

***Appendix 1 - Taraika Master Plan***



# Taraika Master Plan

Horowhenua District Council

**Prepared for**

Horowhenua District Council

**Prepared by**

Local Landscape Architecture Collective

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# Introduction

The Taraika Master Plan is a comprehensive blueprint for residential growth in Taraika. It defines the location of key roads and pedestrian /cycle connections, parks and a village centre. It sets aside an area of open space adjacent to the village centre that could be used for an education site as the community grows. In addition to this the Master Plan also sets out guidance on housing types, property sizes, stormwater management and street design.

The Taraika Master Plan will help to ensure new development is well designed, co-ordinated and connected to the rest of Taitoko/Levin, while allowing enough flexibility to ensure it can adapt to changing market and community demands over time.

The Master Plan includes key design principles (objectives) and a spatial plan. These have informed the District Plan rules that will apply in the area. It is envisioned that all development proposals within the Master Plan area will be consistent with this Master Plan.

## Project Background

Horowhenua District Council (Council) first identified Taraika as a growth area in 2008. Initially, Council anticipated rural lifestyle development within the area. However, the District has since begun to experience rapid population growth, leading to Council to prepare the Horowhenua Growth Strategy 2040, which determines where and how the District will grow. The Growth Strategy identified that given the current growth projections, Taraika should develop at an urban residential scale. This instigated the Master Plan process.

The community outcomes identified within the Council's Long Term Plan 2018-2038 have informed the Master Plan. These outcomes are:





## Important Considerations

### Location

Taraika is located immediately south east of Levin, enabling the easy extension of infrastructure and ensuring that future residents are close to jobs, shops, and services. The area should be developed as an extension of the town not as a standalone community. The development of Taraika therefore should complement and reinforce the existing town's facilities and services, provide links to the town centre to reinforce its vitality and the wider town's growth. To achieve this of Taraika needs to be well connected to Levin and the surrounding amenities.

### Land characteristics

The land is considered suitable for development for a range of reasons. The area has the status of *Land Use Class 3* and constraints on its usability due to presence of stony soils at the surface. Concentrating development in this area supports the protection of other higher class agricultural soils provided by the current Horowhenua District Plan. In addition it is largely flat and not subject to any known natural hazard.

### O2NL / State Highway Network

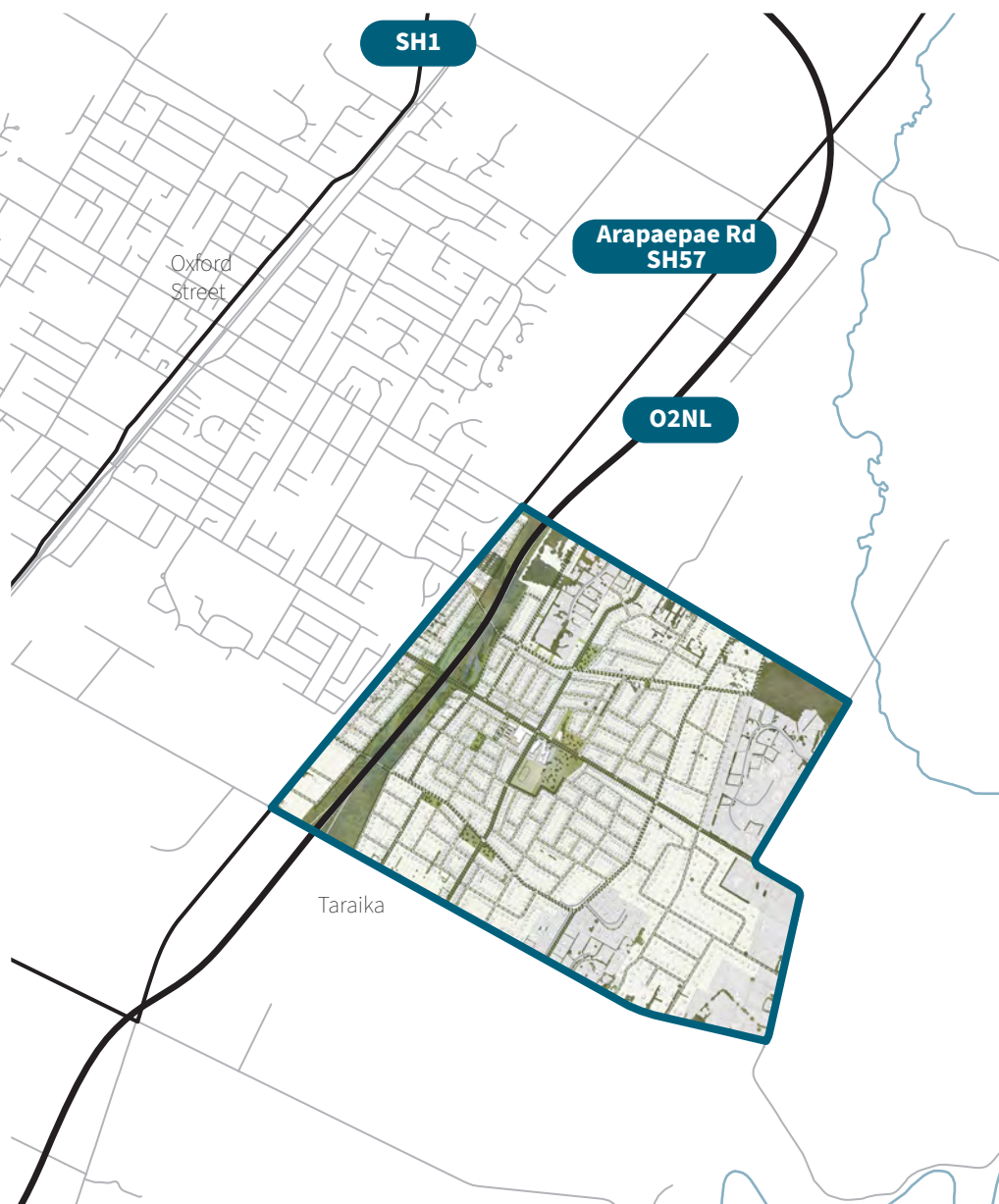
Taraika is immediately east of State Highway 57, with the main access into Levin being via the busy and dangerous State Highway 57/Queen Street intersection. The Otaki to North of Levin expressway corridor (O2NL) also traverses the development area. While O2NL will bring massive safety benefits for the

whole community, a key factor in preparing the Master Plan was how to manage effects arising from the expressway.

Furthermore, it will be several years before O2NL is completed. Taraika will begin developing long before this, resulting in additional traffic passing through the State Highway 57/Queen Street intersection. This means interim safety improvements such as a roundabout will be required in the immediate future.

### Implementation and delivery

The Taraika area is currently home to a number of large and small properties. The Plan needs to respond to these homes and land patterns and allow for development by a number of different landowners to occur incrementally over time. Taraika is Levin's most significant planned growth area and is expected to meet a large proportion of Levin's future housing demand.



# The Vision



*Taraika will transform into a thriving part of a growing Levin. It will provide the community with a choice of house types and living options, with excellent connections to Levin's town centre and the region's attractions. A network of leafy green streets and shared paths will provide residents with easy access to local facilities such as shops, parks, and education services at the centre of the community.*

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# Key Moves

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## 1. Connectivity

Ensure a high level of internal and external connectivity for good local access and multi-modal movement.

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## 2. Streets for people

Create a high-quality streetscape environment for pedestrians and cyclists as an attractive setting for urban life.

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## 3. Variety and choice of housing

Provide for housing diversity with a range of lot sizes from small urban to large rural-residential lots, with smallest lots and highest intensity in high amenity locations closest to the centre.

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## 4. A centre for the community

Local service retail, education and recreational open space facilities as a focus of community.

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## 5. Distinctive and memorable character

High streetscape quality and public space amenity to give a unique and memorable identity that assists legibility and complements but does not replicate existing urban development.

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## 6. A network of parks and open space

Distributed public open spaces and recreational paths are readily accessible within all local neighbourhoods.

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## 7. Stormwater and ecology

Urban ecology and environmentally sustainable stormwater management achieved by integrating wetlands and raingardens into public spaces.

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## 8. Integrated services infrastructure

Connection with existing and planned services networks, and the staged roll-out of new services.

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## 9. Planning for staged implementation

Coordination of structure, space and connections with current land ownership to enable gradual release of existing land, and ensure access is possible to all landholdings and development.

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# The Plan









# 1.

## Connectivity

**Good connectivity means providing easy, safe, and efficient transport options, for both vehicles and people walking or cycling.**

**Taraika presents an opportunity to plan the street network to provide for this at the outset and to ensure a connected network is achieved. The Master Plan achieves this by locking in the primary and secondary roads and cycle connections.**

### Internal Connections

#### Design Principle

**A logical and coherent interconnected network of streets and movement links.**

To achieve this, the Master Plan includes:

- Short street blocks to encourage walking and to provide a variety of different routes – in urban areas, blocks will generally be 60-100 metres across and no more than 200 metres long.
- A 'deformed' grid road layout. Grid networks provide multiple route options, making wayfinding easy. 'Deformed' street layouts (e.g. roads with curves) assist with slowing and calming traffic.
- Minimal use of cul-de-sacs.

### External Connections

#### Design Principle

**Roading connections to all areas in Taraika, Levin, and to future urban growth areas.**

To achieve this, the Master Plan includes:

- High-quality roads, walking paths and cycleways that connect to the rest of Levin, including to Liverpool Street, Queen Street and Arapaepae Road.
- Accessible links to existing open space networks including Waiopahu Reserve and the Trig Walkway to the east.
- Connections into existing pathways and cycle lanes.
- Intersections are to be designed to ensure safe movements for vehicles,

and people on foot or cycling. The use of roundabouts will be minimised to key intersections to aid movement and wayfinding.

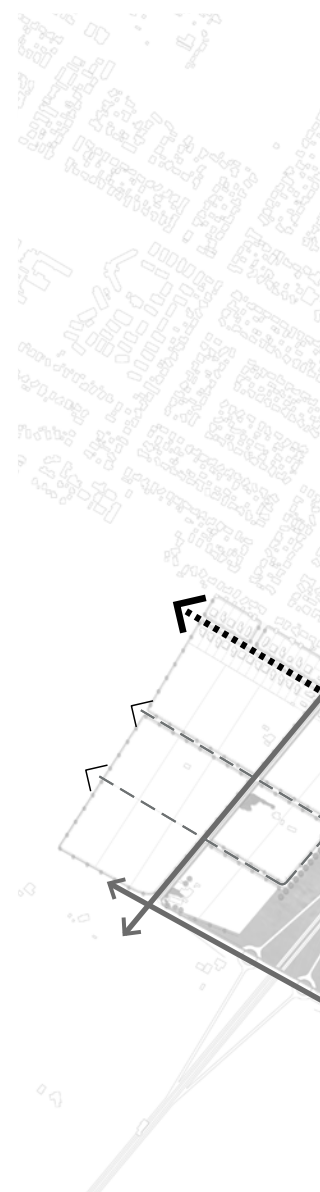
- Connections into existing rural-residential streets and future development areas wherever possible.

#### Design Principle

**Integration with O2NL alignment.**

To achieve this, the Master Plan includes:

Multiple connections across the expressway including three street crossings, and two cycle/ pedestrian bridges.



Horowhenua Growth Strategy growth management principles:

**“Address in any new growth areas the potentially disconnecting influence of main roads/highways either current or future-planned.”**

(page 24)



#### Design Principle

##### Integration with Arapaepae Rd (SH57).

To achieve this, the Master Plan includes:

- Safety improvements at the Queen Street/SH 57 intersection.
- Key connections across SH57 to ensure it is a connector, not a divider.
- Intersections that allow for safe and convenient movement of pedestrians and cycles.

#### Design Principle

##### Plan for public transport in the future.

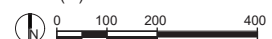
To achieve this, the Master Plan includes:

- A hierarchical system of interconnected streets with sufficient width to allow for an efficient local public transport network.

#### Key

- Existing road
- Arterial road
- - Collector road
- ... Local road
- ..... Laneway
- Existing cycle path
- Strategic Cycleways

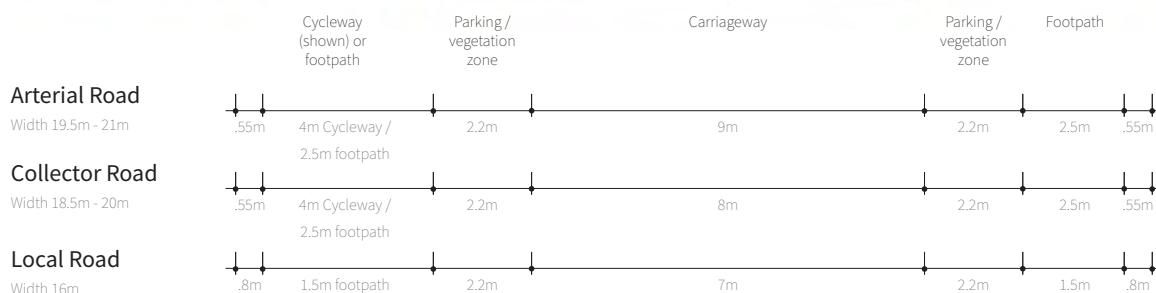
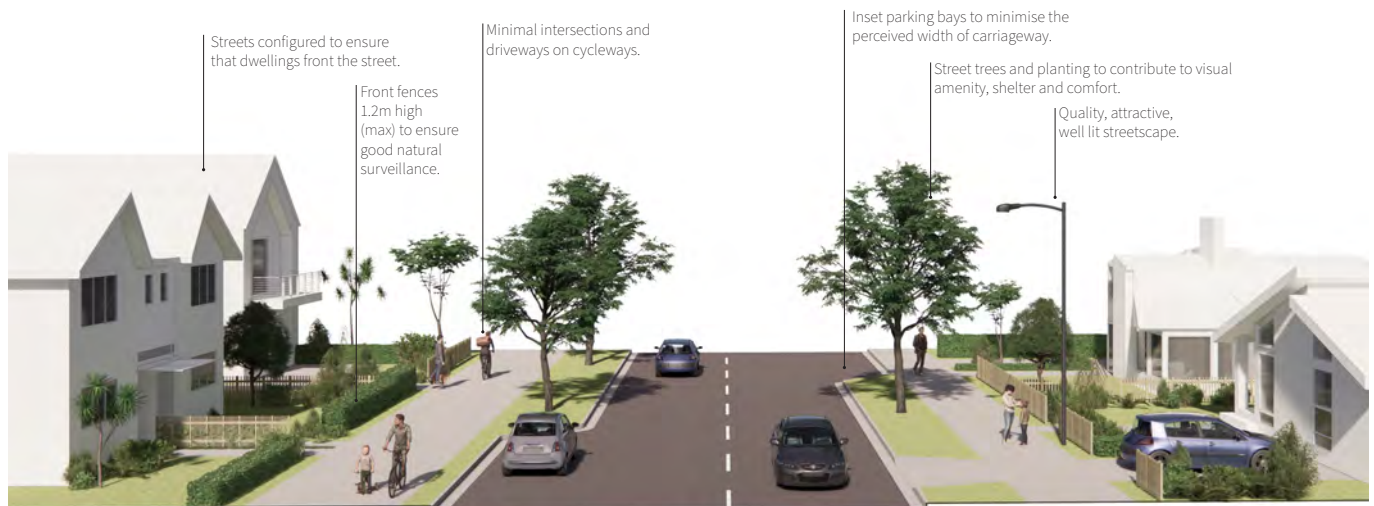
Scale (m)



# 2.

## Streets for people

**A high-quality streetscape will create a safe and comfortable environment attractive to pedestrians and cyclists. As a backdrop to urban life, positive visual and landscape attributes contribute to the quality of the setting and outlook from people's homes, encouraging natural surveillance and a sense of community.**



**Note** Laneways to be shared spaces with a carriageway of 6m



Horowhenua Growth Strategy growth management principles:

- **Provide safe and comfortable streets for walkers, cyclists, cars and other transport.**
- **Provide for walking and cycling as healthy, sustainable and affordable ways of moving around.**
- **Ensure streets are interconnected to assist with efficient movements, walkability and way finding.**
- **Improve the use of street trees to provide scale, shade, visual amenity and definition of street hierarchy.**
- **Establish clear hierarchies in street design of arterial roads (e.g. State Highway), primary roads, local traffic to collector roads and residential traffic to neighbourhood access streets.**
- **Encourage the transport system to provide adequately for the community's long term transport needs.**
- **Recognise the influence of State Highways economically to the settlements and of the railway for movement of people and goods for the future.**
- **Encourage through urban development areas increased viability for public transport.**



#### Design Principle

**An environment that encourages the community's health and wellbeing making walking and cycling safe, easy, and fun.**

#### To achieve this, the Master Plan includes:

- Cycleways along major transport routes, connecting key features such as commercial area, parks, and future community services.
- Connections to the existing and planned town-wide cycleway network.
- Quality, attractive, well lit streetscape to encourage walking and cycling.
- Street trees and planting to contribute to visual amenity, shelter and comfort.

#### Design Principle

**Public accessibility and safety.**

#### To achieve this, the Master Plan includes:

- Minimal intersections and driveways on cycleways, to reduce potential risks between cyclists and cars - using rear lane access to lots facing these cycleways wherever appropriate.
- Streets and their related lots that are configured to ensure that dwellings front the street. This contributes to visual interest and amenity along the street edge as well as providing the natural surveillance that contributes to safety and security.

#### Design Principle

**Coordinate with the requirements for Arapaepae Road (SH57)**

#### To achieve this, the Master Plan includes:

- Modification of Arapaepae Road to be an urban arterial following construction of the expressway.
- Positive street frontage and quality streetscape along Arapaepae Road with a combination of boulevard treatment and district plan controls on frontages.
- Building frontages and a streetscape treatment along Arapaepae Road to ensure it gives the appearance of entering a residential environment.



# 3.

## Variety and choice of housing

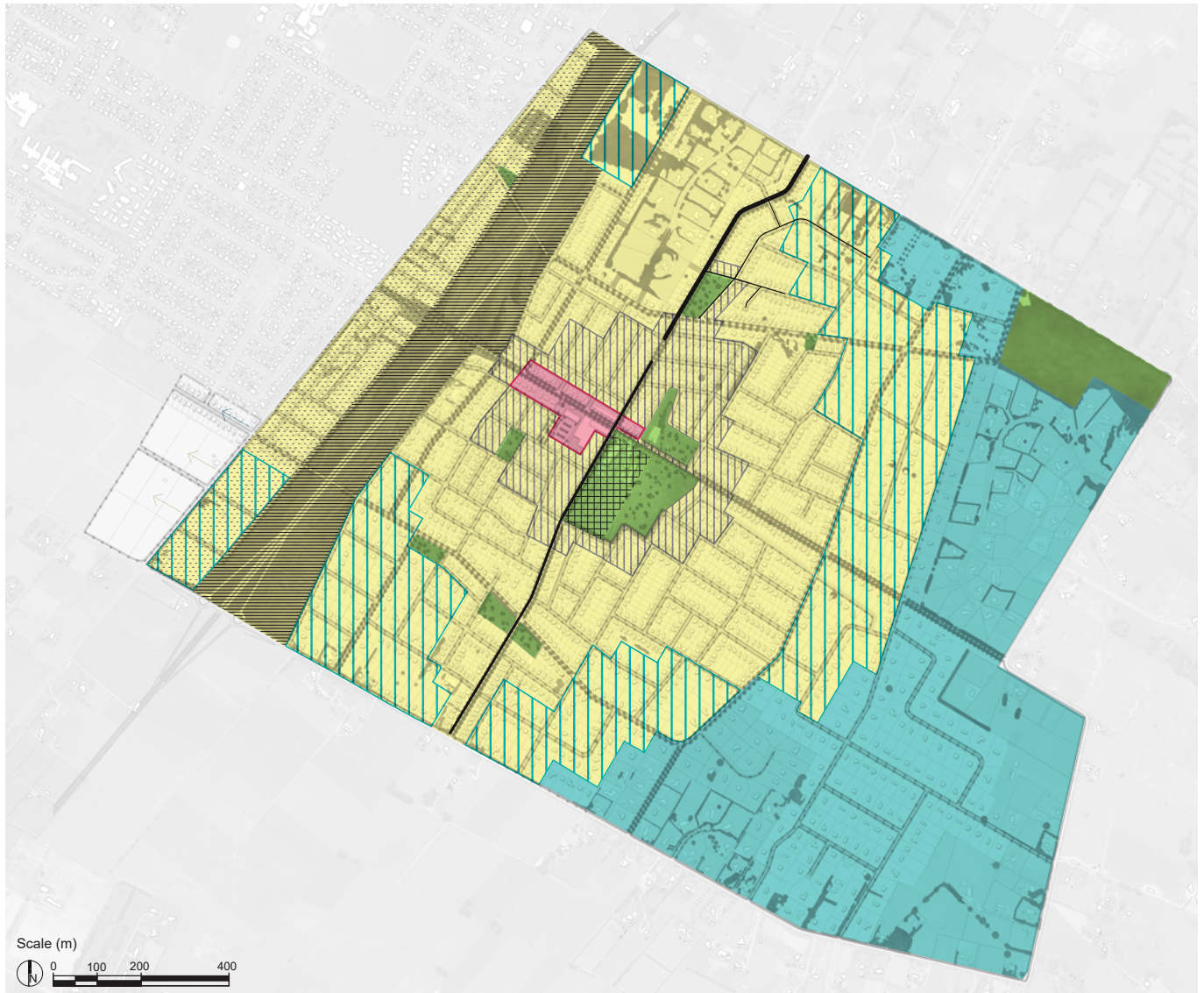
**Taraika will provide a variety of housing options as part of an integrated and inclusive neighbourhood. The smallest / highest density housing will be located near to the village centre, where there is easy access to key facilities (e.g. shops, parks and reserves), transitioning to lower density and existing rural-residential lots further from the centre.**



Horowhenua Growth Strategy growth management principles:

**Provide housing choice - range of lot sizes/densities. Higher densities around centres (e.g. 25-50dw/ha) and larger lots at edges.**

**Recognise and provide affordable housing choices for people with a low income.**



## Design Principle

### Choice and variety of housing types.

To achieve this, the Master Plan includes:

- A mix of housing types and sizes that caters to a wide cross section of the community.
- A variety of lot sizes, with smaller lots at the centre and large rural residential lots at the periphery.
- A street network that generates an efficient block depth appropriate to the housing type and densities.
- Provisions for high quality streets and medium density development between Arapaepae Road (SH57) and the expressway to ensure integration of the new housing and eastern Levin.

## Key

- Commercial
- Education Overlay
- Arapaepae Rd special effects overlay
- O2NL Corridor
- Medium density Residential
- Residential
- Low density Residential
- Greenbelt Residential
- Open Space



# 4.



## A centre for the community

**There will be a centre with local service retail, education, and recreational open space. These facilities will become a focus for neighbourhood and community.**





Carlton North, Melbourne



Coffee House, Nove Mesto nad Vahom



Browns Bay New World, Auckland



King's Cross, London



Cringleford Primary, Norfolk

## Design Principle

**Local community and educational services at the centre.**

To achieve this, the Master Plan includes:

- Provision for future education or community services at the centre of Taraika where they are easily accessible and near to other services and facilities, creating a hub for the community.
- Encourage non-Council community infrastructure to form part of the public open space network to allow the community better use of the parks.

## Design Principle

**Enable a neighbourhood commercial centre that will provide a hub for the community and serve their day to day needs, in a manner that does not compete with Levin Town Centre.**

To achieve this, the Master Plan includes:

- A neighbourhood commercial centre located at the centre of the development to support commercial viability and be readily accessible to the community.
- Some flexibility to ensure the centre is adaptable to cater for changing feasibility and community needs.

- Ample street-side parking, complemented by a shared on-site car park behind the village centre to reduce the overall dominance of parking in the area.
- Enable social, educational and amenity services as well as small scale retail to establish within the neighbourhood commercial centre.
- Ensure the centre is of a quality design, to make it an attractive place to spend time.

# 5.

## Distinctive and memorable character



**Taraika will have a distinctive character that recognises and protects the unique heritage of the area, as well as the special landscape values derived from views of the Tararua Ranges.**

### Design Principle

Distinctive character that is well-designed and complementary to adjoining areas.

To achieve this, the Master Plan includes:

- Clear thresholds and a design treatment and landscaping along Arapaepae Road/ SH57 that signals entry to a residential area. Use similar landscaping and design elements along key roads across the development area.
- The design of streets, parks and reserves to have a consistent palette of materials



Horowhenua Growth Strategy growth management principles:

**Utilise natural landscape features to guide the pattern of development and retain features that contribute to ‘sense of place’.**



and plants relating to the Levin's natural and cultural context.

- Distinctive streets orientated and positioned to take advantage of local features and views of the Tararua ranges.

#### Design Principle

**A distinctive identity for individual neighbourhoods.**

**To achieve this, the Master Plan includes:**

- Neighbourhood-scale character areas with open spaces at their centre.

#### Design Principle

**Easy navigation and wayfinding.**

**To achieve this, the Master Plan includes:**

- A combination of street network connectivity, streetscape hierarchy and memorable local variation.
- Expression of hierarchy including consistency along main arterial streets
- Inclusion of memorable local features and variation relating to variation in uses along the street edge.

#### Design Principle

**Retention, celebration and protect of cultural, heritage and landscape values.**

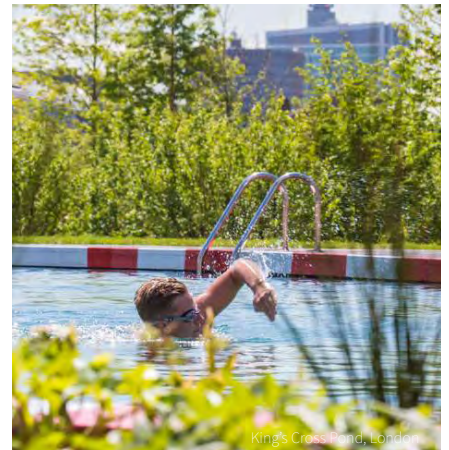
**This is achieved with:**

- Identify and protect the Maunu Wahine refuge and Waihau waterhole.
- Protect the rural setting of the Prouse Homestead.
- Recognise and celebrate the history of the area through steps such as street and reserve naming.
- Locate key roads to follow historic land and vegetation patterns and to emphasise views.

# 6.

## A network of parks and open space

**Taraika will provide a distributed network of public open spaces that integrates stormwater treatment and recreational paths, and ensures passive and active recreational open space is readily accessible within all local neighbourhoods.**



### Design Principle

A fit-for-purpose network of open space distributed across the development area, which provides a variety of recreational opportunities for the Taraika community as well as the rest of the District.

### To achieve this, the Master Plan includes:

- The primary public open space (A) for Taraika will be located alongside the neighbourhood commercial centre,

potentially co-located with services that will support the needs of the new community, with smaller parks distributed throughout the development area (B).

- Minimum of 2ha of useable recreational space per 1000 people.
- Public open spaces with play or recreational areas within 800m of all dwellings.
- Lots and streets designed to front houses towards parks and reserves and



#### Open Space Principles

- **Provide for the formal and informal recreational needs of people in towns – sports and casual use.**
- **Provide for definition to the neighbourhoods by local parks and linkages, such as along waterways.**
- **Maintain a low density of development and thus more open landscape around towns to define the urban/rural boundary and to protect the versatility of productive rural land.**
- **Provide a linked network of open space for alternative movement network for walkers, recreational use, and ecological corridors.**
- **Recognise the natural values in the hills, plains and coastal environments and the recreational opportunities in these.**
- **Ensure that public open space is safe and comfortable for public use.**



provide natural surveillance over them to contribute to safety.

#### Design Principle

**Open spaces designed to provide positive environmental outcomes.**

#### To achieve this, the Master Plan includes:

- Open spaces are to be designed to provide recreational, stormwater and ecological benefits.
- Preserve vegetation and ecological areas

near the Prouse Homestead

- Prioritise use of native planting over exotic plants within the open spaces to provide habitats that encourage native fauna.
- Provide pedestrian and cycle access and ecological corridor links from Taraika to Waiopahu Reserve.

#### Design Principle

**Provide community activities and recreational opportunities for all**

**Horowhenua residents and visitors.**

#### To achieve this, the Master Plan includes:

- A diverse range of local and destination activities and environments for all ages.
- A recreational network that extends and complements the town's existing facilities including continuation of the existing cycle path network, and extension of new connections to Waiopahu Reserve and towards the trig walkway.

# 7.

## Stormwater and ecology

**Stormwater shall be managed onsite at a range of scales from individual lots through to a wider development scale. All infiltrated flows will receive water quality treatment prior to discharge or be solely from low contaminant surfaces such as roofs. A key objective of the stormwater management approach is to manage the quantity and quality of stormwater runoff to avoid further degradation of water quality in Waipunahau/Lake Horowhenua. This is very important given the value this environment holds for mana whenua and the wider community.**

### Design Principle

**Implement principles of water sensitive urban design.**

To achieve this, the Master Plan includes:

- An integrated approach to stormwater management to protect downstream environments and enhance amenity.
- Open space that is located in co-ordination with stormwater management to support community and environmental health and wellbeing.
- Recommendations to explore the use of rainwater collection tanks, to contribute to both stormwater management and water demand reduction.

- Recommendations to explore use of water meters in order to reduce water consumption.

