx. 200 existing households, this limits residential growth to 800 households.

(b)   Whilst Waipapa has a good foundation for commercial growth, the existing centre at Kerikeri is better placed for expansion of commercial land use.

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[2]   Urban areas in this context refers to land that is zoned Mixed Use, General Residential, Industrial and Open Spaces zones that are contiguous with these zones. Rural-Residential Zoned land is excluded.

(c)   There is some need for industrial land in Kerikeri, the bulk of industrial growth is expected to locate in Waipapa due to the proximity to the state highway network and existing industrial land use.

Based on the above, the following distribution for residential growth was proposed and reviewed by Market Economics:

Table 3: Distribution of Growth | Residential

Area	Percentage	Households/ Dwellings
Kerikeri	78%	3658
Waipapa	17%	797
Rural growth (outside scenario)	5%	235

Market Economics noted that the distribution proposed is a significant departure from historic patterns. Historically, a large portion of growth occurred in the rural areas (32% to 39%). Reducing the rural component to 5% will have a material impact on the quantum of growth to accommodate in the urban areas. Furthermore, Waipapa historically has captured only a small share of residential growth (between 7% and 10%; and in two years less than 1% of residential growth).

This distribution reflects the ambitious and aspirational nature of the plan, and the drive to achieve more affordable housing typologies. On review, Market Economics considered that the 5% share of growth allocated to the rural areas appears appropriate but noted that the relative distribution of the remaining growth between Waipapa and Kerikeri seemed marginally overweighted to Waipapa. A suggestion of 10% residential growth in Waipapa was floated for consideration.

Upon review, and recognition of historic growth pattern and infrastructure constraints, the Project Team decided to:

(a)   retain the aspirational growth target of 17% for Waipapa (approx. 797 households) as these reflect the outcomes of the community consultation and evaluation process, as well as the outcomes that may be achieved through future infrastructure projects, and[3]

(b)   split greenfield residential growth in Waipapa into an initial growth area (where growth will occur in the medium term) and a future growth expansion area (where growth can expand to meet demand). This is delineated on the spatial plan maps as "medium density" and "potential future medium density."

When considering the distribution of growth between greenfield and brownfield areas, the Project Team reviewed the initial ranges considered for the scenarios and identified the following splits:

Table 4: Distribution of Household/Dwelling Growth | Greenfield & Brownfield

Area	Brownfield	Greenfield
Kerikeri	15 – 25%	75 – 85%
Waipapa	30 - 40%	60 – 70%

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[3]   For example, the completion of the four-laning of SH1

The above splits broadly align with the brownfield splits initially proposed for scenario D and E and are similar with approaches to intensification followed elsewhere.[4]

In respect to the distribution of commercial and industrial growth, the following assumptions have been agreed based on the discussion above:

Table 5: Distribution of Growth | Commercial & Industrial

Area	% Commercial	% Industrial
Kerikeri	70% - 80%	25% - 35%
Waipapa	20% - 30%	65% - 75%

2.2.2 Density

As the initial growth scenarios did not distinguish between low- and medium-density areas, a density analysis was undertaken to confirm the density measures that will apply to the yield calculations (as this has implications for the spatial extent of intensification areas). The density of development is a metric that is used in understanding the feasible capacity for brownfield areas (and in determining how much greenfield land is required.

This analysis confirmed that for medium density development (via intensification or within new greenfield areas) a density of around 40-48 dwellings per hectare. This is based on the different housing typologies anticipated and would likely include a typical lot size of between 145-175sqm and capture various typologies, including walk-up apartments, terraces, and duplexes.

This analysis included:

1. understanding of the existing density of development at random sample sites,

2. review of the density proposed through the PDP, and what would be required to deliver a mix of housing typologies, and

3. identifying appropriate locations for higher density, based on the Planning and Design principles.

For low-density development in greenfield areas, a typical lot size of 500sqm is assumed, which would achieve a density of around 15 dwellings per hectare.

2.2.3 Walkable catchments

A walkable catchment refers to the area within a comfortable walking distance from a specific point, such as a public transport stop, school, or commercial centre. A walkable catchment with a radius of 400 or 800 meters roughly translates to about a 5 to 10-minute walk (respectively). This distance is considered manageable for most people to walk without significant effort. The National Policy Statement on Urban Development sets out certain requirements in relation to walkable catchments in specific urban contexts which, although these not directly relevant in Kerikeri or Waipapa, establishing a walkable catchment is considered appropriate in supporting a compact and sustainable urban form.

