Feilding
Urban Growth Framework Plan

adopted May 2013

Manawatu District Council

Boffa Miskell

Feilding Urban Growth
Framework Plan

Prepared for: Manawatu District Council
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Contents

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01
Introduction

Purpose of the Framework Plan

Planning for urban growth and development presents an opportunity to consider the type of urban environment that will best meet the community's future needs.

The purpose of this Framework Plan is to present the results of a strategic analysis of the needs and challenges for Feilding's urban growth and development. It also examines the opportunities for an 'urban form' that addresses the urban growth and development needs and challenges through the application of urban planning principles.

The challenges to the future for Feilding are common to many being experienced by other urban places throughout New Zealand. These include the need to:

- provide for a changing population demographic and its different needs like smaller households, less structured and informal recreation facilities, accessibility to services
- provide for more flexibility in the way the urban area can adapt over time to recognise the pace with which our needs change over time
- provide for sustainable forms and placement of development that both reduce the large investment in infrastructure and energy to service, as well as reduce the risk from damage from natural or induced hazards
- provide for increasing costs of transport and the need for cheaper as well as more accessible forms of moving around (like walking and cycling)
- provide for local businesses and economies to be maintained and new ones established and to prosper to ensure that the viability of the town as a place to live and work
- provide for a cyclical growth environment with its attendant fluctuations in demand for new houses or business
- provide for a range of socio-economic influences on the community's ability to access services and housing
- provide for a distinctive and positive character to instill local pride and a clear differentiator that will attract people to live, visit and conduct business there.

01
Introduction

District Plan Relationship

The Manawatu District Council's (MDC) process to develop an approach for Feilding's growth has been to consider it at two levels. These levels are outlined below and described graphically in the diagram alongside. The over-arching strategic direction is provided by the MDC Manawatu District Vision (2012).

Framework Plan (this document) The Framework Plan document provides and has included:

- Projected demand and supply for urban development at Feilding
- Urban planning principles that can guide future urban development
- Density and urban form analysis of existing neighbourhoods in Feilding
- Intensification potential for more efficient use of existing urban area
- Preliminary site analysis for greenfield growth - opportunities and constraints
- Technical inputs (infrastructure and hazards) as appropriate
- High level spatial guidance - Framework Plans for 'edge growth' areas, and location/design requirements for density change in the existing urban area

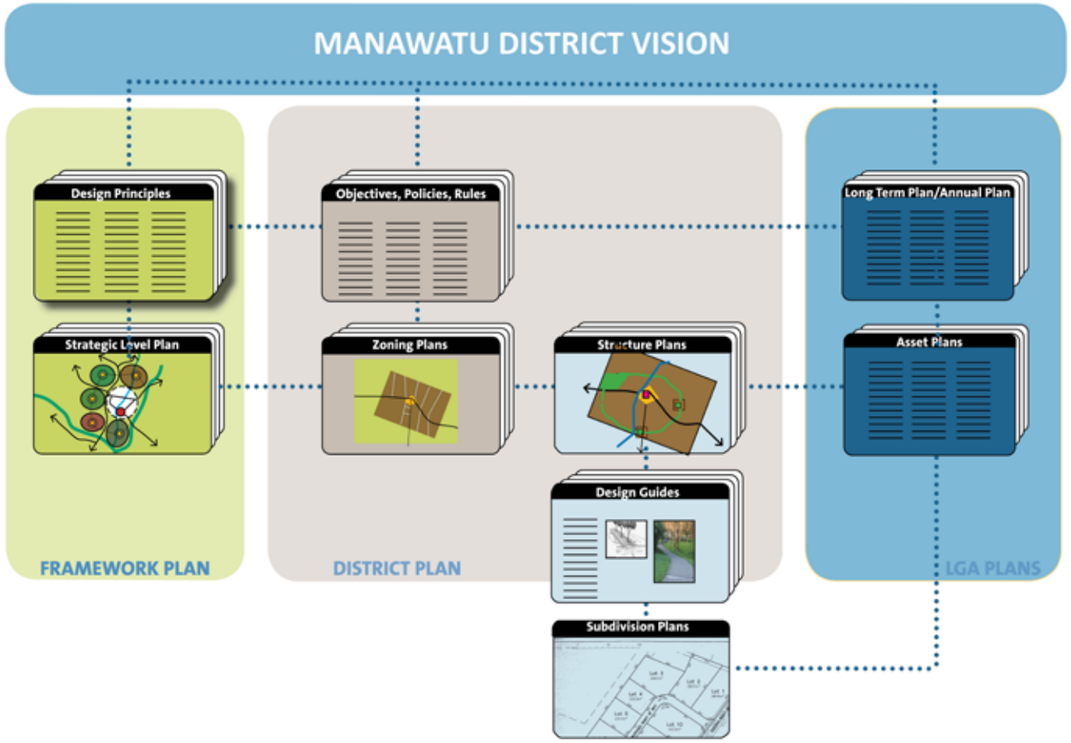
District Plan Change(s) The District Plan changes are expected to provide the following:

- Structure plans for edge growth areas
- Design guidance for edge growth area subdivision and urban density change
- Key stakeholder (major landowner) consultation
- Definition of priority growth areas
- Basis for development contributions (implemented by separate process)

Referencing to the Framework Plan

Strategic direction from the Framework Plan will be implemented (refer also to Section 10 of this Framework Plan for more detail) by MDC through the Manawatu District Plan and other documents prepared under the Local Government Act (eg Long Term Plan and Asset Plans).

The Framework Plan is a reference for the District Plan provisions. For each growth precinct it describes conceptual spatial plans that apply principles for good urban planning. Council will reference these growth precinct plans in its application of District Plan design guidelines. The growth precinct plans can assist developers and others to see how urban planning principles can be applied to generate good quality urban environments.



Growth Planning Relationship Diagram

The Framework Plan is not a 'statutory' document - the District Plan is the basis on which MDC will make decisions regarding resource consent applications (such as for subdivision for example).

02
Demand and Supply

Demographics and Growth

Part of understanding the needs for the future of Feilding is to know what types of growth and change are likely to occur over the next 20 years and well beyond. It is important to know the quantum of population change as well as its demographic profile - how many people and what ages will they be?

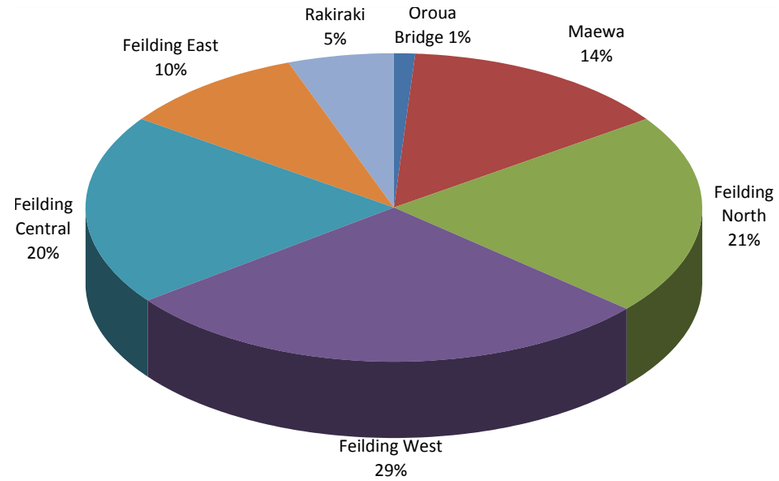
The projection of population and demographic profile will not provide an exact basis for planning as many variables will influence the future. However, as trends the projections are useful and this is the manner in which they have been used. The statistics presented in this document have been based on 2006 census.

The census was retaken in 2013, but at the time of this report the information had not been available. The changes in the census period are not expected to significantly change the way in which the Framework Plan provides for urban growth given the long range nature of the Framework and strategy approach described in Section 5. As part of monitoring progress of urban growth (action noted in Section 10) the trends evident from successive census can be provided for by the strategy.

Summary (projections unless otherwise stated). Details are provided in the tables and graphs on the following pages.

- Feilding population growth - 780 people by 2031 (22% of the region's growth)
- Feilding household growth - 910 households by 2031 (36% of the region's growth)
- Feilding household growth share - 29% Feilding West; 21% Feilding North; and 20% Feilding Central
- Manawatu District population growth - 3,550 people by 2031
- Manawatu District population growth - people aged over 65 will more than double by 2031
- Manawatu District household growth - 2,530 households by 2031
- Manawatu District's economy will grow at the same rate as the national economy: 3.5% (GDP) per year to 2016, and then 3.1% per year to 2026
- Manawatu - Wanganui region one-person household = currently 26.1% (Census 2006)
- Manawatu - Wanganui region one-family household = currently 67.4% (Census 2006)
- Manawatu - Wanganui region household size = currently 2.5 people
- Manawatu - Wanganui region car ownership = currently 35.7% 1 car; and 34.8% 2 cars

Projected Share of Household Growth within Feilding by 2031
source: Manawatu District Council



Projected Feilding Population Growth - Medium Series - 2006 (base) - 2031

	2006	2011	2016	2021	2026	2031	% Change	Actual Change
Oroua Bridge	170	180	180	190	190	190	12%	20
Maewa	520	580	630	680	740	800	54%	280
North Feilding	3,820	3,900	3,950	3,970	3,970	3,940	3%	120
West Feilding	3,690	3,790	3,850	3,880	3,900	3,890	5%	200
Central Feilding	2,850	2,890	2,930	2,960	2,980	2,990	5%	140
East Feilding	2,930	2,950	2,950	2,940	2,910	2,860	-2%	-70
Rakiraki	280	300	320	340	350	370	32%	90
	14,260	**14,590**	**14,810**	**14,960**	**15,040**	**15,040**	**5%**	**780**

Projected Feilding Household Growth - Medium Series - 2006 (base) - 2031

Household projections produced by Statistics New Zealand according to assumptions agreed to by MDC
Prepared for: MDC (Philip Bronn) - Ref No: ROM27206

	Households						% Change	Actual Change	Share of Change
	2006	2011	2016	2021	2026	2031			
Oroua Bridge	60	60	60	60	70	70	17%	10	1%
Maewa	190	210	240	260	290	320	68%	130	14%
Feilding North	1,370	1,430	1,490	1,530	1,550	1,560	14%	190	21%
Feilding West	1,590	1,670	1,740	1,790	1,820	1,850	16%	260	29%
Feilding Central	1,150	1,190	1,230	1,270	1,300	1,330	16%	180	20%
Feilding East	1,150	1,180	1,210	1,230	1,230	1,240	8%	90	10%
Rakiraki	100	110	120	130	140	150	50%	50	5%
Total Households	**5,610**	**5,850**	**6,090**	**6,270**	**6,400**	**6,520**	**16%**	**910**	**100%**

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02
Demand and Supply

Existing Zoned Land Supply

The information shown on the plan beside is a compilation of the MDC data [January 2011] which describes the potential for new lots within the existing Feilding urban area. These zones can be considered as the land bank (supply of all available land available for urban development). It also shows the total area currently zoned and used for business and industrial purposes.

It is important in considering the need for future land to be zoned to understand the existing 'land bank'. It is also important to recognise that this land bank is theoretical to some extent as there are many influences on the potential utilisation of this land bank including existing owner's intentions to develop, value, serviceability, constraints (eg. lot shape or access).

The methodology followed for the land bank estimate was as follows:

Residential Yield Calculation Estimate

Vacant land within residential zone (with no existing dwellings)

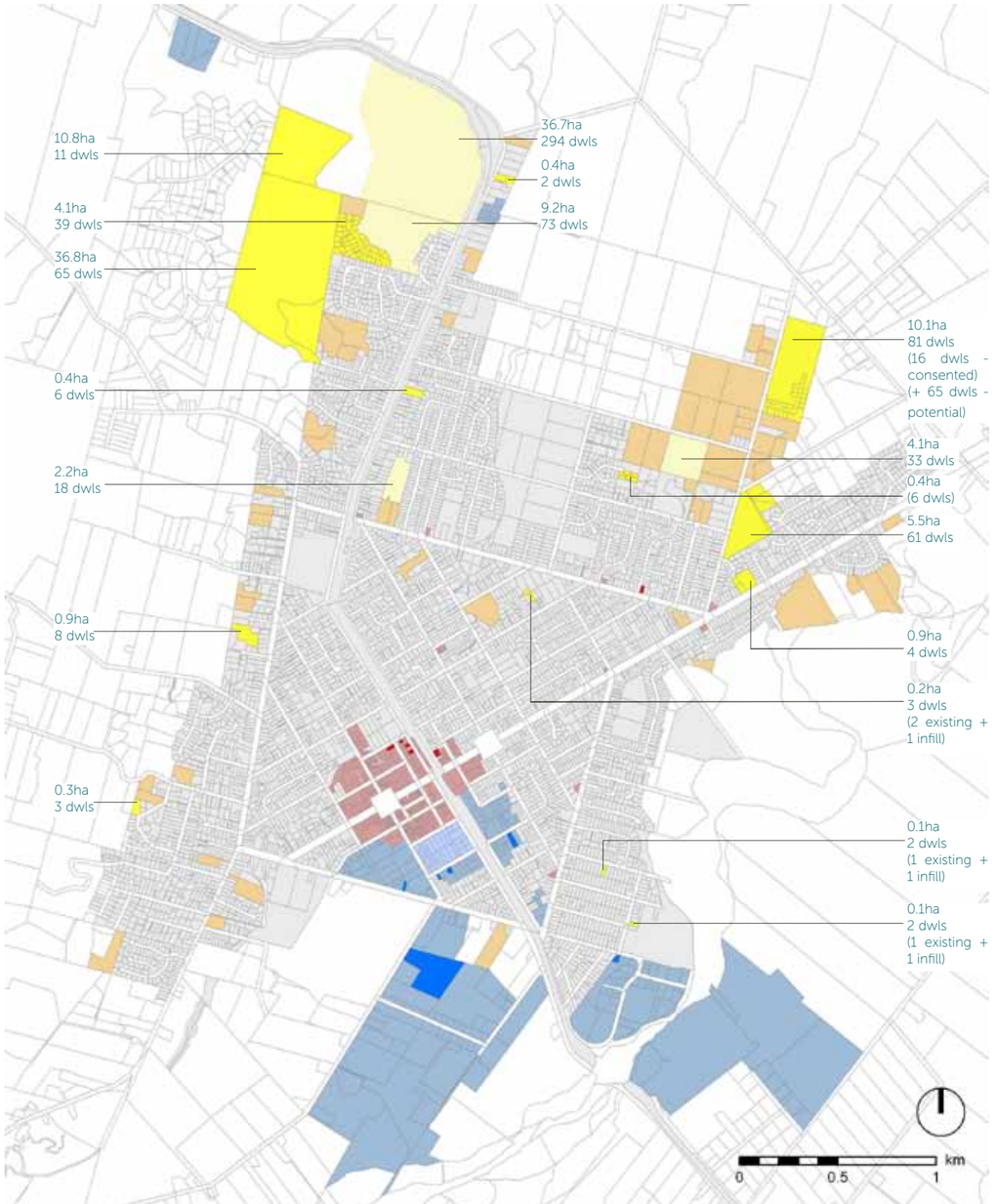
- Yield was estimated for each vacant parcel and was based on a gross density of 8 dwellings per hectare (average density of recent developments in Feilding)
- A gross density of 8 dwl/ha would provide lot sizes ranging from 800m^2 to 1000m^2, with 30% of the land dedicated for roads and green open spaces

Land with resource consent for subdivision (consented - post 2006)

- Areas and lot numbers as per information provided by MDC

Lots greater than 5,000m^2, with one existing dwelling, within the residential zone (not yet subdivided and with no resource consent)

- Yield was estimated for each parcel based on a gross density of 8 dwellings per hectare (average density of recent developments in Feilding)
- A gross density of 8 dwl/ha would provide lot sizes ranging from 800m^2 to 1000m^2, with 30% of the land dedicated for roads and green open spaces



- Residential - vacant land within residential zone *
- Residential - land with resource consent for subdivision (consented) *
- Residential - lots > 5,000m^2 within residential zone (not yet subdivided and with not resource consent) *
- Business 1 - with commercial activities *
- Business 2 - with residential activities *
- Industrial 1 - vacant or with industrial activities *
- Industrial 2 - with residential or rural activities *
- Industrial 3 - LFR is a permitted activity (Plan Change 33) *
- Feilding urban area *

02
Demand and Supply

Industrial and Business Area Estimate

Business 1 (as identified by MDC)

- Lots within the Business zone that are currently used for business/commercial purpose

Business 2 (as identified by MDC)

- Lots within the Business zone that are currently used for residential purpose. While these lots are currently used for residential purposes, they have been considered as part of the land bank for business activities

Industrial 1 (as identified by MDC)

- Lots within the Industrial zone that are currently used for industrial purpose or are vacant or have resource consent - exclusively industrial uses.

Industrial 2 (as identified by MDC)

- Lots within the Industrial zone that are currently used for residential purposes (1 dwelling per parcel) or large rural residential (1 dwelling per parcel). While these lots are currently used for residential purposes, they have been considered as part of the land bank for industrial activities

Industrial 3 (as identified by MDC)

- Lots within the Industrial zone where large format retail (LFR) is a permitted activity. Refers to the LFR Private Plan Change (Plan Change 33 - Operative)

Summary of Estimated Land Bank

Residential

The land bank of vacant residential land is 52.2ha, which would yield 418 lots/dwellings. This calculation assumes an average gross density of 8 dwellings per hectare across the vacant land parcels.

Land parcels with proposed subdivision development that have been granted resource consent (post 2006) would deliver an additional 289 lots/dwellings. Based on information provided by MDC, the consented subdivisions have lots ranging in size from 600m^2 to 4,000m^2.

For lots larger than 5,000m^2, and assuming an average gross density of 8 dwellings per hectare, the total area of these vacant lots is 68.9ha, which would yield an additional 549 lots/dwellings.

Summing the estimates above, the land bank within the existing urban area (residential land) would yield 1,256 lots/dwellings, with the majority of lots ranging in size from 800m^2 to 1,000m^2.

It is also noted that there is a theoretical potential source of new lots /dwellings to be derived from infill. Lots larger than 800m2 can be subdivided by resource consent - the larger the lot the more dwellings it could accommodate. An analysis identifies that there is a theoretical additional 6,000 dwellings that could be generated by infill. However, this analysis takes no account of the suitability of the land for more intensive development (like slope, access, existing uses), or the interest of the owner in development. It is also noted that many infill developments result in poor living environments. Many lot shapes are not suitable for infill and pursuing a strategy of infill without better control over the form of this development is not recommended (refer to sections 7 and 8).

Business

Based on the Manawatu District Plan 2007, there are currently 19.9 ha of land zoned business, of which 0.4 ha are currently used for residential purposes and 19.5 ha are used for business purposes.

MDC has completed an assessment (Property Economics [2012] Feilding Growth Assessment) of the future demand for business (retail, commercial and industrial) land. In summary that report concludes:

...the existing zoned provision in the Feilding Town Centre provide large enough land quantum to accommodate projected retail demand and land requirements over the forecast period (to 2041) without the need to extent the town centre.

projected industrial land requirements of 15.6 ha over the assessed period to 2041 can easily be absorbed by the zoned provision suggesting no additional industrial land zoning is required.

The demand for residential lots is estimated at 910 dwellings by 2031 - the supply of residential lots that can be provided by the existing land bank is 1256 (not including infill).

This land bank is theoretical. Because the land is zoned residential and currently under-utilised does not mean it is available for development.

In respect of industrial land supply it is noted that some additional demand is expected (15.6ha). Although at face value there is land zoned and vacant for industrial use this tends to be held in larger parcels and in limited ownerships. It is also distributed in a range of locations and of variable conditions/suitability for industrial activities. It is of significance to Feilding's economic sustainability that there are a range of new business and business expansion.

Use	Area (ha)	Nº of additional dwellings (potential or proposed) *
Residential		
Vacant land	52.2	418
Consented land	71	289
Lots > 5,000m^2	68.9	549
Total	192.1	1,256
Business		
With commercial activities	19.5	-
With residential activities	0.4	-
Total	19.9	-
Industrial		
With industrial activities	161.2	-
With industrial activities (LFR is a permitted activity)	4.1	-
With residential activities	4.8	-
Total	170.1	-
* assumes 1 dwelling per lot		

03
Design Principles

The Design Principles in the context of Feilding growth planning are a means of describing the aspirations for the form of the town to be realised over time. All of these principles equate or contrubnte the liveability of a place as well as its environmental quality. There are both residential and industrial types of growth proposed in Feilding (commercial and town centre growth and change are addressed separately) and the principles set out below will apply in different ways depending on the type of development. The Design Principles below are proposed to guide the design of the potential growth areas for Feilding. They should be considered as high level strategic objectives and will inform the statutory District Plan provisions. They will also have some 'portability' in the sense that they can become useful as a basis for planning for other settlements in the District.