### Design Principle

**Design to both improve the quality of stormwater and to retain stormwater onsite, to the greatest extent possible.**

To achieve this, the Master Plan includes:

- Where possible, retain and treat stormwater onsite.
- Larger residential lots will be encouraged to include rainwater tanks for the capture of roof runoff. To be used for internal non-

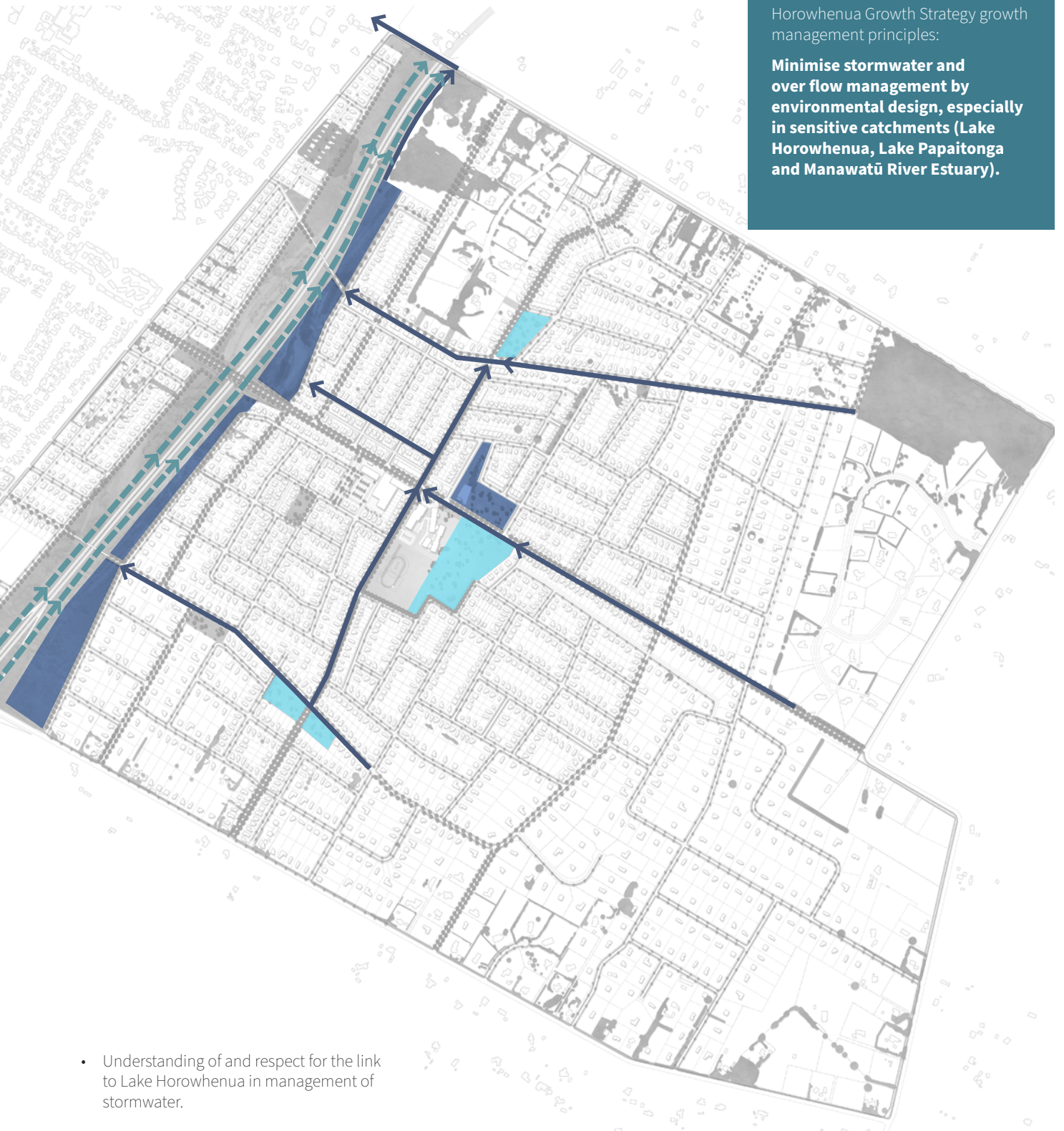
potable demands and external uses such as garden watering.

- Overflow from rainwater tanks and runoff from paved surfaces (except driveways and other trafficable surfaces) shall discharge to soak pits where possible.
- Integrate stormwater treatment into open spaces and streets.
- Use landscape buffers alongside the expressway to manage and treat stormwater.
- Design stormwater management approach to accommodate predicted climate change.



Horowhenua Growth Strategy growth management principles:

**Minimise stormwater and over flow management by environmental design, especially in sensitive catchments (Lake Horowhenua, Lake Papaitonga and Manawātū River Estuary).**



- Understanding of and respect for the link to Lake Horowhenua in management of stormwater.

#### Design Principle

**Infrastructure is feasible and affordable.**

To achieve this, the Master Plan includes:

- Extension of existing water and wastewater infrastructure that is future proofed with sufficient capacity.
- Road layouts that allow for extension of services.

#### Design Principle

**Ngā Wai Ora & Rangatiratanga**

To achieve this, the Master Plan includes:

- Provision for the active involvement of Tangata Whenua in the stormwater management design to ensure that freshwater, waterways, and springs are protected.

#### Key

- Wetland Areas
- Integrated detention & open spaces
- Overland flow paths
- - - Infiltration swales/bypass

Scale (m)





# 8.

## Integrated water and waste water infrastructure

**The development of Taraika requires a coordinated response to services to ensure existing planned service networks are efficient and manageable over time. Connection to existing and planned services are set out in the Infrastructure Plan that supports this Master Plan.**

### Design Principle

Infrastructure is feasible and affordable.

To achieve this, the Master Plan includes:

- Extension of existing water and wastewater infrastructure that is future proofed with sufficient capacity.
- Road layouts that allow for extension of services.
- The primary network maximises the ability of landowners to initiate development independent of neighbouring properties for service connections.

Horowhenua Growth Strategy growth management principles:

**Provide water, sewer, stormwater to an adequate standard to reflect Council strategies.**

**Plan and develop infrastructure which minimises energy use, discourages emissions, and reduces waste.**

**Minimise stormwater and over flow management by environmental design, especially in sensitive catchments (Lake Horowhenua, Lake Papaitonga and Manawatū River Estuary).**

**In non-reticulated areas, adopt best practice solutions for on-site disposal of wastewater and the supply of portable water.**

Scale (m)



### Key

- Primary water network
- Secondary water network
- Primary sewer mains

# 9.

## Planning for staged implementation

**This masterplan is intended to guide coordinated development within Taraika. To successfully achieve this a number of consistent elements are essential across all development stages. These will be accomplished through a number of key process and responses set out here.**

### Structure Plan

The spatial plan within this Master Plan will be used to create a Structure Plan for inclusion in the District Plan. The Structure Plan will identify the location of key features such as arterial and collector roads, parks and reserves, and require developers to provide for these when they subdivide/develop.

### District Plan

A Plan Change to the Horowhenua District Plan will rezone the land and enable the type of development anticipated by the Master Plan. This will result in the inclusion of new objectives, policies, and rules to enable and to ensure development is consistent with the Master Plan and Design Principles.

### Infrastructure Plan

The Infrastructure Plan that supports this Master Plan sets out:

- Stormwater Management Approach
- Water Supply
- Waste Water
- Roding Layout.

### Connectivity

The Master Plan requires developers to construct arterial and collector roads and cycleways in or near to the locations identified within the Master Plan and supporting Structure Plan. This will ensure the intended function is delivered, and is consistent with the typologies identified by the Master Plan.

Developers are required to deliver an interconnected network of local streets and rear access lanes as or in general accordance with the layout on the Master Plan. There is flexibility within the Master Plan, as long as overall the connectivity intent is protected.

Variation in street typology may be acceptable so long as it is consistent with the intent of the master plan, and will achieve plan objectives in a localised area.

### Streetscape

The Master Plan show the proposed dimensions and design of streets and associated vegetation. Subdivision and development will need to provide these in the manner shown on the Master and Structure Plans. Council will only consider variations when there is strong justification to do so, subject to an assessment of the potential impact on the Taraika area as a whole.

### Open space

Subdivision and development is required to provide public open space in the locations, and of a size and shape as shown on the Master and Structure Plans. Council will only consider variations when there is strong justification to do so, subject to an assessment of the potential impact on the Taraika area as a whole.

### Lot Layout and Design

All lots within the medium density and residential areas should front the street or public open space, with rear lots representing only a minor proportion (i.e. less than 5%) of any development.

Lot size and housing density will be largely consistent with the Master Plan. This means that smaller lots will be near the neighbourhood centre. Large lots (suitable for rural residential properties) are not anticipated in this location and will be located at the periphery of the development.





***Appendix 2 - Taraika Master Plan Design Rationale***



# Taraika

Design Rationale

Horowhenua District Council



**Prepared for**  
Horowhenua District Council

**Prepared by**  
Local Landscape Architecture Collective  
McIndoe Urban Ltd.

**Document Issue**  
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# Design Rationale

The Tariaka Master Plan is described in full in *Tariaka Master Plan* and the research and analysis that informs it in *Tariaka Master Plan : Background and Process*. The Master Plan is based on a set of key moves that will achieve an integrated, sustainable and high-quality urban environment. These moves are:

- **Connectivity**  
Ensure a high level of internal and external connectivity for good local access and multi-modal movement.
- **Streets for people**  
Create a high-quality streetscape environment for pedestrians and cyclists as an attractive setting for urban life.
- **Variety and choice of housing**  
Provide for housing diversity with a range of lot sizes from small urban to large rural-residential lots, with smallest lots and highest intensity in high amenity locations closest to the centre.
- **A centre for the community**  
Local service retail, education and recreational open space facilities as a focus of community.
- **Distinctive and memorable character**  
High streetscape quality and public space amenity to give a unique and memorable identity that assists legibility and complements but does not replicate existing urban development.
- **A network of parks and open space**  
Distributed public open spaces and recreational paths are readily accessible within all local neighbourhoods.
- **Stormwater and ecology**  
Urban ecology and environmentally sustainable stormwater management achieved by integrating wetlands and raingardens into public spaces.
- **Integrated services infrastructure**  
Connection with existing and planned services networks, and the staged roll-out of new services.
- **Planning for staged implementation**  
Coordination of structure, space and connections with current land ownership to enable gradual release of existing land, and ensure access is possible to all landholdings and development.

Following these key design moves the Master Plan aims to create a high-quality neighbourhood with the qualities, services and facilities that will support communities and be an attractive place to live. This Design Rationale document provides a summary of the analysis and rationale behind some of the features of the Master Plan. These features are described in further detail within *Tariaka Master Plan*.



## Location of the neighbourhood centre

There will be a centre with local service retail, education, and recreational open space. These facilities will become a focus for neighbourhood and community.

The centre is located at the heart of the new neighbourhood at the intersection of two major cross streets. It provides for community facilities including an education site, a large area of green open space, as well as local shops and supermarket. Its central location and the fine grained network of connecting streets here makes the centre readily accessible for people on foot or on a cycle, as well as in cars, and by planned future public transport. The area around the centre is highly walkable, and the easy access to services, amenities and open space here make this an attractive place to live and a suitable location for smaller lots and more intensive housing.

Factors which influenced the location of the neighbourhood centre included:

- Its accessibility as a centre for essential local services and community hub within this new neighbourhood;
- Creating strong direct connections to the wider catchment outside of Taraika;
- The location of the O2NL Levin bypass/motorway; and
- The desired centre build date, with the intention that the earlier the centre is constructed, the better serviced the neighbourhood will be.

A number of different locations were considered, taking the above into account.

### Alternative centre location considered and discounted

An alternative centre location close to the edge of SH57/Arapaepae Road was considered. This would have put the centre within the catchment of South East Levin, serving this existing residential area as well as Taraika. A neighbourhood centre and community facilities in this location would have also benefitted from movement to and along SH57/Arapaepae Road and with this existing demand base, could have been expected to be established earlier. However this potential location was discounted when NZTA chose the route of the O2NL expressway which would have severed a centre in this alternative location from the new neighbourhood it is primarily intended to serve.

Because there is no existing residential catchment to be served by the centre described in the Master Plan, that is likely to be established later and will be smaller than it might have been if close to SH57/Arapaepae Road.



Previous iteration of the master plan showing alternative centre location



Previous iteration of the master plan showing chosen centre location

## Location and size of parks and reserves

A fit-for-purpose, safe and maintainable network of open space that provide a variety of recreational opportunities for the Taraika community, is readily accessible to all, and meets Council open space expectations.

- Parks and reserves are located to ensure all dwellings in the general residential areas are not more than 800m or a 10 minute walk away from a play or recreational area.
- The total area of parks and reserves is based on meeting a standard of a minimum of 2ha of useable recreational space per 1000 people. This minimum standard is applied across Levin.
- The parks and reserves are also an important part of the stormwater management plan. The size and location of these spaces has been designed to work with the natural fall across the site, and the network includes wetlands as well as integrated detention and open space areas used to detain stormwater during heavy rain events.





## Interconnected street network

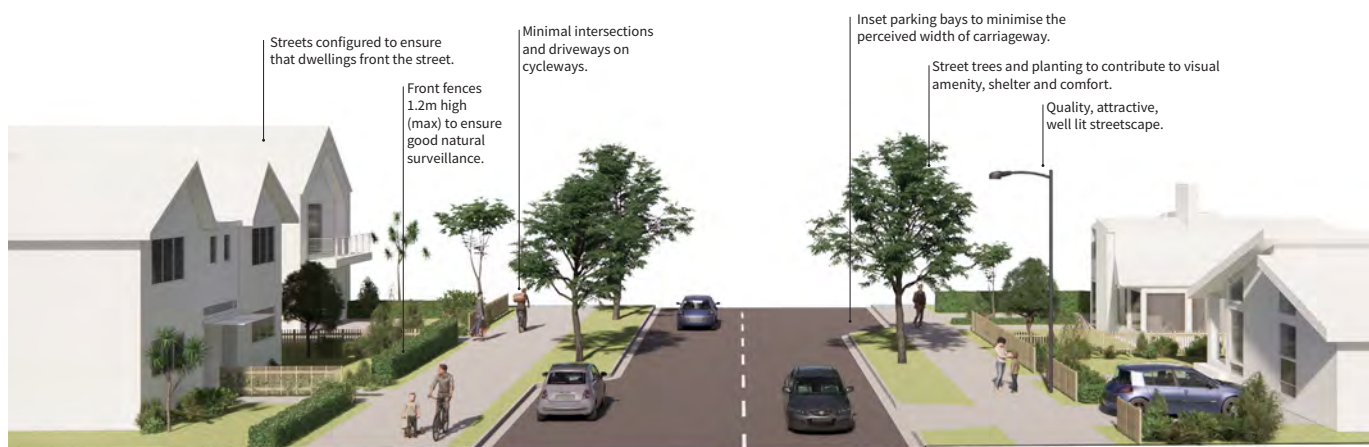
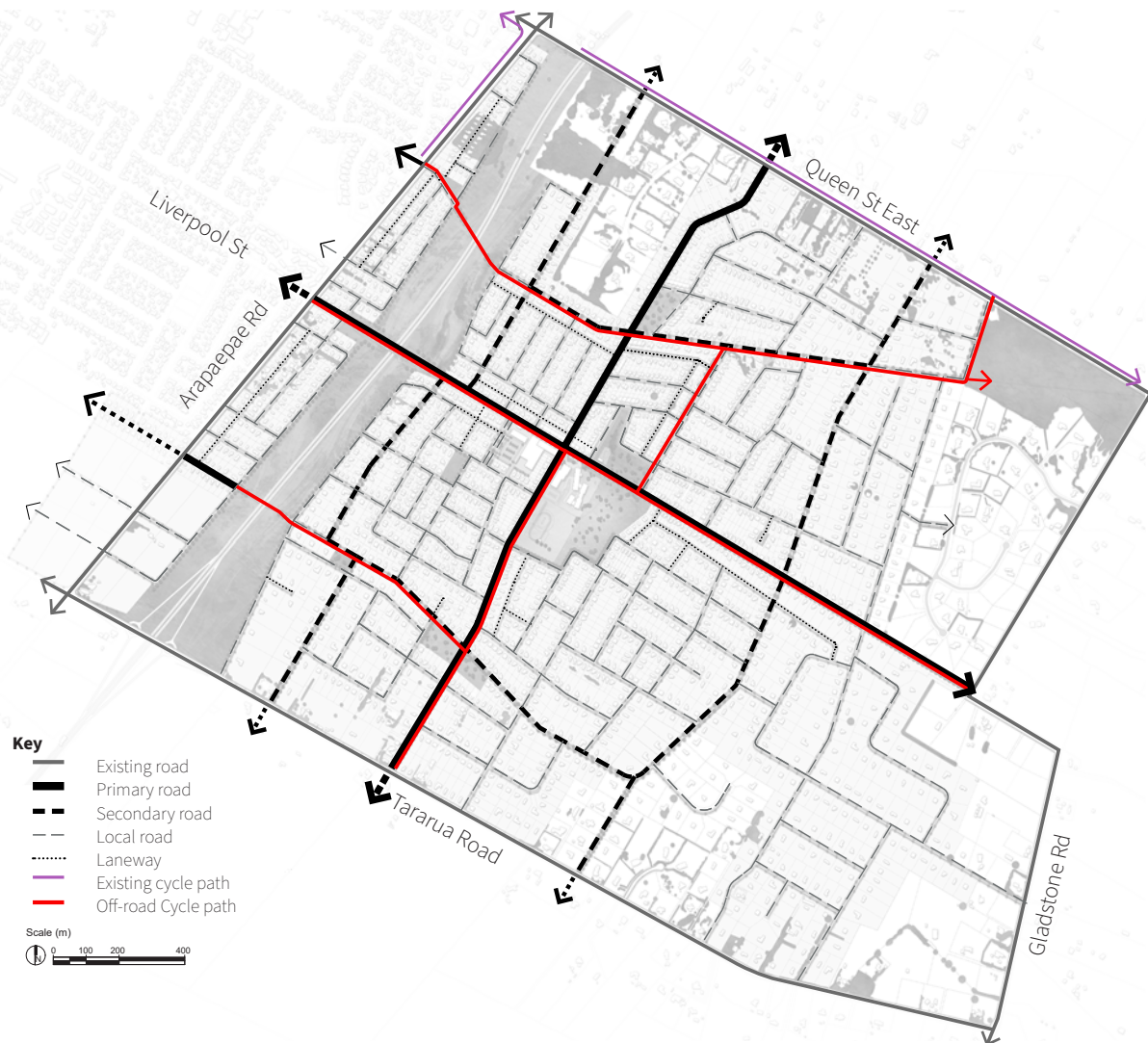
A high level of connectivity allows people to readily access friends and places both within and around Taraika. This provides good local access with a choice of routes, and excellent multi-modal movement including walking or cycling as well as driving. Multiple connections over the O2NL expressway are critically important.

- Connectivity within the development area and to the rest of Levin is a key priority. For this reason, the Master Plan connects to both existing major streets and to the areas around. Provision is made for future extension of primary and secondary roads to areas beyond Taraika where future long-term urban growth might occur.
- The interconnected street network provides a choice of routes and provides for excellent walkability and cycle access within Taraika. This encourages active modes of travel, provides recreational walking circuits around the neighbourhood and contributes to health and wellbeing.
- All roads and streets are to be developed with high-quality streetscape and street trees to create an environment attractive to pedestrians and cyclists, and an attractive setting for urban life. There is a hierarchy of roads streets and lanes with differing character and functions.
  - Primary roads are the widest and are primary movement routes. These are aligned to ensure easy physical connection, but also to frame views to the Tararua Ranges.
  - Secondary streets provide a roading collector function
  - Local streets are the shortest and narrowest streets, and are allow speed, high amenity setting for residential development.
  - Rear laneways are used to allow frontages to streets in medium density areas or along cycleways to not be interrupted by vehicle crossings.
- This range of street types with differing cross-sections and related but different streetscape treatments contributes visual interest, and the difference between streets assists people to understand where they are.
- Cul-de-sacs are avoided as these preclude easy and convenient connections between parts of the neighbourhood.

## Cycleways

A safe and attractive walking and cycling environment is a key feature of the Master Plan and the principles that determine the cycleway network are:

- Connect to the existing and planned town-wide cycleway network
- Provide a dedicated off-road cycle paths on key routes. These connect key features includes parks and reserves, the neighbourhood centre, and the school with the outer corners of the development and to the town centre.
- Minimise kerb crossings across cycleways, using rear lane access to lots facing these cycleway wherever appropriate. This purpose of this is to avoid having these routes interrupted by vehicle crossings, reducing conflict points between vehicles and cyclists/pedestrians.
- Anticipate that cyclists will also use the network of low speed, local residential streets - ensure these are an interconnected network



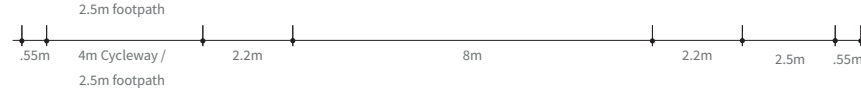
### Primary Road

Width 19.5m - 21m



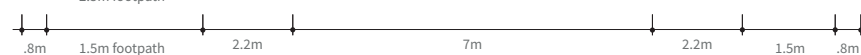
### Secondary Collector

Width 18.5m - 20m



### Access Street

Width 16m



**Note** Laneways to be shared spaces with a carriageway of 6m



## Range of housing types and densities

Provide for housing diversity with a range of lot sizes from small urban to large rural -residential lots, with smallest lots and highest intensity in high amenity locations closest to the centre.

- A range of small and large lot sizes housing types provide for choice for future residents, and allow for a range of different household types and sizes.
- The highest density housing is provided for at the centre close to the amenities of the neighbourhood centre and around public parks and reserves which provide openness, recreational opportunities and high quality outlook.
- For this reason, the medium density zone has been drawn to include land within 400m of the centre, with some parts slightly extended to include land that is slightly further from the centre but near to a public park or reserve.
- Large lots are provided for at the periphery. These are beyond easy walking distance to the centre and transition to existing rural residential and rural areas beyond.



## **Relationship to the O2NL expressway**

- The proposed O2NL expressway has the potential to sever Taraika/Gladstone Green from the rest of Levin. While decisions about the design and function of the highway are the responsibility of NZTA, the Master Plan seeks to minimise the impact of this, including providing roading connections at Tararua Road, Queen Street, and Liverpool Street, and walking and cycling overbridges between these.
- The Master Plan describes how the carriageway might be trenched and bounded by heavily planted landscaped berms to reduce or eliminate the visual and noise effects of the expressway.

***Appendix 3 – Summary of Community Feedback on the Master Plan***



# Taraika Master Plan – Community Feedback Summary

## Introduction

Throughout August 2020, Horowhenua District Council sought feedback from the community on the Draft Taraika Master Plan. Public drop-in sessions were held at Te Takeretanga o Kura-hau-pō, affected landowners were mailed information, and media releases were published in the Horowhenua Chronicle.

This feedback process was relatively informal and sought to give community members an opportunity to input into the process prior to the formal Resource Management Act process. A total of 40 provided some form of written feedback and approximately 100 people visited the drop-in sessions.

## Support for the proposal

Many of the people who visited the drop-in sessions were generally supportive of the proposal. People recognised that the population is growing and that additional housing is required to support this. These people supported the planned approach of the Master Plan, as opposed to allowing growth to occur in an adhoc manner.

People who supported the Master Plan liked the mix of housing, that the development would be supported by shops, parks, and potentially a school, and that it prioritised good connectivity.

However there was a group of community members, largely comprised of neighbouring residents, who were opposed to the Master Plan. They believed that the area should either not be developed or be developed at a low density/rural lifestyle scale.

**Response:** Concerns about the impact of additional development in Taraika on existing residents is noted. The proposal seeks to address this by having development density reduce towards the outer edges of the development (e.g. towards Pohutukawa Drive and Tararua Road), resulting minimum site sizes of 1,000-2,000m<sup>2</sup>. While this development density will still be higher than what could occur under the existing zoning, it will help to reduce the impact on these residents. Additional development in this area will likely take some time to establish and it is noted that existing landowners will be able to retain their existing character (e.g. significant plantings). The extent of development expected may also have some positive effects in that it is likely to attract facilities such as a school and a small supermarket, which will increase the services available to existing residents in this area.

It is also noted that the Council must give effect to requirements of Central Government, such as the National Policy Statement for Urban Development (NPS-UD). This requires Council to provide zoned and serviced land to meet housing demand. It also requires Council to provide opportunities for a variety of housing types (e.g. different densities) to establish. This land has been identified for some form of growth since 2008. It is located close to Levin, allowing for easy extension of reticulated infrastructure and good access to jobs, shops, and other urban amenities. As the land is flat, held in large ownership parcels (by landowners willing to develop) and is not subject to known natural hazards it presents a viable development option. There are few, if any, other options in Levin to deliver land supply for housing at this scale. If this option was not pursued, Council would likely be in breach of its obligations under the NPS-UD.

## Key improvements/changes sought

Those who provided feedback had a range of suggestion about how the Master Plan could be improved. This includes:

Comment	Response
Provide more parks, including a dog park.	<p>The parks and reserves shown on the Master Plan meet a minimum provision of 2ha per 1,000 people, a 400m walk (5 minutes) from some form of public open space and 800m walk (10 mins) from a more significant reserves space. This is consistent with current targets and balances the importance of providing reserve space without compromising the viability of the development.</p> <p>The function of each reserve is still being investigated. This will be determined when there is more clarity on factors including the speed and nature of development.</p>
Provide equestrian facilities	<p>Through the 2020/2021 Annual Plan process, Council committed to undertake an investigation into how and where equestrian recreation opportunities could be provided for. This is the appropriate process for this to be investigated.</p>
Make it safe for walking and cycling	<p>This is a key feature of the Master Plan. The Master Plan identifies key cycling/walking connections from the outskirts of the development, to the neighborhood centre and school, and across the highway into Levin. On these cycle routes, it is proposed that housing are accessed via rear access lane to avoid having vehicle crossings (driveway entrances) into cycle routes.</p>
Prevent solid fuel heaters (wood burners) and rural burn-offs	<p>This is outside the scope of what can be achieved through the Plan Change. The Horizons Regional Council is responsible for managing air quality.</p>
Consider Electra powerlines	<p>Electra have been made aware of the proposal. Council are working through agreements with Electra to address the issues of the powerlines.</p>
Make the Master Plan flexible, especially for zoning and local roads	<p>The location of 'local roads' is proposed to be flexible, while the location of arterial and collector roads is more fixed. The zoning boundaries are proposed to be fixed to ensure the following can be managed:</p> <ul style="list-style-type: none"> <li>- Logical urban form, with density reducing towards the outskirts of the development to protect rural environment</li> <li>- Infrastructure planning requires an understanding of expected density</li> <li>- That we know where the higher density areas will be so as to provide sufficient park and reserve space.</li> </ul> <p>While Council can consider changing the zoning for particular properties through the Plan Change process, it is difficult to comment on the appropriateness of this generally.</p>
Reduce the density	<p>For the reasons specified above under 'support for the proposal' this is not considered a viable option, as it would not give effect to Government direction.</p>

Allow for 'tiny shops'	The proposed rules allow for this to happen.
Require houses to achieve a high 'Homestar' rating	This is outside the scope of the Plan Change. The Resource Management Act does not allow for such rules. The Building Act process is the primary tool for managing build quality although it is acknowledged that high Homestar ratings require a higher standard than the Building Act. As such, complying with Homestar rating will be the owner's choice.
Clarify who is paying for infrastructure	Lead infrastructure is being delivered through a range of funding mechanisms, including Crown Infrastructure Partners and Council. Mechanisms to recover the cost of Council's contribution of lead infrastructure are being investigated through processes such as the Long Term Plan. Infrastructure within individual developments will be at the cost of the developer.
Protect Waiopēhu Reserve and views of Tararua Ranges	The Waiopēhu Reserve is vested as a Scenic Reserve under the Reserves Act and is therefore protected under this legislation. It is managed by the Department of Conservation. The roading network of the Master Plan is drawn to enhance views towards the Tararua Ranges.
Protection of cultural sites	Council are working with local iwi to understand the most appropriate means of protecting cultural sites.
Introduce monitoring and targets for delivery of affordable housing	The Plan Change proposes to introduce maximum site areas within the medium density zone, to compel the market to provide smaller sections (and therefore houses) in certain locations. It is hoped this, along with the general increase in land supply, will help with affordability. NPS-UD requires relatively extensive monitoring of market indicators so that Councils know whether District Plans are enabling development and addressing affordability issues.
Consult with downstream properties (stormwater management)	The details of the stormwater management approach are still being finalised. The key objective is to retain stormwater onsite to the greatest extent possible. Engagement with downstream neighbours will occur.
Remove connection into Pohutukawa Drive	This connection was intended to provide for future connectivity between Taraika (and the future school, parks, shops etc.) and Pohutukawa Drive residents. As a result of community feedback, this connection has since been removed. Density adjoining Pohutukawa Drive has been changed to Greenbelt Residential (consistent with zoning of Pohutukawa Drive) to reduce impact on these residents.
Change density standard for sites adjoining Redwood Grove to lower density.	The zoning adjoining Redwood Grove has remained standard density to allow for a logical future urban form. Redwood Grove density has also changed to standard density to allow these properties to develop at the same level as neighboring properties.



Concern that the proposal has not gone through the 'proper' process	The first round of feedback was an additional round of informal feedback, ahead of the formal RMA process which is being followed.
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## Support for a Structure Plan

Those who supported development in Taraika were largely supportive of using a Structure Plan to achieve integrated development. Those who did not support development at Taraika were not supportive of a Structure Plan.

## Other Comments Raised

Other comments raised throughout this feedback included concerns about traffic, including speeding traffic and the capacity of outer roads (Taraia, Gladstone, and Queen) to cope with the additional traffic. There were also request for a cycle connection across Queen Street, in addition to the one shown slightly further south.