In determining an appropriate walkable catchment extent, the team have:

1. reviewed prior walkable catchment work done by FNDC,

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[4] Scenario D and E identified between 15% - 20% brownfield growth in Waipapa, and between 45% - 40% in Kerikeri respectively. Other districts taking a similar approach include Napier, Hastings, Nelson and South Waikato (Market Economics memo);

2. tested several walkable catchment extents (400m, 800m and Kainga Ora (200-300m)),

3. tested the walkable catchment from various key destinations, and

4. confirmed a walkable catchment and mapped the spatial extent.

Key to this analysis was the identification constraints and opportunities, including pedestrian walkways that enable safe and direct access to the town centre, and opportunities to improve the walkable catchment (i.e. future connections, intensification around community facilities on the edge of the catchment). Environmental factors were also considered, as these can impact perceptions of walking distances and how far someone is willing to travel. Based on the above analysis, the following walkable catchments were recommended:

Table 6: Walkable catchments | Kerikeri & Waipapa

Area	Catchment Extent	Comment
Kerikeri	400m	Bespoke catchment adopted that is based on a walking distance from core retail area within town centre.
Waipapa	400m/800m	Standard walkable catchment adopted that is based on a future residential and commercial layout.

2.2.4 Infrastructure Allocation

The proportion of land required for infrastructure and other aspects related to support development is 32%. The reason an allocation is set is to be able to confirm the space needed for infrastructure as well as housing when identifying spatial extents. The 32% allocation is a common metric used in spatial planning and includes the areas needed for: local roads and footpaths and below-ground infrastructure.

The following section articulates some of the assumption around the provisions of infrastructure.

2.2.4.1 Parks and Reserves

The draft spatial plan assumes that all future demand for active park space will be consolidated in Waipapa at Te Puāwaitanga (moving some activities away from Baysports displaced by residential development), creating a centralised hub for recreational activities.

Additionally, provision has been made for five neighbourhood parks, each approximately 0.2 hectares in size. These include two parks in greenfield medium-density areas in Waipapa, two in greenfield low density residential areas in Kerikeri, and one on the Turnstone land, ensuring access to adequate green spaces for future residential developments.

2.2.4.2 Community facilities and network utilities

Community facilities necessary to support growth, such as schools and libraries, and network utilities such as transmission lines, will not be identified (mapped) in the spatial plan. This aligns with the level of detail that is typical of spatial plans and recognises that network utility operators and Requiring Authorities have separate processes relating to the identification of sites for projects.

2.2.4.3 Infrastructure

The Project Team has reviewed the infrastructure needs to accommodate growth in a hybrid scenario.

Some aspects of key infrastructure, such as the indicative location of new transport connections, will be mapped to show communities how they might move through future urban spaces. Others, including the location of any new Wastewater Treatment Plan (WWTP) and associated infrastructure, will not be mapped. However, under-ground infrastructure (such as transmission pipelines) would be included in the transport corridor and accounted for in the infrastructure allocation percentage discussed above.

Table 7: Infrastructure Assumptions | Hybrid Scenario

Infrastructure	Indicative requirement
Transport	• Intersection upgrades • Roading connections • Footpath/shared path improvements • Pedestrian crossings • Bus service and bus stops
Stormwater	• Topography in the southern areas is generally higher in elevation, which may limit suitable outlet/discharge locations to existing water courses • Investment into upgrading existing pipe networks will be required to manage growth • Surface water protection zones to the Kerikeri River network may make water quality criteria more rigorous for developers.
Water	• Kerikeri water treatment plant upgrades • A new water source or increased take from existing sources • 3.2km of water pipe upgrades • Additional reservoir storage • Booster pump upgrades at Kerikeri and Waipapa reservoirs.
Wastewater	• Kerikeri wastewater treatment plant upgrades • A small-scale, modular wastewater treatment plan for Waipapa • 3.3km of new or upgraded wastewater pipes • Pump upgrades (x4) • New pump stations (x2).

2.3   Summary of Assumptions | Kerikeri

The table below summarises the key assumptions that were worked out in Section 2 of this Report. Additional key assumptions that were used to define the spatial extent of growth in Kerikeri are noted below the table.