Context

Feilding is not an isolated entity – it sits within an existing district and regional context and the town itself is a context for which the growth planning will need to provide.

1.0 Plan for the Future Growth

Recognise the growth demand and needs of Feilding over time and plan for this in a staged way that provides a managed approach for development into the future which is economically sustainable, including an appropriate management of zoned land supply.

2.0 Take an Integrated Approach

Take an integrated approach to the urban planning and design for district and local connections in regards to infrastructure, major roads and environmental corridors, open space network, pedestrian and cycle network, street network and land use.

3.0 Recognise the Overarching Vision

MDC has developed Vision Statements for the District, its villages, rural community and the Feilding urban township. For Feilding urban area the vision is: A thriving community enjoying the most vibrant country town in New Zealand, servicing the regional rural sector. Key concepts are:

- The best country town in New Zealand
- Regional rural servicing centre hub supported by dynamic infrastructure able to support growth
- Value-add food businesses generating wealth and creating employment
- Attractive entrances leading to a pleasant and attractive town centre
- Wide range of residential choices
- Unique attributes and special character retained
- Public transport options to Palmerston North enhanced, including commuter train to Wellington starting in Feilding
- Excellent public spaces and recreational facilities suitable for young and old
- Compliments Palmerston North City, not competes
- Growth into rural areas is carefully directed

Character and Identity

The character of an area will determine its identity - how people perceive it and the amenity they gain from living or working there.

4.0 Learn from Existing Developments in Feilding

Reference existing types of urban form in Feilding and repeat the positive attributes of development in new neighbourhoods.

5.0 Provide a Focal Point

Ensure each neighbourhood has a focal point or a "heart" where people can meet and socialise. The focal point should be within a 5 to 10 minutes walking distance to the majority of residents. The focal point should not compete with the town centre and may be for example a green space, a corner shop, a community hall and/or a childcare facility.

6.0 Consider the Site's Features

Ensure new developments take into consideration the area or site's natural features, orientation and heritage values to minimise negative impacts on these features and utilise them as part of the identity of the place.

7.0 Retain and Restore the Natural Environment

Plan to recognise the character and identity of the town that can be derived by the natural environment

Each neighbourhood to have a focal point

Consider the site's natural features

Connections and Networks

(biodiversity, urban ecology) such as from streams, gullies, riparian corridors and greenways.

The pattern and form of streets will influence the efficiency of traffic flow distribution as well as the enablement of people moving around the town using different modes of transport, be that by car, bus, walking or cycling.

8.0 Provide Good Street Connectivity

Ensure the new street pattern enables connections within neighbourhoods and to existing surrounding neighbourhoods as well as from growth areas to destinations such as community facilities and the town centre.

9.0 Enable a Range of Modes of Transport

Provide the street network that enables a range of modes of transport (walking, cycling, future public transport and vehicle) to increase the accessibility of all people, reduce vehicle trips for short distance movements, and promote an active and healthy lifestyle.

10.0 Provide a Range of Street Types

Provide a range of street types that reflect an appropriate road hierarchy and recognise the scale and frequency of movement as well as the type of environment sought (ie arterial as different from a 'slow street' where there is pedestrian priority, but shared with vehicle use);

Public open space can provide for a combination of uses that enhance recreational opportunities, community

Range of street types and hierarchy

Range of modes of transport

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03
Design Principles

Open Space Networks and Community Amenity

amenity and identity, social interaction, ecological biodiversity, as well as infrastructure such as stormwater management.

11.0 Provide a Range of Recreational Activities

Promote a diversity of recreational activities by the provision of active open spaces (regional parks, playing fields, greenways, neighbourhood parks and/or communal open spaces) and passive open spaces (pocket parks, plazas and/or private open spaces).

12.0 Define the Neighbourhoods

Define the spatial extent and identity of each neighbourhood by the provision of a park within 5 minutes walking distance to the majority of residents and green buffers, greenways and linkages at the edge of each neighbourhood.

13.0 Ensure Safe Public Open Spaces

Ensure that public open spaces are safe and comfortable for public use - use the principles of Crime Prevention Through Environmental Design (CPTED).

14.0 Provide Community Facilities

Consider the need for new community amenities and facilities, but with reference to existing community facilities and amenities in the town or area to avoid oversupply.

The neighbourhood design and the building design in the growth areas will shape the type of houses and buildings that can be developed – the diversity of community needs over time and environmental performance of new buildings are important aspects of sustainability.

Neighbourhood and Building Design

15.0 Encourage a Mix of Housing Types

Encourage a mix of housing types within Feilding's neighbourhoods using a range of densities and lots sizes to provide opportunities for housing for the range of lifecycle needs of residents and to recognise different affordability factors;

16.0 Promote Sustainable Stormwater Management

Provide for an urban form that responds to the natural hydrology of the area and that minimises urban water run-off by a continuous chain for stormwater provision, which includes source control (on-site rainwater tanks and recycling), conveyance control (along streets, reticulation or greenways) and downstream control (passive stormwater systems in open space areas such as in detention);

17.0 Encourage Buildings that are Responsive to the Topography

Promote built form solutions ranging from slab on ground, split level homes and suspended floor construction in response to the natural topography of the site to reduce requirements for earthworks;

18.0 Ensure Solar Access to Public and Private Spaces

Plan neighbourhoods, public spaces and buildings in accordance with the principles of passive solar design. Designing for solar access means providing for the sun to penetrate a building, a lot or an open space to gain solar heat in winter and control solar radiation in summer.

19.0 Recognise the Hydrological System

Recognise the waterways, flood risks and overland flow paths across the plain and avoid development in high risk areas.

20.0 Consider the Surrounding Neighbourhoods

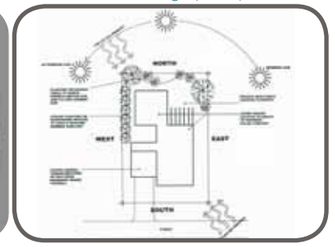
Consider any adverse impact to existing neighbourhoods and rural edge activities and consider appropriate mitigation strategies.

Diversity of open space types, and sizes

Preserve and restore the natural environment

Range of housing types and sizes with buildings that are responsive to the natural topography and features of the site

Passive solar design principles



Sustainable stormwater management "greenways"

Active and highly visible frontages (crime prevention through environmental design)

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04
Density and Urban Form Analysis

Purpose

The Density and Urban Form Analysis examines the different patterns of development that have occurred in the Feilding urban area over time.

The benefit of undertaking this analysis is that it provides a more empirical (measurable) basis for determining what form of development works best relative to the Principles (in 3.0 above).

This analysis provides indicators as to the form of new growth and development that is appropriate to the optimise the liveability and environmental quality for the town.

It is also useful to reflect on the local examples from Feilding to recognise that whatever type of development occurs in the future, it should be planned to suit Feilding - not some other place. Local people will also be familiar with the study areas and if they wish can visit them all to get their own sense of the contrasts between that the analysis shows.

The analysis uses five different study areas from within Feilding of similar sizes (approximately 19 hectares). The five study areas were selected to provide a range of existing densities and urban forms that typify different types of neighbourhoods within Feilding. These forms typically reflect different eras in the Feilding's development.

It is important to note that the analysis is not intended to be read as being negative of the places studied - although there is a measure of their performance relative to the principles as criteria, the aim is to look for the positive attributes so they can reapplied. It is recognised also that what has been a popular type of urban development in the past may not now suit the different needs of the future.

Geographic information systems (GIS) and field work were used to gather information about each study area.

The urban design criteria used to analyse each study area are as follows:

» Population and residential density

Analyses the range of lot sizes, range of dwelling sizes, number of people per household and number of dwellings per hectare.

» Urban form

Considers the street connectivity, streetscape quality, the interface between public and private spaces and the provision of nearby community facilities.

» Walkability

Examines the distance travelled by a pedestrian from each of the study areas to community facilities such as schools, shops, parks and bus stops.

» Built form

Analyses built form typologies such as site coverage, building height, housing types and setbacks.

The Density and Urban Analysis is presented below in three parts

» Methodology

An explanation of the assessment criteria, data gathering tools and assumptions when statistics are not available. It describes two distinct methodologies used for the "Case Studies Investigations" and the "Assessment"

» Case studies Investigation

A detailed analysis of each study area against the design criteria mentioned above

» Assessment

An evaluation of each study area and a comparison between the study areas in regards to the following:

1. Population and residential density

A comparison of the different densities and range of lot types in each Study Area to guide the densities for the new Growth Areas.

2. Walkability

The ease with which people of all abilities can walk to and from the places they need access to - from home to school, to the shops or parks.

3. Urban form

The combination of street connectivity, streetscape, community facility location and type, and built form

4. Liveability

A combination of the walkability and urban form criteria as key factors in achieving sustainable and liveable communities

The evaluation also provides recommendations on existing patterns of development to be promoted or avoided in the new growth areas.

04
Density and Urban Form Analysis

Methodology - Definitions

The principles outlined in the previous section of this report have corresponding component attributes that are defined below. For example, the principle that seeks a mix of housing types (Principle 15) will require a pattern of development that allows for lots of different sizes, a range of dwelling sizes, and the ability to accommodate different household sizes (see population and density below). Accordingly below the analysis begins by defining the attributes of urban development that will be studied so there is a direct link to the principles. From the analysis the best forms of existing development in Feilding can be applied to the new growth areas.

Population and Residential Density

nº of dwellings

Total number of dwellings
Includes detached, semi-detached and attached dwellings. Does not include vacant lots.

Density
Calculated as gross density (includes roads, open spaces, commercial and community facilities)

lot sizes

Total number of lots
Includes vacant lots.

Range of lot sizes
Shows the percentage and the total number of lots for each range. Range defined as <300m^2; 301m^2 to 450m^2; 451m^2 to 800m^2; 801m^2 to 2,000m^2; 2,000m^2 to 5,000m^2; >5,000m^2

dwelling sizes

Range of dwelling size
Dwelling size estimates the number of bedrooms. It shows the percentage and the total number of dwellings for each range. Range defined as 1 to 2 bedrooms; 3 bedrooms; 4 bedrooms or more.

nº of people

Population Density
The total number of people per dwelling is estimated within each of the study areas. This analysis assumes an average number of people per household of 2.5 people per gross hectare (Statistics NZ 2006)

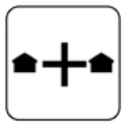
Urban Form

street connectivity

Block length
The length of a block separated by roads. This analysis does not consider cul-de-sacs as separations between blocks because they don't provide through block connectivity

Block depth
The width of a block separated by roads

Intersections
The total number of intersections in each study area. Intersections to cul-de-sacs are not included in the calculations because they don't provide through block connectivity



Connections to adjoining neighbourhoods
The total number of streets that provide connections to adjoining neighbourhoods

focal point

Community focal point
A pocket park/neighbourhood park or neighbourhood shops that are not categorised as take away/grocery shops.

public space interface

High visibility and active frontages (residential)
The total number of houses that have a good public space interface. For the purpose of this analysis, "high visibility and active frontages" is achieved when fences are not fortifications, windows front onto the public spaces, and there is an ability to maintain a visual relationship between people in buildings and the street

Low visibility and inactive frontages (residential)
The total number of houses that have a poor public space interface. This analysis considers "low visibility and inactive frontages" when high and solid front fencing, lack of windows and high and dense shrubs front onto the public space

Urban Form

public space interface

High visibility and active frontages (commercial)
The total number of retail buildings that have good public space interface. "High visibility and active frontages" is achieved when buildings are placed close to the street boundary and have transparent windows and verandahs fronting onto the public spaces

Low visibility and inactive frontages (commercial)
The total number of retail buildings that have poor public space interface. This analysis considers "low visibility and inactive frontages" when large surfaces of car parking, blank walls and/or opaque windows front onto the public space

streetscape

Walkable streets
The percentage of streets within each study area that are considered "walkable streets"

Car-dominant streets
The percentage of streets within each study area that are considered "car-dominant streets"

Assumptions

- The analysis uses the building footprint and the total number of storeys per dwelling to calculate the gross floor area. Ancillary buildings such as sheds and garages or carports are not included in the gross floor area calculations. The number of bedrooms per dwelling are calculated based on the gross floor area and it assumes the following: 1 to 2 bedrooms (gross floor area less than 120m^2); 3 bedrooms (gross floor area between 120m^2 to 160m^2); 4 bedrooms or more (gross floor area greater than 160m^2).
- The population density for each study area assumes an average number of people per household of 2.5 people per gross hectare (Statistics NZ 2006).

The following are 'definitions' of terms used above.

- Community focal point is a public amenity where the community can get together. The amenity is generally located within a 400m walking distance to the residents.
- Public space interface means the relationship of the houses (private ownership) with the streets and/or parks (public ownership). Low visibility and inactive frontages means any visual barrier between the private and the public spaces.
- The streetscape analysis only considers local streets. Connector streets are not included in the analysis because some of the study areas do not have them. The inclusion of collector streets would not create a equal comparison between study areas.
- "Walkable streets" are streets that are designed to provide good connectivity for vehicles but also to offer a pleasant and safe experience for pedestrians and cyclists. A walkable street has footpaths, street trees and narrow carriageway (depending on its hierarchy). From an urban design point of view, there are other factors that are important in creating good streetscapes which have not been included in this analysis - such as sustainable stormwater management systems, good width of footpaths and cycleways, landscape treatment, street furniture and on-street parking configurations).
- "Car-dominant" streets are streets designed for cars only. They have no footpaths, no street trees and wide surfaces of asphalt.

04
Density and Urban Form Analysis

Methodology - Case Studies Investigations

Walkability — community facilities and activities

Primary school
The distance to the nearest primary school

Neighbourhood park
The distance to the nearest neighbourhood park/ playground

Neighbourhood shop
The distance to the nearest neighbourhood shop

Childcare
The distance to the nearest childcare

Bus stop
The distance to the nearest bus stop

Walkaway
The distance to the nearest recreational walkway. This analysis does not consider on-street footpaths as recreational walkways. Recreational walkways are generally along streams or bushwalks trails

The definition of 'walkability' for this study was the distance measured from a centre point within each study area (point A) to the closest community facility (point B). The analysis takes two factors into consideration as follows:

- Direct route - is the distance from A to B
- Along the path - is the distance travelled by a pedestrian from A to B along the footpath

Built Form

site cover

Residential site coverage
The total area of a lot occupied by buildings. It includes the primary building and any ancillary structures within the lot. Site coverage is shown in percentage, ranging from less than 10% to 65% (maximum site coverage within the study areas)

building height

One storey building
The percentage and the total number of dwellings within each study area that are 1 storey buildings

Two storey building
The percentage and the total number of dwellings within each study area that are 2 storey buildings

housing type

Detached dwelling
The total number of detached dwellings within each study area. A detached dwelling is a stand-alone building that has a setback (separation) between adjoining dwellings. It does not share a common wall with the adjoining dwellings.

Semi-detached dwelling
The total number of semi-detached dwellings within each study area. A semi-detached dwelling is a building that is attached on one side to an adjoining dwelling. It shares one common wall with the adjoining dwelling.

Attached dwelling
The total number of attached dwellings within each study area. A attached dwelling is a building that is attached on both sides to the adjoining dwellings. It shares two common walls with the adjoining dwellings.

construction type

Responsive to the local topography
The total number of dwellings that are site responsive. Buildings that are site responsive are classified as follows:
- Flat sites (up to 10% slopes) - slab on ground
- Steep sites (greater than 10% slopes) - split level (retaining elements within the built form and/or on driveways) or suspended floors (pole homes). Minimum retaining elements on lot boundaries

Not responsive to the local topography
The total number of dwellings that are not site responsive. Buildings that are not site responsive are classified as follows:
- High retaining elements on lot boundaries and/or extensive earthworks (cut and fill)

Built Form

front setback

2 to 5m
The total number of dwellings that have a front setback of up to 5 metres

Greater than 5m
The total number of dwellings that have a front setback greater than 5 metres

car parking typology

Not car-dominant built form
The total number of dwellings where the garage doors do not dominate the built form. A not car-dominant built form occurs when:
- Lock-up garage doors are at the same alignment or set back from the main building line
- The design of the garages are integrated with the design of the building form for a dwelling
- Garages do not compromise the visual connection to the public space

Car dominant built form
The total number of dwellings where the garage doors dominate the built form. A car dominant built form occurs when:
- Lock-up garage doors fronting the streets project in front of the main building line
- The design of the garages are not integrated with the design of the building form for a dwelling
- Garages compromise the visual connection to the public space

04
Density and Urban Form Analysis

The methodology to assess walkability and urban form uses accepted standards based on best practice planning and design solutions.

The assessment classifies each of the assessment criteria as "good", "adequate" and "poor". If a site scores "good" for every assessment criteria it will have the maximum total score of 1. If a site scores "adequate" for every assessment criteria it will have a total score of 0.5. If a site scores "poor" for every assessment criteria it will have a total score of 0.

Methodology - Assessment

Walkability — community facilities and activities

The methodology to assess walkability uses the same parameters for the different community facilities and activities (such as primary school, neighbourhood park, neighbourhood shops, childcare, bus stop and walkway). Neighbourhoods that provide nearby facilities create opportunities for people to walk and cycle and reduce car dependency. People will generally walk up to 1km (10 to 15 minutes walk) to go to neighbourhood facilities. A maximum of 500m walking distance is considered the ideal. People will generally not walk to neighbourhood facilities that are greater than 1km.

Walkability is measured from a centre point within each study area (point A) to the closest community facility (point B). The analysis takes three factors into consideration as follows:

- Direct route - is the distance from A to B
- Along the path - is the distance travelled by a pedestrian from A to B along the footpath
- Percentage change - is the difference in distance from A to B travelled directly and along the footpath. The percentage change is used to analyse how well connected each of the study areas are. The percentage change between "along" and "direct" is also influenced by the pattern of connectivity in the surrounding neighbourhoods. This analysis reinforces the importance of a high level of connectivity within each neighbourhood as a contributor to a highly connected street network within Feilding.

Distance along the footpath

Good	less than 500m
Adequate	between 500m and 1km
Poor	greater than 1km

Percentage change between "along" and "direct"

Good	less than 130%
Adequate	between 130% and 160%
Poor	greater 160%

Urban Form — street connectivity

Good	less than 200m
Adequate	between 201m to 250m
Poor	greater than 250m

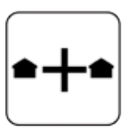
Block lengths of up to 200m promotes a good distribution of traffic flow by improving the numbers of possible routes taken by a pedestrian, cyclist or vehicle. Block lengths greater than 250m is considered inadequate as it generally increases the distance travelled from "A" to "B".

Good	less than 100m
Adequate	between 101m to 120m
Poor	greater than 120m

Block depth of up to 100m is considered the ideal outcome as it enables every lot to have a street frontage. Designing all lots with street frontage increases the possibility of changes overtime. for example, a 25m x 40m lot (1,000m^2) with street frontage can be subdivided into 3 townhouses (8m x 40m) in the future. In contrary, block depth greater than 120m generally creates battle-axe lots which reduces the opportunities for re-development overtime.

Good	more than 10
Adequate	between 7 and 9
Poor	less than 7

The greater the number of intersections within a neighbourhood the greater the opportunities to distribute vehicle traffic flow and to promote a more walkable neighbourhood. Intersections to cul-de-sacs are not included in the calculations because they don't provide through block connectivity . Less than seven intersections within a neighbourhood is considered inadequate.



Good	more than 10
Adequate	between 7 and 9
Poor	less than 7

The greater the number of connections between neighbourhoods the greater the opportunities to distribute vehicle traffic flow and to promote a more walkable neighbourhood. The analysis considers inadequate less than seven connections.

Urban Form — focal point

Good	less than 400m walking distance
Adequate	between 401m and 600m
Poor	greater than 600m walking distance

A community focal point is a place where residents can get together. To work effectively, this places should be provided within a 5 to 10 minutes walking distance to the majority of the houses. Therefore, a focal point located more than 600m from the majority of the residents is considered a poor solution.