People identified a need for other facilities to support population growth, including health care and rail services and questioned whether there was sufficient infrastructure capacity (e.g. potable water and firefighting water) to service the development.

Other concerns included:

- That the development was occurring on high quality farmland;
- That the development would result in a significant increase in rates;
- The impact of noise from the O2NL highway on the new development.

Feedback was also received from Government Agencies including Ministry of Education (MOE) who advised that, a new primary school within Taraika is likely required and that the area identified as an 'education site' in the Master Plan would appear to be the most appropriate location for a potential school.

Department of Conservation (DOC) identified a number of species that may be present within the area and recommended development setbacks from freshwater areas, riparian planting, stormwater swales and gardens, effective management of stormwater wetlands, and consideration of climate change in stormwater planning.

**Response:** An independent traffic engineer has been commissioned to assess both the proposed roading network within the Master Plan area and the impact on outer roads. This will be used to inform upgrade programmes and to avoid future traffic issues.

Cycle connections across the highways (O2NL and SH57) are considered very important, hence they have been demonstrated on the Master Plan. However, no decisions have been made about where these should be, or how many are required. All decisions pertaining to current (SH57) and future state highways (O2NL) are the responsibility of Waka Kotahi New Zealand Transport Agency (WKNZTA).

Council is working with a range of agencies, including Ministry of Education, Ministry of Health and WKNZTA to make them aware of the growth occurring and the potential services needed to support these. While Council can advocate for new services, all decisions ultimately lie with these agencies who work across the country assessing and evaluating need for upgraded or additional services.

An infrastructure plan is being prepared to determine how the Taraika area will be serviced to ensure that there is sufficient capacity for water supply to meet levels of service, which in residential areas, includes provision for potable and firefighting supplies.

The Taraika development is not located on high quality farmland. Taraika has a land use capability class of 3 (LUC3). LUC 1-3 covers 42% of the Horowhenua District. The remaining land is hill country and coastal land. Given the extent of LUC 1-3, the current Horowhenua District Plan affords specific protection to LUC 1 and 2 only. Taraika in particular, has some constraints on usability due to presence of stony soils at the surface and is already a growth area with development of between 2,000m<sup>2</sup> to 5,000m<sup>2</sup> already establishing. Developing in less productive areas such as this protects other, more productive parts of the District.

Under the current rating policy, existing landowners will not be rated for the new water and sewer services so long as they had constructed their dwelling before these services became available (unless they later choose to connect, in which case they would be charged). It is possible that population growth will eventually ease rating increases and the costs of services are able to be spread across more people.

While the O2NL highway may have an impact on Taraika, no decisions have been made about the details of O2NL (e.g. road height, road surfacing etc) so it is difficult to determine what the effects will be. As WKNZTA have yet to lodge a notice of requirement for the new highway, it has no legal status and therefore no restrictions can be imposed on landowners through this plan change. Council are working closely with WKNZTA to achieve a good outcome. WKNZTA are aware that O2NL will be passing through an urban environment. WKNZTA have indicated their support for Taraika.

Council acknowledge and appreciate the support of the MOE and are heartened to hear that the Taraika development is likely to be supported by a primary school in the future.

Council are preparing a stormwater management approach that takes into account all the matters raised by DOC.

***Appendix 4 – Medium Density Housing Report***



# Mixed Density Housing - Taraika - Objectives, Methods & Delivery

Draft Report

October 2020

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**DISCLAIMER:** The information contained within this document is prepared for Horowhenua District Council. It has no binding effect of itself but is intended to assist the planning process to facilitate the development of a range of housing types in Horowhenua. Information contained in this document is provided in good faith and is believed to be correct at the time of printing. However, the statements or representation contained in it should not be accepted as statements of fact nor should it be capable of universal application. Urbacity and its employees, agents or contractors shall not be liable to any person, whether through contract, tort or any other legal or equitable obligation for any past, present or future loss or damage that may result from any implementation of or failure to implement the material set out in this document.

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# 1 The Challenge

The purpose of this document is to outline the need to improve housing diversity in Horowhenua generally, but more specifically in Levin and in Council's major growth area, Taraika. The first part of this document considers the condition of the market for mixed density housing in Horowhenua. The subsequent parts considers the mechanisms needed to achieve mixed density housing.

## 1.1 Introduction

Horowhenua is currently on a steady growth path in terms of population, housing and employment. This path is likely to continue unabated for the next 20 years and beyond. Trends in remote jobs, concerns about density and disease, already reinvigorated regions within touch of metropolitan cities, and quasi-country living are attracting people from the cities and their suburbs. Lower housing cost is also an attraction factor, but the evident growth in housing demand is reducing the housing cost gap between the regions and the cities.

The now-approved construction of the Otaki to North Levin (O2NL) motorway extension from Otaki to North Levin will bring Wellington to within than an hour's drive of Levin. This is likely to result in increased demand for Levin housing for workers in the Wellington area. The initial market will likely initially come from retirees exiting Wellington, some investors and a growing tide of workers, more likely reaching a peak after completion of O2NL.

Growth in the Horowhenua population has been static for decades until the census period to 2013. Over the same period, the District's housing market has grown incrementally as a consequence of reduced household occupancy ratios and the construction of holiday houses at the beaches.

Since 2013 however, Horowhenua has begun to grow markedly, as shown in Table 1 following.

This growth will pressure Horowhenua home builders in terms of capacity and their ability to deliver diversity of housing product. As demand for housing is heavily influenced by availability of housing product that builders bring to market, diversity of the current mix is an indicator of builder/developer product in Horowhenua.

Whilst this paper is not an in-depth study of the capacity and product diversity of Horowhenua home builders, there must be some concern over the ability of local builders to provide the volume and variety of product needed to offer existing and future Levin residents within Taraika housing suited to their diverse lifecycles and aspirations. Simultaneously, the Council will be looking to manage growth to promote a more sustainable development outcome around the District, but particularly at Taraika.

## 1.2 Growth

As discussed, growth has been relatively static in Levin and Horowhenua between 2001 and 2013 years as shown in Table 1 below, but has resumed between 2013 and 2018.

Table 1 - Horowhenua Characteristics of Growth

Horowhenua	2001	2006	2013	2018
Total Dwellings	13,395	14,208	15,048	15,780
Total Occupied Dwellings	11,535	12,027	12,633	13,302
Occupied Dwelling Ratio	86%	85%	84%	84%
Total Population	29,820	29,868	30,096	33,261
Population Growth		48	276	3,165
Growth rate % pa		0.03%	0.18%	2.1%
Household Occupancy Ratio	2.6	2.5	2.4	2.5
New All Dwellings 2001-2018				2,385
New Dwelling Annual Construction Rate		163	120	146
Median Age	40	42	46	47
Median Age NZ	35	36	38	37

Source: Statistics NZ

The characteristics of growth show a marginal increase in the population between 2001 and 2013, despite the increase in houses built, with many of these new houses being holiday homes. Both the occupied dwelling ratio and the household occupancy levels fell between 2001 and 2013. Since 2013 population growth has substantially increased along with an upswing in average household size. Horowhenua populations are ageing faster than those in the rest of the country, suggesting that younger residents are leaving and being replaced with older residents. However, with O2NL that may change.

Table 2 - Horowhenua Housing Typologies and Age

Characteristic	NZ	Horowhenua
Median Age	38	47
Household Occupancy Ratio	2.7	2.5
As % of all ages - over 50's Living in Detached Housing	26%	36%
% total residents living in Detached housing	13%	10.7%
Median House Price	\$714,747	\$416,000
Increase 2019-2020	4.4%	21.1%
Horowhenua Avg Housing Cost Relative to New Zealand		58%

Source: Statistics NZ; QV NZ

The data in the tables suggest the following:

1. A lack of diversity in housing stock in Horowhenua;
2. Substantial latent demand for multi-family housing for over 50s;
3. Older population likely living in unsuitable housing due to lack of choice and inability to move elsewhere (due to differences in housing values in the region)
4. Possible mental health issues for over 50s related to lack of choice and lack of mobility;
5. Housing stock is out of alignment with the household occupancy ratio;
6. New Zealanders generally have larger families yet living in denser housing.;
7. Horowhenua produced 1,000 new households between 2001 and 2013 for no meaningful increase in population;
8. Horowhenua has low numbers of people in the 20-50 year age cohort;
9. The ratio of holiday homes to permanent residential homes is increasing.

The following table records the type and ratio of housing built on Horowhenua since 2006.

Table 3 - Horowhenua New Housing 2006-2018

Occupied Dwellings	2006	2018
<b>Horowhenua</b>		
Joined Housing Ratio	10.9%	10.7%
Separate House	10,080	11,799
Joined Dwelling	1,308	1,425
Percentage of Joined Dwelling Construction 2006-2018		6.8%
<b>Levin Urban Area</b>		
Joined Housing Ratio	18.1%	17.3%
Separate House	5,335	6,276
Joined Dwelling	1,260	1,320
Percentage of Joined Dwelling Construction 2006-2018		9%

Source: Statistics NZ

An issue with the mix of housing that has been developed between 2006 and 2018 is the low level of joined housing as a percentage of new housing. Horowhenua has seen an average of five joined house builds per annum between 2006 and 2018. This data tells us a number of things:

- Only 60 joined dwellings were built in the Levin urban area in the 12 years between 2006 and 2018.
- Whilst Levin is the major urban area of the District, it has only inspired 50% of new joined housing construction across the District since 2006.
- Ohau Manakau, Waiterere and Miranui contributed 66 joined dwelling units between 2006 and 2018.

Recent growth in the District is likely representative of a longer term trend, as outlined in Council's Draft Horowhenua Growth Strategy 2040. Its projections for growth beyond 2018 are shown in Tables 4 and 5 following.



Table 4 - Horowhenua Growth Projections - Housing

Year	2020	2030	2040
Occupied	14,018	16,221	18,157
Unoccupied	2,474	2,863	3,204
Total dwellings	16,492	19,084	21,361
Joined Dwellings to Meet NZ Average	2,145	2,480	2,775
Current Joined Dwellings	1,450*	1,450	1,450
<b>Joined Dwellings Catchup (cumulative)</b>	<b>695</b>	<b>1,030</b>	<b>1,325</b>

Source: Statistics NZ, Horowhenua District Council, \* Note: This is an estimate. In the 2018 Census Horowhenua was recorded as having 1,425 joined dwellings. Horowhenua District has seen an average of 10 joined dwellings built per annum since 2006.

The notional target figure of 1,325 joined dwellings by 2040 in Table 4 is based on the New Zealand average. If we adjust for the percentage of urban populations in Horowhenua (78.2%) compared with New Zealand (87.2%), then we would need to drop the “requirement” in Horowhenua by 10%. However, the demand for joined dwellings is likely to be higher in Horowhenua due to lower household occupancy ratios and an older median age when compared with New Zealand.

For the Levin urban area, Council estimate a requirement for an additional 1,515 dwellings to 2040, split between 1,246 urban and 267 larger lot sections. Most of these will be within Taraika.

The current annual construction rate between 2006 and 2018 for “joined dwellings” is 10 and so the shift to a more diverse mix of housing will require more innovation from the District’s builder/developer market.

In our view, the quality of the builder/developer market will be key to the delivery of more diverse mix of housing and in particular, higher density housing in Taraika particularly, as well as in other parts of the District. Based on our experience elsewhere, we have little doubt that higher density housing in appropriate locations within Horowhenua will sell well, but that the weakness in terms of delivery may well sit with local builder/developers. We will discuss delivery options for more diverse housing in a subsequent section of this report.

Projected growth of housing in the Levin urban area to 2040 is 1,515 and it may not be appropriate to achieve the joined housing target figure by 2040 and certainly not appropriate to contain it to Levin. The population projections take the District population from 33,261 in 2018 to 42,000 in 2040. Council’s projections generally spread housing growth across all settlements in the District.

Taraika has a draft Master Plan, which seeks housing density around its proposed centre. Taraika project is probably the key Horowhenua project with ability to change market behaviours in relation to mixed density housing.

Whilst population projections and the housing projections indicate a low household occupancy rate (1.7 persons per household), this is probably a consequence of an assumption of ongoing construction of holiday homes along the coast.

Table 5 - Horowhenua Population Growth Projections

Year	Population	Population (annual average growth rate)
2018	33,261	
2020	33,596	0.5%
2030	37,738	1.2%
2040	41,958	1.1%

Source: Horowhenua District Council; Statistics NZ

The nexus for mixed density housing is either amenity (swapping private open space for quality public open space) or amenities (adjacent to retail and services).

Whilst growth will be a factor in the market on the demand side, there is ample land that is zoned for medium density around Levin town centre, which has remained largely untouched by builder developers. Many of these sections are over 1,000 square metres and easily capable (in groups) of converting to medium density. The key issue therefore is not that the regulation is wrong, but that the market on the supply side has little or no appetite to convert large sections on the fringes of Levin Town Centre to medium density housing. There may also be a price and cost equation related to land areas and project feasibility. We shall cover this issue in the strategic approach to Taraika housing toward the end of this document.

In order to test an acceptable outcome for a more intensive product within the Levin density zone we have arbitrarily selected the block on Queen Street between Rugby Street and Queenwood Road. A subdivision that fits the zone would be as shown in Figure 1. Six homes converts to eleven. In this example, only six of the 12 dwellings would be joined (one apartment above garage). The intent of the housing product is not simply to expand housing options but also establish a meaningful relationship with the street in order to promote walking. In the example below we have enhanced walkability by providing a rear lane for garages and have brought the houses forward on the block to meet the street (and people walking past).

Figure 1 - Typical Queen Street Block



However, this analysis raises the issue of the relationship between density and housing diversity and whether “joined” housing on its own is a fair measure of housing density and diversity.

Likely most of the housing within an easy walk of Taraika’s future village centre will fit the definition of medium density but will not be “joined” housing.

Diagram by Steve Thorne

### 1.2.1 Housing, Population & Age Relationship

Housing numbers have increased by 2,385 since 2001 but the population remained almost constant to 2013. The population grew significantly between 2013 and 2018. Occupied houses as a percentage of total houses has also fallen slightly, reflecting an increase in holiday homes as a percentage of total stock.

Diversity of housing choice is generally regarded as the basis of strong and sustainable communities, allowing people to access a range of housing options geared to changing life circumstances. In Horowhenua some 80% of over 65 residents live in a separate house. Of these around 80% are couples or singles. The average Horowhenua house has 3 bedrooms, which means that most houses are oversized for this age group.

Research across the globe indicates that older people prefer to live within 5-10 kilometres of where they have always lived, maintaining contact with their existing networks and family. For Horowhenua, the older age group will be looking for housing with low maintenance, easy and level access and a variety of internal features relating to ease of movement and servicing.

The lack of available multi-family/joined housing in Horowhenua is constraining the District's ability to age in place. Joined housing is ideally located close to amenities, especially those found within centres.

Whilst joined housing is often suited to the older age group, it is also suited to singles and couples without children. Joined housing provides a stronger relationship between the footpath and the house and sets up the basis for a walkable neighbourhood in Tararua. However, density in the form of joined housing and urban amenity are a consequence of design - not density alone.

Table 6 - Relative Ages - Getting Older

Age under 50 Years	1996	2001	2006	2018
New Zealand	75%	72%	71%	66%
Horowhenua	68%	64%	61%	54%

The ageing ratio is more pronounced in Horowhenua relative to the New Zealand average.

In summary, there is a mismatch between Horowhenua housing types and the District's population age groups

### 1.2.2 Housing Price and Growth Relationship

Population growth has not been the main driver of rising house prices in Horowhenua. Falling household occupancy ratios has been driving most of the housing demand to 2013. However, falling occupancy ratios do not explain the nature and extent of the rises in house values.

Turnover or mobility of residents in Horowhenua between 2013 and 2018 Census is close to the NZ average. So, a changing population base does not explain the level of increase in Horowhenua housing values either. The clues to increased Horowhenua dwelling values appear to largely lie with the growth in values to the south and the likely value creep



northward. However, with the advent of O2NL and recent and ongoing population growth, this value rise would be expected to gather pace.

Table 7 - Median Household Incomes

Location	2013	2018
Horowhenua	\$39,200	\$47,800
New Zealand	\$63,800	\$75,700
Horowhenua / NZ Ratio	61%	63%

Source: Statistics NZ Census.

Household incomes reflect in part lower household occupancy ratios in Horowhenua. The dynamics of future growth and improved connections to Wellington metro will also likely improve household incomes looking forward.

## 1.3 Aligning Centre Planning & Housing Strategy

*“The duty of the architect, urban planner and engineer is to give physical form to a social condition.”* (Joseph Rykwert 1982).

Housing strategies tend to have a supply-dominant focus, with housing diversity or demand geared to lifecycles relegated as a subservient element.

Housing within an easy walk to the centre should be differentiated in the District Plan from all other housing. The village centre in Taraika, should facilitate a responsive housing typology within walking distance of the centre and not waste the land and opportunity by the development of a house on a standard suburban section. This proposed change reinforces the traditional logic that housing adjacent to village centres should be a part of the village centre. We shall discuss mechanisms needed to align centre performance with centre-supportive housing later in this report. The key planning (and design) principle is to ensure that the walking journey is at least as attractive in the motivation to walk as the destination (the centre). To achieve this outcome requires a particular housing design response.

Density and “walkable” design together will deliver the required response in relation to medium density zones proposed for Taraika. Density alone is not enough without a typology and building siting control that delivers an appropriate activity alignment with the centre and pedestrian-friendly “walkable” interface between buildings and people.

The main focus of this village housing “relationship” is a social and economic one. The village housing overlay is there to increase the desire to walk and to increase casual social exchange on the walking journey to and from the village centre. At the same time, the intent is to widen the centre-adjacent village housing zone to increase the settings for local businesses.

For a centre however, there is a proven relationship between the capacity or performance of the centre and the spatial organisation of the movement network. *The theory of the ‘movement economy’ was developed from the notion of ‘natural movement’ (Hillier et al 1993) which had arisen from studies showing that, other things being equal, movement flows in different parts of a street network were systematically influenced by the spatial configuration of the network itself.*<sup>1</sup>

<sup>1</sup> Professor Bill Hillier, *Centrality as a Process, Accounting for Attraction Inequalities in Deformed Grids*, Space Syntax

The integrity of this statement has been proven time and again by Space Syntax modelling in towns, villages and cities across the globe. Hillier further expands on the structure of centres and their need to achieve greater levels of integration within a settlement.

*Locally, as centres grow, they create pressure for greater local integration of the kind described by Siksna<sup>2</sup>, that is grid intensification and smaller block size to allow greater ease of movement within the centre. The greater the scale of the centre, the stronger the 'Siksna process' will be.*

The street network supporting the centre will be a key factor in its social and economic capability. It is understood that the Structure Plan (SP) will be a part of the Plan Change for the project, but adjustments outside of the SP may be needed around the centre.

### 1.3.1 Village Housing for Wider Jobs Settings

If we take our knowledge of the influence of structure and form of traditional towns and villages forward, we find a correlation with the current way we work. According to MBIE, 97% of all New Zealand businesses are small businesses (less than 20 employees). Many of these businesses are home-based or operate out of non-traditional business premises. Many of these businesses would like the exposure and availability of a centre nearby but are unsuited to the relatively rigid and retail-dominant spaces of centres. Many of these businesses fit easily within a house designed with a relationship with the street and close to a centre.

Changes in the way we work are having a marked effect on centres, and business formation rates in centres are well below those in the surrounding suburban environment. Outside of CBDs, centres are no longer the main focus of urban economic activity and growth. Centre planning frameworks and should steer us toward flexible workplaces and a wider range of building typologies in and around centres in order to grow economic capacity. Our ability to form and grow businesses is in part influenced by the range and settings of premises. Centres provide a narrow range of settings, but in older, traditional urban centres, there are wider settings at a wider range of price points - for rental or for purchase.

Figure 2 - Functional Layout of Village Housing Contributing to Walkability and Adaptability of Use

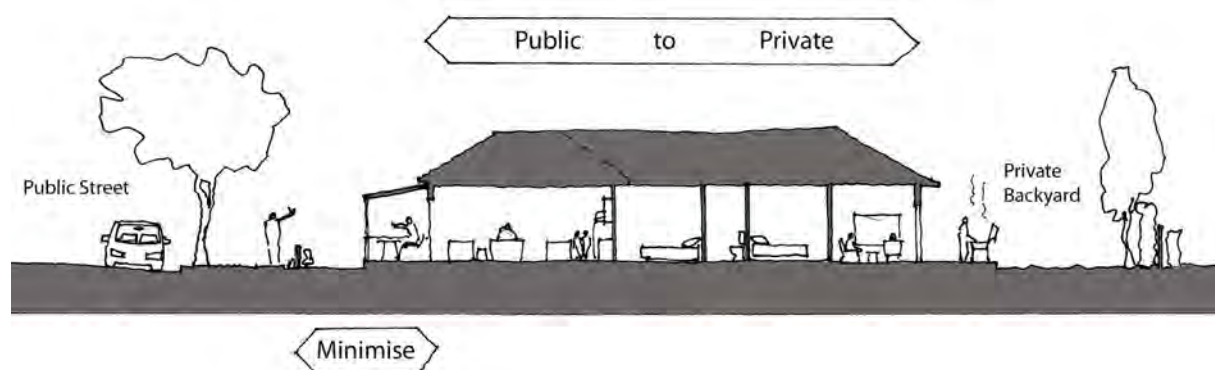


Diagram by Steve Thorne

The above diagram shows how the design of a house can establish a social and business relationship with the street and leverage off the street. The house is well forward on the

Second International Symposium, Brasilia 1999

2 Siksna A (1997) 'The effects of block size and form in North American and Australian City Centres Urban Morphology 1, 19-33

block and the public activities of the house are also brought forward to offer the inhabitants the opportunity of using the house for business.

The main principle is not to specify how a house is to be used, but rather to facilitate the growth of businesses outside of traditional commercial premises and adjacent to centres. This reflects how traditional villages operate, with older housing on the edges of centres used for business. These traditional houses were built to address the street and are ideal for small businesses in the 21<sup>st</sup> Century. These houses have two roles - to make walking more interesting generating higher levels of walking, and to provide adjacent-to-centre business opportunities.

Figure 3 - Traditional Village Housing Adapting to Business



The principle of village housing containing businesses is a function of building design and siting. The houses above do not represent the likely form of Taraika Village Housing but any decent architect is capable of expressing such housing in modern form. A modest home based business might take the form of the image below, shown with its front office

Figure 4 - Village House with Home Based Business (office via separate door to the right off the verandah)



House as designed by Steve Thorne

The walkable context of towns (such as Levin) and new villages (such as Taraika) needs to facilitate and encourage a more business-friendly housing typology with strong relationships between the centre and people in the street. These typologies must, by design, encourage



higher levels of walking, as walking is a major economic and social enabling mechanism of any urban environment.

With the growth of online retail and a shrinking bricks and mortar retail sector, the main focus on centres needs to shift from a functional view to an experiential view. Well performing centres today are physically interesting to pedestrians, with retailers also seeking to locate in centres that offer an enhanced experience. The utilitarian nature of online shopping has similarities to the homogeneous shopping mall but not to authentic and attractive urban centres. Regrettably, we haven't built any of these centres in New Zealand for over 100 years.

Street-front housing at the edge of centres widens the settings for business and allows businesses who would otherwise not consider an in-centre building to locate in a building adjacent to a centre thereby expanding the social and economic base of the centre. This reinforces NZ business formation characteristics outlined below.

- Most businesses created today do not need to be in centres in order to thrive;
- Bricks and mortar retail is declining and the justification of a centre to simply "get stuff" is under competitive pressure from the other "get stuff" activity - internet shopping
- An urban centre is a higher performing social and economic asset than shopping centres (and online shopping);
- Existing buildings in centres are a product of an older and now mostly defunct economic model and are not universally adaptable to modern work trends;
- Business formation in centres is heavily associated with urban amenity and critical mass, and it is the quality of buildings and their relationships with the street that is most important to urban amenity (not land use);
- The economics of agglomeration in centres is diminished by communication technology;
- Retail for its own sake is not sufficient to generate optimum levels of economic and social exchange and therefore,
- Zoning in centres is less relevant as an economic management and optimisation tool.

Mixed density housing provides an adaptable typology for a range of businesses and is an ideal transition from a centre zone to suburban neighbourhood zone.

The term "village" in older centres did not apply only to shops and businesses, but to all buildings within the village including village houses. As a consequence we find numerous businesses in these houses close to these old village centres. As the building must be designed as a house the zone has a "grain" that delivers small independent buildings. Given that the design of the building is primarily that of a house, it is not possible for business activities to compromise the integrity of the centre as all businesses in these buildings will be small businesses. The design requirement means that the supply side for business settings is expanded and enhanced. The aim is for Taraika to get more businesses in and around the centre whilst expanding the centre's walkable geography.

Housing within a centre zone overlay is doing a number of things simultaneously:

1. Providing wider settings for jobs and business formation;
2. Providing for higher density housing in a most efficient location;
3. Providing for lower cost housing and lower cost living;
4. Providing for housing for active elderly close to the centre<sup>3</sup>;
5. Is designed and located in a manner that increases the desire to walk to the centre;
6. Delivers more people within an easy walking distance of the centre;
7. Delivers greater social and public health benefits by increasing levels of walking and social

3 The American Seniors Housing Association describe such places as "NORCs", (Naturally Occurring Retirement Communities).

exchange.

Adaptable village housing widens the physical and functional geography of a centre and therefore improves its economic and social capacity.

### 1.3.2 Housing Density

An accepted driver of housing density is proximity to amenity or amenities. Denser housing is an acceptable trade-off for people wanting to be close to the resources of a centre

As the earlier tables showed, Horowhenua is substantially under-provided with attached housing suited to both a young market looking for entry level housing and the retiree market seeking proximity to amenities and lower maintenance obligations. The “need” for a more diverse housing mix is to catch up with a likely market deficit, but also to develop Taraika in a more sustainable manner.

Centres need to be intimately tied to walkable neighbourhoods if they are to be socially active and economically resilient. Housing within walking distance of a centre such as Taraika should respect its functional proximity and urban context. That context requires housing to promote walking and enable a wider variety of businesses, from consulting rooms, to cafes/ restaurants, to local fashion and homewares (for instance). These fine-grained buildings have no capacity to undermine the centre by virtue of scale.

Horowhenua has a housing diversity issue as the low representation of higher density housing may be restricting its growth, as well as its social and economic capacity. Designed appropriately, higher-density housing encourages walking as it established a relationship with the street and increases the population close to centres<sup>4</sup>. Horowhenua’s ratio of joined dwellings to separate houses was 11% in 2018 (NZ average is 15.3%). This tells us two things:

- Horowhenua may not be building housing that adapts to life cycles enabling people to remain within the community as their life circumstances change;
- Horowhenua housing development is not meeting the changing preferences of the market.<sup>5</sup>

Engaging nearby housing as a component of the walking journey to the centre switches on a number of things simultaneously:

1. Increases the capacity for housing diversity and density;
2. Improves the affordability of social housing due to lower land cost;
3. Increases levels of walking (public health & social benefit and adds to centre vibrancy);
4. Increases levels of social exchange (public health and economic benefit);
5. Expands the settings for employment adjacent to and within centres;
6. Increases the size of the market for the centre.

In terms of centre planning, the advent of COVID 19 has done two things:

1. Created an environment where personal bio-security has become a behavioural issue within the public realm (but more so within enclosed shopping centres);
2. Created an environment of social disconnectedness, where social exchange is discouraged, leading to increasing levels of depression, suicide and feelings of isolation;

4 Ewing et al. *Do Better Urban Design Qualities Lead to More Walking in Salt Lake City, Utah?* Journal of Urban Design Volume 20, Issue 3, 2015. Pages 393-410

5 Surveys of housing preferences in New Zealand and Australia have indicated a mismatch between what the development industry are building and what the market prefers.

3. Highlighted the need for housing that is socially enabling and bio-secure;
4. Highlighted preferences for comfortable outdoor spaces rather than large internal spaces.

COVID is also highlighting the role of housing as a mechanism for safe social engagement. Regrettably, most modern housing built in the latter part of the 20th Century and early 21st Century is setback and often walled from the street. This increases a sense of neighbourhood isolation, reduces levels of walking and increases the potential for crime<sup>6</sup>.

### 1.3.3 Housing for Safe Social Engagement

Often our housing is designed to isolate us from others and from a relationship with the street. Housing that is close to a centre should be designed to facilitate social exchange as well as allowing for small business. Low cost housing as well as housing to cater for older people should be within walking distance of a centre. The design and placement of houses, and the potential relationship with the footpath are all subject to simple design controls.

With COVID we are recognising the need for safe, virus-free social engagement. This engagement is important to offset increased levels of isolation and depression. Social engagement leveraged around streets and centres is a simple design condition that can be expressed on a single page of design principles. To setup the condition for housing and to reinforce the performance of centres, the functional layout of the house as well as the relationship between the house and the street are important. The functional layout allows for the house to be a home or a business, but sets up a social condition.

Behavioural mapping studies have shown that for ease of social engagement the outdoor space of the house should be elevated as shown in the diagram below so that the eye line of people seated is slightly above that of people walking. When that condition is satisfied more people will sit on the verandah and engage with people walking in the street. In addition, the relative proximity of the verandah and the footpath results in a polite obligation for people in the street or on the verandah to acknowledge each other.