Table 8: Assumptions | Kerikeri

Kerikeri	Overall requirement	Brownfield	Greenfield
Residential			
Households required (%)	78%	30 – 40%	60 – 70%
Households required (#)	3,658	1,097 – 1,463	2,195 – 2,561
Hectares required	121.5ha	N/A	121.5ha
Medium-density			
Hectares required	44.5ha	N/A	44.5ha
Developable area (Within intensification area for Brownfield)	114.9ha	85ha[5]	29.9ha

[5] Walkable catchment area

Kerikeri	Overall requirement	Brownfield	Greenfield
Theoretical household plan enabled yield	5,144	3,437	1,707
Low-density			
Hectares required	77ha	N/A	77ha
Developable area	214.7ha	162.7ha	52ha
Theoretical household plan enabled yield[6]	3,448	2,409	1,039
Commercial			
Percentage required (%)	75%	20%	80%
Hectares required (ha)	13.9	2.8	11.1[7]
Industrial			
Percentage required (%)	30%	20%	80%
Hectares required (ha)	1.4	0.3	1.1

Additional assumptions include:

- Existing business land will be redeveloped in main town centre, making better use of existing space in existing Mixed-Use Zone.

- New commercial areas should be connected to the existing business land.

- Medium-density Residential applies within walkable catchments.

- Extent of Walkable catchment is to be compact (preferred from an economics perspective, keep in mind demand, concentration effects).

- Greenfield land should be connected to "town centre" / commercial hub and mindful of location of future "connection road".

- To support a logical medium density layout, a small neighbourhood centre to the south of the industrial area will be introduced, which will link that to another new neighbourhood centre one via and intensified corridor. This would support a future 'loop' bus network around the town.

- Future demand for active park space will be consolidated in Waipapa at Te Puāwaitanga.

- Provision for 5 x approx. 0.2ha neighbourhood parks. 2 in greenfield medium density, 3 in greenfield low-density.

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[6] The theoretical yield identifies a higher number of households than required, reflecting the plan-enabled capacity that may be achievable in the future. This approach accounts for market uncertainty in delivering the anticipated outcomes.

[7] approx. 1ha required for formation of new neighbourhood centre to serve new greenfield residential growth.

2.4 Summary of Assumptions | Waipapa

The table below summarises the key assumptions that were worked out in Section 2 of this Report. Additional key assumptions that were used to define the spatial extent of growth in Waipapa are noted below the table.

Table 9: Assumptions | Waipapa

Waipapa	Overall requirement	Brownfield	Greenfield
Residential			
Households required (%)	17%	20%	80%
Households required (#)	797	159	638
Hectares required	15.95ha	N/A	15.95ha
Medium-density			
Hectares required	15.95ha	N/A	15.95ha
Developable area	21.35ha	5.4ha	15.95ha
Theoretical household plan enabled yield	728	88	640
Commercial			
Percentage required (%)	25%	40	60%
Hectares required (ha)	4.6ha	1.8ha	2.8ha
Industrial			
Percentage required (%)	70%	20%	80%
Hectares required (ha)	3.3ha	0.7ha	2.6ha

Additional assumptions include:

- Residential growth in both brownfield and greenfield areas will all be medium density with the majority of residential land use accommodated north of Waipapa Road. The intention is to provide more affordable housing and achieve and efficient use of land). This can potentially be terraced toward blue/green network.

- Greenfield residential growth will be split in Waipapa into an initial growth area (where growth will occur in the medium term) and a future growth expansion area (where growth can expand to meet demand). This is delineated on the spatial plan maps as "medium density" and "potential future medium density."

- Future WWTP (requiring approx. 10 ha area) can be located in rural area ideally within 3km of town.

- Existing Large Format Retail to be recognised in the spatial plan.

- Blue / green connection going to Te Puāwaitanga.

3   Process Overview | Spatial Plan Mapping

The process for preparing maps and figures for the draft spatial plan was both iterative and linear. It was linear in that certain tasks needed to be completed before others could commence, and iterative in that defining the spatial extents (from step 4 onwards) required testing and refinement.

Testing and refinement were completed through several multi-disciplinary workshops over the course of several weeks. Workshop attendees and inputs were derived from: Market Economics (economic consultant), the Property Group (GIS expertise and walkable catchment and yield analysis), Boffa Miskell (urban design), Beca (planning, transport and three-waters infrastructure) and FNDC staff (planning and parks / recreation). The purpose of these workshops was to:

(a)   Ground-truthing assumptions and ability to achieve distribution splits

(b)   Understand the feasibility of spatial layouts and alignment with overarching objectives and Planning and Urban Design Principles