Urban Form — public space interface

Good	between 85% to 100% of the total number of dwellings with high visibility and active frontages
Adequate	between 75% to 84% of the total number of dwellings with high visibility and active frontages
Poor	less than 75% of the total number of dwellings with high visibility and active frontages

Public space interface means the relationship of the houses (private ownership) with the streets and/or parks (public ownership). An active street frontage (low fences, low shrubs and windows fronting the public space) is important in creating safe environments and is part of the principles for Crime Preventions Through Environmental Design. The greater the number of houses with active frontages the better.

Urban Form — streetscape - local streets

Good	carriageway less than 7.5m (including car parking); street trees planted in 10m spacing; and footpath on one or both sides
Adequate	carriageway less than 7.5m (including car parking); street trees planted in 15m spacing; and footpath on one side

Poor	any street without street trees or planted with spacing greater than 20m

The streetscape assessment only considers the local streets. Street trees, narrow paving and footpaths are important in creating streets that are pleasant and safe for cars, pedestrians and cyclists. Bare streets, wide paved surfaces or lack of a footpath in urban areas is also considered to be poor.

04
Density and Urban Form Analysis

Case Study Investigations - Study Area 1

Land use	Areas (ha)
residential	15.38 (78%)
senior living	0
open space	0
community facility	0
commercial	0
roads	4.45 (22%)
total	19.83

Walkability

community facilities and activities

direct	1.2km
along	1.6km
direct	600m
along	1km
direct	400m
along	500m
direct	900m
along	1.3km
direct	450m
along	700m
direct	900m
along	1.3km

Population and Residential Density

nº of dwellings: 129 dwellings

6.5dwellings/ha

lot sizes: 126 lots

<300m²	00 (0%)	801 to 2,000m²	65 (52%)
300 to 450m²	09 (7%)	2,001 to 5,000m²	10 (8%)
451 to 800m²	40 (32%)	>5,000m²	02 (2%)

dwelling sizes

2 bed or less	15 (12%)
3 bed	32 (25%)
4 bed or more	82 (64%)

nº of people: 322 people

16people/ha

Urban Form

street connectivity: 300m to 360m

80m to 200m

5

6

focal point: No

1km distance to the closest park

public space interface: 85% active frontages

15% inactive frontages

streetscape: 30% walkable streets

70% car-dominant streets

Built Form

site cover

<10%	05 (4%)	40 to 50%	05 (4%)
10 to 20%	51 (40%)	50 to 60%	00 (0%)
20 to 30%	43 (34%)	>60% (65% max)	00 (0%)
30 to 40%	22 (17%)		

building height: 118 dwellings (92%)

11 dwellings (8%)

housing type: 123 dwellings (95%)

6 dwellings (5%)

0 dwellings (0%)

construction type: 127 dwellings (98%)

2 dwellings (2%)

front setback: 32 dwellings (25%)

97 dwellings (75%)

car parking typology: 121 dwellings (94%)

8 dwellings (6%)

Manawatu District Council

Boffa Miskell

04
Density and Urban Form Analysis

Case Study Investigations - Study Area 2

Land use	Areas (ha)
residential	10.80 (56%)
senior living	0
open space	0.81 (4%)
community facility	0.14 (1%)
commercial	1.58 (8%)
roads	6.03 (31%)
total	19.36

Walkability

community facilities and activities

direct	400m
along	500m
direct	0m
along	0m
direct	100m
along	100m
direct	50m
along	50m
direct	100m
along	100m
direct	1km
along	1km

Population and Residential Density

nº of dwellings

157 dwellings

8 dwellings/ha

lot sizes

126 lots

<300m²	02 (2%)	801 to 2,000m²	72 (57%)
300 to 450m²	19 (15%)	2,001 to 5,000m²	02 (2%)
451 to 800m²	31 (25%)	>5,000m²	00 (0%)

dwelling sizes

2 bed or less	30 (20%)
3 bed	54 (35%)
4 bed or more	69 (45%)

nº of people

382 people

20people/ha

Urban Form

street connectivity

120m to 200m

100m

11

12

focal point

Yes
less than 400m distance to the closest park

public space interface

84% active frontages

16% inactive frontages

streetscape

10% walkable streets

90% car-dominant streets

Built Form

site cover

<10%	00 (0%)	40 to 50%	17 (13%)
10 to 20%	14 (11%)	50 to 60%	01 (1%)
20 to 30%	54 (43%)	>60% (65% max)	01 (1%)
30 to 40%	39 (31%)		

building height

155 dwellings (98%)

2 dwellings (2%)

housing type

116 dwellings (74%)

14 dwellings (9%)

27 dwellings (17%)

construction type

153 dwellings (100%) - flat site

0 dwellings (0%)

front setback

43 dwellings (28%)

110 dwellings (72%)

car parking typology

146 dwellings (95%)

7 dwellings (5%)

04
Density and Urban Form Analysis

Case Study Investigations - Study Area 3

Land use	Areas (ha)
residential	11.50 (61%)
senior living	0
open space	0
community facility	2.75 (14%)
commercial	0.07 (1%)
roads	4.79 (24%)
total	19.11

Walkability

community facilities and activities

direct	400m
along	800m
direct	1.4km
along	1.8km
direct	200m
along	230m
direct	200m
along	300m
direct	385m
along	500m
direct	900m
along	1.4km

Population and Residential Density

nº of dwellings

156 dwellings

8 dwellings/ha

lot sizes

145 lots

<300m²	00 (0%)	801 to 2,000m²	50 (34%)
300 to 450m²	06 (4%)	2,001 to 5,000m²	01 (1%)
451 to 800m²	88 (61%)	>5,000m²	00 (0%)

dwelling sizes

2 bed or less	31 (20%)
3 bed	75 (48%)
4 bed or more	50 (32%)

nº of people

390 people

20people/ha

Urban Form

street connectivity

400m

80m to 240m

06

08

focal point

No

1.4km distance to the closest park

public space interface

84% active frontages

16% inactive frontages

streetscape

00% walkable streets

100% car-dominant streets

Built Form

site cover

<10%	00 (0%)	40 to 50%	08 (6%)
10 to 20%	22 (15%)	50 to 60%	03 (2%)
20 to 30%	79 (54%)	>60% (65% max)	00 (0%)
30 to 40%	33 (23%)		

building height

153 dwellings (98%)

3 dwellings (2%)

housing type

136 dwellings (87%)

8 dwellings (5%)

12 dwellings (8%)

construction type

156 dwellings (100%) - flat site

0 dwellings (0%)

front setback

15 dwellings (10%)

141 dwellings (90%)

car parking typology

152 dwellings (97%)

4 dwellings (3%)

Manawatu District Council

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04
Density and Urban Form Analysis

Case Study Investigations - Study Area 4

Land use	Areas (ha)
residential	12.69 (68%)
senior living	2.83 (15%)
open space	0
community facility	0
commercial	0
roads	3.15 (17%)
total	18.67

Walkability

community facilities and activities

	direct	900m
	along	1.1km
	direct	1.1km
	along	1.2km
	direct	700m
	along	1km
	direct	900m
	along	1.3km
	direct	700m
	along	1km
	direct	1.1km
	along	1.2km

Population and Residential Density

nº of dwellings
- 71 dwellings
- 3.88 dwellings/ha

lot sizes
- 145 lots

<300m²	00 (0%)	801 to 2,000m²	01 (14%)
300 to 450m²	00 (0%)	2,001 to 5,000m²	02 (29%)
451 to 800m²	00 (0%)	>5,000m²	04 (57%)

dwelling sizes

2 bed or less	62 (87%)
3 bed	02 (3%)
4 bed or more	7 (10%)

nº of people
- 177 people
- 9people/ha

Urban Form

street connectivity
- 400m
- 400m
- 04
- 05

focal point
- No
- 1.2km distance to the closest park

public space interface
- 85% active frontages
- 14% inactive frontages

streetscape
- 00% walkable streets
- 100% car-dominant streets

Built Form

site cover

<10%	06 (67%)	40 to 50%	00 (0%)
10 to 20%	01 (11%)	50 to 60%	00 (0%)
20 to 30%	02 (22%)	>60% (65% max)	00 (0%)
30 to 40%	00 (0%)		

building height
- 71 dwellings (100%)
- 0 dwellings (0%)

housing type
- 21 dwellings (30%)
- 50 dwellings (70%)
- 0 dwellings (0%)

construction type
- 71 dwellings (100%) - flat site
- 0 dwellings (0%)

front setback
- 61 dwellings (86%)
- 10 dwellings (14%)

car parking typology
- 71 dwellings (100%)
- 0 dwellings (0%)

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Manawatu District Council

04
Density and Urban Form Analysis

Case Study Investigations - Study Area 5

Land use	Areas (ha)
residential	14.26 (71%)
senior living	0.42 (1%)
open space	0.12 (1%)
community facility	0
commercial	0
roads	5.43 (27%)
total	20.23

Walkability

community facilities and activities

	direct	1.2km
	along	1.4km
	direct	350m
	along	350m
	direct	250m
	along	250m
	direct	700m
	along	900m
	direct	700m
	along	1.2km
	direct	350m
	along	350m

Population and Residential Density

nº of dwellings

132 dwellings

6.5 dwellings/ha

lot sizes

132 lots

<300m²	00 (0%)	801 to 2,000m²	108 (82%)
300 to 450m²	03 (2%)	2,001 to 5,000m²	02 (2%)
451 to 800m²	19 (14%)	>5,000m²	00 (0%)

dwelling sizes

2 bed or less	07 (5%)
3 bed	42 (32%)
4 bed or more	83 (63%)

nº of people

330 people

16people/ha

Urban Form

street connectivity

370m

120m

08

08

focal point

Yes
350m distance to the closest park

public space interface

77% active frontages

23% inactive frontages

streetscape

20% walkable streets

80% car-dominant streets

Built Form

site cover

<10%	00 (0%)	40 to 50%	04 (3%)
10 to 20%	59 (44%)	50 to 60%	01 (1%)
20 to 30%	53 (40%)	>60% (65% max)	00 (0%)
30 to 40%	16 (12%)		

building height

131 dwellings (99%)

1 dwellings (1%)

housing type

126 dwellings (95%)

06 dwellings (5%)

0 dwellings (0%)

construction type

132 dwellings (100%) - flat site

0 dwellings (0%)

front setback

08 dwellings (6%)

124 dwellings (94%)

car parking typology

126 dwellings (95%)

06 dwellings (5%)

Manawatu District Council

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04
Density and Urban Form Analysis

Assessment

Population and Residential Density

In terms of population and residential density, there are similarities between Study Areas 1 and 5 and Study Areas 2 and 3.

Study Areas 2 and 3 have the highest density of all the study areas with both having a gross density of 8 dwellings/ha and 20 people/ha. Study Area 2 provides a much greater diversity of lot sizes and housing types compared with Study Area 3, which has a greater proportion of 3 bedroom houses in lots ranging from 450m^2 to 800m^2.

Study Areas 1 and 5 present a gross density of 6.5 dwellings/ha and 16 people/ha. There is a greater diversity of housing types in Study Area 1. More than 60% of dwellings in both Study Areas are 4 bedrooms or more.

The majority of site coverage within Study Areas 2 and 3 range from 20 to 40%, whilst within Study Areas 1 and 2 the range is between 10 to 30%.

Study Area 4 contains a small portion of senior living residential and the remaining is rural lots. It presents the lowest gross density of 3.8 dwellings/ha and 9 people/ha. However, the senior living (2 bedrooms houses) has a net density of 22 dwelling/ha, which is high in comparison with the other Study Areas. The site coverage is quite low, ranging from 10 to 30%.

Study Areas	Dwelling/ ha	Lot Size						Dwelling Size			People/ ha	Site Coverage						
		<300	300 - 450	451-800	801-2,000	2,001-5,000	>5,000	<2bed	3bed	>4bed		<10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-65%
1	6.5	0%	7%	32%	52%	8%	2%	12%	25%	64%	16	4%	40%	34%	17%	4%	0%	0%
2	8	2%	15%	25%	57%	2%	0%	20%	35%	45%	20	0%	11%	43%	31%	13%	1%	1%
3	8	0%	4%	61%	34%	1%	0%	20%	48%	32%	20	0%	15%	54%	23%	6%	2%	0%
4	3.8	0%	0%	0%	14%	29%	57%	87%	3%	10%	9	67%	11%	22%	0%	0%	0%	0%
5	6.5	0%	2%	14%	82%	2%	0%	5%	32%	63%	16	0%	44%	40%	12%	3%	1%	0%

- Population and Residential Density

Study Areas 1 and 5 and 2 and 3 present the same densities despite the fact of having different urban form solutions. There is a good range of housing types and lots sizes in Study Areas 1 and 2, which promotes a greater mix of household types within each neighbourhood. Although Study Area 1 is located on steeper slopes, it still provides for some 2 bedrooms houses. This model (range of lot types) should be applied to each of the growth areas when applicable.

The site coverage analysis shows that once the density increases, the site coverage increases as well. However, it also shows that site coverage within Feilding is reasonably low - generally less than 40%.

The lot size and dwelling type analysis shows that there are few lots of less than 450m^2 and 2 bedrooms houses - the 62 two-bedrooms senior living houses in Precinct 4 is an exception to the pattern of development that generally occurs in Feilding. If we take into consideration that most of the growth within Feilding will be in the over 65 age group (refer to "Demographics and Growth") it means that there will be a need for smaller housing within the Growth Areas. Site coverage for the smaller lots will have to increase as well.

Walkability

A good walkability score is achieved by the combination of a mix of land uses and good street connectivity. All the Study Areas have achieved a good score, which is generally adequate, good or very good. Study Area 4 is the exception because many of its lots are rural lifestyle lots with areas greater than 5,000m^2. In this case, a mix of land uses and street connectivity are not relevant. Therefore, the walkability analysis is not so relevant to Study Area 4.

Study Area 2 achieved the best score - very good - due to a highly connected street pattern, a good mix of uses and community facilities located nearby. Study Area 5 is also a walkable neighbourhood with a "good" score. It could have achieved a "very good" score if its block lengths were shorter than 370m.

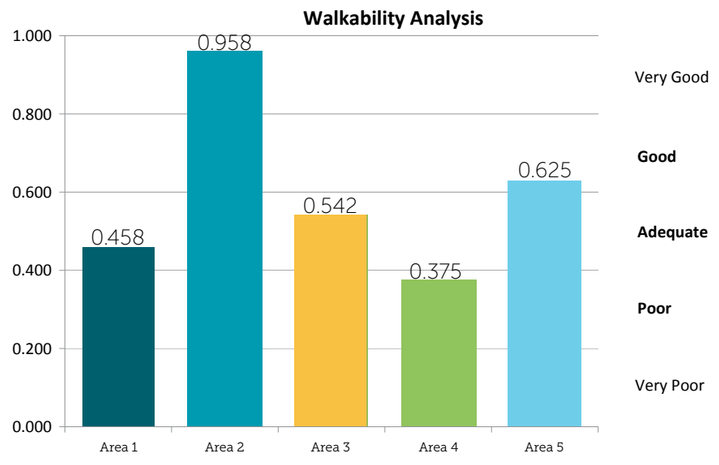
Study Area 3 has a very good mix of uses and presents a variety of nearby community facilities. However, its various cul-de-sacs compromised the results. A "very good" score would have been achieved by providing better street connectivity.

Study Area 1 did not achieve a "good" or "very good" score generally because of the lack of community facilities close by and the poor mix of uses. Although it is located on a steeper site, its street connectivity was less favourable as well.

- Walkability

The analysis shows that the study areas are generally walkable neighbourhoods due to their good mix of uses and community facilities in close proximity to the dwellings. Street connectivity in some areas are poor due to a large number of cul-de-sacs.

To achieve walkable neighbourhoods within the Growth Areas new developments should provide connected streets in accordance with the "good" and "adequate" parameters described in the "street connectivity" under "Methodology - Evaluation". A good mix of uses and neighbourhood amenities should also be encouraged.



04
Density and Urban Form Analysis

Assessment Summary

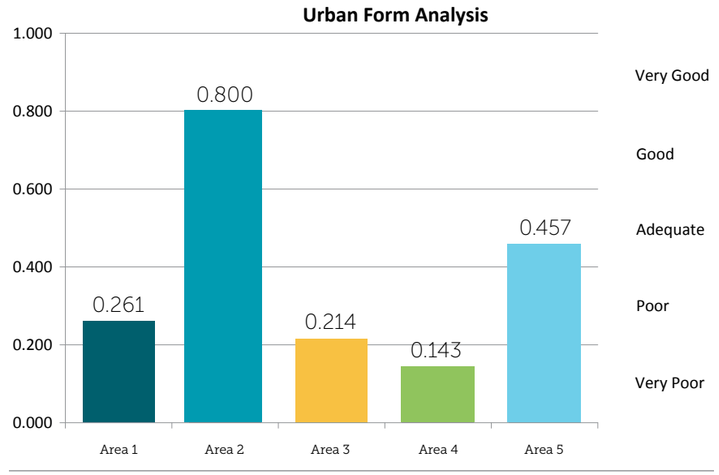
Urban Form

A good neighbourhood design is achieved when its urban form provides for a flexible (enable changes overtime), compact (mixed densities and land use) and walkable and safe environment.

Study Area 2 scored the best as "very good". It is highly connected and the majority of lots have street frontage. It is compact - has a diversity of housing types and mix of uses, has a community focal point (squares) and nearby community facilities (childcare, school, bus stop). The other Study Areas did not score as well. They generally lack a community focal point and have the street pattern of predominantly various battle-axe lots and cul-de-sacs which limit walkability and the ability to adapt overtime.

Streetscape is poor in many of the Study Areas. There is a lack of street trees and landscape treatment and the surface of asphalt is too wide for the purpose of a local street. This is not only a waste of space, but requires more maintenance and generates large hard surface areas that load the stormwater system.

The interface with the public space is generally "good" to "adequate". The majority of the houses have low front fencing, garages at the rear of the lots and windows fronting the streets. All these factors improve the opportunities for passive surveillance and create safer public spaces. However, newer houses have double lock-up garages fronting the streets and tall fences, which compromise the interface between public and private spaces. The analysis does not apply to Study Area 4 for the same reasons previously mentioned.

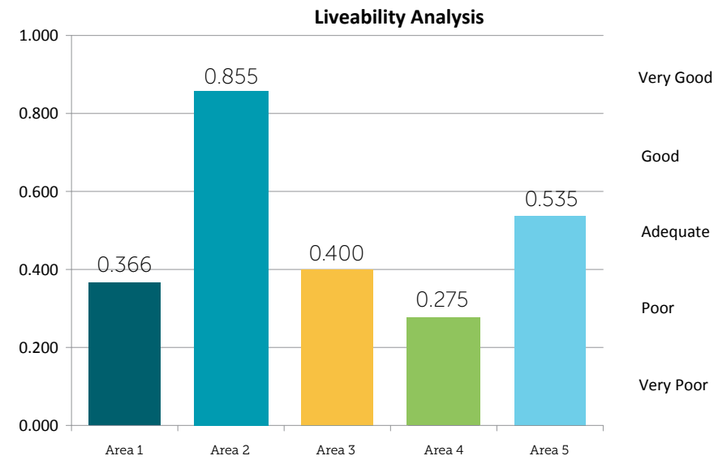


Liveability

For the purpose of this analysis, liveabilty is determined by the combination of the assessment criteria under walkability and urban form. It analyses how the neighbourhood design influences the way people live and interact in each Study Area. It does not consider the different desires of the community in terms of a more urban lifestyle versus a rural lifestyle.

Study Area 2 scored the best on liveability being "very good". For many of the same reasons that the urban form score and walkability scores are noticeably higher in Study Area 2 (as described above) it is the ready access to facilities and amenities such as those provided in the town centre close by, the well connected street network that makes movement distances relatively direct, and the built form that has all houses addressing the street (rather than in back lots for example) that makes the difference.

The contrast is Area 4 which is a more recent area of urban development and relatively large lots - many of which are not densely or at all developed. It is located away from the town centre and has not the same amenities and facilities that are provided in other areas. Its street network is less well connected and this makes walking and cycling distances longer and less managable to any facilities that do exist in the vicinity.