Figure 5 - Housing for Social Exchange (Designed and as built)

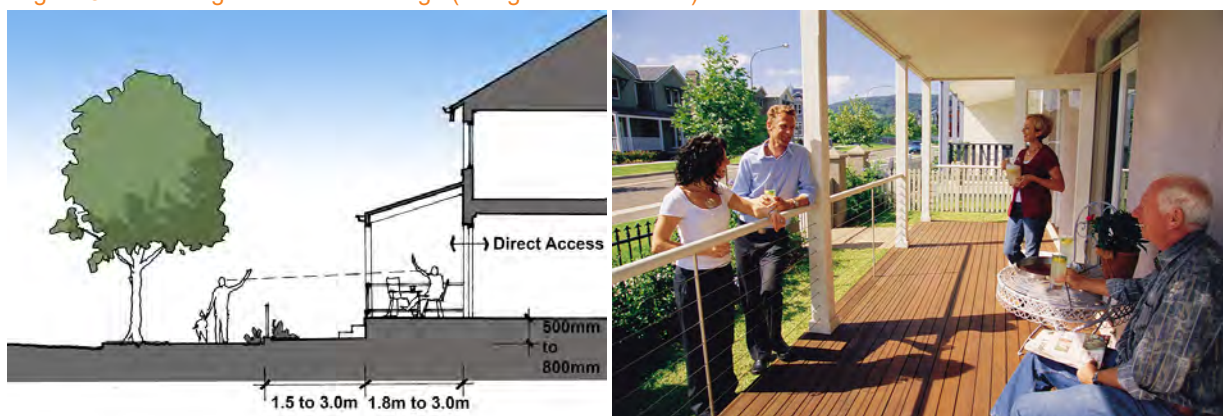


Diagram by Steve Thorne

The designs seek to get more residents outside and engaging safely with each other. The benefits include a stronger sense of community, higher levels of trust and reciprocity, higher levels of community inter-dependence, increased economic opportunities, reduced government support and improved public health. Evidence shows that walking to shop for food changes our attitudes to the food we purchase and affects the supply side, with retailers responding with healthier, fresher food choices.

<sup>6</sup> Steve Thorne & Space Syntax in association with WA Police. Urban & Building Design influences on property crime, analysis of 20,000 crimes against property in Gosnells WA between 1997 and 1999.



With these relationships established, people will identify with Taraika Village. Given the range of densities proposed across Taraika this localised identity will provide wider benefits for the District. Walking-supportive village housing requires few, if any, driveway crossovers due to access from a rear lane. Rear lanes with double or triple garages offer the opportunity for an apartment above. As the site and garage are already paid for by the house, the construction of the apartment provides a profit centre for the builder/developer.

### 1.3.4 Housing for Social Diversity

Price is a key indicator of social diversity. A major cost for housing is the land component. Housing within the Village Housing overlay can substantially reduce land cost, with narrow lots and reduced front yards. Being close to a village centre, such housing reduces transport costs, with everyday items and services within easy walking distance. As the village centre will also be on a public transport route, public transport will be within easy walking distance.

Figure 6 - Housing for Social Diversity (Low Cost - Hobsonville)

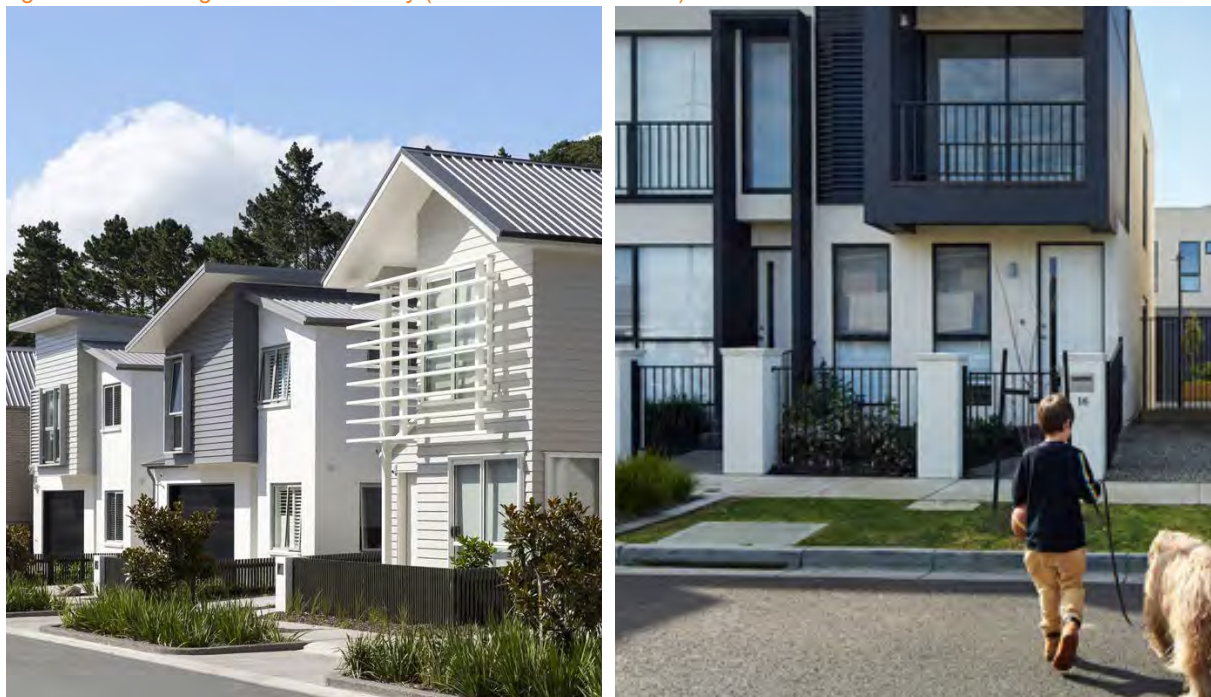


Figure 7 - Rear Lane Housing



The garage apartment in rear lanes (as shown above) provides an affordable housing product.

These garage apartments also often come alive at night with residents socialising along and across the lane whilst social distancing. Whilst this is an extreme example and Levin and Taraika may not yet be a market for such an intensive use of rear lanes, plans to follow in Chapter 2 show how above-garage apartments can be strategically placed on sites in Taraika and Levin to assist with affordability and security.

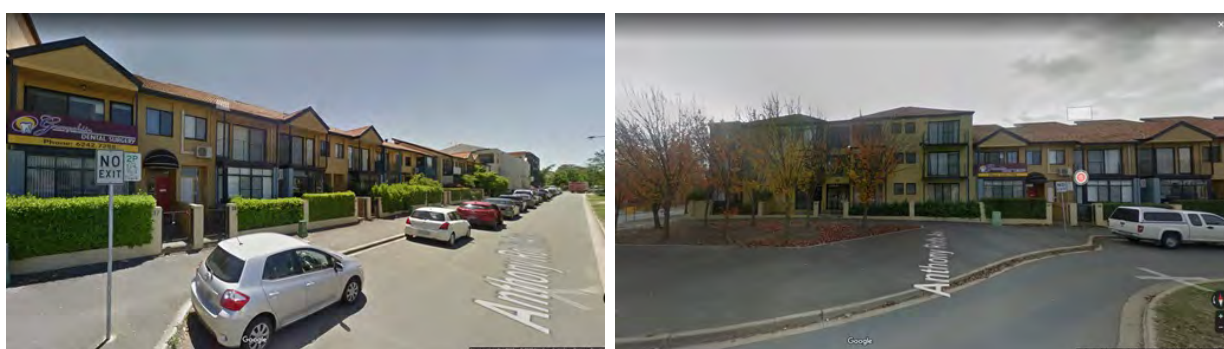
## 1.4 Conclusions

Demographic changes in society are driving a mismatch between housing types being built and housing types preferred by the market. Market surveys of housing preferences (not surveys of dwellings being sold) show that trends in lifecycles are not matched by trends in the production of housing types. In regional townships housing supply tends to be more mono-cultural, as shown in the statistics earlier in this report. The experience of these consultants in Canberra shows that new housing typologies should not be based on analysis of historic sales.

In Canberra three market research firms were appointed to determine the market for medium density housing. All of the research undertaken was supply-based; as in a register of what had been selling over the past decade. This rear-view mirror research purported to indicate demand for new product. The three market studies concluded that no demand existed in Canberra for medium density housing.

The Canberra developer ignored the findings and built 9 apartments (3 storey apartment building) and 12 terrace homes. The apartments all sold off plan in the first weekend of marketing and the terraces followed shortly after. The apartments and terraces (shown below) facilitated an explosion in medium density and apartment construction in the suburb and now within the wider city. Many of the terraces and adjacent apartments contain ground floor businesses and laneway garages have apartments above. The only conclusion from this lesson is that rear-facing market research has almost no bearing on housing preferences. This lesson has been confirmed and repeated universally across markets in New Zealand and Australia by housing preference studies in both countries (Grattan Institute Australia, “The Housing We’d Choose” and the same report heading for Auckland by Market Economics).

Figure 8 - Canberra's Breakthrough Medium Density Housing Development - Otway Terrace



The ground breaking Otway project is two streets back from Canberra's Gungahlin town centre and some of the terrace housing and adjacent apartments contain businesses on the ground floor, reflecting the use adaptability of the typology and the market for non-traditional business premises and settings (see 1.3.1 “Village Housing for Wider Jobs Settings”).

The main issue for Council with respect to diverse housing at Taraika is to not merely enable, but to **require** a more diverse housing mix in proximity to the Taraika village centre, as without such diversity, the social and economic capacity of Taraika will diminish.

## 2 Taraika & Housing Diversity

### 2.1 Walking, Density, Streets & Sections

We now consider the Master Plan for Taraika in terms of its ability to generate the appropriate block and street structure in order to accommodate:

- High levels of housing productivity and diversity within walking distance of the Village Centre;
- The appropriate block and street structure to give optimum access to the Village Centre by all modes;
- The appropriate block and street structure to facilitate the desired variety of medium or higher density housing forms;
- The appropriate block and street structure to facilitate an extended, boutique business setting adjacent to the Village Centre Core Zone and along the edges of streets leading to the Village centre;
- A block and street structure capable of generating the most efficient and attractive pedestrian environment to access the Village centre (ideal “ped shed” plus visually interesting, functionally and socially aligned pedestrian journeys);
- An wider “village housing zone” with a diversity of higher density housing particularly suited to singles, young couples and active aged.

An objective of the Master Plan design was to balance a typology mechanism with a land use mechanism within the village centre area. In all successful and vibrant centres there is a tight partnership between land use and buildings. When density is added, the way the buildings are designed, what they look like and where they sit on the site are fundamental elements in the performance of any village or town.

The primary Principle by which building quality can be managed relates to how buildings in the zone contribute to walkability. In the same manner that standards are applied to activities that are required to deal with setbacks, parking and loading, water, wastewater, public infrastructure etc, these buildings in not meeting specified design standards should be classified as high in the planning control threshold as reasonable. The zone by which to apply walkability design principles sits across two other sub zones, which we will cover later. The same design principles will apply whether the buildings are in a commercial zone (say Village Core) or a Village Core Support Zone as the walkability principles are universal in their application irrespective of land use.

The need for a typology mechanism is to ensure that buildings work together to deliver an intimate pedestrian environment requiring visual complexity, strong vertical proportions and the dominance of solid elements<sup>7</sup>. The Village Zone in an idealised form from the Master Plan is shown below. In practice, the extent of the zone is influenced by the structure.

<sup>7</sup> Kandel, E, 2013, *The Age of Insight*, Random House; Sussman. A & Hollander, 2015, J, *Cognitive Architecture*, Routledge



Figure 9 - Village Zone (Master Plan)

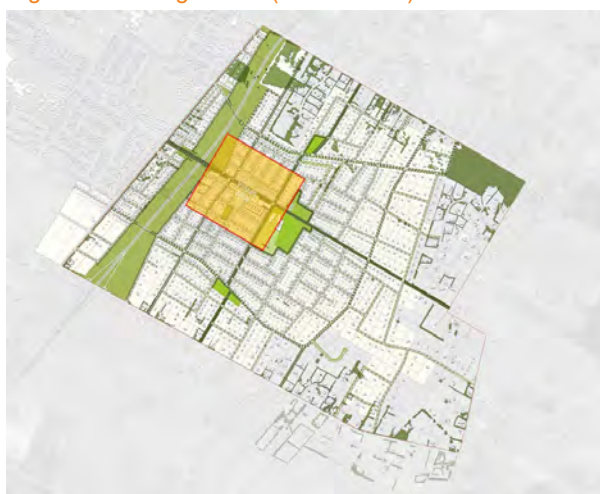


Figure 10 - Village Zone (adjusted Master Plan)



The ability to access the village centre by walking is an issue for the structure proximate to the Village Centre. Space Syntax analysis shows that walking routes that are direct will deliver more walking than routes that are indirect. In the Master Plan, the most direct routes to the Village Core are to the west, away from the Village Core (shown as a black box in Figure 10). This means that the walkable potential within the wider Village Zone is reduced as the major destination is not well connected with direct links into the Village Zone. If we adjust the structure, walkability potential increases, as shown in Figure 11.

There is structural nexus between the ability to generate higher density housing and the placement, dimensions and connections of the streets to the main street of the Village Centre Core<sup>8</sup>. These connecting streets need to be capable of the following:

- Accommodating street trees to provide shade, shelter and reduce heat to improve pedestrian amenity,
- Providing parallel street parking on both sides of the street to enable a wider parking regime for the Village Core and the Village Support zones and giving greater flexibility to parking for housing and for business;
- Connecting directly to the Village Core “main street”;
- Set at block depths suited to the dimensions of multiple medium density housing sections;
- Extending an optimum length back into the community or Village Zone.

The various requirements mean that these streets need to be around 18 metres wide to accommodate a footpath, street trees and parallel parking between.

The structural connections to the Village Centre Core and “main street” generates additional land use opportunities to expand business settings for the village and widen the opportunities for density. The movement network is key to both outcomes. Figure 10 show the structure in the Master Plan and connections to the centre and its “main street”. In Figure 11 we have adjusted the network to improve the feed to “main street.” This adjustment has flow-on effects for business settings and density.

8 Leinburger, C, & Alfonso, M, 2012, *Walk this Way, The Economic Promise of Walkable Places in Metropolitan Washington D.C.* Brookings Institute

Figure 11 - Feeding Main Street (Master Plan)



Figure 12 - Feeding Main Street (adjusted structure)



In the Master Plan, east-west cross streets intervene to reduce the north-south connections to the centre. In taking these through, we irrigate the centre with north-south movement and improve the centre's walkability.

Figure 13 - Village Core (Master Plan)



Figure 14 - Village Core (adjusted Master Plan)



The wider Village Zone is proposed to contain two sub zones. The Village Centre Core Zone and the Village Core Support Zone (shown in red above). The Village Core Zone remains the same with the two alternate structures, but is irrigated with greater movement capability in the adjusted plan.

With the adjusted structure the Support Zone can extend a block or two into the housing area and a little further along the main street. With the Master Plan structure the support zone would mostly be limited to the main street and some housing around the retail and business uses at the western end of the main street (Figures 15 & 16)..

The Village Core contains the main retail and businesses of the Village (Village Core Zone) and in the Village Support Zone, the built typology changes from a business or retail-specific typology to an adaptable or business-capable house, such as a ground floor unit, a villa or terrace house as shown in Figure 8.



Figure 15 - Village Support Zone (Master Plan)



Figure 16 - Village Support Zone (adjusted Master Plan)



Finally, the combination of the structure, the expanded settings for village businesses (outside of the Core zone) influences the level to which the centre will assist to generate demand for housing density - as shown in Figures 17 & 18.

Figure 17 - Housing Density Zone (Master Plan)



Figure 18 - Housing Density Zone (adjusted structure)



Figure 17 shows the sites that are capable of higher density housing as specified in the Master Plan. The density zone is relatively small and understates the capacity of the centre with the appropriate structure to inspire a more diverse housing mix as well as possibly understating latent demand for higher density housing as outlined in the housing mix analysis in Chapter 1. The stronger structural relationship with the village centre as shown in Figure 12 offers a wider spread of mixed housing within an easy walk of the centre.

Block depths are shown in the inset diagram in Figure 18 at around 32.5 metres, with a 7 metre wide rear lane. This allows for a more walkable condition across the zone and assists with the desire to walk to the village centre. The lanes are secured by three above-garage apartments (in this example), and as shown in Figure 7, could also be used more comprehensively as affordable housing within the wider Village Zone.



An example of a house on a block with good solar penetration into the back yard (generally an east-west section) would be similar to the house in Figure 19 below.

Figure 19 - Medium Density Housing (solar access to private yard)



Diagram by Steve Thorne

Block structure (smaller rather than larger) is important for permeability/accessibility to and from the Village Centre (Core).

## 2.2 Blocks & Typologies

The following diagrams are representative of responses to various block sizes and frontages. Taraika and Levin are not Wellington or Auckland, and so the imposition of metropolitan densities across the area are likely inappropriate in Taraika.

Figure 20 - 11.4 metre Frontage - Double Garage and Apartment Above



Diagram by Steve Thorne

The above typology with an apartment above a garage. Likely the frontage width will sit somewhere between 9 metres and 14 metres as an appropriate measure for Taraika medium density housing.

In testing the block structure and subdivision layout, the typical main street block is around 72 metres, with the frontage yielding 7 properties (as shown in Figure 18).

## 2.3 District Plan Zones - for Discussion

The design of buildings is much more important to social and economic performance (and public health) than land use in within the wider Village Zone but we accept that the Council may wish to add descriptive land use zones in and around this area. The recommended approach seeks to recognise the opportunity cost involved in zone-based approaches that result in a commercial zone immediately transitioning to a suburban housing zone. Traditional urban centres (different from shopping centres) do not have definitive boundaries with the ideal urban centre offering a range of business settings across a wide geography at a range of price points. This is the most effective economic strategy for centres and centre-adjacent housing as it allows for a broader range of businesses, start ups and incubators. Closely defined commercial zones with commercial-only buildings do not.

If planning for the wider Village Centre area continues to be zone-based, then there are three notional zones within the general vicinity of the village centre as follows by size of area:

The Village Centre Core Zone (small)  
The Village Centre Support Zone (larger)  
The Village Zone (largest)

As shown in Figures 9-16, the structure influences the definition and boundaries of these three zones. Following are the Master Plan's definition of each of the three zones compared with the adjusted structure plan.

### 2.3.1 Village Centre Core Zone Objectives

This is the zone for the major retail, commercial and community activities/uses of Taraika. In this zone one would expect the buildings to be used solely for commercial activity. The objectives / desired outcomes of the zone would include:

- To provide a consolidated location for inter-related commercial activities, with a strong focus on buildings securing the public realm by addressing streets and being entered from streets (and thereby increasing the likelihood of walking);
- Buildings are designed to appeal to pedestrians;
- Buildings are designed to work together and appear as a series of boutique individual premises with clearly demarcated dividing walls that extend through the roof. This is in contrast to the modern development practice of a single line of shops appearing as one building, glazed floor-to-ceiling;
- Car parking is street-based and at the rear of buildings;
- The zone designed for businesses to serve the wider east Levin community for everyday goods and services including professional services;
- Public realm vibrancy is recognised as an inspirer of a wider jobs mix within and adjacent to the centre in the Village Core Support Zone;

- The appropriate street links that connect to the main street of the village seek to facilitate opportunities for a wider jobs mix in domestic-scale buildings that can be used for business or housing.

### 2.3.2 Village Centre Support Zone Objectives

The Village Centre Support Zone is more effective when the structure is slightly adjusted from that of the Master Plan. The walking connections from the more expansive walkable environment are balanced with parallel street parking in and around the Village Centre Core Zone and the Village Centre Support Zone. If the Village Centre Core is thriving as an urban centre, then centre parking will most certainly flow back into the Village Centre Support Zone. This reflects two dynamics common to successful urban centres

1. The immediate “housing” area needs to reflect a physical and functional transition to housing on larger land parcels further away from the centre;
2. Housing that is proximate to a centre should be adaptable for business use, given its exposure to increased movement and street parking. This has implications for siting and house/building design.

The housing typology proposed or required within the Village Centre Support Zone offsets any concerns around unbalancing the centre. Business uses in these houses will be boutique in nature and will expand on, rather than compete with the spirit of activity within the Village Centre Core. The effect is to make the Village Zone more dynamic, interesting and expand the social and economic influence of the Village Centre Core Zone.

This zone recognises that a robust urban village centre core, with high levels of amenity as a consequence of street-supportive architecture, will create demand for boutique-level businesses that are not ideally suited to the Core Zone to locate nearby. Given that most new businesses in New Zealand are small and many of these businesses are suited to an environment around a vibrant centre. These businesses are in evidence adjacent to older New Zealand centres where housing has a direct relationship with the street. The objectives of the zone would include:

Zone descriptions and objectives are as follows:

- To expand and diversify the settings for small and boutique business, reflecting modern business formation characteristics and low-cost business growth opportunities;
- To encourage the dual use of homes as businesses and residences;
- To ensure that the housing typology of the zone expands the settings for business and is complementary to the settings in the Village Centre zone;
- To encourage small businesses in adaptable housing to locate adjacent to the Village Centre with minimum planning approval requirements;
- To provide buildings brought forward on each block to have a close physical and functional relationship with people on the adjacent footpath;
- To allow any house to be fully or partially used as a business.

Note: The objective is to provide a broader range and settings for full-time **businesses in housing** close to the centre. The apparent anomaly is that the building typology is a home, but the use of the same building can be for a business and not a home. To perform optimally as a business it is essential for the building to have a strong relationship with the street and so reduced setbacks (as shown in Figure 5) will be necessary to the integrity of the zone and the desired outcomes.



Finally, the Support Zone is likely a residential zone with a more permissive range of uses allowing full-time occupation by businesses. This raises the issue of the extent of the zone or whether a subzone is needed. Assuming a more simplistic approach to the zones around the Village Centre, there are likely to be two zones.

1. Commercial Zone
2. Residential Zone with Medium Density Overlay - Permissive for business

The complicating issue of the medium density overlay is that it is likely to be wider than the notional Village Centre Support Zone. This raises the issue of how precious we might want to be about businesses locating some distance from the centre. This could be dealt with in Objectives and Principles by establishing the basis for the business-permissive use. The Objective is to reinforce and support the centre. The further away from the centre, the less this Objective would apply. The other factor is the level to which market factors would apply. Businesses generally would like exposure to and a relationship with the Village Centre. As the distance from the centre increases, it is less likely that properties would be as attractive to business.

### 2.3.3 Village Zone Objectives

The Village Zone is a zone overlay that covers both the Village Centre Core and Village Centre Support zones and extends to cover the area intended for more intensive housing with limited boundary setbacks and within easy walking distance of the Village Centre. The intent of the overlay is to require houses to have a relationship with people walking in the street through the adoption of the principles shown in Figure 4.

Zone descriptions and objectives are as follows:

- To provide more housing and greater numbers of residents within close walking distance of the Village Centre;
- To provide a diversity of housing choice, reflecting the lack of housing diversity in Levin and Horowhenua;
- To provide housing product that matches the various lifecycle stages of residents;
- To provide entry-level housing for young people;
- To provide housing for active retirees within easy walking distance of a wide range of goods and services in the Village Centre;
- To enable older residents of Horowhenua to “age in place” and not leave the community and their support networks due to lack of housing choice;
- To enable older residents to trade down from larger and often more expensive homes and bank equity;
- By design, siting and orientation of the house on the block engenders increased levels of walking;
- By design encourage greater levels of social exchange between people in the house and people in the street;
- By design and the quality of the public and private realm interface which is designed to get people outside, improve physical and mental health.

The houses in this zone are to be diverse, with two and single storey homes on a variety of sections of various sizes. Dwelling yield per ha across the zone would expect to average out at around 22-24.

## 3 Implementation

### 3.1 Levin Builder-Developer Market & Methods

Conflicting data exists on how to determine the capacity of the developer-builder market to actively or pro-actively embrace diverse housing product in the Village Zone. On the one hand, the Levin area has seen very little “joined” housing in the past 20 years, but even in the Village Zone and adjacent to the centre we would expect only a minor proportion of housing to be joined. What we should expect is small sections with a small front yard and narrow block (possibly between 11 and 14 metres). In addition, growth in Levin has been historically low. So demand has been driven by household occupancy changes (which have been reducing for decades, which requires more homes for the same population). Builders tend to be conservative in a low growth market and so the motivation for builders to experiment in such a market also tends to be low. Builders from outside of Levin are already active in the Horowhenua market - as they should be.

Taraika is a project of sufficient size to interest some of the larger corporate builders in New Zealand.

In looking at builders that advertise product at scale in Levin, Homestead Construction appears to have a range of typologies, good capacity and a presence in Levin. Other home builders in the area tend to be project-based, without off-the-plan typologies.

Some of the major national home builders have a presence in Palmerston North and most if not all of the others have a presence in Wellington. Given that O2NL will make Wellington less than 1 hour travel time from Levin, Wellington builders should be comfortable candidates for the Taraika home building market. The Council might consider establishing education and consultation sessions with major builders in Wellington in anticipation of Taraika and O2NL. Council has regulatory options to enable an appropriate form and mix of medium density housing product with Taraika. This will require developer-builders to produce product not seen in any quantity to date in the Levin market. The level to which developer-builders engage with Taraika to deliver an appropriate mix of density and typology is subject to several factors:

- Land cost
- Build cost
- Anticipated market size by product type
- Anticipated sale prices
- Cost of producing new typologies
- Certainty and ease of approvals

Council could offset the cost of the last of these two. In projects elsewhere design processes instigated by Councils (or developers) have substantially reduced the cost of designs and sped up approval times. This gives certainty to developers and reduces their risk.

Council could (for instance) produce a detailed pre-approved plan that removes all risks of planning approval and design costs for the builder/developer. This is called a BAGs plan and an example of such a plan and the built result is shown side-by-side following.

Figure 21 - Building & Access Guideline Plan (BAGs)



Figure 22 - Identical as-Built Overlaid on BAGs Plan



Figure 23 - Duplex (Top image) & Two Houses (Bottom image)

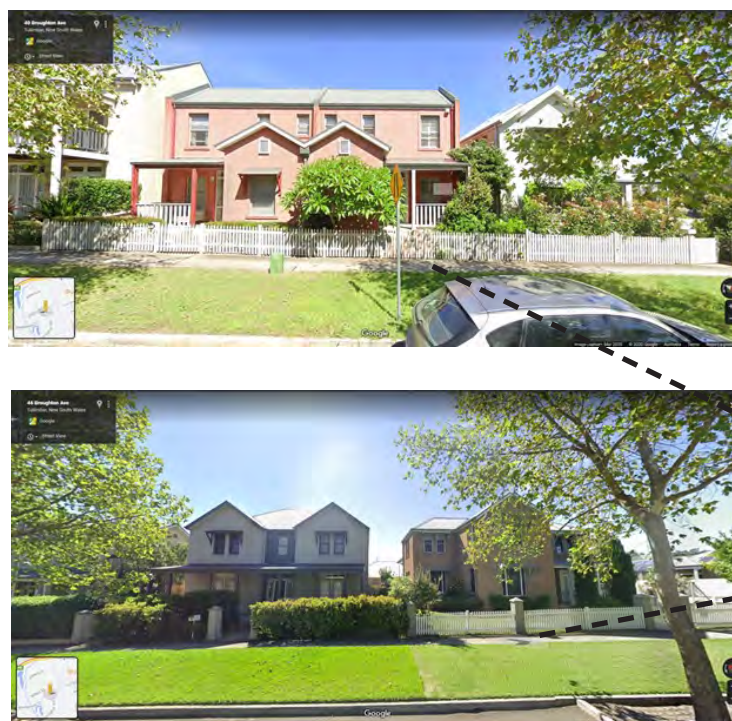


Figure 24 - Location of Each Building on Left



The block with the duplex delivers 6 dwellings across an 80 metre block frontage. The duplex frontage is 8 metres for each, but others are 11 metres (x 2), 14 metres and 17 metres. These are similar to the scale, size and configuration of buildings that we would expect to build in the Taraika Village Zone.



The imposition of a BAGs plan would require in-depth consultation with the builder-developer candidates and possibly also with property owners. The examples shown above are all architecturally designed to be representative of south coast NSW forms (not an appropriate style for Taraika). Design for these went through a rigorous process involving multiple architects (critically analysing each other's drawings and plans) and builders to ensure cost-effective design and construction.

The major benefit of this design and costing partnership is reductions in the risk profiles for the Council (and community) and for the builder developers, who can cost up approved plans and do not need to go backward and forward to Council with design options.

However, whilst this process gives complete certainty of delivery of all constituent objectives, other processes are less prescriptive but are less certain in outcomes. Including a BAGs plan, these would include:

1. BAGs Plan;
2. Council development entity (such as the Trust) developing a demonstration project;
3. Strong design controls in the District Plan;
4. Two-way education sessions with developer builders;
5. Standard District Plan Zoning provisions as seen all over NZ.

For the Village Centre, improving economic capacity will require the Council to revisit its "home occupation" controls. This proposal seeks to allow businesses to fully occupy individual houses, without the need for the building to act as a residence. The individual nature and fine-grain scale of these buildings, which are built as houses, will offset any concerns about scale and competition with activities in the Village Centre Core Zone. These are relatively small domestic buildings that widen the scope for business occupation and are intended to support the performance and enhance the robustness of the wider Village centre and act complementary to the Core Zone. The use table for this Zone should not be too restrictive but should attempt to loosen the zoning collar around the centre to encourage a wider mix of activities and more businesses in and around the centre than that which would normally be confined to the Core zone.

Following is our assessment of the efficacy and risk to the objectives held for Taraika under the five options.