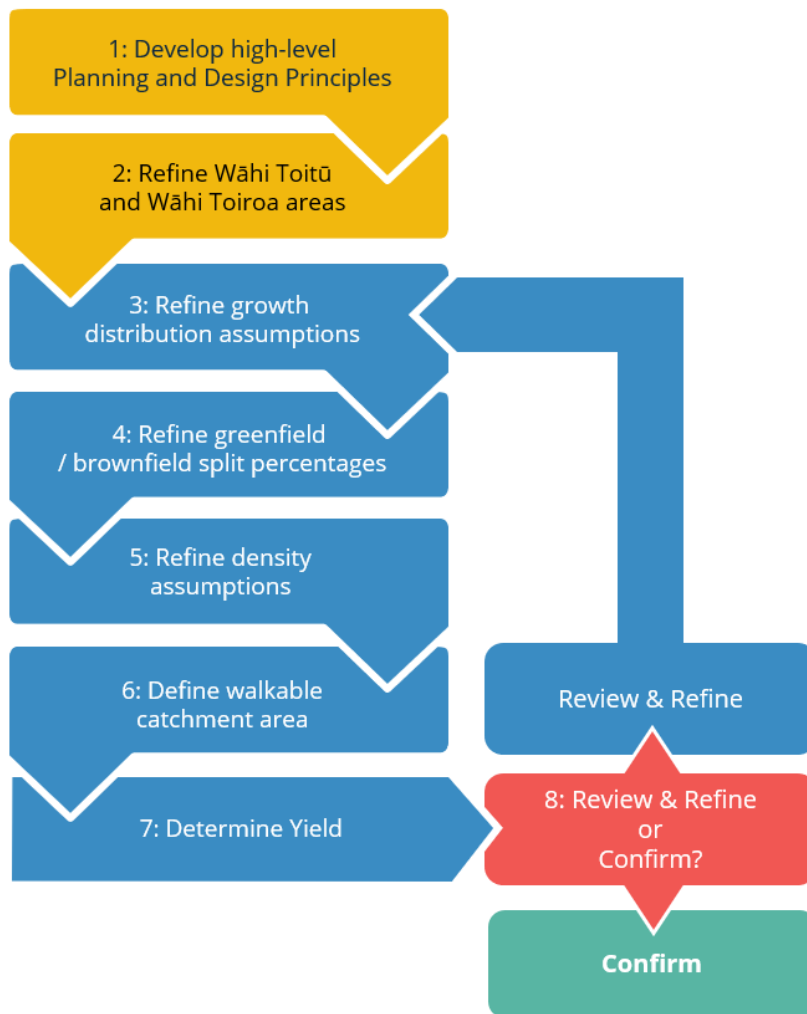The process is shown in the figure below and described overleaf.

Table 10: Process Steps

Step	Date / Comment
1. Develop high-level Planning and Design Principles	Planning and Design Principles were developed which encompass six key themes that respond to the project objectives. Under each theme is a series of interventions that can be taken to achieve these objectives. These principles act as a guideline that will helps shape the physical layout and functionality of existing and future urban spaces and were created to support the Project Team in defining the extent of growth for the spatial plan.
2. Refine Wāhi Toitū and Wāhi Toiora areas	The team has reviewed the constraints mapping that was completed previously and determined that covenants, easements, and consent notices should be included as they have the potential to slow / stop development. Unfortunately, the data did not allow the team to easily distinguish between type of easement / covenant. As such, covenants, easements, and consent notices were all included in the Wāhi Toiora layer (go carefully). This will enable them to be considered on a case-by-case basis in the future.
3. Refine growth distribution assumptions	As described in Section 2.2.1, the growth distribution assumptions were refined to determine the split residential, commercial, and industrial areas between Kerikeri and Waipapa.
4. Refine greenfield / brownfield splits	Once the growth distribution was confirmed, the initial splits for greenfield / brownfield residential distribution was defined (also Section 2.2.1).
5. Refine density assumptions	As detailed in 2.2.2 density assumptions were set for low- and medium-density residential development. These will apply to the yield calculations to understand the feasible capacity for brownfield areas and to determine how much greenfield land is required.
6. Define walkable catchment area	A walkable catchment will enable a transition in the scale and form of development (stepping down) as you move away from the centre of town to the wider residential area and assist to reinforce the primacy a town / neighbourhood centre and achieve a logical urban form. Application of walkable catchments around new neighbourhoods within greenfield areas will also support a more efficient, optimal spatial arrangement/urban form.
7. Determine Yield	This included the calculation of number of lots possible within growth scenarios, with % splits applied to detached housing and higher density typologies.
8. Review, refine and confirm growth distribution and greenfield / brownfield split percentages	Based on the yield, workshops were held to refine the spatial extent of growth areas, which in turn revised the growth distribution and greenfield / brownfield split percentages. This process impacted the initial assumptions set out in steps 4 through 7.