05
Urban Growth Strategy

Background Summary

The previous background sections of this Framework report have established:

- Projected demand and supply for urban development at Feilding
- Urban planning principles that can guide future urban development
- Density and urban form analysis of existing neighbourhoods in Feilding

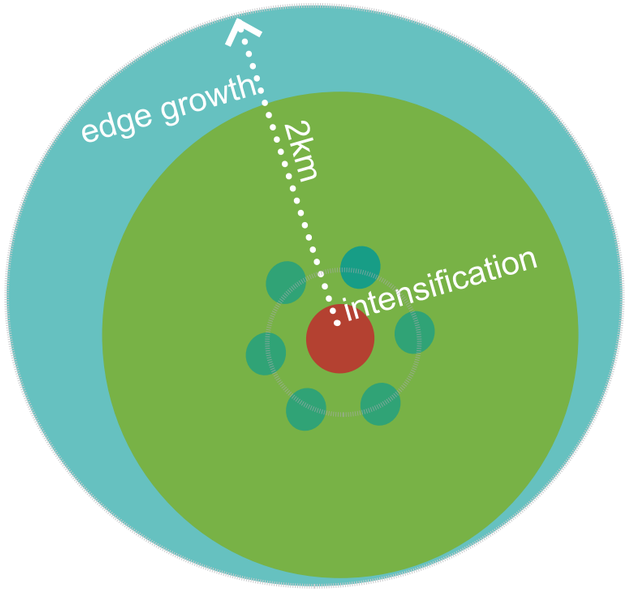
From these sections and in summary it has been determined that the:

- Feilding population growth is projected to be 780 people by 2031 (22% of the region's growth);
- Feilding household growth is projected to be 910 households by 2031 (36% of the region's growth);
- existing Feilding urban area has land that is zoned (or already consented for subdivision) for urban development that could, theoretically, provide for the projected growth of household numbers and commercial development;
- principles for urban growth that should guide the form of Feilding's future urban development to satisfy the Vision for Feilding established with the community should include those which address Character and Identity, Connections and Networks, Open Space and Amenity, and Neighbourhood and Building Design;
- existing Feilding urban area has a range of different patterns (or streets, lots, open spaces and facilities) and that those which provide the greatest levels of connectivity, open space amenity and access to facilities have the highest levels of liveability.

Urban Growth Summary

The Feilding urban growth strategy recognises that:

- although there is existing urban zoned land within the existing urban area that there are a range of factors - such as ownership, development feasibility (eg topography or existing development), and market desireability that will constrain the availability for urban development;
- that projections for housing development demand will vary over time and that establishing a Framework Plan that makes it clear well into the future what the long term direction and pattern of development of the town will be, but also leaves flexibility for land release, is good urban planning practice;
- that MDC wishes to attract business, employment and people to live in Feilding (and the District generally) and by signalling the opportunities for growth and quality of urban development that this may generate interest from those currently outside the District;
- that in order to provide for the range of living environments that may be sought by the range of needs within the existing and future population, that a range of housing choice options is appropriate;
- that Feilding is a relatively small town and that there are a range of options for "edge" growth locations that will continue to provide reasonable accessibility to the town centre (ie less than 2km) whilst also enabling an option for 'country' style living environment;
- that constraints and opportunities analysis suggests the appropriate direction for urban edge growth is west and north and not east or south given the barriers to connectivity presented by the Oroua River; and
- that Feilding has an existing urban form (large and appropriately shaped lots) that will enable urban intensification that will provide people in smaller household sizes with a living option with smaller properties, easier access to shops, social facilities and less demanding maintenance requirements.



As a diagram the urban development strategy consists of edge growth close to the town centre and intensification where there is easy access to existing facilities and social amenities - these could be close to the centre or distributed within the existing urban area

06
Site Analysis: Edge Growth

The following section of the Framework Plan document presents site analysis for the potential edge growth areas. These growth areas form as 7 precincts which generally 'ring' the existing urban area. The precincts are as described below.

Site Analysis - Land Form

Precinct 1
It is bounded by Awahuri Road and Mangaone West Stream to the south, Ranfurly Road to the north, residential neighbourhoods to the east and farmland to the west. The south, south-east and south-west parts of the area are generally flat and susceptible to flood inundation. The high points are located at the northern portion of the area and present a series of terraces and gullies that drain to Mangaone West Stream.

Precinct 2
It is bordered by Ranfurly Road to the south, residential neighbourhoods to the east, Halcombe Road to the north and Ranfurly Road and farmland to the west. The area to the north of Sandon Road has an undulating landform with a large flat terraced area in the centre. A series of gullies run throughout. The area to the south of Sandon Road is characterised by steep slopes that drain towards Sandon Road and a large flat terrace to the north of Ranfurly Road.

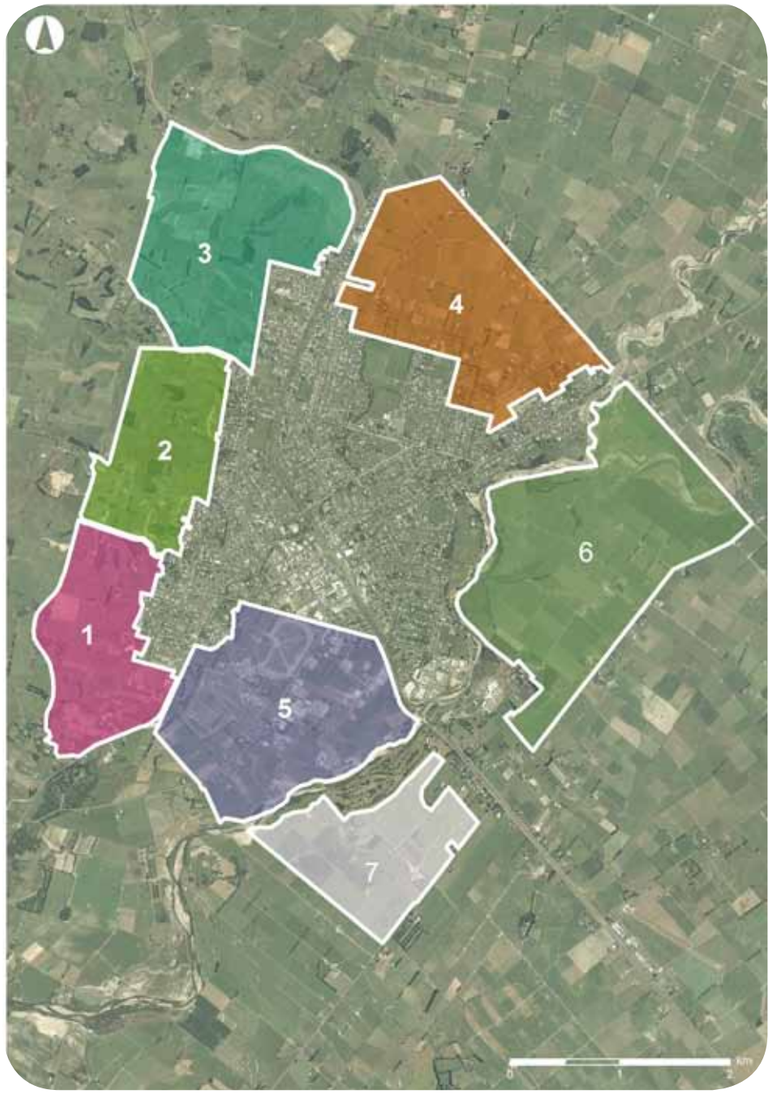
Precinct 3
It is bounded by Halcombe Road to the south, farmland to the west, Lethbridge Road to the north and residential neighbourhoods to the east. The western and central parts have already been built for residential purposes or have developments under construction or already consented. The areas available for future developments are located to the north (adjacent to Lethbridge Road) and the south (adjacent to Halcombe Road). The two areas present an undulating land form with steep slopes and various gullies running west-east.

Precinct 4
Located to the north of North Street. It is bordered by Makino Road to the north, Reids Line West to the east, Arnott and Port Streets to the south and residential neighbourhoods to the west. Makino Stream cuts through the site in a north-south direction. The site is flat, with slopes less than 1:20m, and is susceptible to flood inundation.

Precinct 5
Precinct 5 is to the south of Feilding Town Centre, where Manfeild and the industrial zone are located. Makino Stream and Oroua River bound the site to the north-west and south-east respectively. The site is flat and a large extent of it is susceptible to flooding.

Precinct 6
On the east side of the Oroua River Precinct 6 is a large relatively flat rural area border by the river and Aorangi Road. The south end of this area is near to the freezing works. Areas near the river are susceptible to flooding.

Precinct 7
Like Precinct 6, this area is on the east side of the Oroua River. It is a large relatively flat rural area border by the river and SH54 Camerons Line. The north end of the area is adjacent to the golf club and there are several areas of mature native vegetation within the area generally.



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06
Site Analysis: Edge Growth

Site Analysis - Land Form

The maps below illustrate the land form and elevation of five precincts (the boundaries are described by the white line). It is noted that Precincts 6 and 7 are not shown as these areas were discounted as unsuitable for further consideration when constraints and opportunities were addressed (refer to pages 29 and 30).

It is clear from these maps where the flatter areas are (discrete areas on the tops of the terraces to the west in Precincts 1-3) and most of the area of Precincts 4 - 5. The incised gullies in Precincts 1-3 create potential barriers to connectivity, whilst also presenting opportunities to define neighborhoods and use them as natural corridors for stormwater management and amenity recreation connections.

Precinct 1

Precinct 2

Precinct 3

Precinct 4

Precinct 5

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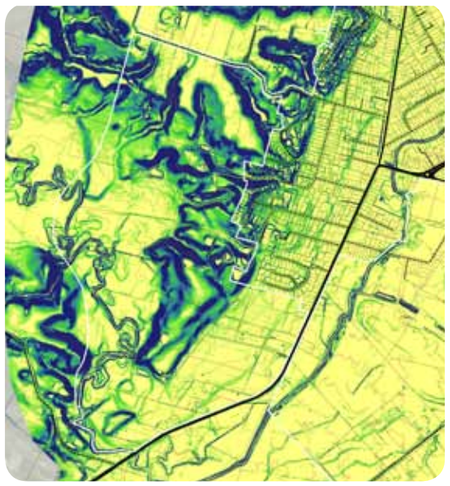
06
Site Analysis: Edge Growth

Site Analysis - Slope Analysis

Precincts 1, 2 and 3 are located to the west of Awahuri and West Streets. Much of the western area is characterised by steep slopes ranging from 10% (1:10m) to greater than 25% (1:4m). The flat areas (less than 5%)are generally located in the floodplain, near Mangaone West Stream, or at the top of the terraces.

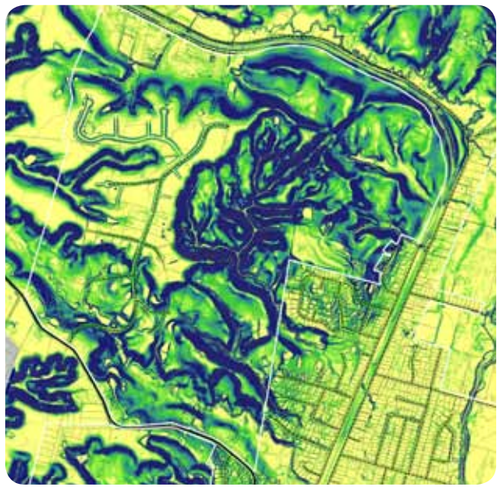
Precincts 4 and 5 are located to the north and south of Feilding respectively. These areas are characterised by minimal slopes - generally less that 5% (1:20m). A large portion of these two precincts are flood prone zones due to inundations from Makino Stream and Oroua River.

It is noted that Precincts 6 and 7 are not included as these were discounted as unsuitable for further consideration when constraints and opportunities were addressed (refer to pages 29 and 30).



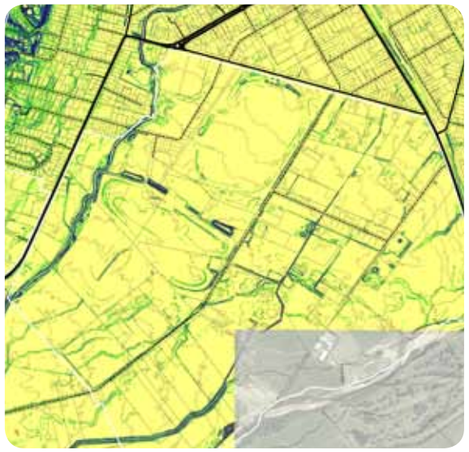
Precinct 1

Precinct 2

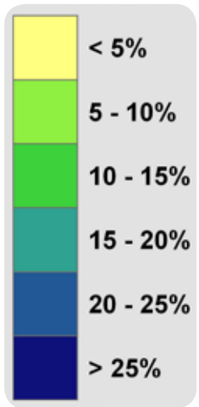


Precinct 3

Precinct 4



Precinct 5



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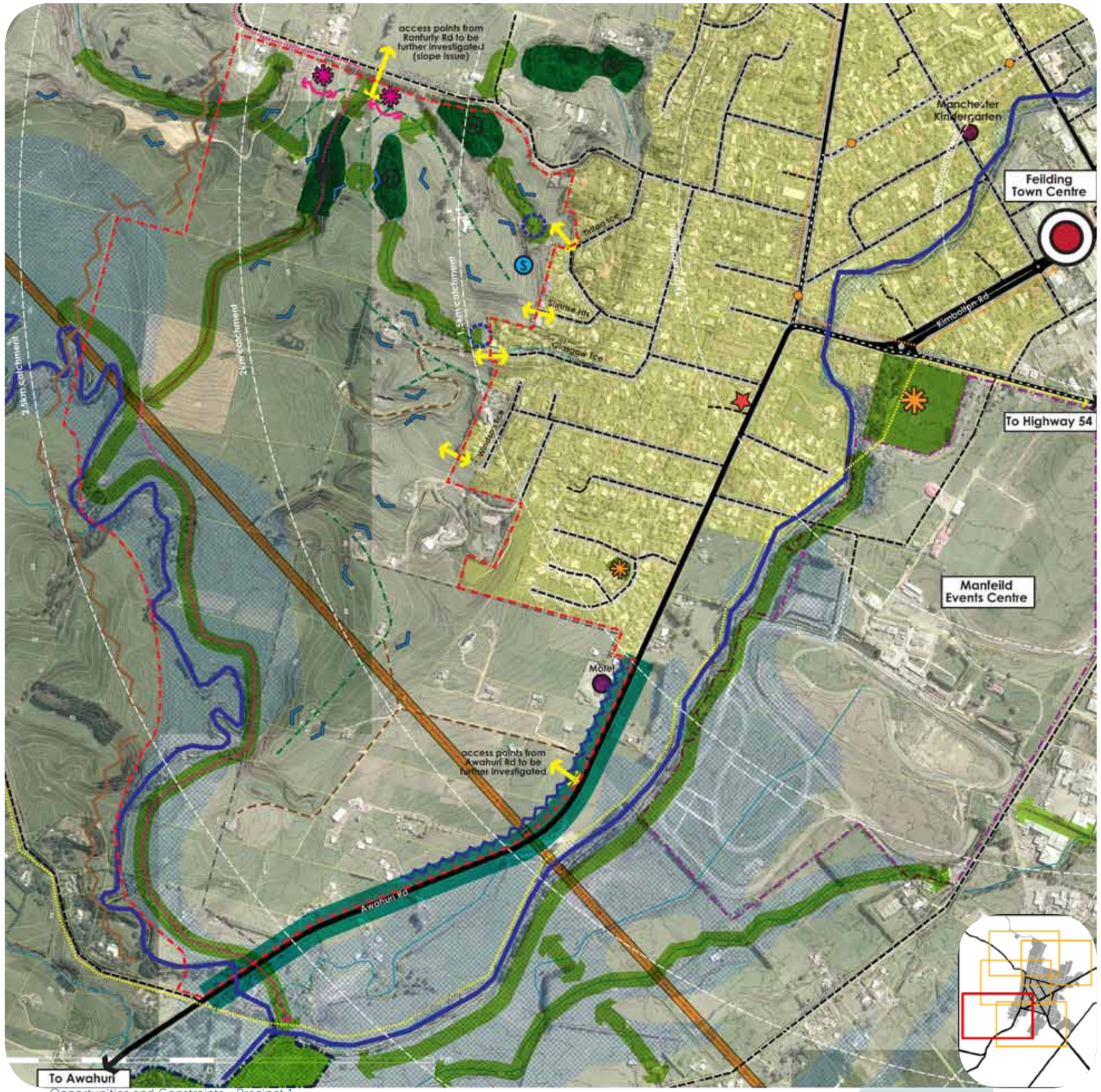
06
Site Analysis: Edge Growth

Opportunities and Constraints - Precinct 1



Opportunities and Constraints - Precinct 1

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06
Site Analysis: Edge Growth

Opportunities and Constraints - Precinct 2

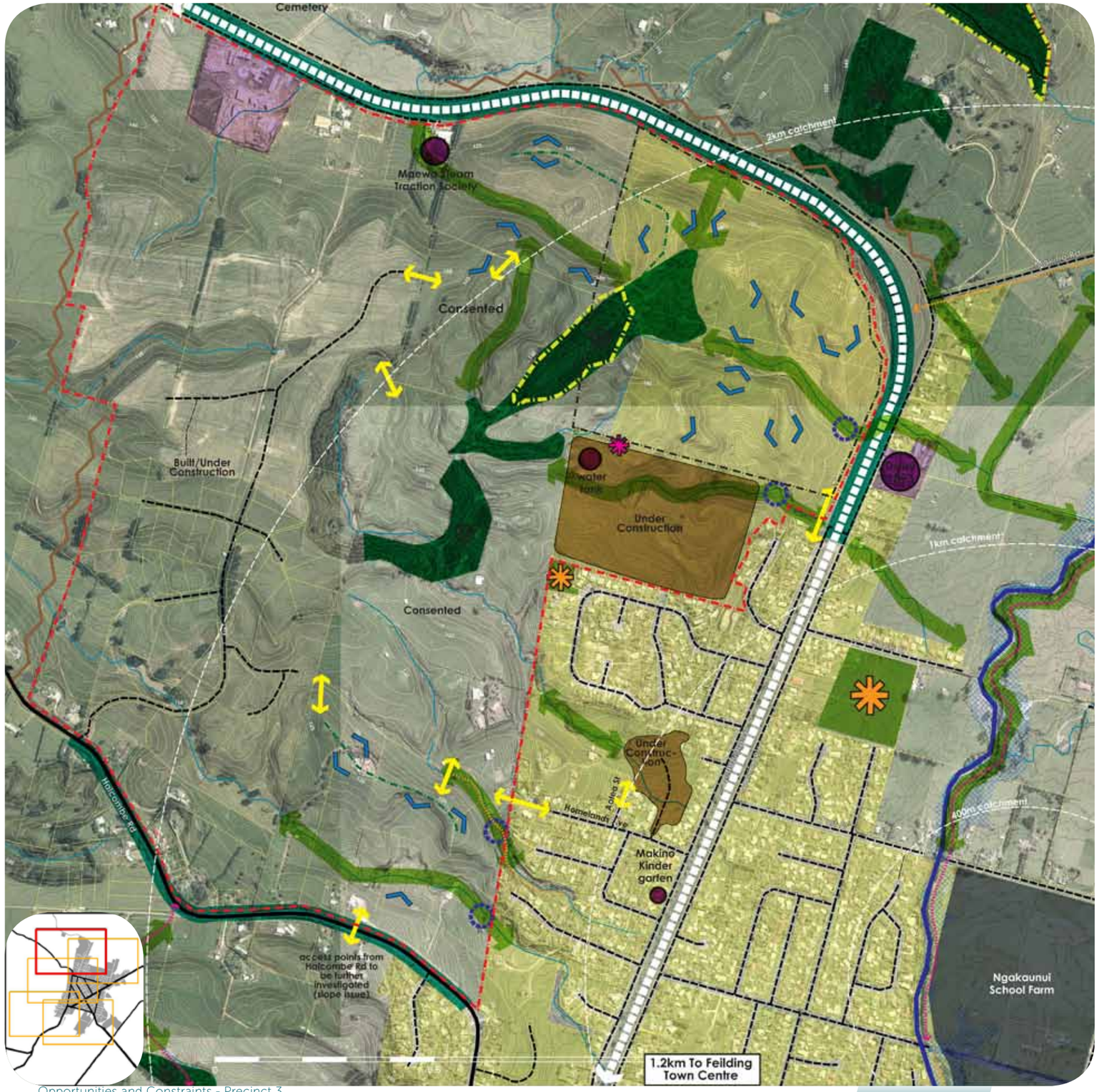
Legend
- Principal streets
- Connector streets
- Local streets
- Railway line (potential cycleway and walkway link)
- Vegetation to be protected (native - subject to further investigation)
- Production wood lot (or mixed - subject to further investigation)
- River/stream
- Drainage lines
- Overland flow
- Possible access points (to be further investigated)
- Adjoining urban areas (residential zones)
- Adjoining new residential developments (built or under construction)
- Adjoining new residential developments (proposed)
- Potential green links (vegetation corridor/riparian corridor/pedestrian links and/or stormwater management)
- Flood Channel 1:100 years (potential green belt /recreational zones)
- High Points
- Important views from the site
- Existing Park
- Existing Shops
- Rural Tracks/roads
- Existing walkway (potential cycleway)
- Potential walkway/cycleway links (subject to further investigation)
- Top of Terrace
- Old Landfill (potential to be rehabilitated /mountain bike track /recycling centre)
- Feilding to Palmerston North bus route
- Bus stop (approximate location)
- Rural/urban interface
- Potential stormwater detention location
- Future urban growth path
- Precinct 2 Boundary (potential - approximately 163ha)

note 1: Information on secondary flow paths and flood extents is limited and requires further investigation.