Control Option	Risk to Desired Outcomes & Objectives
Building and Access Guidelines (BAGs)	Low
Council develop a demonstration project	Moderate
Strong Design Controls	Moderate to High
Two way education session with developers and builders	High
Standard DP provisions	Extreme

There are of course options to do more than one of these together. Design controls and education sessions could be packaged together and a BAGs approach inherently requires the Council to bring the developer-builders together to work through site and building designs, costs and buildability.

Strong design controls, we have assumed, would take the traditional form of a guidelines package referenced and linked by and to the District Plan. The level to which the controls are reinforced in the Plan would largely determine the level of risk, but the experience in New Zealand of Design Guidelines reinforcing District Plan provisions is not good.

The main point in this is that the Taraika project is a consequence of long term and linked together thinking by Horowhenua Council. The development of a standard New Zealand subdivision, with little housing diversity, and a shopping centre setback from the street behind a sea of parking is what the market is most likely to deliver unless it is required by regulation or exemplars to do something different. The rationale for a different design and development approach in Taraika sit within existing work undertaken by and on behalf of Council over the past few years, as well as the principles contained within this document.

It would be a shame to lose a valuable urban asset to conventional development mediocrity. The ability to require a quality path requires planning and design innovation as outlined in this report as well as political will. The Councillors will also need to see the benefits and continually reinforce the quality focus.

Taraika has the potential to be a game changing urban development project not only in Horowhenua but in New Zealand with greater capacity for improved social, economic and health outcomes if developed as outlined in this document.

***Appendix 5 – Liquefaction Assessment***





# Horowhenua District Potential Growth Areas

## Liquefaction Assessment

Prepared for  
Horowhenua District Council

Prepared by  
Tonkin & Taylor Ltd

Date  
September 2020

Job Number  
1009677.v2



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## Document Control

Title: Horowhenua District Potential Growth Areas					
Date	Version	Description	Prepared by:	Reviewed by:	Authorised by:
28/08/2019	1	Draft for comment	DSAH/ADW	CVS	MEJ
14/09/2020	2	Final	ANRO	CVS	MEJ

### Distribution:

Horowhenua District Council

1 copy

Tonkin & Taylor Ltd (FILE)

1 copy

## Liquefaction Assessment Summary

LIQUEFACTION ASSESSMENT SUMMARY	
<p>This liquefaction assessment has been undertaken in general accordance with the guidance document 'Assessment of liquefaction-Induced Ground Damage to Inform Planning Processes' published by the Ministry of Business, Innovation and Employment in 2017.</p> <p><a href="https://www.building.govt.nz/building-code-compliance/geotechnical-education">https://www.building.govt.nz/building-code-compliance/geotechnical-education</a></p>	
Client	Horowhenua District Council (HDC)
Assessment undertaken by	Tonkin + Taylor Ltd, 2 Hunter Street, Wellington 6011
Report date	September 2020
Extent of the study	<p>HDC future growth areas: (refer Figures A1 to A10 in Appendix A)</p> <ul style="list-style-type: none"> <li>- Foxton Beach</li> <li>- Foxton</li> <li>- Tokomaru</li> <li>- Shannon</li> <li>- Waitarere Beach</li> <li>- Mangaore</li> <li>- Levin</li> <li>- Ohau</li> <li>- Waikawa Beach</li> <li>- Manakau</li> </ul>
Intended RMA planning and consenting purposes	Inform HDC strategy for urban growth and identify liquefaction risks associated with identified future growth areas.
Other intended purposes	<ul style="list-style-type: none"> <li>- Inform future liquefaction assessment work required to develop future growth areas.</li> <li>- Indicate potential strategies for liquefaction and lateral spreading mitigation during development of future growth areas.</li> </ul>
Level of detail	This assessment is considered to be a Level A <i>"Basic desktop assessment"</i> for the site assessments of all areas listed above assessments, and is based on the geotechnical investigations currently available.
Notes regarding base information	<ul style="list-style-type: none"> <li>- The assessment included relevant Cone Penetration Test (CPT), Machine Borehole (BH) and Hand-Auger (HA) data within or near the study areas that were available on the NZ Geotechnical Database (NZGD) as at January 2020. Refer Appendix A and Appendix B for details on the investigations.</li> <li>- This assessment also included relevant data (CPT, BH, HA, Scala Penetrometer and Test Pit), within or near the study areas that were provided by HDC and not available on the NZGD. Refer Appendix A and Appendix B for details on the investigations.</li> <li>- Depth to groundwater was based on groundwater encountered within investigations, Horizons Regional Council groundwater database, and observation of surface water such as lakes and rivers.</li> </ul>
Other notes	



# 1 Introduction

## 1.1 General

Tonkin & Taylor Ltd (T+T) was engaged by Horowhenua District Council (HDC) to undertake a liquefaction vulnerability assessment of ten future growth areas identified within their district. These include sites at Foxton, Foxton Beach, Tokomaru, Shannon, Waitere Beach, Mangaore, Levin, Ohau, Waikawa Beach and Manakau.

The work was undertaken in accordance with our proposal dated 15 May 2019<sup>1</sup>, and the variation order dated 25 November 2019<sup>2</sup> detailing the inclusion of additional assessment of future growth areas. This report serves as an updated version to our initial draft assessment dated August 2019<sup>3</sup>, assessing only six future growth areas.

A geotechnical investigation has previously been undertaken at each of the sites and that data is publicly available on the New Zealand geotechnical Database (NZGD). The investigations consisted of Cone Penetration Tests (CPTs), Machine Boreholes (BH's) and Hand-Augers (HA's), which have been used in the liquefaction assessment of each site. The locations of the investigations used are presented in Figures A1 to A10 in Appendix A. A summary of the site investigation data retrieved from the NZGD is provided in Appendix B.

Additional geotechnical data from previous investigations within or near the sites, not available on the NZGD, were provided by HDC. These investigations consisted of CPT's, BH's, HA's and Scala Penetrometer Tests, which have also been used in the liquefaction assessment of each site. The locations of the investigations used are presented in Figures A1 to A10 in Appendix A. A summary of the site investigation data received from the HDC is provided in Appendix B.

Geotechnical investigations and more detailed assessments<sup>4</sup> were undertaken by T&T in 2019, for two smaller areas located near the centre of the current Foxton Beach assessment area. These assessments are considered to be of Level C "*Detailed area-wide assessment*" based on Table 3.3 of the MBIE guidance<sup>5</sup>. As the scope of this assessment was focused on a larger area in Foxton Beach, the two refined assessments were not presented in detail, but the investigation data was utilised for this assessment.

The liquefaction analysis and assessment included the following:

- ∂ Assess likelihood and consequences of liquefaction across each site.
- ∂ Assess liquefaction for 1/25 year, 1/100 year, and 1/500 year seismic events.
- ∂ Identify liquefaction vulnerability across each site.
- ∂ Assess lateral spreading hazard across each site.
- ∂ Identify appropriate ground improvement measures and/or foundations for developments in order to mitigate the liquefaction hazard.

<sup>1</sup> T&T (15 May 2019). Letter of Engagement to HDC. Stage 2: Seismic Risk Assessment. *Proposal for Liquefaction Assessment, Six Potential Growth Areas, Horowhenua District Council, Proposed Rezoning*. T&T Ref: 1009677.0000.

<sup>2</sup> T&T (25 November 2019). Letter to HDC. *Growth Areas, Horowhenua District, Level A Assessment, Liquefaction Vulnerability, Variation Order No. 1*. T&T Ref: 1009677.0000.

<sup>3</sup> T&T (August 2019). Draft Report. *Horowhenua District, Potential Growth Areas, Liquefaction Assessment*. T&T Ref: 1009677.0000.

<sup>4</sup> T&T (September 2020). Report. *HDC Property, Foxton Beach – Liquefaction Assessment*. T&T Ref: 1009677.0010; and T&T (September 2020). Report. *Soo Property, Foxton Beach – Liquefaction Assessment*. T&T Ref: 1009677.0010.

## 1.2 Intended purpose of assessment

This liquefaction assessment is primarily intended to inform HDC of liquefaction hazard associated with their future growth areas as part of the HDC strategy for urban growth and development.

Other intended purposes of this report are to inform future liquefaction assessment work which may be required to develop the HDC future growth areas. In addition, this report indicates potential strategies which may be used during development of future growth areas to mitigate liquefaction and lateral spreading hazard.

## 1.3 Assessment methodology

This liquefaction assessment has been undertaken following the recommendations of the Ministry of Business Innovation & Employment (MBIE) Planning and Engineering Guidance for Potentially Liquefaction-Prone Land<sup>5</sup>. The assessment is based on an understanding of the geology at each of the sites, and a liquefaction analysis of the CPT investigations. Based on the density of investigations available at each site and the overall level of uncertainty in the input information, this is considered to be a Level A “*Basic desktop assessment*”. Earthquakes scenarios for return periods of 25-year, 100-year, and 500-year levels of earthquake shaking specific to each site were used. The specific outcomes of the liquefaction assessment for each site are detailed in the following sections. Technical details regarding the methodology used to undertake the liquefaction analysis, and the calculated results, are provided in Appendix C.

## 1.4 Liquefaction categories

Each site has been divided into liquefaction vulnerability categories as recommended by the MBIE guidance document<sup>5</sup>. Two levels of category have been used based on the understanding of the local geology and the density of investigations at each site. Where sufficient geotechnical investigations are available the land has been categorised as either ***Liquefaction Damage Is Unlikely*** or ***Liquefaction Damage Is Possible***. Where insufficient investigation data is currently available to categorise the land the area has been labelled as ***Liquefaction Category is Undetermined***. The liquefaction categories used are described in Table 4.4 of the MBIE guidance document<sup>5</sup>, which is presented in Table 1.1 below.

Changes in geology, variations in ground surface level, or variations in groundwater level over the site are expected to alter the site’s liquefaction vulnerability. Any significant variations in these parameters, identified during our liquefaction assessment, have been shown on the associated Figures in Appendix A and further discussion is provided under each site’s liquefaction assessment results summary section.

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<sup>5</sup> MBIE (September 2017) *Planning and Engineering Guidance for Potentially Liquefaction-prone Land*  
<https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/planning-engineering-liquefaction-land/>

**Table 1.1: Performance criteria for determining the liquefaction vulnerability category (from MBIE guidance document<sup>5</sup>, Table 4.4).**

<b>LIQUEFACTION CATEGORY IS UNDETERMINED</b> A liquefaction vulnerability category has not been assigned at this stage, either because a liquefaction assessment has not been undertaken for this area, or there is not enough information to determine the appropriate category with the required level of confidence.			
<b>LIQUEFACTION DAMAGE IS UNLIKELY</b> There is a probability of more than 85 percent that liquefaction-induced ground damage will be <b>None to Minor</b> for 500-year shaking. At this stage there is not enough information to distinguish between <b>Very Low</b> and <b>Low</b> . More detailed assessment would be required to assign a more specific liquefaction category.		<b>LIQUEFACTION DAMAGE IS POSSIBLE</b> There is a probability of more than 15 percent that liquefaction-induced ground damage will be <b>Minor to Moderate</b> (or more) for 500-year shaking. At this stage there is not enough information to distinguish between <b>Medium</b> and <b>High</b> . More detailed assessment would be required to assign a more specific liquefaction category.	
<b>Very Low Liquefaction Vulnerability</b> There is a probability of more than 99 percent that liquefaction-induced ground damage will be <b>None to Minor</b> for 500-year shaking.	<b>Low Liquefaction Vulnerability</b> There is a probability of more than 85 percent that liquefaction-induced ground damage will be <b>None to Minor</b> for 500-year shaking.	<b>Medium Liquefaction Vulnerability</b> There is a probability of more than 50 percent that liquefaction-induced ground damage will be <b>Minor to Moderate</b> (or less) for 500-year shaking; and <b>None to Minor</b> for 100-year shaking.	<b>High Liquefaction Vulnerability</b> There is a probability of more than 50 percent that liquefaction-induced ground damage will be <b>Moderate to Severe</b> for 500-year shaking; and/or <b>Minor to Moderate</b> (or more) for 100-year shaking.

## 8 Levin

### 8.1 Site description

The site is located on the western side of the larger Levin area, and covers an area of approximately 1,766 hectares of which the majority is the main town area. Lake Horowhenua is located approximately 440 m northwest of the site, and a small stream runs south-to-north approximately 100 m to the east. Ponds/small lakes are located within the north-eastern site corner. State Highway 1 runs southwest-northwest through the site's centre. The site is occupied mostly by residential and commercial properties. Undeveloped farmland with scattered residential dwellings and structures associated with farming are located across the north-eastern and the southern areas. The foothills of the Tararua Mountain Range are located 1.2 km southeast of the site.

### 8.2 Ground and ground water conditions

#### 8.2.1 Geology and topography

The published geological map of the area<sup>6</sup> indicates that the site spans over a number of different geological units. In the southwest, site is underlain by Pleistocene aged, fluvial, poorly- to moderately-sorted gravel with minor sand/silt (Q2a), and marine gravel with sand (Q5b), in northeast. A small area in the north-eastern site corner is underlain by Holocene aged, alluvial gravel, sand, silt, mud and clay with local peat (Q1a). Two active folds are located approximately 150 m north of the site, but do not traverse the site area. The location of the site in the context of the regional geology is presented in Figure 8.1 below.

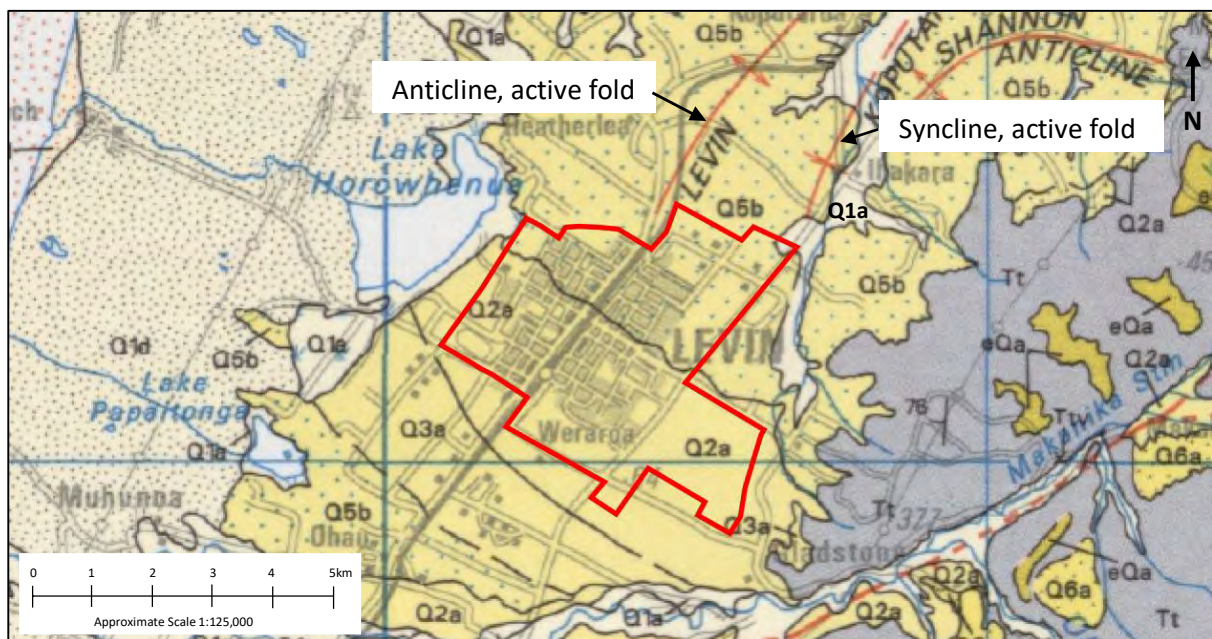


Figure 8.1: Levin geological setting (approximate site location outlined in red).

#### Legend

<span style="color: red;">—</span>	Approximate site boundary
Q2a	River deposits comprising poorly- to moderately-sorted gravel with minor sand/silt
Q5b	Beach deposits comprising marine gravel with sand
Q1a	Alluvial gravel, silt, mud and clay with local peat



The Tararua Range foothills lead down to the south-eastern site boundary, and the ground surface gently slopes northwest across the relatively flat site area. The ground surface across the site is intersected by multiple paleo channels which result in gentle undulations of the ground surface. Several ridges and high points are located along the northern site boundary over the marine gravel deposits, and are up to 10 m higher than the adjacent ground. The LiDAR data has been used to generate 1 m contours across the site, which is presented in Figure A7.1, in Appendix A.

### 8.2.2 Geotechnical model

In the west (Q2a), test pits indicate alluvial, medium dense to dense, sandy gravel to a depth of about 4.5 m. Fill material comprising medium dense to dense, gravelly sand was observed up to a depth of 4.5 m in one location indicating historical earthworks within the area. CPT's within this unit reached refusal conditions at shallow depths, likely on alluvial gravel deposits. It is expected that the remainder of the south-western half of the site (Q2a) is underlain by alluvial gravels with some sand and silt to a depth of greater than 20 m.

In the northeast (Q5b), majority of the CPT's indicate sand, loose to dense with depth, interbedded with sand mixtures, gravelly sand, silt and clay up to a depth of about 11 m, with possible local peat deposits. CPT's reached refusal at varying depths, likely on marine gravel deposits, which are expected to extend to depths greater than 20 m. Paleo channels that have incised into the underlying gravel and later filled with finer grained soils such as sand, silt, or clay are also likely to be present in varying depths across the site.

### 8.2.3 Groundwater

Toward the lower elevation areas in the west, two well records indicate typical groundwater levels of around RL 20.5 m (4.5 m depth) and RL 18 m (4.0 m depth). No groundwater was encountered within nearby test pits terminated at depths of around 2.7 m and 4.5 m. Within elevated areas toward the west, a well and dipped CPT's indicate a typical groundwater level around RL 28 m to RL 31 m, with depths to groundwater of 20 m near the centre, and 2.3 m to 4 m toward the north.

## 8.3 Liquefaction assessment

### 8.3.1 Results summary

The site is split into three categories, as shown on Figure A7.2 in Appendix A.

- ∂ *High Elevation Area (north) – Liquefaction Damage is Possible;*
- ∂ *Low Elevation Area (north) – Liquefaction Damage is Possible; and*
- ∂ *Southern Area - Liquefaction Damage is Unlikely.*

The currently available ground information is not sufficient to categorise the site into the more precise liquefaction vulnerability categories presented in Table 1.1. However, if the general trends observed in the current data are confirmed with more detailed information, our preliminary expectation is that:

- ∂ *High Elevation Area (north) – might eventually be categorised as Low or **Medium Liquefaction Vulnerability**;*
- ∂ *Low Elevation Area (north) – might eventually be categorised as **High Liquefaction Vulnerability**;*
- ∂ *Low Elevation Area (south-west) – might eventually be categorised as **Low Liquefaction Vulnerability**;*

- ∂ High Elevation Area (in the south-east) – might eventually be categorised as **Very Low Liquefaction Vulnerability**.

The variation in expected eventual liquefaction vulnerability categorisation between high and low elevation areas is due to the greater crust thickness and greater depth to groundwater in the high elevation area.

The Levin liquefaction assessment is considered to be a Level A “*Basic desktop assessment*” based on Table 3.3 of the MBIE guidance<sup>1</sup>.

A detailed summary of the liquefaction analysis methodology and results is presented in Appendix C.

### 8.3.2 Lateral spreading assessment

Land within 100 m of a free face are areas assumed to be potentially susceptible to lateral spreading. This assessment is based on the simple geomorphic screening for lateral spreading presented in Section 4.4.3 of the MBIE guidance<sup>1</sup>. Simple geomorphic screening has been completed assuming a free face height of less than 2 m. The following free face sources were identified during our lateral spreading assessment:

- ∂ Land adjacent to ponds/small lakes located in the north-eastern site corner; and
- ∂ Land adjacent to the stream located east of the site.

Land adjacent to Lake Horowhenua is also potentially susceptible to lateral spreading, considering a free face height of more than 2 m. Although this water body is located more than 200 m from the site, this possibility should be considered.

Lateral spreading is expected to occur during 500-year level shaking. Lateral spreading may occur under lower levels of seismic shaking; however, our current assessment is not sufficiently detailed to determine the likely triggering levels for lateral spreading at this site. A detailed lateral spreading risk assessment should be completed as part of any future development works for this site.

A detailed lateral spreading assessment may reduce the area that is assessed as susceptible to lateral spreading if the free face is lower than assumed, near surface liquefied layers are not continuous, or the near surface layers are not expected to liquefy. It is possible that the area assessed as susceptible to lateral spreading could increase during a detailed assessment if the free face is shown to be higher than expected or near surface liquefaction is worse than expected.

### 8.3.3 Key uncertainties

The key uncertainties associated with our liquefaction assessment are the variation in subsoil profile over the site, variation in groundwater level, and the height of the potential free faces.

Additional site specific geotechnical investigations comprising BH's and/or CPTs would be required to properly characterise the variation in subsoil profile over the site. A suitably detailed investigation would be expected to enable categorisation of the site into the more precise liquefaction vulnerability categories presented in the bottom row of Table 1.1.

LiDAR data indicates that a number of paleo channels are present over the site. Paleo channels may have perched groundwater tables, from water running off from surrounding higher land and soaking in, and localised pockets of soft or loose soil. A site walkover assessment by an engineering geologist and targeted geotechnical investigations to assess stratigraphy and groundwater level would reduce the uncertainty relating to paleo channels and variations in groundwater level.

Piezometers installed within borehole investigations should be used to measure the groundwater level at the site over time. CPT investigations may provide an indication of the depth to groundwater at the time the investigation was undertaken. A more detailed understanding of the variation in

groundwater level over time at the site is expected to allow for categorisation of high elevation areas into the more precise liquefaction vulnerability categories.

The height of any potential free faces has a large impact on the expected extent of lateral spreading and the magnitude of lateral spreading. An onsite assessment of free face height should be completed as part of detailed geotechnical investigation works to enable a better assessment of the potential extent and severity of lateral spreading.

## 12 Refinement of liquefaction categories

The liquefaction categories shown in Appendix A, Figures A1 to A10, are based on widely spaced investigations with assessment at a level of detail of “Level A”. These results are likely to be sufficient to inform HDC’s consideration of the relative favourability of future growth areas at the current time.

For the level of accuracy required at subdivision consent, additional investigation would be appropriate to identify whether there are any localised areas of poorer ground. To support any applications for subdivision consent a “Level C” assessment in terms of the MBIE liquefaction planning guidance should be carried out, and stand-alone geotechnical reports prepared. This work should be overseen by a Chartered Professional Engineer (CPEng) with current accreditation in the geotechnical practice field as administered by Engineering New Zealand and/or a Professional Engineering Geologist with current registration on the Engineering New Zealand PEngGeol register. The reports should include all relevant factual and interpretative geotechnical information, clearly distinguishing between fact and interpretation and providing a commentary on uncertainty (and potential consequences). The reports should address the pertinent geotechnical aspects of all natural hazards relevant to the site (including, but not limited to, liquefaction).

If areas of **High Liquefaction Vulnerability** are identified, site-specific geotechnical assessment should be undertaken for each individual lot within the area. This is in order to confirm that the ground improvement and/or foundation design is appropriate for the specific site.



## 13 Site development considerations

### 13.1 Overview

The study areas have generally been classified into areas where *liquefaction damage is unlikely* or, *liquefaction damage is possible*. In areas where liquefaction damage is possible a number of options are available for liquefaction mitigation and lateral spread mitigation. These options are grouped into:

- o Enhanced Foundations (e.g. a waffle slab, enhanced lightweight foundation on timber piles, timber piles on a reinforced concrete slab, or deep piles.)
- o Ground Improvement (e.g. hardfill raft, soil-cement raft, stone columns, or columns of highly compacted aggregate)

Development of the site would be appropriate subject to the options provided. Site specific assessments required for design will provide greater clarity for foundation design and ground improvement requirements for individual lots. This assessment does not remove any requirements for site specific assessment for detailed design. All normal requirements for earthworks and building design still apply (e.g. as stated in NZS 3604).

### 13.2 Ground improvement and foundation options

The current level of assessment allows for general ground improvement and foundation options to be presented for the areas categorised as liquefaction damage is unlikely or possible. Further distinction between areas of very low to high vulnerability should be established through a “Level C” assessment in terms of the MBIE liquefaction planning guidance, as recommended in section 8.

Generally, liquefaction mitigation on land where “*liquefaction damage is possible*” (medium or high category land) can be undertaken either on a house-by-house basis, or as part of area-wide ground improvement, depending on the level of resilience required from the development.

Liquefaction mitigation on a house-by-house basis is generally less effective and leaves a higher risk of disruption to the community in a large earthquake (e.g. due to damaged roads and services). Therefore consideration should be given to requiring area-wide ground improvement as part of subdivision construction.

Development options which could be selected for development are summarised in Table 13.1 below.

The descriptions of damage to services in Table 13.1 assume that no additional protection is provided to road networks or buried services. Additional resilience to roads and services could be provided by implementing localised ground improvement as described in Section 9.4.

**Table 13.1: Expected performance of development options: away from lateral spreading areas**

Development option	Liquefaction damage is unlikely (Very Low/Low Liquefaction Category)	Liquefaction damage is possible (Medium/High Liquefaction Category)
	500-year earthquake shaking	500-year earthquake shaking
<b>(1) Standard NZS 3604 foundation with no ground improvement</b>	Minor to Moderate settlement of dwellings, could be expensive or not possible to repair. Damage to roads and public and private services.	Moderate to severe settlement of dwellings, may or may not be repairable. Significant to Widespread damage to roads and services.
<b>(2) Enhanced foundation with no ground improvement <sup>7</sup></b>	Minor to moderate settlement of dwellings, likely to be readily repairable. Damage to road and public and private services.	Minor to major settlement of dwellings, repair probably feasible but could be expensive. Significant to Widespread damage to roads and services.
<b>(3) Enhanced foundation with ground improvement beneath dwelling footprint only</b>	Minor settlement of dwellings, likely to be readily repairable. Damage to roads and services apart from those adjacent to dwellings.	Minor to moderate settlement of dwellings, likely to be readily repairable. Significant to Widespread damage to roads and services.
<b>(4) Enhanced foundation with area-wide ground improvement</b>	Minor settlement of dwellings, and minor damage to roads and services, all likely to be readily repairable.	Minor settlement of dwellings, likely to be readily repairable. Moderate damage to roads and services.

**Table Legend:**

Yellow shading    Unlikely to meet Building Code requirements

White shading    Likely to meet Building Code requirements

Blue shading    Provides additional community resilience beyond minimum Building Code requirements

*The split-colour shading for some cells recognises that there remains substantial residual uncertainty in the liquefaction assessment undertaken to date. More detailed liquefaction assessment would be required to confirm foundation requirements.*

<sup>7</sup> For land identified as *liquefaction is possible*, enhanced foundations with no ground improvement may require a more robust foundation solution to meet Building Code requirements (e.g. piles). In this case costs will be dependent on the specific ground and building details for each property, but will likely be higher than for Medium Category.

### 13.3 Lateral spread mitigation options

Table 13.2 below summarises the options available for development of land at risk of lateral spreading. Refer Figures A1 to A10, in Appendix A, for the extent of land at risk of lateral spreading at each site.

Lateral spreading mitigation on a house-by-house basis is generally less effective and leaves a higher risk of disruption to the community in a large earthquake. Therefore consideration could be given to a 'Perimeter Treatment'.

A perimeter treatment would involve ground improvement of a strip of land parallel to the edge of watercourse. Such ground improvement would need to be deep enough to create a break in the otherwise continuous liquefiable layer (i.e. 4 to 6 m deep stone columns or columns of highly compacted aggregate).

**Table 13.2: Expected performance of development options: within lateral spreading areas**

Development option	Liquefaction damage is unlikely (Very Low/Low Liquefaction Category)	Liquefaction damage is possible (Medium/High Liquefaction Category)
	500-year earthquake shaking	500-year earthquake shaking
<b>No specific mitigation; standard NZS 3604 foundations</b> (see also Option 1 in <b>Table 13.1</b> )	Lateral spreading not reduced. Dwellings distorted due to ground stretching across dwelling footprint (possible collapse risk), which would be expensive or not feasible to repair. Underground services stretched or disconnected at junctions. Cracks up to 100 mm wide may form in roads and pavements.	Lateral spreading not reduced. Dwellings distorted due to ground stretching across dwelling footprint (possible collapse risk), which would be expensive or not feasible to repair. Underground services stretched or disconnected at junctions. Cracks greater than 100 mm wide may form in roads and pavements.
<b>Enhanced foundations with no ground improvement</b> (similar to Option 2 in <b>Table 13.1</b> , but with specialised deformation-tolerant foundation options)	Lateral spreading not reduced. Dwelling foundations resist stretching, reducing building damage and simplifying repair. Underground services stretched or disconnected at junctions. Cracks up to 100 mm wide in roads and pavements.	Lateral spreading not reduced. Dwellings may or may not resist stretching, may result in distortion due to ground stretching across dwelling footprint (possible collapse risk), repair may or may not be feasible. Underground services stretched or disconnected at junctions. Cracks up to or greater than 100mm may form in roads and pavements
<b>Enhanced foundations with shallow ground improvement</b> (see also Options 3 and 4 in <b>Table 13.1</b> )	Lateral spreading not reduced. Dwelling foundations resist stretching, reducing building damage and simplifying repair. Underground services stretched or disconnected at junctions. Cracks up to 100 mm wide around edges of improved areas.	Lateral spreading not reduced. Dwelling foundations resist stretching, reducing building damage and simplifying repair. Underground services stretched or disconnected at junctions. Cracks up to or greater than 100 mm wide around edges of improved areas.