Opportunities and Constraints - Precinct 2

06
Site Analysis: Edge Growth

Opportunities and Constraints - Precinct 3



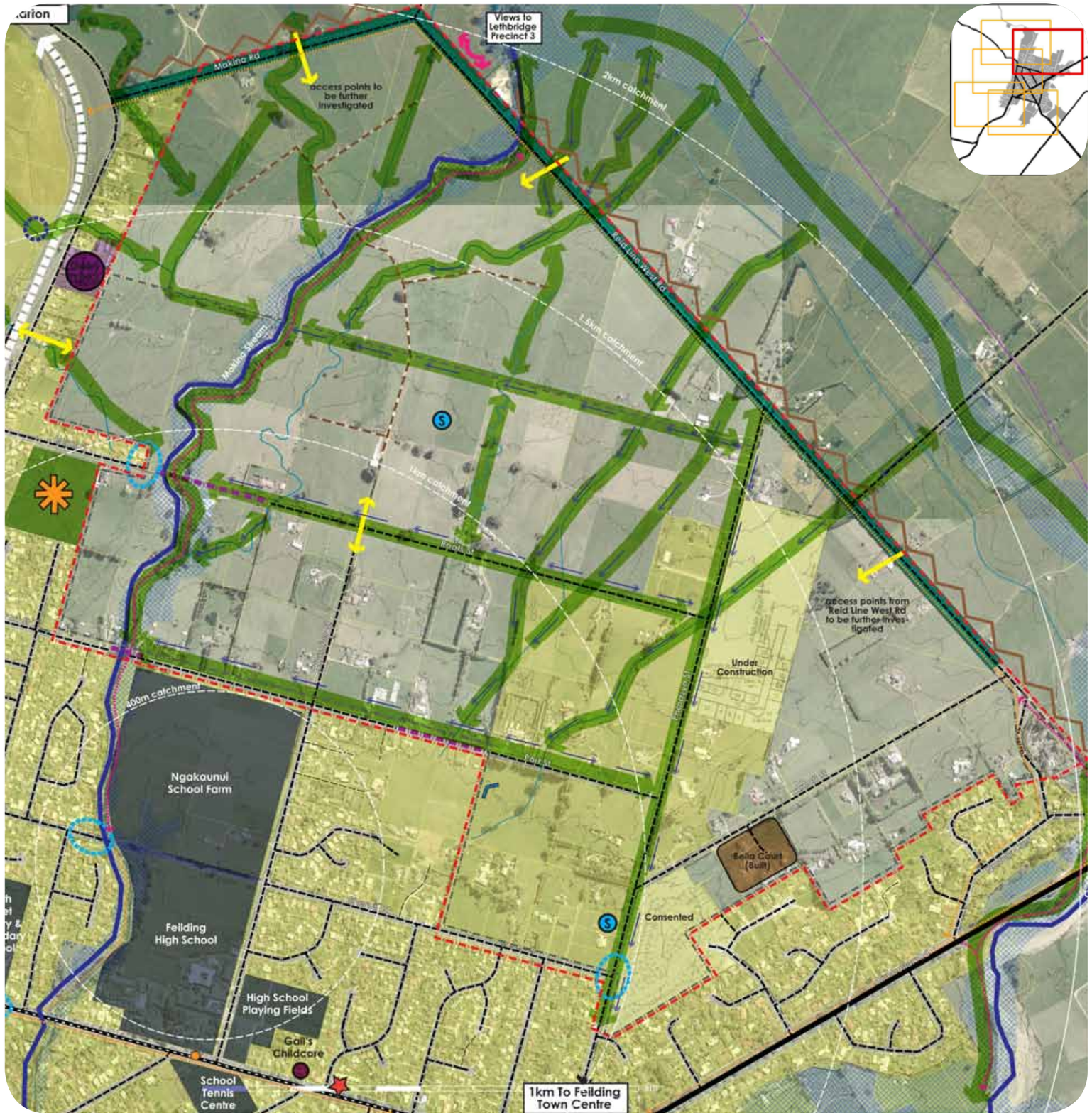
Legend
- Principal streets
- Connector streets
- Local streets
- Railway line (potential cycleway and walkway link)
- Vegetation to be protected (native-subject to further investigation)
- River/stream
- Drainage lines
- Overland flow
- Possible access points (to be further investigated)
- Adjoining urban areas (residential zones)
- Adjoining new residential developments (built or under construction)
- Industrial zone
- Potential green links (vegetation corridor/riparian corridor/ pedestrian links and/or stormwater management
- Flood Channel 1:100 years (potential green belt/recreational zones)
- High Points
- Important views from the site
- Existing Park
- Visual Amenity Corridor
- Queen Elizabeth II Covenant (QEII)
- Top of Terrace
- Existing walkway (potential cycleway)
- Potential walkway/cycleway links (subject to further investigation)
- Rural/urban interface
- Potential stormwater detention location
- Future urban growth path
- Precinct 3 Boundary (potential - approximately 270ha)

note 1: information on secondary flow paths and flood extents is limited and requires further investigation

Opportunities and Constraints - Precinct 3

06
Site Analysis: Edge Growth

Opportunities and Constraints - Precinct 4

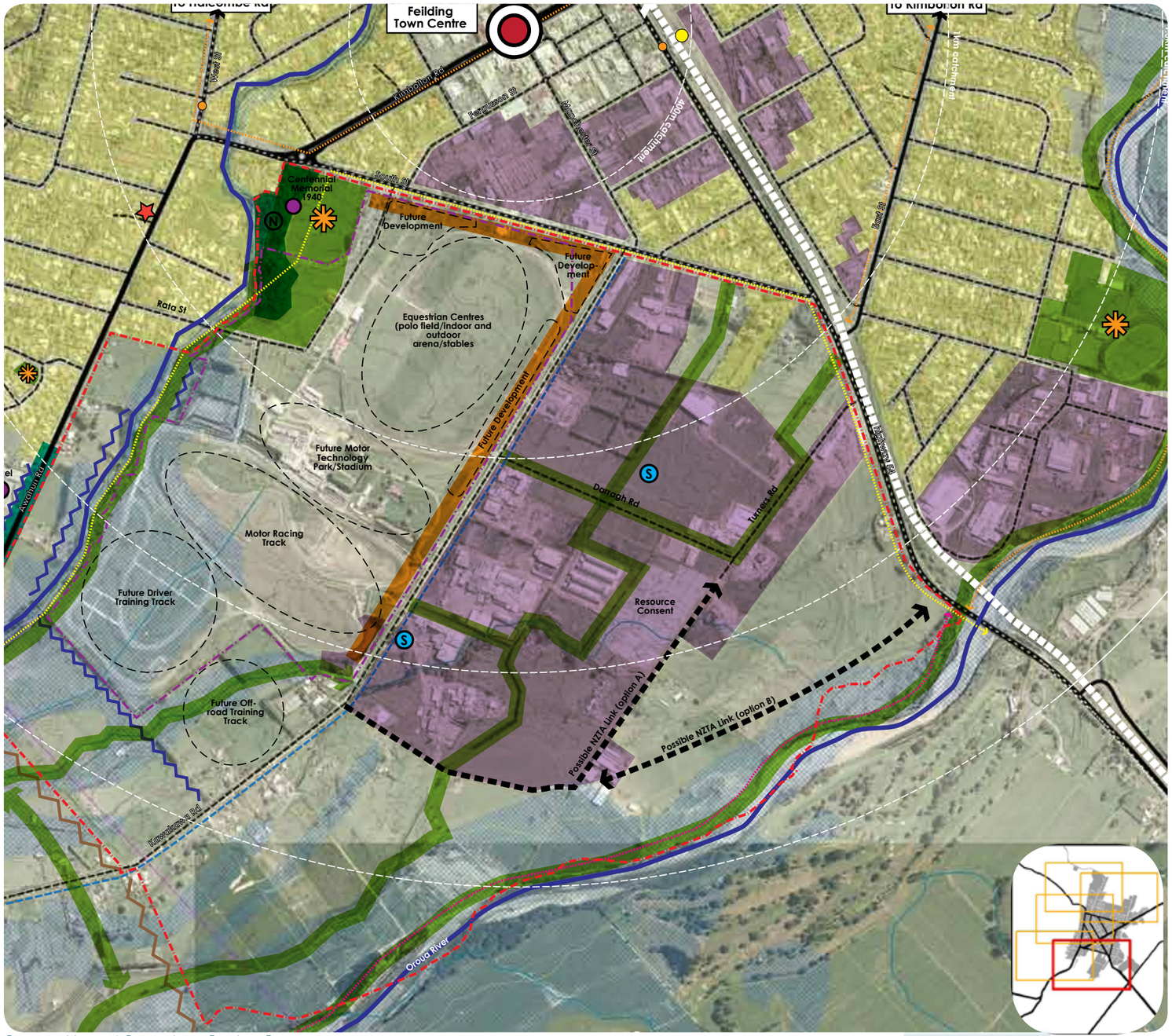


Legend
- Principal streets
- Connector streets
- Local streets
- Railway line (potential cycleway and walkway link)
- Vegetation to be protected (native - subject to further investigation)
- River/stream
- Drainage lines
- Stormwater flow paths
- Possible access points (to be further investigated)
- Adjoining urban areas (residential zones)
- Adjoining new residential developments (built or under construction)
- Industrial zone
- Potential green links (vegetation corridor/riparian corridor/ pedestrian links and/or stormwater management)
- Flood Channel 1:100 years (potential green belt / recreational zones)
- Important views from the site
- Existing Park
- Rural Tracks/roads
- Transmission line
- Feilding to Palmerston North bus route
- Bus stop (approximate location)
- Queen Elizabeth II Covenant (QEII)
- Potential bridge/street connections
- Existing shops
- Rural/urban interface
- Visual Amenity Corridor
- Stormwater issues
- Potential stormwater detention location
- Areas of surface flooding and system surcharge
- Existing walkway (potential cycleway)
- Potential walkway/cycleway links (subject to further investigation)
- Future urban growth path
- Precinct 4 Boundary (potential-approximately 277ha)

note 1: Information on secondary flow paths and flood extents is limited and requires further investigation

06
Site Analysis: Edge Growth

Opportunities and Constraints - Precinct 5



Opportunities and Constraints - Precinct 5

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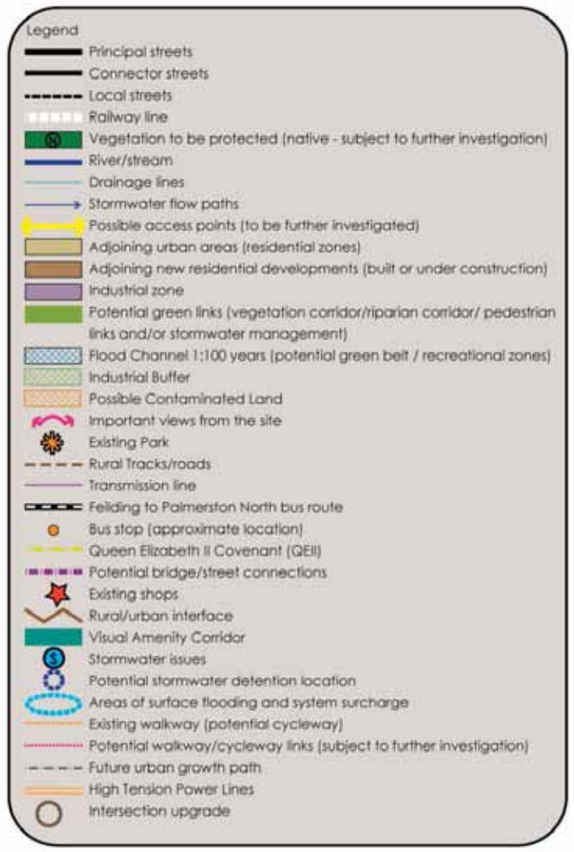
06
Site Analysis: Edge Growth

Opportunities and Constraints - Precinct 6



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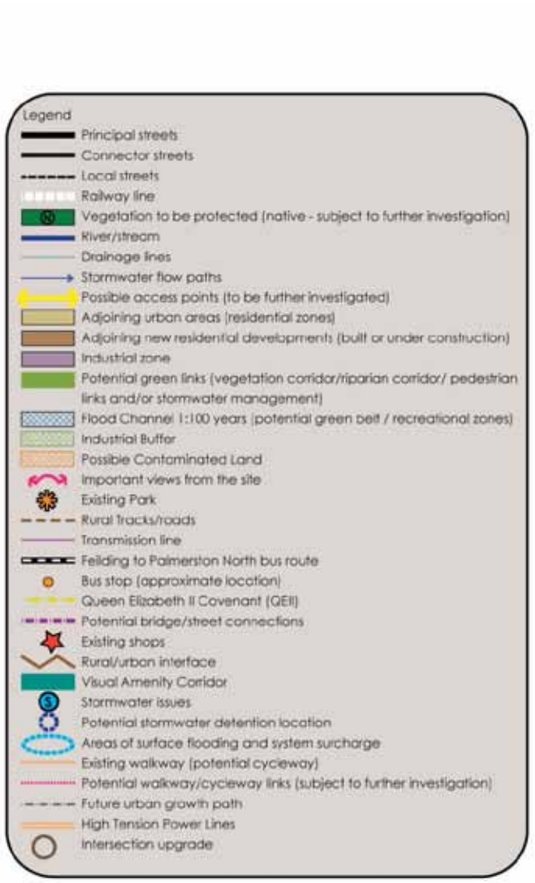
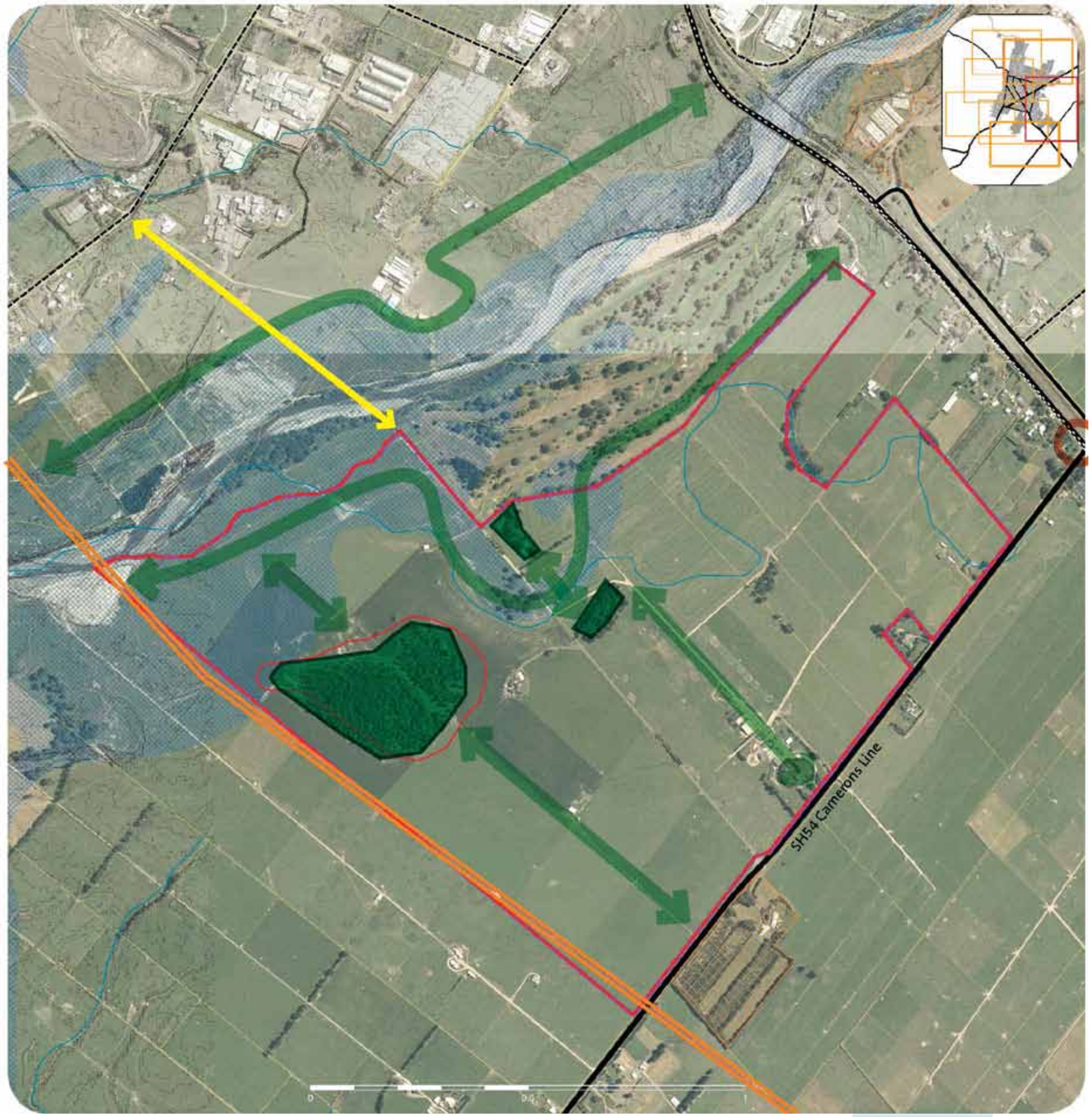
Site Analysis: Edge Growth

Opportunities and Constraints - Precinct 7





07
Concepts: Edge Growth

The following section of the Framework Plan presents 'concepts for five edge growth precincts - two of the seven precincts examined in the previous section have been discounted as not suitable for urban growth (Precincts 6 and 7). The purpose of the concepts is to demonstrate the potential for these growth areas in terms of yields and also service provision feasibility including stormwater. They also demonstrate the application of the urban planning principles outlined earlier.

Population and Residential Density

The following plans provide for a variety of housing types and densities across the Feilding Growth Areas and some additional areas for mixed use and industrial uses to the south. It is noted that concepts for growth within the existing urban footprint are described in sections 8 and 9 of this Framework Plan.

The western hills (Precincts 1, 2 and 3) are shown with a form that responds to the undulating and steep topography. It is proposed that some flat areas at the top of the terrace in Precincts 1 and 2 could be planned in a form that allows intensification in the future (ie they start now with lower density with higher density residential in the future). These areas are located near the proposed neighbourhood centre (Precincts 1 and 2) and a local park (Precinct 2) and they could potentially achieve a gross density of 10 dwellings per hectare.

Much of Precinct 3 has been developed or consented already. The areas available for growth (northern and southern boundary) are proposed as low density, rural lifestyle lots. In the Feilding context, these areas are considered to be reasonably far from the Town Centre (approximately 2.5km) and have a series of gullies, steep topography and native vegetation. Higher density residential is not considered appropriate in this location.

The Framework Plan provides for a more regularised form in Precinct 4. The topography is generally flat (less than 5% slope) and is within close proximity to community facilities such as primary, secondary and high schools. It is envisaged that a neighbourhood centre and a local park centrally located will provide amenities to the new residents and the existing surrounding neighbourhoods.

There is a projected demand in the next 20 years for smaller housing types within Feilding. It is proposed that in the next 20 years the smaller lots with 2 bedroom types (eg cottages or townhouses) would occur near the Town Centre and in Precinct 4. It is important that this type of housing is placed near existing or new community facilities (shops, childcare, parks, schools) to reduce car dependency and promote a more walkable, sustainable and liveable environment for these residents. Typically the smaller households are for people with a lower and fixed income and who benefit from a less car dependant urban form.

Street Network

The plan proposes a well connected system of streets. The new streets should connect adjoining Growth Areas to each other. Each neighbourhood within the Growth Areas should also provide a highly connected system of internal local streets.

Open Space Network

The Framework Plan proposes an integrated approach to the green infrastructure of Feilding. Streams and high value gullies should be utilised and restored as environmental corridors. A network of footpaths and cycleways combined with a sustainable approach to stormwater management (swales, bioretention and treatment ponds) could be provided along these corridors. The plan proposes a network of parks and open spaces ranging from neighbourhood and pocket parks, reserves and environmental and recreational corridors.

Pedestrian and Cycleway Network

A system of footpaths and cycleways running along the streets, major parks, the railway corridor, Manfield Centre and the proposed recreational corridors is proposed to improve the opportunities to use alternative modes of transport within Feilding and also to provide greater opportunities for recreational activities.

Industrial Areas

New mixed use and industrial zones are proposed within Precinct 5. The plan proposes a mixed use zone along South Street to provide for some streetfront retail activities (large format retail format is not recommended), medium density residential, office spaces and short-term accommodation. Light industry is envisaged to occur along Kawakawa Road. A possible business park is proposed near Oroua River.

Existing Urban Area

As noted previously the Framework Plan identifies potential for growth to be provided for within the existing urban area. This should be considered as a growth strategy in parallel with greenfield growth.

In terms of residential development a logical location for smaller houses with 1-2 bedrooms is close in to the town centre. The town house type would be appropriate here.

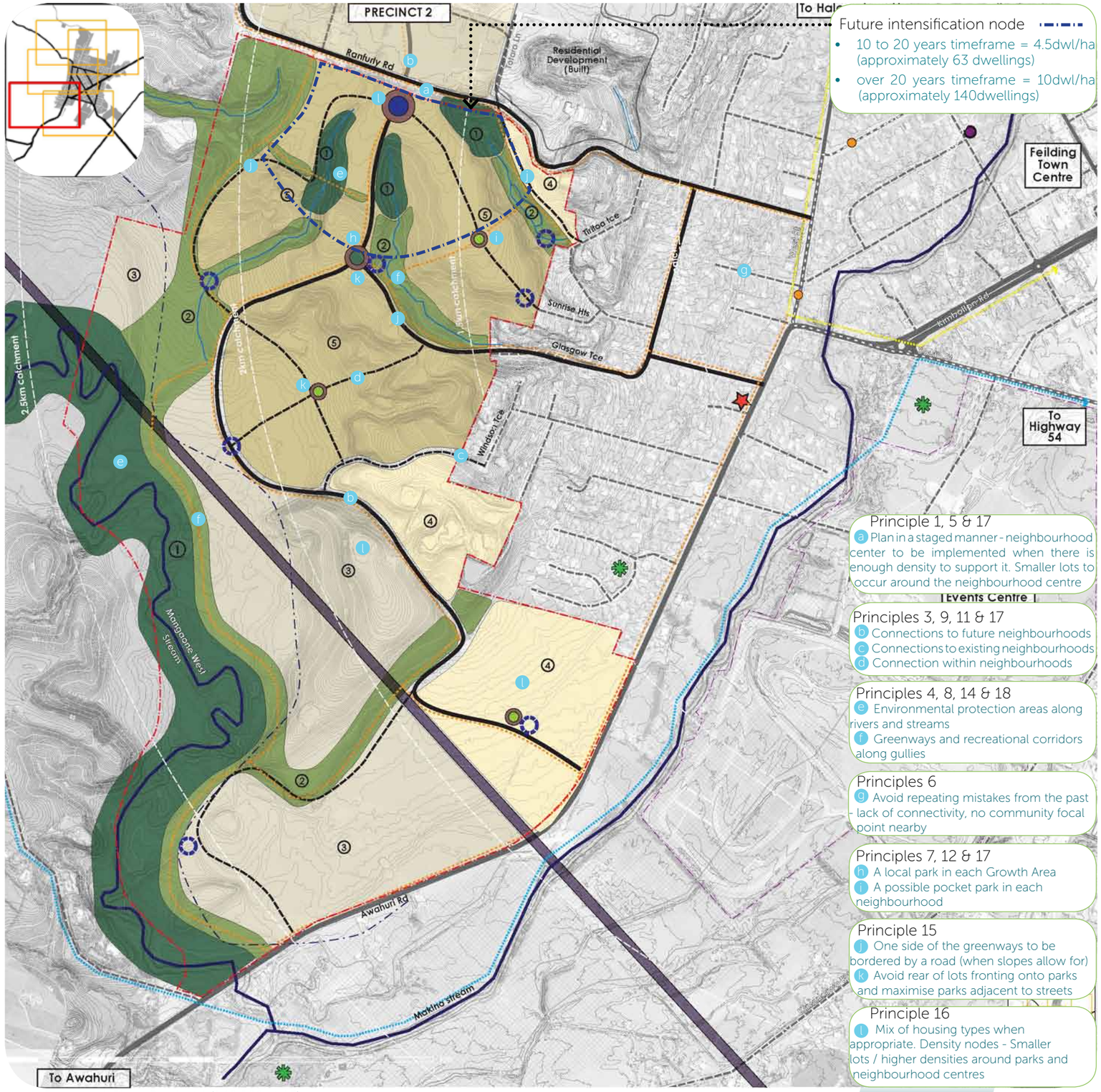
Infill (leaving an existing house and adding more houses to the site) or redevelopment (removing existing house and adding more houses to the site) are two primary ways residential growth is likely to occur in Feilding.

07
Concepts: Edge Growth

Framework Plan - Precinct 1

All of the Precinct Plans illustrate a conceptual application of the urban planning principles. The District Plan itself will set the rules, design guidelines and the structure plans. The structure plans make some reference to key connecting links and open space and slope areas.

Preliminary Yield	
Rural lifestyle lots	
Type 1 (>5,000m²)	55 (18%)
Type 2 (2,000m² to 5,000m²)	44 (15%)
Total rural lifestyle lots	**99 (33%)**
Urban lots	
Type 3 (800m² to 2,000m²)	198 (67%)
Total urban lots	**198 (67%)**
Total Yield	**297 lots**



Framework Plan - Precinct 1 (1:10,000 at A3)

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Manawatu District Council

07

Concepts: Edge Growth

Framework Plan - Precinct 2

All of the Precinct Plans illustrate a conceptual application of the urban planning principles. The District Plan itself will set the rules, design guidelines and the structure plans. The structure plans make some reference to key connecting links and open space and slope areas.

Principle 1, 5 & 17
- a Plan in a staged manner - neighbourhood center to be implemented when there is enough density to support it. Smaller lots to occur around the neighbourhood centre

Principles 3, 9, 11 & 17
- b Connections to future neighbourhoods
- c Connections to existing neighbourhoods
- d Connection within neighbourhoods

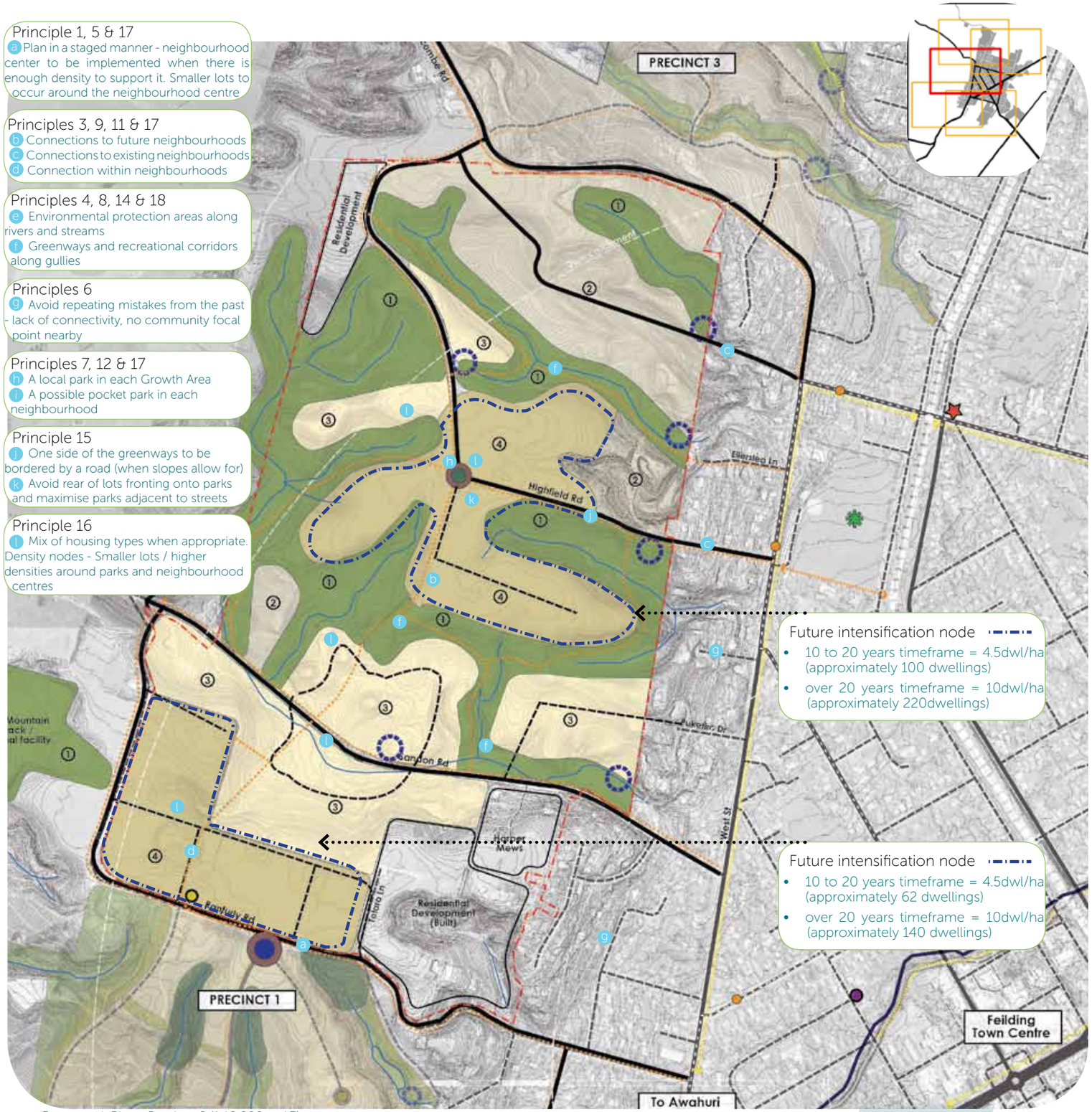
Principles 4, 8, 14 & 18
- e Environmental protection areas along rivers and streams
- f Greenways and recreational corridors along gullies

Principles 6
- g Avoid repeating mistakes from the past - lack of connectivity, no community focal point nearby

Principles 7, 12 & 17
- h A local park in each Growth Area
- i A possible pocket park in each neighbourhood

Principle 15
- j One side of the greenways to be bordered by a road (when slopes allow for)
- k Avoid rear of lots fronting onto parks and maximise parks adjacent to streets

Principle 16
- l Mix of housing types when appropriate. Density nodes - Smaller lots / higher densities around parks and neighbourhood centres



Legend

Proposed
- Connector streets (new or to be upgraded) including swales in most cases
- Local streets including swales in most cases
- ① Recreational corridor / stormwater management
- ② Density type 1 - rural lifestyle lots (1 dwelling/ha - lots > 5,000m²)
- ③ Density type 2 - rural lifestyle lots (2 dwelling/ha - lots 2,000m² to 5,000m²)
- ④ Density type 3 - urban lots (4.5 dwelling/ha - lots 800m² to 2,000m²)
- Neighbourhood centre
- Neighbourhood park
- Dedicated pedestrian and cycleway
- Potential stormwater detention location
- Density node

Existing
- River/stream
- Railway line (potential pedestrian and cycleway)
- Drainage lines
- Roads
- Parks or reserves
- Shops
- Childcare or kindergarten
- Old brick works (heritage value to be assessed)
- Walkways
- Feilding to Palmerston North bus route
- Bus stop (approximate location)
- Precinct 2 Boundary (approximately 163ha)

note 1: Information on secondary flow paths and flood extents is limited and requires further investigation.

Preliminary Yield	
Rural lifestyle lots	
Type 1 (>5,000m²)	27 (11%)
Type 2 (2,000m² to 5,000m²)	48 (20%)
Total rural lifestyle lots	**75 (31%)**
Urban lots	
Type 3 (800m² to 2,000m²)	162 (69%)
Total urban lots	**162 (69%)**
Total Yield	**237 lots**

Framework Plan - Precinct 2 (1:10,000 at A3)

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07
Concepts: Edge Growth

Framework Plan - Precinct 3

All of the Precinct Plans illustrate a conceptual application of the urban planning principles. The District Plan itself will set the rules, design guidelines and the structure plans. The structure plans make some reference to key connecting links and open space and slope areas.

Legend

Proposed

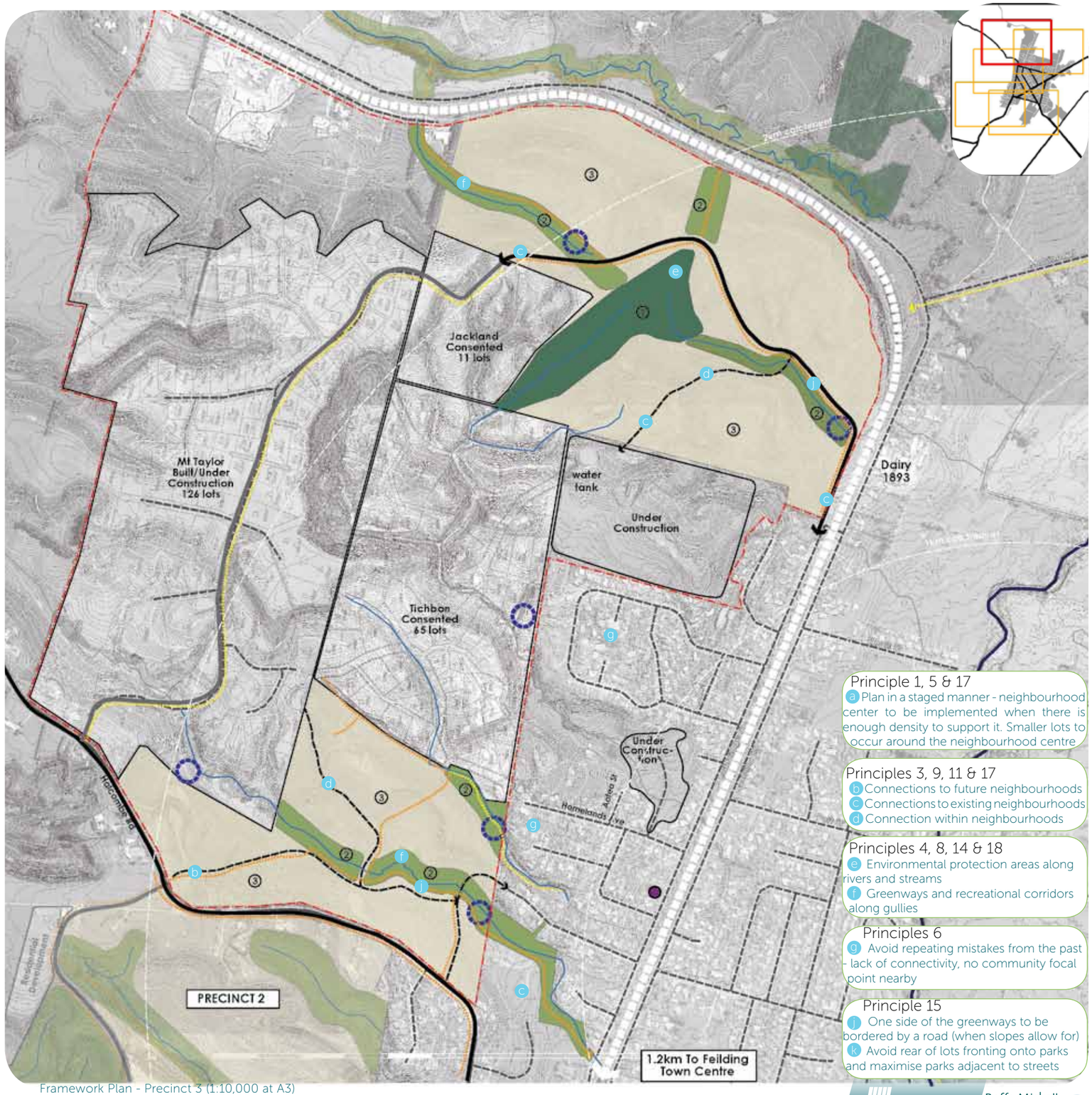
- Connector streets (new or to be upgraded) including swales in most cases
- Local streets including swales in most cases
- ① Environmental protection corridor
- ② Recreational corridor / stormwater management
- ③ Density type 1 - rural lifestyle lots (1 dwelling/ha - lots > 5,000m²)
- Dedicated pedestrian and cycleway
- Potential stormwater detention location

Existing

- River/stream
- Railway line (potential pedestrian and cycleway)
- Drainage lines
- Roads
- Parks or reserves
- Childcare or kindergarten
- Walkways
- Precinct 3 Boundary (approximately 270ha)

note 1: information on secondary flow paths and flood extents is limited and requires further investigation.

Preliminary Yield	
New developments	
Built	126 (46%)
Consented	76 (28%)
Total new developments	**202 (74%)**
Proposed rural lifestyle lots	
Type 1 (> 5,000m²)	71 (26%)
Total rural lifestyle lots	**71 (26%)**
Total Yield	**273 lots**



Framework Plan - Precinct 3 (1:10,000 at A3)

Principle 1, 5 & 17

ⓐ Plan in a staged manner - neighbourhood center to be implemented when there is enough density to support it. Smaller lots to occur around the neighbourhood centre

Principles 3, 9, 11 & 17

ⓑ Connections to future neighbourhoods
ⓒ Connections to existing neighbourhoods
ⓓ Connection within neighbourhoods

Principles 4, 8, 14 & 18

ⓔ Environmental protection areas along rivers and streams
ⓕ Greenways and recreational corridors along gullies

Principles 6

ⓖ Avoid repeating mistakes from the past - lack of connectivity, no community focal point nearby

Principle 15

ⓙ One side of the greenways to be bordered by a road (when slopes allow for)
ⓚ Avoid rear of lots fronting onto parks and maximise parks adjacent to streets

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07

Concepts: Edge Growth

Framework Plan - Precinct 4

All of the Precinct Plans illustrate a conceptual application of the urban planning principles. The District Plan itself will set the rules, design guidelines and the structure plans. The structure plans make some reference to key connecting links and open space and slope areas.