Table 13.2 (continued)

Development option	Liquefaction damage is unlikely (Very Low/Low Liquefaction Category)	Liquefaction damage is possible (Medium/High Liquefaction Category)
	500-year earthquake shaking	500-year earthquake shaking
<b>'Perimeter treatment' with deep ground improvement</b> (e.g. 10 to 15 m wide, 600 m long zone of 4 to 6 m deep stone columns, between watercourse and new development)	Lateral spreading reduced (but not eliminated). Dwelling foundations, underground services, roads, and pavements subject to reduced stretching, but still subject to general liquefaction damage – refer Table 5.1 to for mitigation options.	Lateral spreading reduced (but not eliminated). Dwelling foundations resist stretching, reducing building damage and simplifying repair. Underground services stretched or disconnected at junctions. Cracks up to 100 mm wide around edges of improved areas.
<b>Area-wide treatment with deep ground improvement</b> (e.g. 4 m deep stone columns) (see also Option 4 in Table 5.1)	Lateral spreading and liquefaction reduced (but not eliminated). Dwelling foundations, underground services, roads, and pavements subject to reduced stretching and liquefaction-induced settlement.	Lateral spreading and liquefaction reduced (but not eliminated). Dwelling foundations, underground services, roads, and pavements subject to reduced stretching and liquefaction-induced settlement.

**Table Legend:**

*Yellow shading*    *Unlikely to meet Building Code requirements*

*White shading*    *Likely to meet Building Code requirements*

*Blue shading*    *Provides additional community resilience beyond minimum Building Code requirements*

*The split-colour shading for some cells recognises that there remains substantial residual uncertainty in the liquefaction assessment undertaken to date. More detailed liquefaction assessment would be required to confirm foundation requirements.*



### 13.4 Infrastructure protection options

If area-wide ground improvement is not undertaken (e.g. for options with enhanced foundations or ground improvement under the dwelling footprint only), then buried services and pavements outside the treated areas would be susceptible to liquefaction and lateral spreading induced damage.

The resilience of infrastructure networks could be increased by:

- ∂ Undertaking localised ground improvement along infrastructure corridors, and/or
- ∂ Using flexible pipes, flexible connections, and pressurised (rather than gravity-driven) networks

These options are expected to reduce the risk of liquefaction-induced sand boils, localised differential settlement, and reduce the impact of any settlement on the infrastructure. Overall these options improve the likelihood of infrastructure remaining functional after an earthquake. A targeted approach as outlined in Section 9.3, above, may be considered to manage the effects of lateral spreading. These options are not expected to completely protect infrastructure from liquefaction and lateral spreading induced damage. Pavements and buried services constructed using these options on medium and high risk land may still need significant repair or replacement after large earthquakes in order to meet their required levels of service.

## 14 Applicability

This report has been prepared for the exclusive use of our client Horowhenua District Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that this report will be used by Horowhenua District Council in undertaking its regulatory functions in connection with the identified future growth areas.

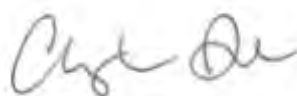
Tonkin & Taylor Ltd

Report prepared by:



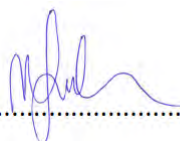
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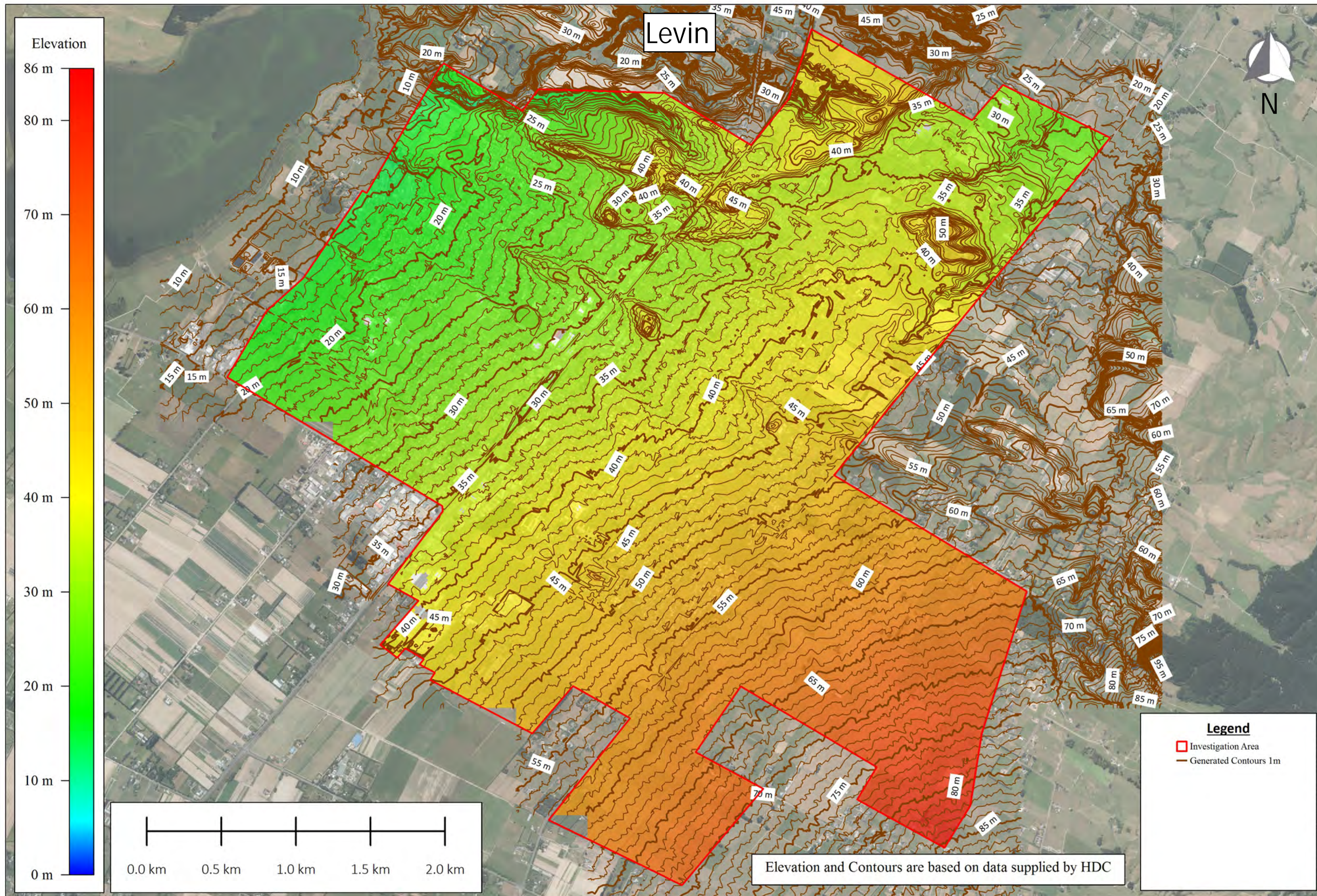
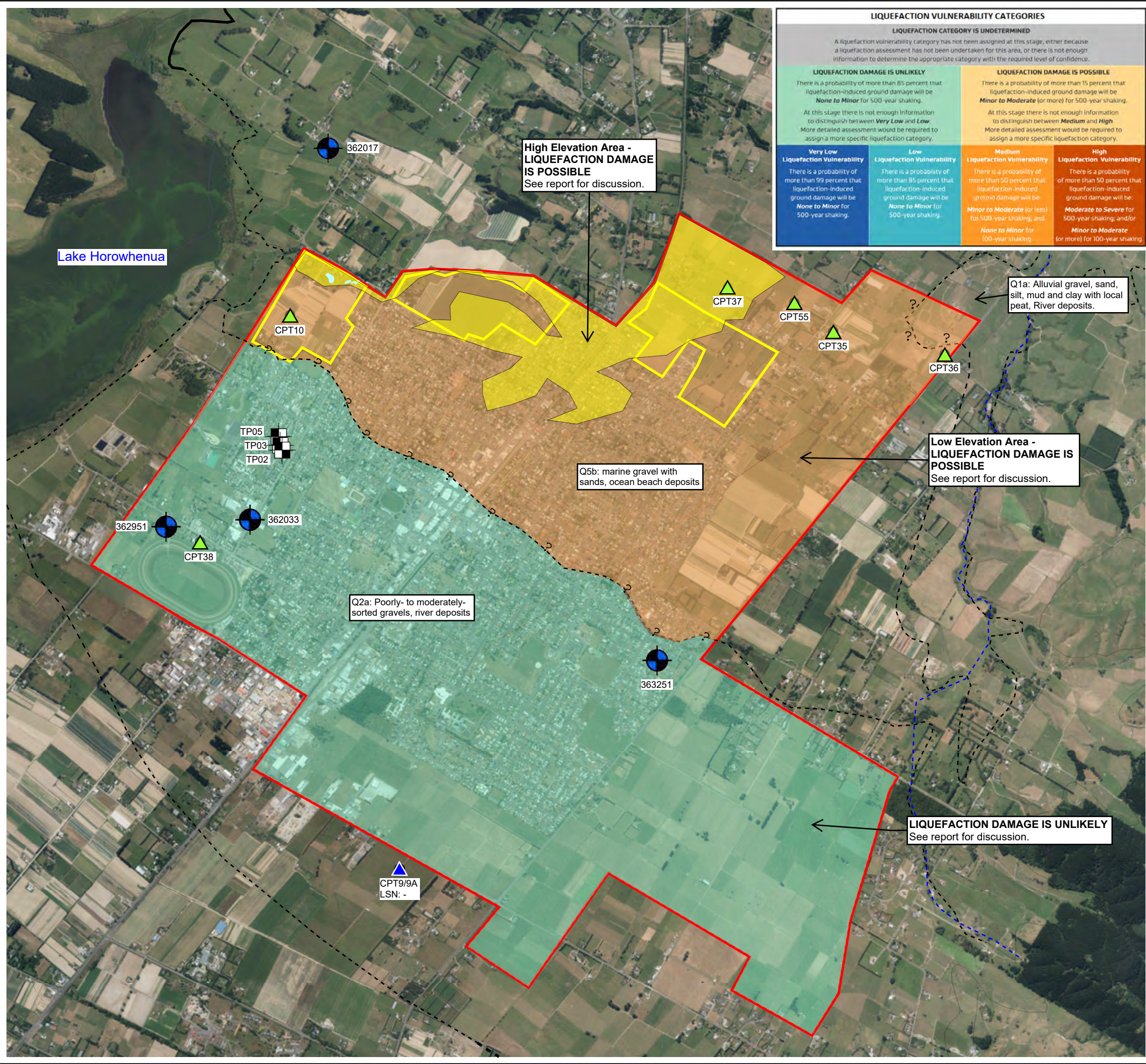


Figure A7.1: LiDAR





LIQUEFACTION VULNERABILITY CATEGORIES			
LIQUEFACTION CATEGORY IS UNDETERMINED			
A liquefaction vulnerability category has not been assigned at this stage, either because a liquefaction assessment has not been undertaken for this area, or there is not enough information to determine the appropriate category with the required level of confidence.			
LIQUEFACTION DAMAGE IS UNLIKELY		LIQUEFACTION DAMAGE IS POSSIBLE	
There is a probability of more than 85 percent that liquefaction-induced ground damage will be <b>None to Minor</b> for 500-year shaking.		There is a probability of more than 15 percent that liquefaction-induced ground damage will be <b>Minor to Moderate</b> (or more) for 500-year shaking.	
At this stage there is not enough information to distinguish between <b>Very Low</b> and <b>Low</b> . More detailed assessment would be required to assign a more specific liquefaction category.		At this stage there is not enough information to distinguish between <b>Medium</b> and <b>High</b> . More detailed assessment would be required to assign a more specific liquefaction category.	
Very Low Liquefaction Vulnerability	Low Liquefaction Vulnerability	Medium Liquefaction Vulnerability	High Liquefaction Vulnerability
There is a probability of more than 99 percent that liquefaction-induced ground damage will be <b>None to Minor</b> for 500-year shaking.	There is a probability of more than 85 percent that liquefaction-induced ground damage will be <b>None to Minor</b> for 500-year shaking.	There is a probability of more than 50 percent that liquefaction-induced ground damage will be <b>Minor to Moderate</b> (or less) for 500-year shaking; and <b>None to Minor</b> for 100-year shaking.	There is a probability of more than 50 percent that liquefaction-induced ground damage will be <b>Moderate to Severe</b> for 500-year shaking; and/or <b>Minor to Moderate</b> (or more) for 100-year shaking.

**LEGEND**

**Public Investigations (NZGD)**

**Investigation Type**

Cone Penetrometer Test (by Opus)

CPT numbers as originally numbered, Liquefaction Severity Number (LSN) is for a 500-year return period at the assumed groundwater level for the investigation location.

**Investigation data provided by HDC (not on NZGD)**

Hand Auger (by Aecom)

Groundwater levels: Horizons database

**Liquefaction assessment details**

Approximate site boundary (Level A Assessment)

Site boundaries for future assessments

**Low Elevation Area**  
**LIQUEFACTION DAMAGE IS POSSIBLE**  
Area is at low elevation relative to surrounding ground. There is a probability of more than 15 percent that liquefaction-induced ground damage will be **Minor to Moderate** (or more) for 500-year shaking. See report for discussion.

**High Elevation Area**  
**LIQUEFACTION DAMAGE IS POSSIBLE**  
Area is at high elevation relative to surrounding ground. There is a probability of more than 15 percent that liquefaction-induced ground damage will be **Minor to Moderate** (or more) for 500-year shaking. See report for discussion.

**LIQUEFACTION DAMAGE IS UNLIKELY**  
There is probability of more than 85 percent that liquefaction-induced ground damage will be **None to Minor** for 500-year shaking. See report for discussion.

Ponds

Approximated river/stream profile

Approximated geological boundary

A3 SCALE: 1:25,000

0 0.25 0.5 0.75 1 1.25 (km)

1. Geological Boundaries GNS Science, Lower Hutt, New Zealand.
2. World Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Created On:	26/11/2019	 <b>Tonkin+Taylor</b> 105 Carlton Gore Road, Newmarket, Auckland www.tonkintaylor.co.nz
Created By:	ARolfe	
Approved By:		
TT Proj Ref:	1009677	
TT Map Ref:	TTMAPREF1433463001.902	

HDC  
LEVIN  
Level A Liquefaction Assessment



***Appendix 6 – Infrastructure Plan***



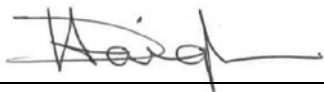
## **3 Waters Infrastructure Plan Taraika Master Plan**

October 2020

## Preamble and Revision History

This document has been prepared by Horowhenua District Council with specialist support from GHD, for the purpose of long-term infrastructure planning and to support the Taraika Plan Change process. The specific conclusions and recommendations described in this report may evolve during the Plan Change and implementation periods.

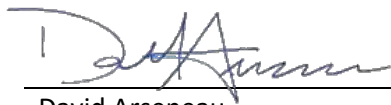
### Report Authors



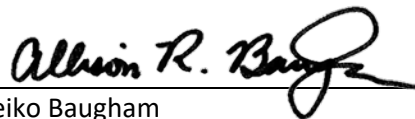
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### Revision History

Version No.	Description	Date	Issued By
01	Issued for Plan Change submission	Oct-2020	Daniel Haigh



# 1. Introduction

Horowhenua District Council (Council) has identified Taraika as a significant growth area in the Levin township. A Master Plan has been prepared, the *Taraika / Gladstone Green Master Plan*, that provides a comprehensive blueprint for this growth area. The Master Plan includes key design principles relating to connectivity, housing choice, character, parks and open space, and infrastructure intended to inform the District Plan rules that will apply to the area. This Infrastructure Plan gives effect to the Master Plan, detailing the infrastructure required for the Taraika development to occur.

The development of Taraika aligns with Horowhenua District Council's Growth Strategy (Horowhenua Growth Strategy 2040) and the Greater Wellington Development Framework (GWDF) which stretches from Wellington up the coast to the Horowhenua District and then on to Palmerston North. Early discussions on the GWDF indicate the desire to house an additional 20,000 people in the Horowhenua District, and Taraika is envisaged to form part of this initiative. The most likely scenario for Taraika is to supply 2,500-3,000 lots which, assuming 2.6 occupants per section, will equate to approximately 6,500 people.

In conjunction with this development, design for the Otaki to North of Levin expressway corridor (O2NL) is underway. The O2NL will ultimately traverse through the development area once constructed, just east of the existing State Highway 57. State Highway 57, also known as Arapaepae Road, also serves as the western boundary of the Taraika development area.

The proposed Taraika development area is an ideal area for development as it is adjacent to the eastern boundary of urban development for the township of Levin. This makes it fairly simple to connect to the existing infrastructure of Levin in terms of water, wastewater and roading infrastructure, while stormwater will be managed separately throughout the development and in the O2NL corridor.

The current township of Levin was engineered around the historical centre of the town which is the intersection of State Highway 1, also known as Oxford Street, with Queen Street. Queen Street runs the full width of Levin from East to West. Figure 1 below provides an overview of Levin with the Taraika extension (outlined in yellow). Existing state highways are highlighted in red.

Figure 1: Map indicating the position of Taraika with respect to Levin





## 2. Levin's Current Infrastructure

Levin is supplied water by the water treatment plant located to the southeast of the town on the Ohau River. Two supply mains service the town, running down Tararua Road and Queen Street respectively. A new reservoir was constructed at the water treatment plant in 2017 to provide buffer during dry periods when the river flow is low. Figure 2 provides an overview of the existing water network relative to the Taraika area (outlined in yellow).

**Figure 2: Existing water supply**

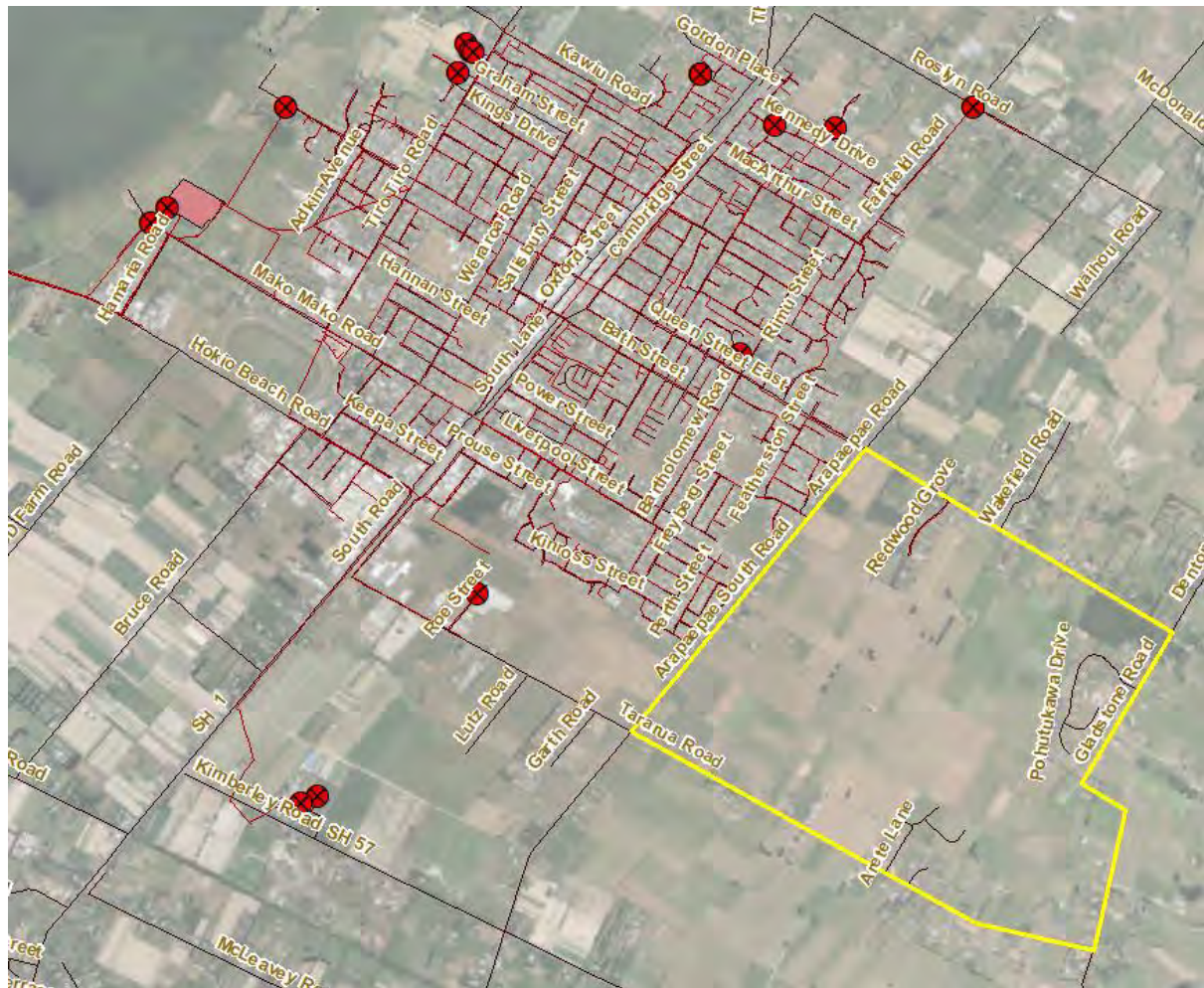


The wastewater is reticulated from the various homes and businesses, mainly by way of gravity sewers, to the Levin Wastewater Treatment Plant (WWTP) which is situated on the western edge of Levin township. The treated wastewater is then pumped to a 110 ha pine and native forest plantation known locally as “the Pot”, which is situated approximately 5.2 kilometres west of the WWTP.



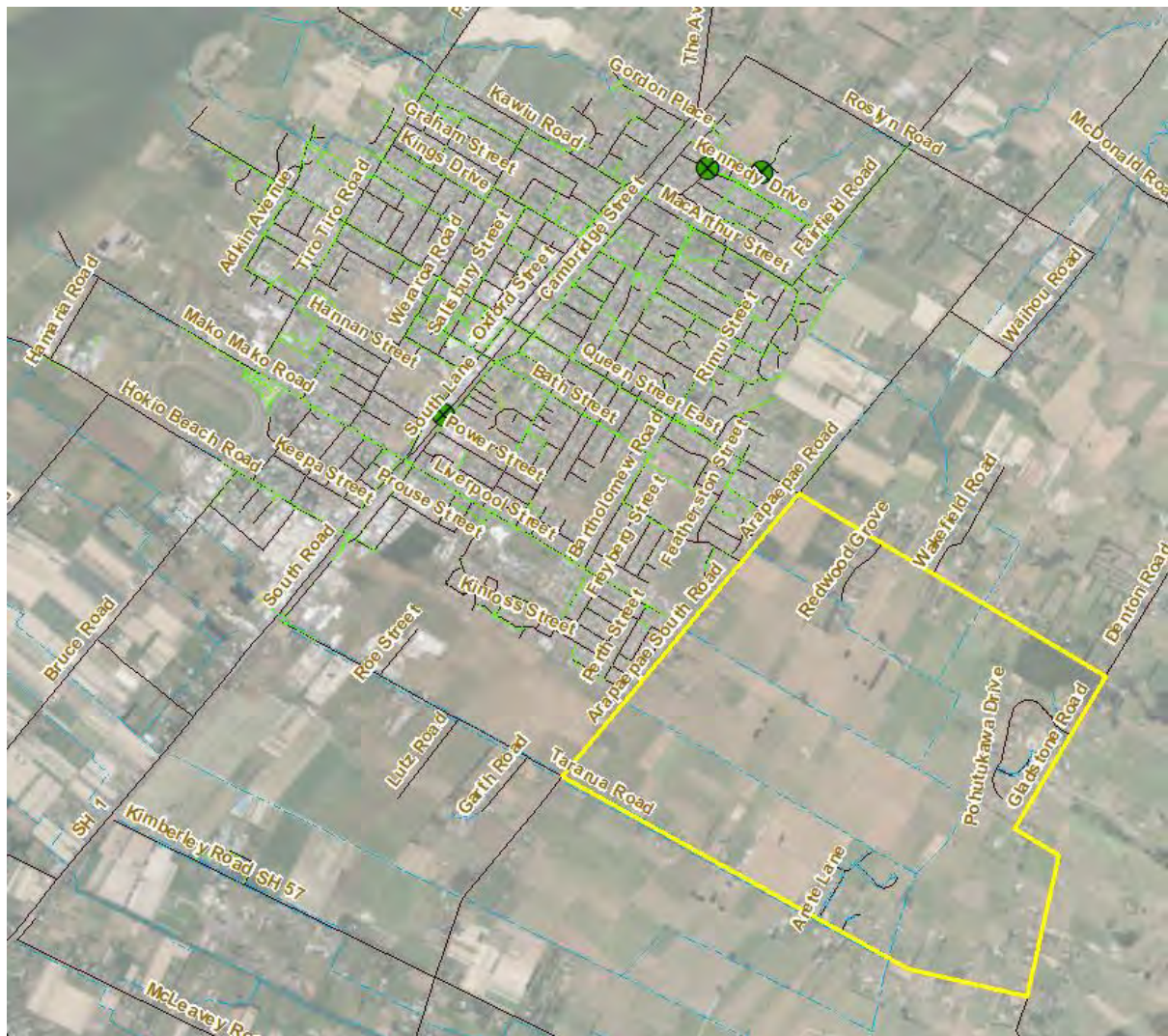
Figure 3 provides an overview of the wastewater network within the main urban area, relative to the location of Taraika (outlined in yellow).

**Figure 3: Existing wastewater network**



Most of the town's stormwater is managed on-site or discharged untreated to Lake Horowhenua via a reticulated network and open channels, with the exception being North East Levin where it is either pumped or drained to the intersection of Roslyn Road and Fairfield Road. Future network design allows for stormwater at this point to be attenuated in a constructed pond and then discharged to the Koputaroa Stream to the north, which ultimately flows into the Manawatū River. The Taraika catchment generally falls from the south east to the northwest towards Horowhenua Lake and the Manawatū River. Figure 4 provides an overview of the urban stormwater reticulation and open channels in relation to the Taraika development area (outlined in yellow).

Figure 4: Existing stormwater network





### 3. Infrastructure Required for the Development of Taraika – High Level

As stated previously, the Taraika development is in close proximity to the existing water and wastewater reticulation. This Infrastructure Plan outlines the required trunk systems required to service the development for the 3 Waters. It should be noted that the plan presented in the overarching Master Plan document includes minor reticulation mains which will be installed as development occurs to service individual subdivisions.

In order to ensure appropriate firefighting supply is provided to the development area, a new water supply main will be required which can be taken off the existing bulk main that runs along the development's eastern boundary. The water supply main will be required to be fitted with an automated pressure reduction valve (PRV) as part of HDC's Pressure Management and Water Demand Management Systems. It will also be required to be fitted with a magnetic flow meter as part of the above systems. Residences will include rainwater tanks to be plumbed into internal non-potable uses. Whilst these will reduce the annualised demand on the mains water supply in terms of volumes required they cannot be relied on to meet 100% of demand during peak summer periods when tanks may be empty and will therefore not reduce the size of the mains needed to service the development. However, this sort of arrangement has benefits in terms of stormwater management by reducing runoff volumes and peak flows, and is therefore still recommended.

In respect of wastewater services, the development is situated on the periphery of the existing sewage reticulation network. In order to add the Taraika area into the wastewater system, some upgrades to the existing network will be required to cope with the additional flow as the development progresses. These upgrades along with the three new connections will be made at Queen Street, Liverpool Street, and Tatarua Road. The upgrades and trunk main connections are such that this can be carried out in a staged manner. The sewer upgrades are anticipated to be straightforward, with the subsequent connections to the development crossing State Highway 57.

Development of Taraika will result in increased stormwater volume and peak flows and result in water quality impacts to downstream areas. Since Taraika is at the top of the drainage catchment, an increase in runoff could have significant impact on the receiving stormwater systems, whether they are the piped networks, open drains, Lake Horowhenua, or the Koputaroa Stream. Water sensitive urban design (WSUD) will be required within the development area to mitigate the effect of development. Examples of WSUD devices which can be incorporated within the development to mitigate the stormwater quantity and quality impacts include rainwater tanks, soakage, permeable pavements and biofiltration. In addition to these, attenuation is to be provided throughout the development area to reduce the peak flow leaving the development area.

Further details of the servicing are provided in the following sections. The development is likely to progress in stages to enable cost effective delivery of infrastructure, so indicative budgets are presented by stage, as per the attached Staging Plan (Appendix A).