Legend

Proposed

- Connector streets (new or to be upgraded) including swales in most cases
- Local streets including swales in most cases
- ① Environmental protection corridor
- ② Recreational corridor / stormwater management
- ③ Density type 4 - urban lots (8 dwellings/ha - lots 450m² to 2,000m²)
- ④ Density type 5 - urban lots (10 dwellings/ha - lots 200m² to 2,000m²)
- Neighbourhood centre
- Neighbourhood park
- Pocket park or neighbourhood focal point
- Dedicated pedestrian and cycleway
- "Green road" (combined use of stormwater management, road and pedestrian and cycleways
- Density node
- Potential stormwater detention location
- Potential stormwater detention in swale/ditch

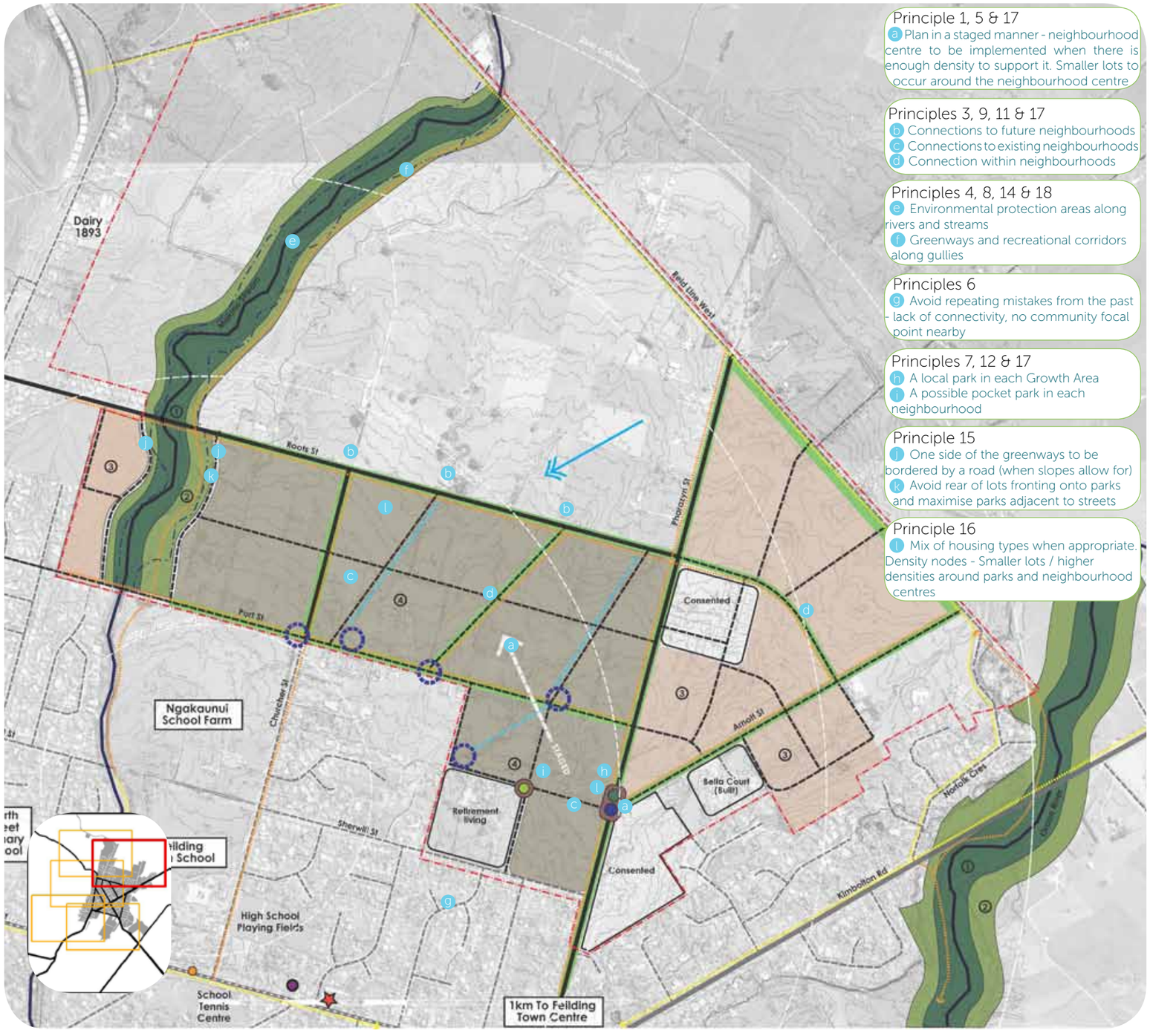
Existing

- River/stream
- Drainage lines
- 1:100ys flood line
- Railway line (potential pedestrian and cycle ways)
- Roads
- Parks or reserves
- Shops
- Childcare or kindergarten
- Walkways
- Feilding to Palmerston North bus route
- Bus stop (approximate location)
- Stormwater flow path
- Precinct 4 Boundary (approximately 277ha)

Preliminary Yield

Urban lots

Type 4 (450m² to 2,000m²)	176 (23%)
Type 5 (200m² to 2,000m²)	590(77%)
Total Yield	**766 lots**



Principle 1, 5 & 17

a Plan in a staged manner - neighbourhood centre to be implemented when there is enough density to support it. Smaller lots to occur around the neighbourhood centre

Principles 3, 9, 11 & 17

b Connections to future neighbourhoods
c Connections to existing neighbourhoods
d Connection within neighbourhoods

Principles 4, 8, 14 & 18

e Environmental protection areas along rivers and streams
f Greenways and recreational corridors along gullies

Principles 6

g Avoid repeating mistakes from the past - lack of connectivity, no community focal point nearby

Principles 7, 12 & 17

h A local park in each Growth Area
i A possible pocket park in each neighbourhood

Principle 15

j One side of the greenways to be bordered by a road (when slopes allow for)
k Avoid rear of lots fronting onto parks and maximise parks adjacent to streets

Principle 16

l Mix of housing types when appropriate. Density nodes - Smaller lots / higher densities around parks and neighbourhood centres

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07
Concepts: Edge Growth

Framework Plan - Precinct 5

All of the Precinct Plans illustrate a conceptual application of the urban planning principles. The District Plan itself will set the rules, design guidelines and the structure plans. The structure plans make some reference to key connecting links and open space areas.

Legend

Proposed

- Connector streets (new or to be upgraded) including swales in most cases
- Local streets including swales in most cases
- Environmental protection corridor
- Recreational corridor / stormwater management
- New industrial zone / business park
- Mixed use type 1 (office spaces / short-term accommodation)
- Light industry
- Dedicated pedestrian and cycleway
- "Green roads" (combined use of stormwater management, roads and pedestrian and cycleways)
- Viewlines / green spaces

Existing

- River/stream
- Drainage lines
- 1:100ys flood line
- Railway line (potential walkway and cycleway)
- Railway station
- Industrial zone
- Roads
- Parks or reserves
- Shops
- Childcare or kindergarten
- Walkways
- Te Araroa walkway
- Feilding to Palmerston North bus route
- Bus stop (approximate location)
- Stormwater flow path
- Precinct 1 Boundary (approximately 175ha)

Note 1: Information on secondary flow paths and flood extents is limited and requires further investigation.

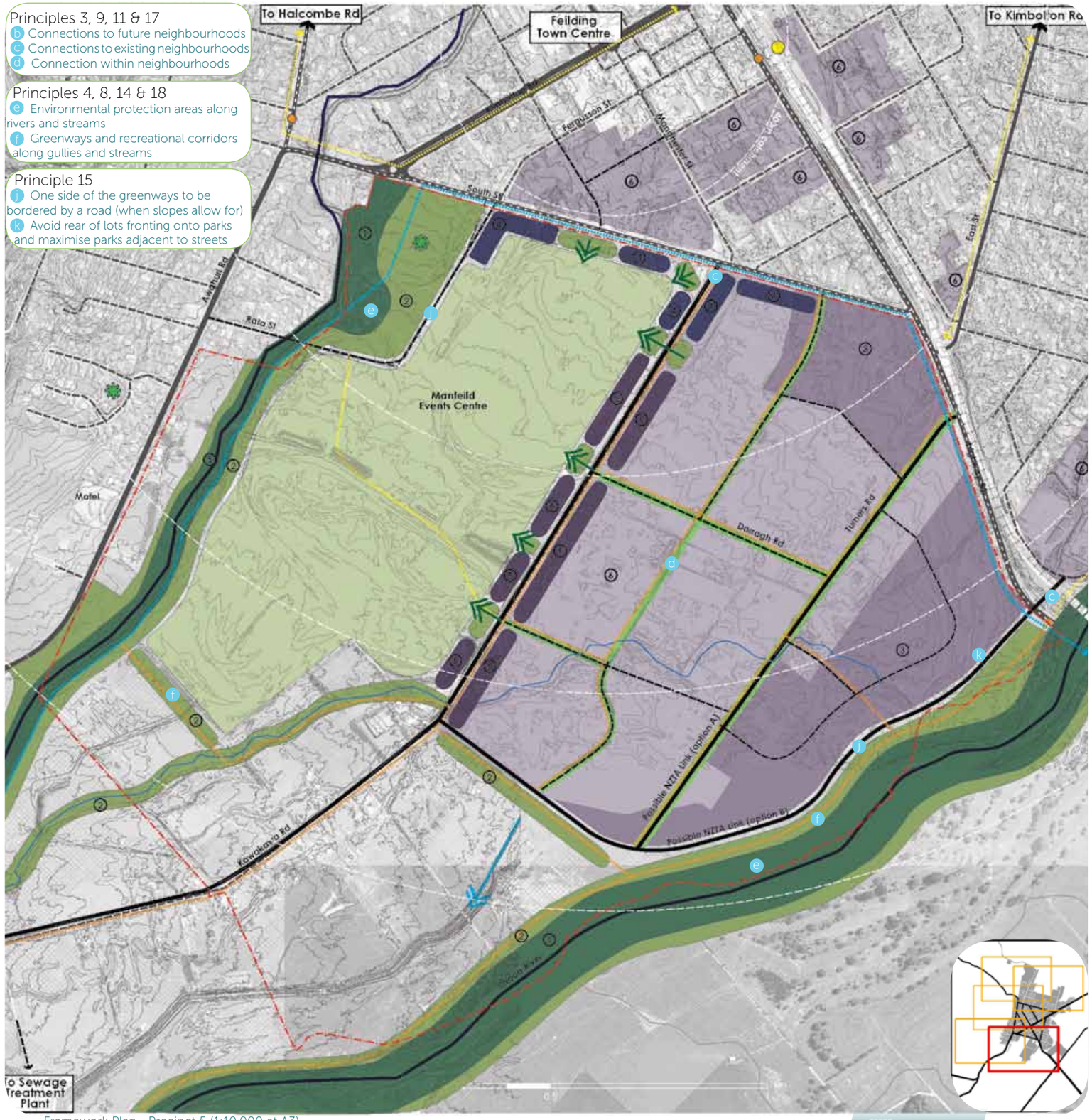
Preliminary Area Calculation (approximate)

Mixed Use	
Mixed use type 1	3ha
Total mixed use	**3ha**
Industry	
Existing industrial zone (within precinct boundary)	74ha
Existing industrial zone (outside precinct boundary)	96ha
New industrial zone/business park	34ha
Light industry	6ha
Total industry	**210ha**
Total	**213ha**

Principles 3, 9, 11 & 17
- (b) Connections to future neighbourhoods
- (c) Connections to existing neighbourhoods
- (d) Connection within neighbourhoods

Principles 4, 8, 14 & 18
- (e) Environmental protection areas along rivers and streams
- (f) Greenways and recreational corridors along gullies and streams

Principle 15
- (j) One side of the greenways to be bordered by a road (when slopes allow for)
- (k) Avoid rear of lots fronting onto parks and maximise parks adjacent to streets



Framework Plan - Precinct 5 (1:10,000 at A3)

08
Analysis: Intensification

Feilding's urban growth will be accommodated and promoted by the encouragement of both edge growth and the intensification of development of the existing urban footprint. Sections 6 and 7 describe edge development analysis and concepts. The following sections 8 and 9 address intensification.

Current Provision for Intensification

Residential Intensification is often described alternatively as infill, medium or high-density development.

In Feilding it is anticipated that intensification of residential activities will occur by a combination of infill (additional houses are added to an existing site and the existing house retained), or comprehensive redevelopment (existing house is removed and site completely redeveloped with additional houses, or sites amalgamated to make a larger redevelopment site).

Within Feilding currently there are multiple lots which have the theoretical ability to be intensified (by resource consent) given the minimum lot size of 500m^2 . The Figure below describes the range of infill potential lots based on lot size. However, the distribution of these lots and their suitability (lot shapes, access slope etc) requires a more considered strategy to guide intensification to appropriate sites. Sections 7 and 8 examine the appropriate condition of lots for intensification and suggests a basis for District Plan changes to guide this type of development in the future.

Lot Size (and number of possible additional lots)

- 800m^2 - 1149m^2 (1 additional lots)
- 1150m^2 - 1549m^2 (2 additional lots)
- 1550m^2 - 1899m^2 (3 additional lots)
- 1900m^2 - 2299m^2 (4 additional lots)
- 2300m^2 - 2599m^2 (5 additional lots)
- 2600m^2 - 2999m^2 (6 additional lots)
- 3000m^2 - 3999m^2 (7 additional lots)
- 4000m^2 - 4999m^2 (8 additional lots)
- = or >5000m^2 (9 or more additional lots)
- Feilding urban area

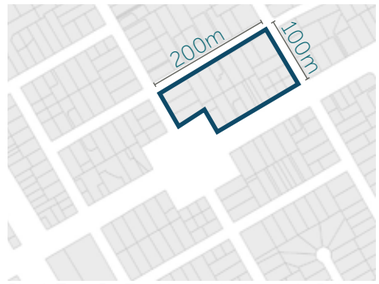
Historical Patterns of Development

Residential intensification in Feilding has occurred as larger lots have been subdivided over time. Where blocks are relatively deep they have tended to result in multiple rear lots (Type A). Blocks of lesser depth (Types B and C at 100-120m) have allowed subdivision to a form where all sites have a street frontage and rear lots are rare.

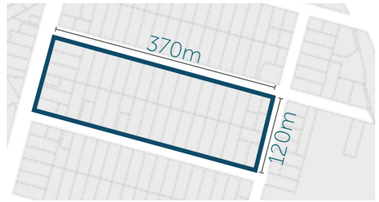
The other block form which has tended to be generated from more recent greenfield subdivision (Type D) is less distinct given the combination of dead end disconnected streets.

The shape and form of lots is very influential to the suitability for intensification. Lots suitable for intensification have a direct street frontage, have good width and shape, are flatish, and have good access to public open space.

Block Type A - Traditional block type in Feilding Central



Block Type B - Traditional block type in Feilding Central



Block Type C - Block Type in Feilding East

Block Type D - Recent block type in Feilding North

08
Analysis: Intensification

Methodology

The following pages (37 and 38) of this section identify and assess nine different configurations of existing urban development in Feilding to understand their quality. This assessment allows the most appropriate lot shape for identification to be determined.

A | Six Detached Dwellings

street frontage:	yes
dwellings at rear:	yes (4)
dwellings fronting street or green space:	yes (2)
lot frontage width:	40m
lot depth:	58m
lot area:	2,320m²
Net Density:	26dwl/ha
Average lot size/dwl:	385m²

B | Five Attached Dwellings

street frontage:	no
dwellings at rear:	yes (all)
dwellings fronting street or green space:	no
lot frontage width:	25m
lot depth:	51m
lot area:	1,275m²
Net Density:	38dwl/ha
Average lot size/dwl:	255m²

C | Two Detached Dwellings

street frontage:	yes
dwellings at rear:	yes (1)
dwellings fronting street or green space:	yes (1)
lot frontage width:	20m
lot depth:	50m
lot area:	1,000m²
Net Density:	20dwl/ha
Average lot size/dwl:	500m²

D | Five Attached Dwellings

street frontage:	yes
dwellings at rear:	no
dwellings fronting street or green space:	yes (all)
lot frontage width:	50m
lot depth:	20m
lot area:	1,000m²
Net Density:	50dwl/ha
Average lot size/dwl:	200m²

E | Two Detached Dwellings

street frontage:	yes
dwellings at rear:	yes (1)
dwellings fronting street or green space:	yes (1)
lot frontage width:	40m
lot depth:	50m
lot area:	2,000m²
Net Density:	10dwl/ha
Average lot size/dwl:	1,000m²

F | Ten Detached Dwellings

street frontage:	yes
dwellings at rear:	yes (9)
dwellings fronting street or green space:	yes (1)
lot frontage width:	40m
lot depth:	160m
lot area:	6,400m²
Net Density:	16dwl/ha
Average lot size/dwl:	640m²

G | Six Detached Dwellings

street frontage:	no
dwellings at rear:	yes (all)
dwellings fronting street or green space:	yes (all)
lot frontage width:	variable
lot depth:	variable
lot area:	2,214m²
Net Density:	27dwl/ha
Average lot size/dwl:	370m²

H | Four Detached Dwellings

street frontage:	yes
dwellings at rear:	yes (3)
dwellings fronting street or green space:	yes (1)
lot frontage width:	21m
lot depth:	66m
lot area:	1,386m²
Net Density:	28dwl/ha
Average lot size/dwl:	350m²

I | Five Detached Dwellings

street frontage:	yes
dwellings at rear:	yes (4)
dwellings fronting street or green space:	yes (all)
lot frontage width:	variable
lot depth:	variable
lot area:	5,400m²
Net Density:	9dwl/ha
Average lot size/dwl:	1,080m²

08
Analysis: Intensification

Residential Intensification: Quality

The different examples analysed have different levels of quality associated with them. These are discussed below.

Examples B & D (attached dwellings) have similar densities but with very different design outcomes. Example D is considered good because all dwellings front onto the street giving each small households an outlook, and individual address. Example B has located housing at the rear of the block, with poor connectivity and visual aspect. This is not a recommended alternative and should be avoided.

Example C is a common type of infill and has only minor issues (quality of building design) that can be addressed with design guidelines. Example E could be a useful positive example for more comprehensive development as it relies on a relatively large site.

Example F lot is long (160m) and the dwellings are at the rear with poor visual amenity and connectivity - this is not a recommended solution and should be avoided.

Examples A, G & H (detached dwellings) have achieved similar densities but with very different design outcomes. The wider street frontage of Example A has positively enabled 2 dwellings to front the street. Potential issues arising from this type of development (such as poor building quality, access, orientation and spaces between buildings) can be effectively addressed with site planning and building design guidelines.

Example G (detached dwellings) can be an appropriate alternative for larger irregular shaped lots. Small dwellings placed around a communal park can create good living environments. The disadvantage of Example G is that as a rear lot it creates various no-exit accessways that exacerbate problems with connectivity in this block.

Example H (detached dwellings) is not positive with issues including inadequate space between buildings, poor orientation and solar access; poor aspect of the buildings fronting the accessway; and low quality landscape treatment of accessways.

Example I has the advantage of providing dwellings facing the creek, but would benefit from better connectivity.

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08
Analysis: Intensification

Areas Less Suitable for Residential Intensification

This is a broad scale assessment of areas that may be less well suited to residential intensification. The assessment includes the following aspects:

A. Poor Connectivity

For the purpose of this analysis, areas with poor connectivity are identified as residential zoned land (may include schools) with high percentage of no-exit roads and with block depths greater than 120m.

High percentage of no-exit roads can create a negative impact on pedestrian, vehicle and cycle circulation. Block depth greater than 120m can create lots deeper than 55m-60m long, which will require long no-exit accessways.

B. Distant to the Town Centre and/or Community Amenities

These are areas zoned residential that are located more than 2km from the Feilding Town Centre and/or with poor nearby community amenities, such as parks, shops and schools.

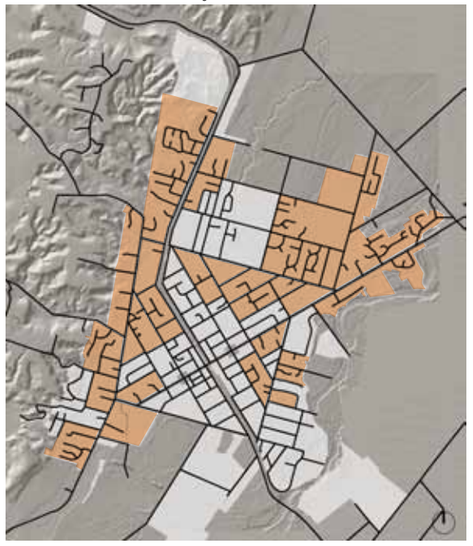
C. Steep Slopes

Areas where slopes are greater than 15% (1:6m). If not properly designed, residential intensification could significantly alter the natural landform of these areas.

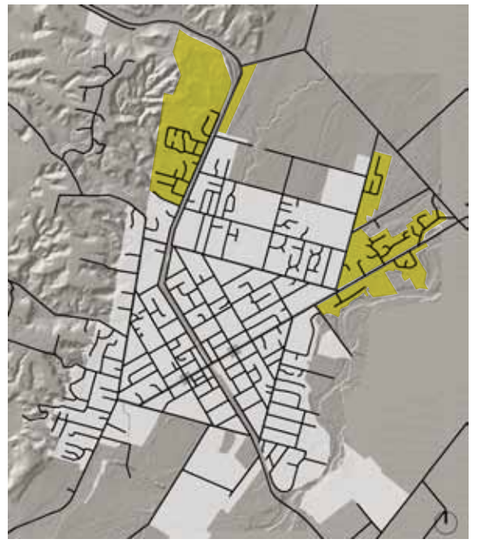
D. Proximity to Industrial Land

There are some residential zoned land that have poor amenity values due to its close proximity to industrial areas.