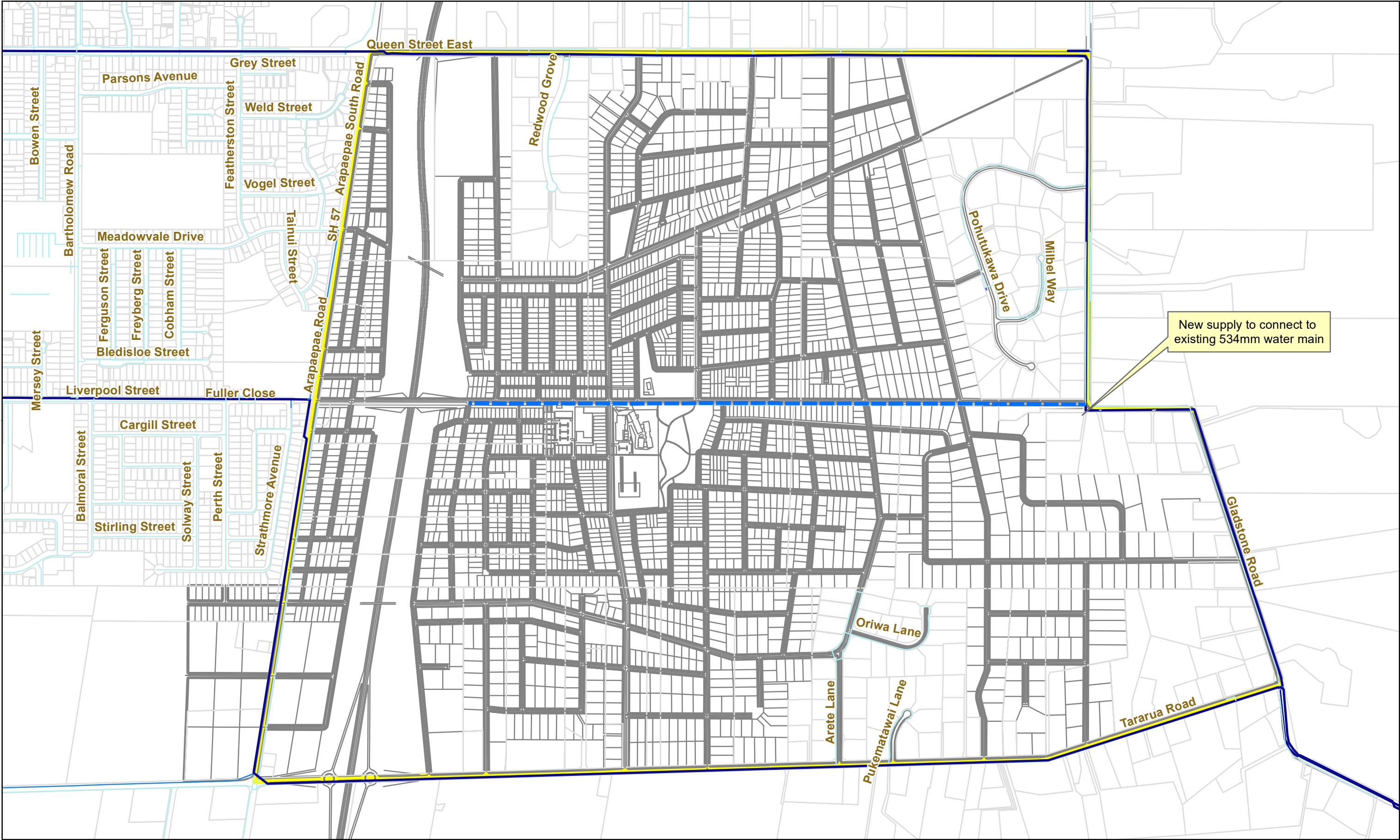


## 4. Water

Alternative water supply sources or supplementary water supply options are being explored to meet current peak demand and future growth. Additionally, a masterplan study for Levin Water Treatment Plant, WTP, will be performed in the near future. This would enable better planning for the future. This would potentially include sourcing supplementary water supply in a sustainable manner.

The infrastructure required for servicing Taraika with potable water is as indicated by the map shown in Figure 5. A central trunk main through the development is proposed off the 525NB Gladstone Road trunk main.

Queen St East, Gladstone Road and Tararua Road mains are in place and are sufficient to also service Taraika. An upgrade of Tararua Road (west of SH57) would be required to increase flows in Tararua industrial area, however this a separate project and does not impact on the ability to service Taraika. A future linkage of the new trunk main to the existing water main on Liverpool Street may also be incorporated to improve resiliency, however this does not impact the serviceability of Taraika.



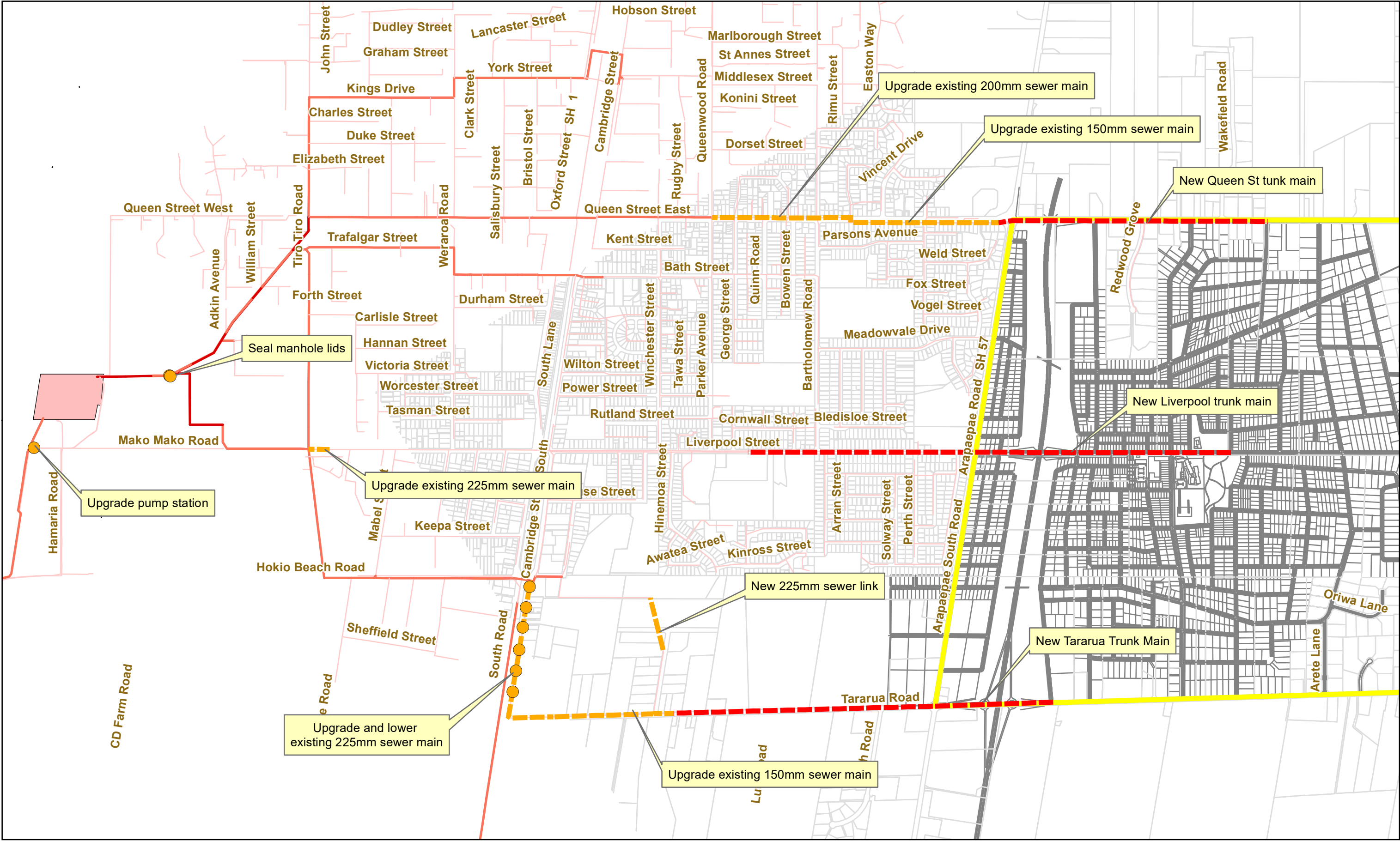
## 5. Wastewater

The infrastructure required for servicing Taraika with wastewater reticulation and treatment is as follows:

- Three new trunk mains to connect to existing mains on Queen Street, Liverpool Street and Tararua Road.
- Upgrades of the existing sewers and pump stations downstream where “pinch points” have been identified with modelling.
- For planning purposes and enabling Council making an informed decision, a masterplan study of Levin WWTP to understand its current and future capacities and impact of growth.
- A share in the cost of upgrading the Levin Wastewater Treatment Plant rock media biofilters to plastic media to allow for extra treatment capacity.

An overview of the trunk infrastructure and downstream upgrades required to service development is provided in Figure 6.





## 6. Stormwater

Stormwater from the development shall be managed to mitigate the potential for adverse impacts on the downstream receiving environment, primarily being Lake Horowhenua. It is well understood that the inflow of untreated urban and rural stormwater is a contributing factor in the ongoing and persistent water quality issues within the lake and it is the intention for Taraika to not worsen these impacts, and to improve the lake water quality whilst connecting the community to the water through integration and education to understand the importance of Te Mana o te Wai.

This shall be achieved through the implementation of a site wide integrated stormwater management strategy and the incorporation of water sensitive design principles. This includes the management of both water quality and water quantity in terms of frequent small events and large infrequent peak flows to mimic the existing water balance conditions as much as practicable.

Any stormwater discharged to Lake Horowhenua (via Queen Street drain), Koputaroa Stream (via O2NL corridor) or underlying groundwater shall be treated to reduce risks from a range of urban contaminants. This includes private on lot management of stormwater which is either soaked to ground or plumbed into dwellings to increase resilience, reduce demands on mains water (and associated carbon impacts) and increase community understanding of the value of water.

Public stormwater management shall include large scale wetland systems, daylighted streams and dry attenuation basins designed to attenuate and soak large storm events and remove a range of urban contaminants whilst increasing urban ecology, biodiversity, and public amenity. Wetlands and streams shall include extensive plantings of eco-sourced indigenous wetland plants and include flow controls to attenuate peak flows to reduce the risk of flood in the Queen Street open channel or downstream urban areas of Levin.

To support these aspirations the following shall be adopted across the development;

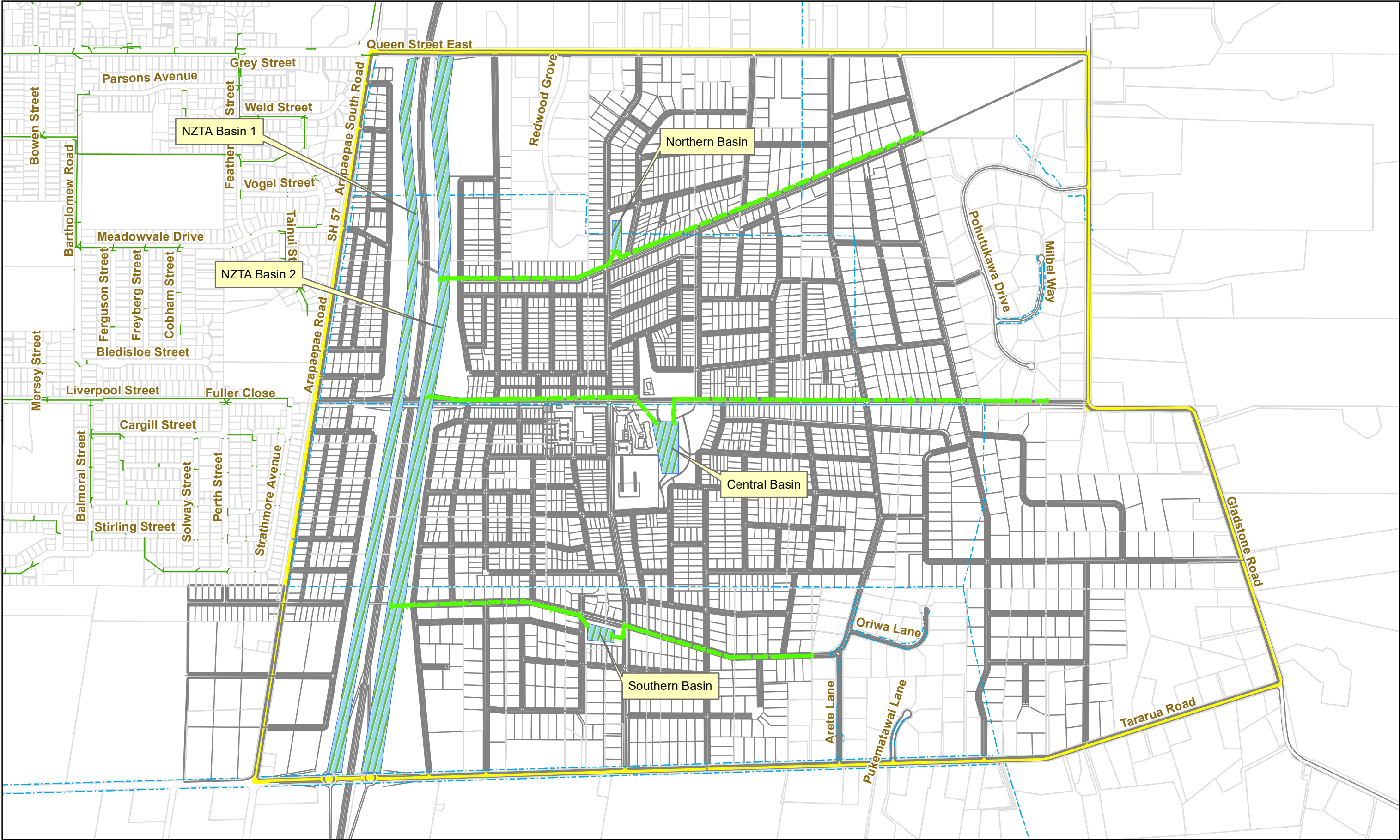
- Private rainwater tanks on all stand alone and duplex dwellings plumbed into internal (toilet and laundry) and external (outside taps). Tank size shall range from 2 – 5 kL dependant on roof size and number of bedrooms.
- Rainwater tanks and other private pavements shall discharge to on lot soakage devices located within accessible positions on properties (driveways). Soakage devices shall be sized to accommodate up to the 10% AEP stormwater volume for the connected roof. These shall be based on a standardised design suited to efficient inspection and cleanout to support long term functionality.
- Stormwater from roads shall be collected and conveyed in a standard reticulated network in accordance with HDC standards and sized for the 10% AEP flows. Where possible streetscape planting shall support passive irrigation through connections with kerb and channel. Distributed public streetscape raingardens (bioretention) may be located at high trafficked intersections in the town centre but shall not be implemented throughout the road corridors. Where possible the road corridor stormwater will be directed to soakage devices sized to accommodate up to the 10% AEP stormwater volume.
- Large private car parks (> 10 vehicles), service stations and commercial roofs (over 500 m<sup>2</sup>) shall provide their own water quality treatment to be approved by HDC and supported by appropriate maintenance contracts. Stormwater will be directed to soakage devices sized to accommodate up to the 10% AEP stormwater volume.
- Stormwater from roads (and lots without private rainwater tanks and/or soakage) shall be conveyed to centralised constructed wetlands for treatment. These wetlands shall primarily

be located along the landscape buffer between O2NL and the development. Dedicated constructed wetland treatment areas shall be sized based on the final area of untreated stormwater from the development. Wetlands shall broadly be aligned to flow south to north and discharge treated flows outside of the development area to Koputaroa Stream along the future O2NL corridor (to be confirmed) and shall be designed with the inclusion of high-low bypass integrated into the adjacent landscaped areas. Where feasible, wetlands can be integrated with stormwater discharging from O2NL assuming inlets are compatible (in terms of levels and position) and wetland function will not be compromised. Where feasible areas of soakage (for treated stormwater) shall be included in the integrated wetland design.

- Flood detention of flows up to the 1% AEP events shall be included within the buffer wetland area including temporary storage above the operating level of the wetlands and within the adjacent landscaped area ensuring this does not impact essential shared paths or create public safety issues. Further flood detention shall be provided within public green spaces within the development through subtle contouring of parks to create shallow dry detention basins which is only engaged in events greater than 10% AEP events and is free draining immediately following.
- Overland flow paths shall be maintained within public road corridors and comply with relevant New Zealand Building Code standards (Austroads or similar). Flow paths shall converge on the main east-west connector roads which shall be designed with a cross section to accommodate these up to the 1% AEP peak flowrates. Overland flow paths shall discharge into the wetland buffer and be managed as part of site wide flood detention.

It is noted that the infrastructure required for servicing Taraika with stormwater services are still in the concept stage, with an in principle agreement having been reached with NZTA that Horowhenua District Council and NZTA will work together in treating stormwater in the road reserve of the new SH1.





## 7. Summary and Recommendations

In summary, the Taraika Development area is able to be serviced by reticulated water and wastewater infrastructure, subject to the extension of water and wastewater mains and, as the development progresses, upgrades to both the Levin Water Treatment Plant and the Levin Wastewater Treatment Plant would be determined after completion of Masterplans of both Levin WTP and WWTP. Stormwater. Stormwater will be treated and disposed of via a combination of onsite methods, including ultimate disposal through the O2NL expressway corridor northeast to Koputaroa Stream.

The development is likely to progress in stages to enable cost effective delivery of infrastructure. The expected staging plan is attached.

### **Stages 1 and 2**

Stage 1 can be serviced almost immediately, utilising existing budgets. As indicated above, there is already a water main along Queen Street which can service portions of the development. Council also have funding identified in the Long Term Plan 2018-2038 to construct a sewer main on Queen Street to service the first stages of development. This is planned to be constructed in November 2020, concurrent with NZTA's planned upgrade to the Queen Street/State Highway 57 intersection upgrade. Once this sewer main is in place, capacity will be provided for approximately 900 lots. Plant upgrades would not be required for this stage.

Stage 2 will require an upgrade of the existing wastewater main along Queen Street west of SH57 in order to service the full build out of this stage.

### **Stages 3 through 5**

Stages 3 through 5 will require more extensive extensions to the existing networks, network upgrades and plant upgrades. These works are to be funded through Council long term plan and \$25M grant and loan funding from Crown Infrastructure Partners announced in August as part of government's response to Covid-19.

The following recommendations are made:

- Stage 1 of the development can be serviced for 3 waters by already planned works, utilising existing budgets.
- Stages 2 through 5 require works which, along with revenue from developers, are to be budgeted in Council's next Long Term Plan and will be accelerated as part of the Crown Infrastructure Partners enabling infrastructure programme.

## Appendix A – 3 Waters Infrastructure Staging Plan



***Appendix 7 – Independent Traffic Review (to provided)***

***Appendix 8 - Statement from HDC Roading Services Manager***

# Statement of Support

## Taraika District Plan Change

### Purpose

The purpose of this document is to provide a statement of support for Plan Change 4 in relation to the transportation aspects of the Taraika Master Plan and to summarize the rationale of this support. This statement is provided by Council's Rooding Services Manager, James Wallace.

The Taraika Masterplan forms the basis to guide development in the Taraika area to achieve the following outcomes:

- a connected and integrated future-proof development that represents good urban design and provides a high level of residential amenity;
- encourages a variety in housing choice, including higher density options;
- a development that utilises low impact, sustainable servicing solutions and encourages walking and cycling;
- a development which provides facilities and open space to meet the needs of the community;
- a development that maintains and enhances cultural, heritage, and ecological values of the area.

### Key Transportation Considerations

There are two key transportation considerations in the Taraika Master Plan: connectivity within the Taraika area, and connectivity between Taraika and Levin and other key connections outside Levin. In order for the Taraika Master Plan to achieve the above outcomes, both of these key transportation considerations must achieve the following transport criteria:

- **Safety** – transport infrastructure must be designed to reduce the probability and severity of crashes
- **Accessibility** – transport infrastructure must be fit for purpose to enable efficient transport to an acceptable level of service for the foreseeable future
- **Transport Choice** – transport infrastructure must provide safe and accessible facilities for pedestrians and cyclists of all abilities and allow for the potential future introduction of public transport

These criteria may be achieved either by direct provision through the Masterplan, or enabled through other processes within Council's purview. These criteria have been assessed by Council's Rooding Services Manager. Certain criteria require expert assistance for which the Integrated Transport Assessment for the draft Taraika Master Plan is referenced.

### Connectivity within Taraika

#### Safety

The Taraika Masterplan prescribes a layout and cross-sectional concept design of primary and secondary roads while local roads are shown indicatively. The layout of the primary and secondary roads within Taraika has been designed to provide an attractive level of connectivity, so as to direct traffic onto roads designed with appropriate safety features including separated cycleways, limited numbers of intersections, safe intersection treatments and limited private vehicle entrances. It is outside the scope of the Masterplan to directly prescribe these features, as they are delivered at the detailed design phase, however these outcomes are ensured through Council's rigorous development engineering processes through the resource consent process, these process are the key mechanism for ensuring the layout and design of roads are safe and fit for purpose.

#### Accessibility

Taraika will be fit for purpose for accessibility, providing acceptable connectivity levels of service throughout. There is only one intersection within Taraika that could conceivably present an unacceptable level of service, the intersection between the internal primary roads. This intersection has been assessed in the ITA - *"For visual inspection of the initial (beg-October 2020) link flows this intersection (site S2) does not have much motor vehicle traffic so it is assumed that signals (or a roundabout) will perform adequately."*

#### Transport Choice

Active transport is a key consideration for Taraika, with dedicated pedestrian and cycling facilities prescribed where appropriate. Council's resource consenting processes also have strong mechanisms for ensure safe active transport infrastructure is delivered by developers.

At the time of the plan change, public transport is not active outside the CBD area of Levin, however the Taraika Masterplan has been designed with consideration to Public Transport. Special consideration has been taken to ensure the layout will be useable for public transport if/when it is introduced to Taraika.



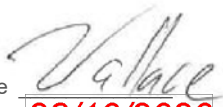
## Connectivity between Taraika and Levin and other key connections outside Levin

There are three key connections which connect Taraika to Levin and outside Levin which require consideration. These are the intersections with Arapaepae Road (State Highway 57) and Queen Street, Liverpool Street and Tararua Road. In the ITA, these three connections have been assessed for the three transport criteria. To summarize the ITA assessments at these intersections, all these intersections can be considered feasible, as long as the intersection treatment for all three are Roundabouts. The ITA goes into detail in recommended detailed design aspects which may be considered when these projects reach the detailed design stage.

For the purpose of this Plan Change, the transport criteria can be considered achieved, as there are confirmed plans for the implementation of roundabout treatments for each intersection. NZTA are currently implementing a roundabout treatment at Queen Street / Arapaepae Road intersection. Council will be implementing the Tararua / Arapaepae Road intersection by June 2022, and the Liverpool / Arapaepae Road intersection by June 2024.

### Summary

Transport considerations relevant to the Taraika Masterplan have been briefly listed and assessed to be acceptable. The Taraika masterplan adequately satisfies all relevant transport requirements for aspects which a masterplan is able to prescribe. Aspects outside the master planning process are delivered through Council's internal processes, identified forwards works plans, resource consenting processes and detailed design processes. Therefore the desired transport outcomes of the Taraika Masterplan will be comprehensively delivered alongside work undertaken within the larger framework of Council's purview.

Signature   
Date 28/10/2020

Authored by James Wallace – Horowhenua District Council Roadway Services Manager.

***Appendix 9 – Proposed Plan Change 4 (Chapter 6A Objectives and Policies, Chapter 15A Rules, Structure Plan 13, District Planning Maps)***

## 6A OBJECTIVES/POLICIES: TARAICA MULTI-ZONE PRECINCT

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### 6A. TARAICA MULTI ZONE PRECINCT

The following objectives and policies are to be read in conjunction with the objectives and policies contained within Chapters 1-14 of the Horowhenua District Plan. In the event there is conflict between the objectives and policies in this chapter and those contained within the remainder of the District Plan, the objectives and policies contained within this chapter (Chapter 6A – Taraika) shall apply.

Taraika is a large greenfield site located to the east of the existing urban area of Levin, with the Tararua Ranges forming an impressive backdrop to the area. The Taraika Development Area (Taraika) totals 470ha and has been master planned to provide a range of housing options and other supportive non-residential activities such as commercial and education activities. The area is expected to accommodate approximately 2,500 residential dwellings and will be home to more than 5,000 people. Some of the surrounding environment has already been developed for rural lifestyle purposes.

The land has been identified as a growth area for the Horowhenua District since the Horowhenua Development Plan was prepared in 2008. The land was subsequently rezoned to Greenbelt Residential Deferred with an associated Structure Plan to guide development introduced to the District Plan. Since this time, growth projections for the District have changed significantly with the District's population now expected to grow rapidly. This prompted the decision to consider Taraika for a greater density of development than what could occur under a Greenbelt Residential Zoning.

Taraika was considered suitable for additional residential capacity due to a range of factors including:

- The site is very flat and relatively unconstrained in term of risk from natural hazards;
- The site is close to the existing urban area of Levin;
- The site has already been identified as a growth area and has had a level of rural lifestyle development occur under the existing zoning. As such, additional development in this area does not result in a significant loss of rural production land.

As such, the area has been master planned and the land consequently rezoned to enable a variety of different residential and non-residential activities to establish.

Taraika is made up of the following zones:

- Commercial Zone (*Taraika Precinct*)
- Open Space Zone (*Taraika Precinct*)
- Residential Zone (*Taraika Precinct*)
- Greenbelt Zone (*Taraika Precinct*)

Each zone has individual objectives, policies, and rules to ensure development achieves the desired objectives and principles for the area. There are also objectives and policies that apply to all zones within Taraika. In addition, the relevant objectives, policies and rules from the existing District Plan chapters and zones will apply. In the case where there are duplicate provisions, the more specific provision (i.e. Taraika specific provisions) will apply in place of the more general provisions.



## 6A OBJECTIVES/POLICIES: TARAİKA MULTI-ZONE PRECINCT

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### ISSUE 6A.1 OVERALL PRINCIPLES FOR DEVELOPMENT IN TARAİKA

*Through the Horowhenua Growth Strategy 2040, Council identified that the existing zoning and structure plan for the area previously known just as " " was unlikely to accommodate the level of growth anticipated in the District, or deliver the outcomes desired for the area. Furthermore, the resource consent process was considered unlikely to provide sufficient opportunity to deliver an integrated and co-ordinated development at the scale anticipated. As a result, the Taraika Master Plan was prepared in order to guide and enable residential and other development to ensure that this happens in an integrated and co-ordinated way. This master plan is the basis of the Structure Plan 013 and the following objectives and policies.*

### ISSUE DISCUSSION

Taraika is anticipated to become high amenity residential development. However, there is also a risk development could adversely affect the environmental quality of the area due to effects arising from increased built form, traffic, and demand for infrastructure and services.

State Highway 57 separates Taraika from the rest of the urban area of Levin. The preferred corridor for the Otaki to North of Levin highway is also located in Taraika (near to existing State Highway 57), creating a risk of severance between Taraika and the rest of Levin.

Due to the alignment of future and existing state highways, there is a risk that Taraika will develop in way that is disconnected from the urban area of Levin and associated services. Unless addressed, this will have a negative impact on the amenity of the resulting development and the well-being of residents.

As a large greenfield site, Taraika represents a 'blank' canvas. This presents an opportunity to establish a unique character. However, this also means there is no existing pattern of urban development to follow (for example, lot design and layout, street trees and provision for open space). Without an established urban pattern from adjoining areas to replicate, there is a risk that an incoherent urban form and disconnected structure will follow. This could result inadequate dwelling interaction with the street, adhoc section sizes that affects character and amenity, or establishment of a commercial area in an inappropriate location. It is also possible that future development will not sufficiently consider or prioritise the amenity or functionality of the public realm, resulting in poor quality urban form, inadequate or inappropriate use of street trees and a lack of quality, functional reserve space. The master plan seeks to respond to these risks.

Master planned greenfield development at Taraika therefore presents an opportunity to achieve the following:

- a connected and integrated future-proof development that represents good urban design and provides a high level of residential amenity;
- encourages a variety in housing choice, including higher density options;
- a development that utilises low impact, sustainable servicing solutions and encourages walking and cycling;
- a development which provides facilities and open space to meet the needs of the community;
- a development that maintains and enhances cultural, heritage, and ecological values of the area.

To achieve the above, it is important that subdivision, development, and land use activities are coordinated to occur in locations and at densities that enable sustainable and efficient use of land and delivery of infrastructure and contribute to a high amenity environment.

## **6A OBJECTIVES/POLICIES: TARAİKA MULTI-ZONE PRECINCT**

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It is also important that development at Taraika is resilient to the effects of climate change and natural hazards and minimises effects on the natural environment. Both of these considerations require careful stormwater design.

The following objectives and policies seek to respond to the above issue and opportunity.

### **Objectives & Policies**

#### **Objective 6A.1**

To achieve an integrated and connected development that reflects cultural values and local identity, represents good urban design, is supported by a well connected roading network that supports a range of transport modes and has the facilities, infrastructure, and amenities necessary to contribute to the health, safety, and wellbeing of residents. This includes:

- Encourage housing at a range of densities;
- Provision for a local-scale commercial centre;
- Access to quality public open space;
- Safe and efficient walking and cycling options;
- Well connected, safe and efficient roading network;
- Design that reflects cultural values and local history and identity;
- Protection of culturally significant sites;
- Environmentally sensitive design

#### **Policy 6A.1.1**

Subdivision, infrastructure and land development in Taraika must be consistent with Structure Plan 013. Subdivision and land development that deviates from the current or future implementation of the Structure Plan will only be considered where an alternative is proposed that will achieve the following:

- The same or similar level of connectivity within Taraika;
- The same or similar level of connectivity between the Taraika and the existing urban area of Levin;
- Protection of opportunities for land adjacent to Taraika to be connected to Taraika in the future;
- Public recreation space of an equivalent functionality as that shown on the Structure Plan and that is within walking distance of a similar number of properties as shown on the Structure Plan;
- A streetscape that maintains an appropriate expression of street hierarchy and consistency of treatment along any arterial or collector street;

#### **Policy 6A.1.2**

Subdivision and land development in Taraika will acknowledge, protect, and celebrate cultural values, cultural history and local identity in the following ways:

- Use of both Māori and non-Māori names for streets and reserves;
- Protection of culturally significant sites;
- Prioritise use of indigenous plants in street and reserve planting
- Tikanga observed during site works.

## **6A OBJECTIVES/POLICIES: TARAİKA MULTI-ZONE PRECINCT**

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### **Policy 6A.1.3**

Require development to be designed in a manner that enables passive surveillance of public places (such as parks and roads) from private properties using techniques such as good site layout, restricting fence heights, and landscape treatments that will not obscure key sightlines.