A. Poor Connectivity



B. Distant to the Town Centre



C. Steep Slopes

D. Proximity to Industrial land

08

Analysis: Intensification

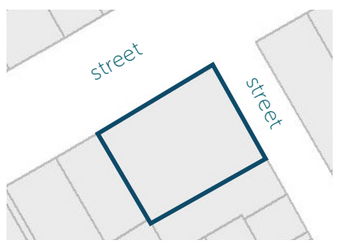
Lot Shapes for Residential Intensification

As described above)page 40) the location of some areas of Feilding makes them less suitable for intensification. The follow pages (41 and 42) assess the shape factor of lots that makes them good, challenging or to be avoided for intensification.

Regular Shaped Lots - Good

Type A - standard lot
street frontage: yes
lot frontage width: >18m
lot depth: 25m-55m

Type B - shallow lot *
street frontage: yes
lot frontage width: >16m
lot depth: 20m-25m



Type C - corner lot
street frontage: yes
lot frontage width: >13m
(primary street)
lot depth: 20m-100m

Lot types A, B and C offer the best opportunities to achieve good design outcomes for residential intensification.

The benefits are:

Direct street frontage

Type A - wide street frontages that enable at least two attached dwellings to face the street (assuming 6m wide building frontage per dwelling), a 4m wide (minimum) accessway with space for landscaping, and a side setback to adjoining property

Type A - lot depth no greater than 55m, which avoids the need for long driveways

Type B - wide street frontage that enable at least two attached dwellings to face the street (assuming 6m wide building frontage per dwelling), and side setback to adjoining property.

Type B - lots are shallow and do not require accessways. All dwellings can be designed to front the street.

Type C - corner lots enable various alternatives to vehicle access and provide wide street frontages

Regular Shaped Lots - Challenging

Type D - standard lot narrow
street frontage: yes
lot frontage width: 13-17m
lot depth: 25m-55m

Type E - standard lot long
street frontage: yes
lot frontage width: >18m
lot depth: 55m-100m

Lot types D and E can offer good opportunities to achieve good design outcomes for residential intensification. But, narrower frontages (Type D) and long lots (Type E) will require site specific assessment criteria.

The benefits are:

Direct street frontage

Type D - 13m to 17m wide street frontages enable one dwelling to face the street, a 4m wide (minimum) accessway with space for landscaping, and a side setback to adjoining property.

Type D - lot depth no greater than 55m, which avoids the need for long driveways

Type E - wide street frontage that enables at least two attached dwellings to face the street , a 4m wide (minimum) accessway with space for landscaping and side setback to adjoining property.

The Challenges are:

Type D - new houses that do not address the street

Type E - lot depth greater than 55m will create a series of long no-exit accessways.

Type E - sites are flat. Potential poor visual aspect and amenity values of the houses at the rear

Regular Shaped Lots - Avoid

Type F - narrow lot
street frontage: yes
lot frontage width: <13m
lot depth: <55m

Type G - narrow and long lot
street frontage: yes
lot frontage width: <13m
lot depth: >55m

Lot Types F and G can create poor quality residential intensification. Residential intensification should only occur if lots are amalgamated.

The benefits are:

Direct street frontage

The challenges are:

Lot frontage width is too narrow to enable appropriate side setbacks, accessways, and at least one dwelling to front the street

Lot frontage width can potentially compromise the correct orientation of living spaces and private open spaces to ensure solar access

Type G - lot depth greater than 55m will create a series of long no-exit accessways. Potential negative impact on connectivity

Type G - sites are flat. Potential poor visual aspect and amenity values of the houses at the rear

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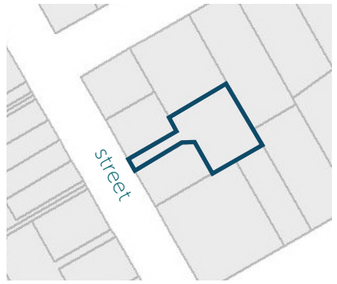
Analysis: Intensification

Lot Shapes for Residential Intensification

Regular Shaped Lots - Avoid



Type H - rear lot
street frontage: no
lot frontage width: variable
lot depth: variable

Type I - multiple rear lots - small
street frontage: no
lot frontage width: variable
lot depth: variable

Type J - multiple rear lots - large
street frontage: no
lot frontage width: variable
lot depth: variable

Lot Types H, I and J can create poor quality residential intensification. Residential intensification should only occur if lots are amalgamated.

Existing no-exit accessways should be linked or new streets and/or pedestrian ways should be provided when possible.

The benefits are:

Lots are regular in shape

The challenges are:

Lots with no frontage to the street

Sites are flat - potential poor visual aspect and amenity values of the houses at the rear

Types I and J - multiple rear lots will create a series of long no-exit accessways. Potential negative impact on connectivity

Irregular Shaped Lots - Challenging

Type K - L shaped lot
street frontage: yes
lot frontage width: >15m
lot depth: >55m

Lot Types K can create poor quality residential intensification. Site specific assessment criteria will be required.

The benefits are:

Direct street frontage

Street frontages greater than 18m wide enable at least two attached dwellings to face the street (assuming 6m wide building frontage per dwelling), a 4m wide (minimum) accessway with space for landscaping, and a side setback to adjoining property

Street frontages between 15m and 17m wide enable at least one dwelling to face the street, a 4m wide (minimum) accessway with space for landscaping, and a side setback to adjoining property

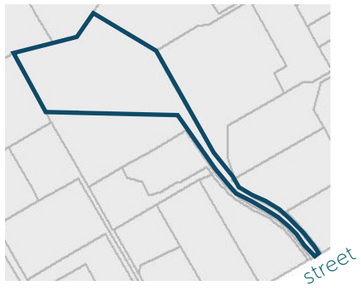
The challenges are:

Lot depth greater than 55m will create a series of long no-exit accessways. Potential negative impact on connectivity

Sites are flat - potential poor visual aspect and amenity values of the houses at the rear

Irregular Shaped Lots - Avoid

Type L - corner lot
street frontage: yes
lot frontage width: variable
lot depth: variable



Type M - rear lot
street frontage: no
lot frontage width: variable
lot depth: variable

Type N - triangular lot
street frontage: yes
lot frontage width: variable
lot depth: variable

Lot Types L, M and N can create poor quality residential intensification. Residential intensification should only occur if lots are amalgamated.

The benefits are:

Types L and N have direct street frontage

The challenges are:

Correct placement and orientation of buildings can be difficult due to the irregular shape of the lots

Site specific assessment criteria can be difficult due to the variance in shapes and dimensions

Type M - rear lot will create a series of long no-exit accessways. Potential negative impact on connectivity

Type M - sites are flat. Potential poor visual aspect and amenity values of the houses at the rear

09

Concepts: Intensification

Residential Intensification Quality

Feilding's urban quality and attractiveness as a place to live relies on providing a choice of housing with different market offerings to respond to the wide range of needs in the community - for today and into the future.

It is important that the quality of development is good as this influences quality of life including personal safety and health, accessibility to facilities and services, and costs of maintenance for example.

When considering intensification, careful planning and design to generate good quality is even more important than for standard forms of residential development. This is because people will live closer together and with higher density, more people stand to be affected by the quality than lower density development.

New Zealand now has various examples of good quality intensification and it is the living environment of choice for an increasing number of people. Feilding will need to develop its own forms of intensification that suit its character and the market there.

MDC will use the analysis and concepts in this strategic Framework Plan document to guide the development of District Plan provisions. The aim of the provisions will be to encourage intensification, but ensure the quality is good and that the resultant development makes a positive contribution to the town's development future.

The previous Section 8 identifies the locations and lot shapes that less well suited for urban intensification.

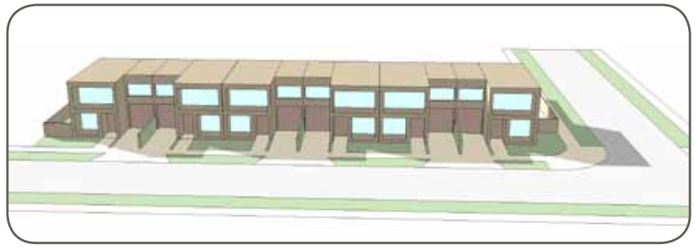
Section 9 describes concepts for intensification that would generate good quality living environments. These concepts are indicative only. As the urban growth strategy (Section 5) describes, the principles are for intensification to occur close to existing facilities and amenities including open space. As the previous Section 8 has described, there are some locations and lot shapes in Feilding that are less well suited to intensification and the implementation of the urban growth strategy will need to address these matters.

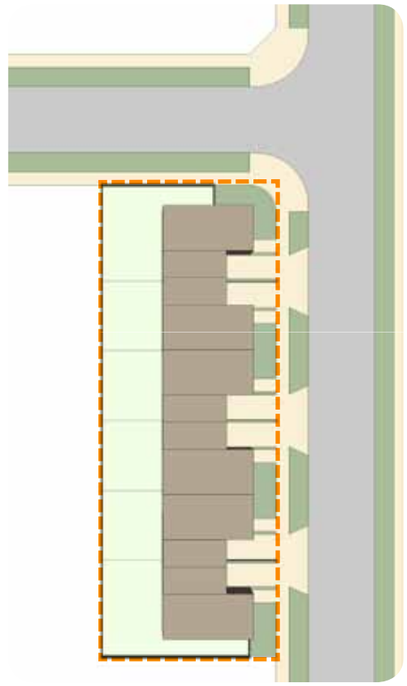
Attached Dwellings

Row houses | 6 units

Corner lot or shallow lot

Lot frontage width:	54m
Lot depth:	20m
Lot area:	1,080m^2
Street frontage:	yes (all)
Dwellings at rear:	none
Net density:	60dwl/ha
Average lot size/unit:	160m^2
Average unit size:	100m^2 (& 1 garage)
Height:	2 storeys
Vehicle access via:	street
Floor area ratio:	0.66
Site coverage:	39.5%
Average Private Open Space Area:	48m^2





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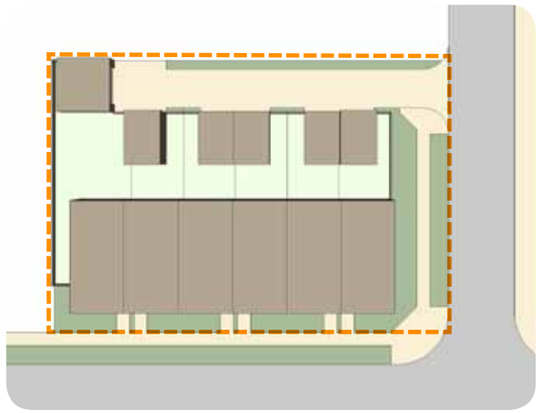
Concepts: Intensification

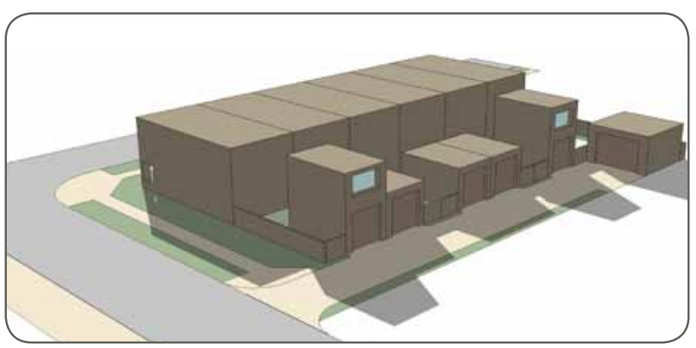
Attached Dwellings

Row houses rearlane | 6 units

Corner lot

Lot frontage width:	50m
Lot depth:	35m
Lot area:	1,750m^2
Street frontage:	yes (all)
Dwellings at rear:	none
Net density:	34dwl/ha
Average lot size/unit:	155m^2
Average unit size:	150m^2 (& 1 garage)
Height:	2 storeys
Vehicle access via:	rear lane
Floor area ratio:	0.60
Site coverage:	35%
Average Private Open Space Area:	35m^2





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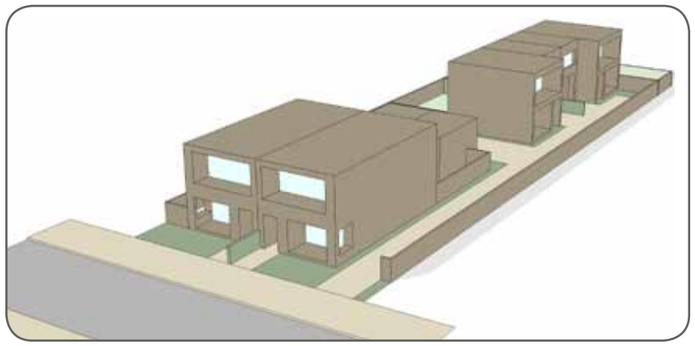
Concepts: Intensification

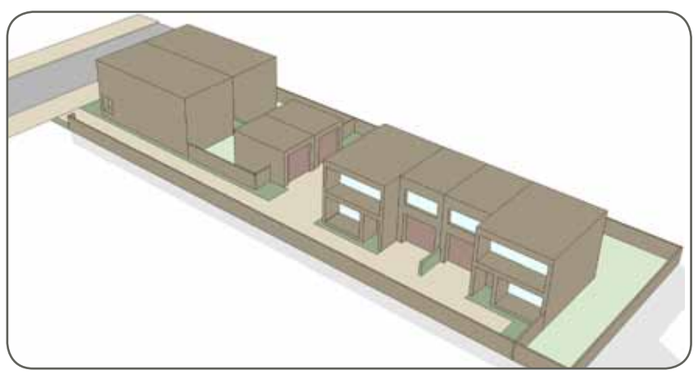
Semi-detached Dwellings

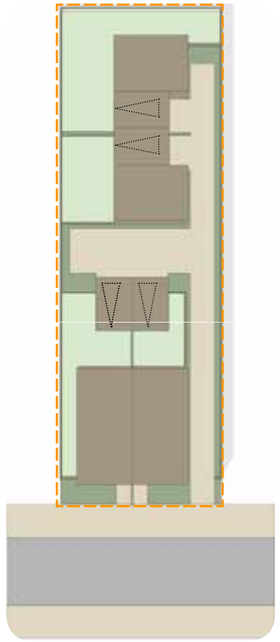
Duplex side-by-side | 4 units

Standard lot

Lot frontage width:	18m
Lot depth:	55m
Lot area:	990m^2
Street frontage:	yes (2)
Dwellings at rear:	yes (2)
Net density:	40dwl/ha
Average lot size/unit:	150m^2
Average unit size:	120m^2 (& 1 garage)
Height:	2 storeys
Vehicle access via:	accessway
Floor area ratio:	0.58
Site coverage:	35%
Average Private Open Space Area:	40m^2







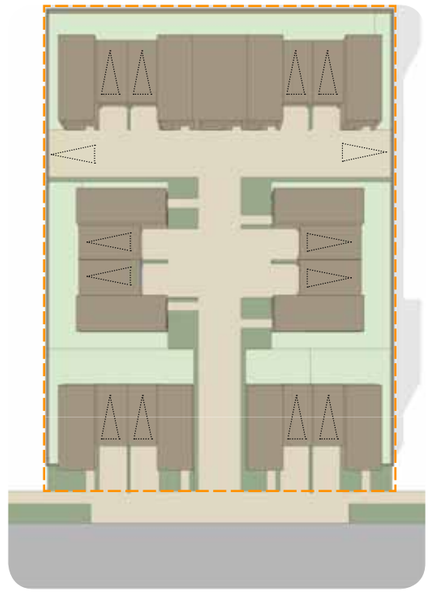
09
Concepts: Intensification

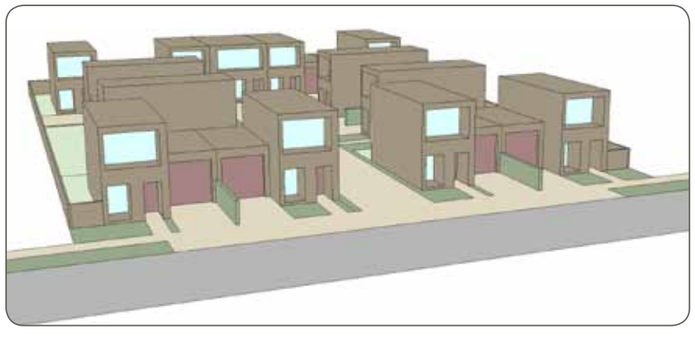
Semi-detached Dwellings

Duplex side-by-side | 8 units
Row houses | 5 units

Standard lot

Lot frontage width:	40m
Lot depth:	55m
Lot area:	2,2000m^2
Street frontage:	yes (4)
Dwellings at rear:	yes (9)
Net density:	60dwl/ha
Average lot size/unit:	170m^2
Average unit size:	105m^2 (& 1 garage)
Height:	2 storeys
Vehicle access via:	street & accessway
Floor area ratio:	0.62
Site coverage:	40%
Average Private Open Space Area:	55m^2





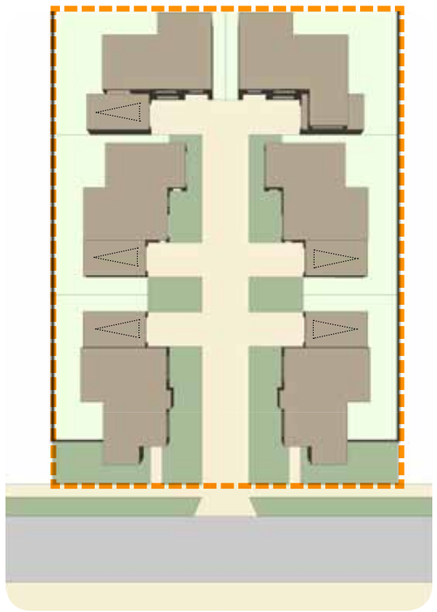
09
Concepts: Intensification

Detached Dwellings

Narrow house | 6 units

Standard lot

Lot frontage width:	40m
Lot depth:	55m
Lot area:	2,2000m^2
Street frontage:	yes (2)
Dwellings at rear:	yes (4)
Net density:	27dwl/ha
Average lot size/unit:	350m^2
Average unit size:	100 to 200m^2 (& 1 garage)
Height:	1 to 2 storeys
Vehicle access via:	accessway
Floor area ratio:	0.52
Site coverage:	34%
Average Private Open Space Area:	90m^2



10
Implementation

Actions

The Framework Plan Introduction (Section 1) describes the relationship between various planing documents produced by MDC. As noted in Section 1, the Framework Plan is not a statutory document - it provides a strategy only. As a strategy it requires a range of other actions to implement it. Those actions are set out below:

Action	Timing	Who
1. Formally adopt the Feilding Urban Growth Framework Plan (May 2013) with it attendant spatial planning principles as its strategy for directing urban growth into the future	May 2013	MDC
2. Draft Manawatu District Plan Changes that provide for the Framework Plan spatial planning and design principles through a series of Structure Plans, Design Guidelines and District Plan objectives, policies and rules.	2012/ 2013	MDC and advisers
3. Consult with landowners in principal growth areas to determine constraints and opportunities	2012	MDC and landowners
4. Include in Action 2 provision for the staged release for the edge growth areas to recognise the project current demand, the need for flexibility in release and the MDC service provision programme	2012/ 2013	MDC and advisers
5. Engage expert engineering advice to confirm by assessment suitability of the structure plan areas and any matters that may affect urban growth in these locations	2013	MDC and advisers
6. Review and adjust as required Financial Contributions requirements and/or Asset Plans to reflect the infrastructure supply (including open spaces) requirements generated by the growth areas	2013	MDC and advisers
7. Confirm District Plan Changes documentation and publicly notify for submissions as required under RMA statute	2013	MDC
8. Review submissions, undertake hearings and makes decisions under RMA statute		MDC, advisers and community
9. Manage process of land development making approve or decline decisions on subdivision applications using the Framework Plan as background and the new provisions of the District Plan to guide the quality of design		MDC, advisers and community
10. Monitor the quality of development and the growth rates to gauge the need for release of further land or changes to design provisions or their application to development proposals		MDC