### **Policy 6A.1.4**

Provide for non-residential activities, such as community, recreational, educational and commercial activities, which support the day to day needs of the local community, while avoiding any such non-residential activities of a nature and scale that compete with the Levin Town Centre.

### **Policy 6A.1.5**

Require subdivision layout to ensure street design enables the safe and efficient movement of people and traffic, provides a high level of safety and amenity for pedestrians and cyclists, and contributes positively to the public realm.

### **Objective 6A.2**

Efficient delivery of infrastructure within Taraika will enable development while protecting environmental values and achieving a high level of residential amenity.

### **Policy 6A2.1**

Make provision within the Taraika for housing yield of 2,500-3,000 houses.

### **Policy 6A2.2**

Require subdivision and development to be managed, designed and staged to align with the coordinated provision and upgrading of the infrastructure network (including roading network), public open space, streetscape and local service facilities within the Taraika, as illustrated on Structure Plan 013.

### **Policy 6A2.3**

Avoid subdivision and development that compromises the ability to provide efficient and effective infrastructure networks for the wider Taraika.

### **Objective 6A.3**

Stormwater management in Taraika will be resilient and environmentally sustainable, including:

- Resilient to natural hazards and the likely effects of climate change;
- Water sensitive design;
- Minimise adverse effects from changes in the nature (including quality and quantity) of

## **6A OBJECTIVES/POLICIES: TARAIIKA MULTI-ZONE PRECINCT**

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natural flows on downstream ecosystems.

### **Policy 6A.3.1**

Require an integrated approach to managing stormwater from Taraika to ensure the quality and quantity of runoff does not have an adverse effect on Lake Horowhenua.

### **Policy 6A.3.2**

Recognise the significance to iwi of the Taraika environment and its connection to Lake Horowhenua by working with iwi to manage stormwater quality and quantity.

### **Policy 6A.3.3**

Require rainwater collection tanks to be provided on all new residential allotments to capture and reuse runoff to mimic, as much as practicable, pre-developed hydrological conditions for the site.

### **Explanation and Principal Reasons**

Large scale greenfield development has the potential to lead to adverse environmental outcomes, particularly when the land is owned by multiple different parties. Without a strong framework to guide growth and development in this area, there is potential for individual subdivisions to progress in a fragmented and disconnected manner. Furthermore, there is a risk that no individual application will make provision for facilities such as open space, supportive commercial activities, or educational activities. Further, individual subdivision applications progressing in an adhoc manner are likely to result in inefficient delivery of infrastructure and limit opportunities for connectivity.

The Structure Plan for the Taraika is based on the Taraika Master Plan. It provides a comprehensive framework to manage growth and development in the Taraika, including infrastructure, roads and open space. Subdivision and development is required to be undertaken in accordance with the Structure Plan to ensure efficient use of the land and physical resources. It is important the principles of this Structure Plan are adhered to in order to achieve the development outcomes anticipated for this area.

Ensuring subdivision and development is aligned with the Structure Plan will help to deliver a quality living environment that is supported by necessary non-residential activities, amenities, and services.

It is also important to recognise cultural history and identity in this area. One way to achieve this is to ensure that streets and reserve names include Māori names chosen by Tangata Whenua.

## **ISSUE 6A.2 RESIDENTIAL ZONES (TARAIIKA PRECINCT)**

The character of the Residential Zone of Taraika is likely to be different to the wider Levin area due to the era of development, housing density expected, integrated master planning approach to development, and the detail of the design principles identified for this area.

It is important Taraika complements and integrates with the existing residential areas of Levin while providing a different offering (for example, more housing variety).



## **6A OBJECTIVES/POLICIES: TARAIIKA MULTI-ZONE PRECINCT**

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### **ISSUE DISCUSSION**

The Taraika residential area needs to develop in a manner that reflects good urban design and form to achieve a high amenity living environment that contributes to the wellbeing of its residents.

At present, there is limited variation in residential housing types available within the District. The predominant housing type available is 'family sized' standalone dwellings on relatively large residential sections, ranging from 400m<sup>2</sup>-800m<sup>2</sup>. However, this uniformity of housing type does not fully satisfy the diverse needs of the Horowhenua community. Taraika offers an opportunity to respond to this by encouraging more variety and improving housing affordability and small lots suitable for smaller dwellings. The following objectives and policies seek to respond to this.

### **Objectives & Policies**

#### **Objective 6A.4**

Achieve a high amenity, walkable residential environment with a range of section sizes and housing types, including affordable housing options, in Taraika.

#### **Policy 6A.4.1**

Optimise walkability and encourage choice and a variety of housing types, by providing for higher density residential development near to commercial and community facilities and lower density residential development at the outer edge of Taraika.

#### **Policy 6A.4.2**

Enable and encourage a range of housing types and section sizes in Taraika to meet the variety of needs and preferences in our community, while ensuring a high level of residential amenity.

#### **Policy 6A.4.3**

Use both minimum and maximum density standards to encourage housing variety and to ensure development occurs at a scale and density consistent with the amenity expected for that particular area.

### **Explanation and Principal Reasons**

Management of the residential environment generally focuses on providing for ongoing use and development in a way that maintains and enhances their character and amenity values. In the case of Taraika, the early stages of development will not have an established residential character or amenity to be informed by. Both the Taraika Master Plan and Structure Plan 013 outline some of the characteristics of urban form and design that will lead to the creation of a residential character and amenity that is considered appropriate within this particular context. The above objectives and policies, supported by District Plan rules, seek to achieve these outcomes to build and establish a high amenity residential character for Taraika.

### **ISSUE 6A.3 COMMERCIAL ZONE (TARAIIKA PRECINCT)**

Given the anticipated population of Taraika and the proximity of Taraika to existing residential areas on the eastern side of Levin, the area will likely be supported by a commercial centre in

## **6A OBJECTIVES/POLICIES: TARAICA MULTI-ZONE PRECINCT**

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the future. It is important that this is located in the appropriate location to maximise accessibility for the community served, support viability and consequently maximise the benefits this will offer the community. In addition, it is important that the nature and scale of this centre is controlled so as to ensure it offers a high amenity 'focal point' for the community, while not conflicting with the existing Levin town centre.

### **Issue Discussion**

It is important that commercial development in Taraika agglomerates in a highly accessible, central location. If commercial activities and community services establish in an adhoc or sprawling manner, the vibrancy and vitality of the neighbourhood centre will be reduced, limiting the opportunity for it to act as a central point for the community.

The commercial centre will provide an important service to the community, through meeting the daily or weekly needs of the local catchment. This can reduce the need to travel across town and improves the overall experience of living within an area that, due to the distance from the commercial area of Levin and the presence of a State Highway (State Highway 57 in the short term and the Otaki to North of Levin highway in the longer term), would otherwise be underserved by convenience facilities.

The design and layout of commercial development is important to ensuring a vibrant and attractive centre that the community will want to spend time in. Important considerations include the design of building frontages and the location of carparks. An attractive commercial centre that demonstrates good urban design can also support other types of land uses. This is because quality commercial development can act as an 'attractor' for land uses such as medium density development. This is considered an important relationship to acknowledge and enhance in order to encourage housing variety, as well as to achieve an attractive commercial centre.

In addition to the above, it is important that the Taraika commercial centre does not compete with the Levin town centre, particularly given the proximity of the Taraika commercial centre to both existing and proposed State Highways. Therefore, it is important that the nature and scale of this centre is controlled in order to protect the primacy of the Levin town centre.

### **Objectives & Policies**

#### **Objective 6A.5**

Encourage development of a sustainable and attractive local commercial centre that accommodates a variety of compatible land use activities, while protecting the vitality of the Levin Town Centre.

##### **Policy 6A.5.1**

Provide for supermarket and/or convenience retail facilities at a scale suitable for the area.

##### **Policy 6A.5.2**

Provide for service based commercial activities that support the daily or weekly needs of the local community, so long as nature and scale does not compete with the Levin Town Centre.

## **6A OBJECTIVES/POLICIES: TARAIIKA MULTI-ZONE PRECINCT**

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### **Policy 6A.5.3**

Ensure of the design, nature, and scale of commercial activities contributes positively to the image and overall amenity of the commercial area of Taraika.

### **Policy 6A.5.4**

Ensure the development in the commercial zone contributes positively to the amenity of public places (including footpaths and roads) by:

- (a) avoiding blank walls facing the roads;
- (b) providing level access for pedestrians into shops;
- (c) ensuring fascia boards and associated signage are of a consistent size and height;
- (d) avoiding freestanding signs;
- (e) maximising outlook onto streets and public places;
- (f) providing weather protection for pedestrians along the road frontages;
- (g) providing service access, car parking and staff parking away from the frontages;

### **Policy 6A.5.5**

Avoid establishing commercial activities that are of a nature and scale that would detract from the vibrancy and vitality of the Levin Town Centre. Examples of such activities include but are not limited to entertainment activities, hotel/motel accommodation, large format retail and other activities of a type and scale that will compete with the Levin Town Centre.

### **Explanation and Principal Reasons**

Given the anticipated population of Taraika, it is both likely and desirable for a range of small scale commercial activities to establish.

Commercial centres fulfil both a functional need for residents, thus reducing their need to travel into Levin or other surrounding areas to meet their daily and weekly convenience needs and provide a focal point for the community. This is important as it provides a place for people to meet and interact with both their neighbours and the wider community. This contributes to feelings of safety, social connectedness and wellbeing, which ultimately improves the overall quality and amenity of the surrounding residential environment. However, it is important that the commercial area of Taraika does not compete with the vibrancy and vitality of the Levin Town Centre.

In order to achieve these outcomes, the above objectives and policies (and supporting rules in Chapter 15A of the District Plan) seek to control the design of signs and buildings and the nature and scale of residential activities in ensure a high amenity environment that encourages walking, cycling through quality of experience. Controls on the scale and nature of commercial activities allowed to establish within Taraika will also avoid conflict with adjoining land uses and ensure that Levin's town centre remains the primary commercial centre in the District.

## **ISSUE 6A.4 OPEN SPACE ZONE (TARAIIKA PRECINCT)**

### **ISSUE DISCUSSION**

Given the size of Taraika and the number of lots it will accommodate, the development will require open space provision. It is important that the reserve space is provided in the appropriate location and that it is of a functional size and shape.

## **6A OBJECTIVES/POLICIES: TARAIIKA MULTI-ZONE PRECINCT**

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### **Objectives & Policies**

#### **Objective 6A.6**

To provide high quality public open space that is accessible and can be used for a variety of purposes, including stormwater management.

#### **Policy 6A.6.1**

Ensure public parks or reserves are distributed through Taraika to be easily accessible to all residential lots by requiring all subdivision and development to comply with Structure Plan 013.

#### **Policy 6A.6.2**

Ensure public parks and reserves are of a size, shape and type that enables a functional, recreational use by requiring all subdivision and development to comply with Structure Plan 013.

#### **Policy 6A.6.3s**

Enable education facilities to establish at a scale that supports the needs of the local community, with limits on scale to protect the amenity of the surrounding environment.

#### **Explanation and Principal Reasons**

Open space that can be used for a range of recreational purposes is an important asset for both the wider community and the Taraika community. Furthermore, recreation space contributes positively to residential amenity. In addition, recreation space provides opportunity to manage stormwater during heavy rain events and to contributes to the ecology of an area.

It is important that Taraika is serviced by quality reserve space. As a large greenfield site, there is opportunity to secure land for recreation space early in the land development process, to ensure it is functional, accessible, and of high amenity. The above objectives and policies (and supporting rules in Chapter 15A of the District Plan) seek to secure this outcome.

### **Methods for Issues and Objectives in Taraika**

#### **District Plan**

- A range of zones, supported by a 'Taraika Precinct', will be identified on the planning maps.
- Taraika precinct specific rules will be applied, in addition to general zoning rules, to specify how subdivision and development will be managed in order to achieve the above objectives and policies.
- A structure plan will guide subdivision and development in the Taraika area in order to achieve the above objectives and policies.
- The resource consent process will provide opportunity for appropriate subdivision and development proposals that are not permitted, either because of non-compliance with environmental standards or because of the nature of the non-residential land uses.
- Conditions on resource consents will control the effects of subdivision and



## 6A OBJECTIVES/POLICIES: TARAIIKA MULTI-ZONE PRECINCT

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development.

*Standards expressed as District Plan rules are considered to be the most appropriate and effective method of maintaining minimum standards for the matters over which the Council has jurisdiction. Rules provide certainty for resource users and for neighbours which is important for community understanding of what environmental quality is expected. The use of a Design Guide is effective in providing guidance on the matters and outcomes for achieving quality medium density developments.*

### **Taraika Master Plan**

The Taraika Master Plan formed the basis of the above objectives and policies and Structure Plan. The Master Plan provides further detail, assessment, and information that justify the outcomes sought for the Taraika area.

### **Long Term Plan/Annual Plan**

- Council will undertake amenity improvement work including street planting and traffic management schemes within residential areas. Council will co-ordinate the provision of appropriate infrastructure to support residential development.
- Council will continue to maintain the landscape of streets (berms and sealed surfaces) and areas of public open space throughout the settlements.
- Council will require developers to contribute to the costs of new infrastructure and upgrading, reserves provision, community and recreational facilities and amenity improvements in residential areas.
- Council will require developers to contribute to the costs of new infrastructure and upgrading, reserves provision, community and recreational facilities and amenity improvements through its Development Contributions Policy.

There are a range of non-District Plan methods available to promote a good standard of residential design and development, particularly through the use of Codes and Guidelines, and through Council funded initiatives for community and residential amenities. Development Contributions from residential development will be used in the upgrading and expansion of the District's roads, reserves and other civic amenities and facilities.

### **Other**

- Council will work with iwi, particularly in regard to stormwater design, reserve design, planting, and street and reserve naming.
- Contractors will be briefed on the tikanga requirements.

# 15A RULES: TARAIIKA MULTI-ZONE PRECINCT

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## 15A. TARAIIKA MULTI-ZONE PRECINCT

*A 'multi-zone precinct' is a tool set out in the National Planning Standards. The National Planning Standards define a 'precinct' as follows:*

A precinct spatially identifies and manages an area where additional place-based provisions apply to modify or refine aspects of the policy approach or outcomes anticipated in the underlying zone(s).

*Taraika contains a number of different zones, including Residential, Greenbelt Residential, Open Space, and Commercial. The majority of the current rules and standards contained within these existing zone will apply within Taraika. However, there are some instances where different rules and standards will be required within Taraika. Therefore, the respective zone chapter provisions will apply within Taraika, except as modified by the provisions contained within Chapter 15A. If there is conflict between chapters, the provisions of Chapter 15A will override.*

### 15A.1 PERMITTED ACTIVITIES

The following activities are permitted activities provided activities comply with all relevant conditions in Rule 15A.6 and Chapters 21, 22, 23 and 24.

*Note: The permitted activity conditions within the relevant zone chapter for the relevant activity type also apply. Where there is conflict between provisions, the more specific provision (i.e. the provisions of this chapter) apply.*

#### 15A.1.1 All Zones

##### 15A.1.1.1 Activities permitted by the underlying zone chapters

- (a) Within the Residential Zone of the Taraika Precinct, activities listed as a permitted activity in Chapter 15 are a permitted activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (b) Within the Greenbelt Residential Zone of the Taraika Precinct, activities listed as a permitted activity in Chapter 18 are a permitted activity, provided activities comply with all relevant conditions contained within Chapter 18.
- (c) Within the Open Space Zone of the Taraika Precinct, activities listed as a permitted activity in Chapter 20 are a permitted activity, provided activities comply with all relevant conditions contained within Chapter 20.

#### 15A.1.2 Commercial Zone

In the Commercial Zone, the only permitted activities are:

- (a) Commercial (excluding entertainment activities) up to 250m<sup>2</sup>
- (b) Retail up to 250m<sup>2</sup>

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- (c) Community activities
- (d) Recreation facilities
- (e) Public conveniences
- (f) Open space
- (g) Residential activities above ground floor (i.e. 1st floor or above), or at ground level only where the residential activity does not directly front onto the road boundary (i.e. they are located to the rear of a commercial activity).
- (h) The following types of signs
  - (i) Advertising signs, including public facility or information signs identifying a building, property or business.
  - (ii) Official signs.
  - (iii) Temporary signs.
  - (iv) Signs advertising sale or auction of land or premises.
  - (v) Health and safety signs.
- (i) The following network utilities and energy activities:
  - (i) The construction, operation, maintenance and upgrading of network utilities.
  - (ii) Domestic scale renewable energy devices.
- (j) Temporary activities

### 15A.2 CONTROLLED ACTIVITIES

The following activities are controlled activities provided activities comply with all relevant conditions in Rules 15A.6 and Chapters 21, 22, 23 and 24. In addition, refer to the relevant zone chapters for matters of control and conditions for controlled activities:

*Note: The matters of control contained within the relevant zone chapter for the relevant activity type also apply.*

#### 15A.2.1 All Zones

- (a) Within the Residential Zone of the Taraika Precinct, activities listed as a controlled activity in Chapter 15 are a controlled activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (b) Within the Commercial Zone of the Taraika Precinct, activities listed as a controlled activity in Chapter 17 are a controlled activity, provided activities comply with all relevant conditions contained within Chapter 17.

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- (c) Within the Greenbelt Residential Zone of the Taraika Precinct, activities listed as a controlled activity in Chapter 18 are a controlled activity, provided activities comply with all relevant conditions contained within Chapter 18.
- (d) Within the Open Space Zone of the Taraika Precinct, activities listed as a controlled activity in Chapter 20 are a controlled activity, provided activities comply with all relevant conditions contained within Chapter 20.

### 15A.3 RESTRICTED DISCRETIONARY ACTIVITIES

The following activities are restricted discretionary activities provided activities comply with all relevant conditions in Rule 15A.7. Refer to Rules 15A.8.1, 15A.8.2 and 15A.8.3 for matters of discretion and conditions for restricted discretionary activities.

*Note: The matters of discretion and conditions for restricted discretionary activities contained within the relevant zone chapter for the relevant activity type also apply.*

*Note: Refer to Chapter 25 for Assessment Criteria as a guide for preparing an assessment of environmental effects to accompany a resource consent application for any of the above activities.*

#### 15A.3.1 All Zones

- (a) The subdivision of land.
- (b) Within the Residential Zone of the Taraika Precinct, activities listed as a restricted discretionary activity in Chapter 15 are a restricted discretionary activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (c) Within the Commercial Zone of the Taraika Precinct, activities listed as a restricted discretionary activity in Chapter 17 are a restricted discretionary activity, provided activities comply with all relevant conditions contained within Chapter 17.
- (d) Within the Greenbelt Residential Zone of the Taraika Precinct, activities listed as a restricted discretionary activity in Chapter 18 are a restricted discretionary, provided activities comply with all relevant conditions contained within Chapter 18.
- (e) Within the Open Space Zone of the Taraika Precinct, activities listed as a restricted discretionary activity in Chapter 20 are a restricted discretionary, provided activities comply with all relevant conditions contained within Chapter 20.

#### 15A.3.2 Residential Zone

- (a) Any development within the Arapaepae Road Special Treatment Overlay noted on Structure Plan 013

#### 15A.3.3 Commercial Zone

- (a) Development of new buildings and additions or external alterations to building frontages. (Refer Rule 15A.8.2.1).



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- (b) Supermarkets (Refer Rule 15A.8.2.2).
- (c) Drive-through restaurants. (Refer Rule 15A.8.2.3).

### **15A.4 DISCRETIONARY ACTIVITIES**

The following activities are discretionary activities.

Note: Refer to Chapter 25 for Assessment Criteria as a guide for preparing an assessment of environmental effects to accompany a resource consent application for any of the above activities.

#### **15A.4.1 All Zones**

- (a) Within the Residential Zone of the Taraika Precinct, activities listed as a discretionary activity in Chapter 15 are a discretionary activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (b) Within the Commercial Zone of the Taraika Precinct, activities listed as a discretionary activity in Chapter 17 are a discretionary activity, provided activities comply with all relevant conditions contained within Chapter 17.
- (c) Within the Greenbelt Residential Zone of the Taraika Precinct, activities listed as a discretionary activity in Chapter 18 are a discretionary activity, provided activities comply with all relevant conditions contained within Chapter 18.
- (d) Within the Open Space Zone of the Taraika Precinct, activities listed as a discretionary activity in Chapter 20 are a discretionary activity, provided activities comply with all relevant conditions contained within Chapter 20.
- (e) Any activity not otherwise specified.

#### **15A.4.2 Residential Zones**

- (a) Any subdivision that does not comply with the restricted discretionary activity conditions (Refer Rule 15A.8.1.1), except where the subdivision is a non-complying activity in accordance with Rule 15A.5.1(a) and/or Rule 15A.5.1(f).

#### **15A.4.3 Commercial Zone**

- (a) Commercial activities that do not comply with floor area limits.
- (b) Development of a new building, or additions and/or alterations to existing building frontages that do comply with the conditions for Restricted Discretionary Activities in Rule 15A.8.2.1

### **15A.5 NON-COMPLYING ACTIVITIES**

The following activities are non-complying activities.

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Note: Refer to Chapter 25 for Assessment Criteria as a guide for preparing an assessment of environmental effects to accompany a resource consent application for any of the above activities.

### 15A.5.1 All Zones

- (a) Within the Residential Zone of the Taraika Precinct, activities listed as a non-complying activity in Chapter 15 are a non-complying activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (b) Within the Commercial Zone of the Taraika Precinct, activities listed as a non-complying activity in Chapter 17 are a non-complying activity, provided activities comply with all relevant conditions contained within Chapter 17.
- (c) Within the Greenbelt Residential Zone of the Taraika Precinct, activities listed as a non-complying activity in Chapter 18 are a non-complying activity, provided activities comply with all relevant conditions contained within Chapter 18.
- (d) Within the Open Space Zone of the Taraika Precinct, activities listed as a non-complying activity in Chapter 20 are a non-complying activity, provided activities comply with all relevant conditions contained within Chapter 20.
- (e) Subdivision or land use activities that are not consistent with Structure Plan 013.
- (f) Subdivision that do not comply with Rule 15A.8.1.2(b)(ii), 15A.8.2.4(b)(ii), 15A.8.3.1(b)(ii), or 15A.8.4.1(b)(ii).
- (g) Any activity that does not comply with Rule 15A.6.1.1 – Vehicle Access into Strategic Cycleways.
- (h) Industrial Activities.
- (i) Large Format Retailing.

### 15A.6 CONDITIONS FOR PERMITTED ACTIVITIES

*Note: The permitted activity conditions within the relevant zone chapter for the relevant activity type also apply. Where there is conflict between provisions, the more specific provision (i.e. the provisions of this chapter) apply.*

The following conditions shall apply to all permitted activities:

#### 15A.6.1 All Zones

##### 15A.6.1.1 Vehicle Access into Strategic Cycleways

- (a) No vehicle crossings shall cross a strategic cycleway shown on Structure Plan 013 will be permitted. In such cases, vehicle access to the site shall be via the rear access lanes shown on Structure Plan 013

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## 15A.6.2 Residential Zones

### 15A.6.2.1 Rainwater Tanks

- (a) All dwellings shall have a stormwater collection tank permanently connected to internal and external non-potable reuse including toilet flushing, laundry, and outdoor taps. Rainwater tanks must:
- (i) Size of tank:
    - Roof area of 75m<sup>2</sup> or less - 2,000 litre capacity
    - Roof area of 75m<sup>2</sup> to 200m<sup>2</sup> - 3,000 litre capacity
    - Roof area of more than 200m<sup>2</sup> - 5,000 litre capacity
  - (ii) The roof area to be connected will be the total footprint of the building (excluding freestanding accessory buildings) and 90% of this must be able to freely drain to the tank.
  - (iii) The rainwater tank, plumbing and pump system must be maintained in working condition of the life of the dwelling.
  - (iv) The public potable water supply shall be adequately protected by installation of a non-return valve.

### 15A.6.2.2 Maximum Building Height

- (a) In the medium density area the maximum height shall be 10 metres.

### 15A.6.2.3 Integral Garages

- (a) Integral garages shall account for no more than 50% of the front façade of the dwelling unless the garage component is recessed back from the main pedestrian entrance to the dwelling by at least 1 metre

### 15A.6.2.4 Building Setback from Boundaries

#### *Front/Road Boundary*

- (a) No building shall be located closer than 2 metres from any road boundary, except that a 5 metre long vehicle standing space shall be provided between the road boundary and any structure housing a vehicle where the vehicle takes direct access to the structure from the road.

### 15A.6.2.5 Daylight Access

- (b) Where two dwellings are joined, there shall be no daylight access standard along the shared boundary.

### 15A.6.2.6 Fencing

- (a) Front Road Boundary

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- (i) Local Roads
  - The maximum height of a fence or wall sited on the boundary or within 2 metres of the boundary shall be no greater than 1.2 metre high.
- (ii) Collector and Arterial Roads
  - The maximum height of a fence or wall sited on the boundary or within 2 metres from the boundary is 1.5m high
- (b) Boundaries adjoining a public reserve or cycle way
  - The maximum height of a closed style fence or wall sited on the boundary or within 1.2 metre from the boundary is 1m high
- Or
  - The maximum height of an open pool style or trellis fence or wall sited on the boundary or within 1 metre from the boundary is 1.8m high
- (c) Other Boundaries
  - The maximum height of a fence or wall sited on the boundary or within 1 metre from the boundary shall not exceed 2 metres.
  - Fences perpendicular to the road shall taper downwards towards the road boundary. The taper should commence at least 1.5m from the road boundary and the maximum height of the fence where it meets the road boundary shall be 1m high if the road is a local road, or 1.5m high if it is an arterial or collector road.

### 15A.6.3 Commercial

#### 15A.6.3.1 Signs

- (a) A maximum of 2 signs will be permitted per frontage in any 2 of the following preferred locations:
  - Building façade;
  - Verandah fascia;
  - Under verandah;
  - Side wall;
  - Inside the display window.



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(b) Signs in the shall be limited to the following sizes

**Table 15A-1: Sign Dimensions**

Sign Type	Maximum Dimensions
Building Façade	Maximum area 1.2m <sup>2</sup> .
Verandah Fascia	Must not extend beyond the fascia.
Under Veranda	Must have a least 2.5m clearance above the ground.
Side Wall	Maximum 8m <sup>2</sup> and set back at least 0.5m from corner.
Inside the Display Window	Depth of sign must be no greater than 0.3m and must be either above 2m high or below 0.8m high in relation to ground.

(c) There shall be no remote signage

### 15A.7 MATTERS OF CONTROL AND CONDITIONS FOR CONTROLLED ACTIVITIES

*There are no Taraika Precinct specific Matters of Control. The matters of control and conditions for controlled activities contained within the relevant zone chapter for the relevant activity type apply.*

### 15A.8 MATTERS OF DISCRETION AND CONDITIONS FOR RESTRICTED DISCRETIONARY ACTIVITIES

*Note: The matters of discretion and conditions for restricted discretionary activities contained within the relevant zone chapter for the relevant activity type also apply.*

The matters over which Council has restricted its discretion for each restricted discretionary activity, and the conditions for each activity, are detailed below:

#### 15A.8.1 Residential Zones

##### 15A.8.1.1 Development within the Arapaepae Road Special Treatment Overlay (Refer to Rule 15A.3.2(a))

(a) Matters of Discretion

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- (i) Reverse sensitivity effects, including:
    - Noise
    - Vibration
    - Visual
    - Traffic
  - (ii) Compatibility with surrounding and anticipated land uses.
  - (iii) Safe and efficient access
- (b) Conditions
- (i) New buildings or alterations to existing buildings containing noise sensitive activities must be design, constructed and maintained to achieve the indoor design noise levels from Arapaepae Road/State Highway 57 traffic set out in Table 15A-2 below (excludes area not deemed to be habitable spaces as defined by Schedule 1 of the Building Regulations 1992:

**Table 15A-2 Indoor Design Limits**

Building Type	Occupancy/Activity	Maximum Indoor Design Noise Level $L_{Aeq}(24h)$
Residential	Living spaces, sleeping spaces (including visitor accommodation and retirement accommodation)	40dB
Education	Assembly halls	35dB
	Conference rooms, drama studios	40dB
	Lecture rooms and theatres, music studios	35dB
	Libraries	45dB
	Sleeping areas in educational facilities	40dB
	Teaching areas	40dB
Health	Overnight medical care, wards	40dB
	Clinics, consulting rooms, theatres, nurses' stations	45dB
Cultural Buildings	Places of worship, marae	35dB

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*Note: This table is informed by NZTAs guidance material on managing State Highway noise. The purpose of this table is simply to specify the noise level standards for different types of activities. It should not be taken as an indication of what types of activities will more broadly be considered acceptable in this location.*

- (ii) If windows must be closed to achieve the design noise levels in (i), the building must be designed, constructed and maintained with a ventilation and cooling system. For habitable spaces a ventilation cooling system must achieve the following:
    - Ventilation must be provided to meet clause G4 of the New Zealand Building Code. Noise from the system must not exceed 30 dB LAeq(30s) when measured 1 m away from any grille or diffuser.
    - The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. Noise from the system must not exceed 30 dB LAeq(30s) when measured 1 m away from any grille or diffuser.
    - The system must provide cooling controllable by the occupant that can maintain the temperature at no greater than 25°C. Noise from the system must not exceed 30 dB LAeq(30s) when measured 1 m away from any grille or diffuser.
  - (iii) A design report prepared by a suitably qualified and experienced acoustics specialist must be submitted with the building consent application for construction or alteration of any building containing a noise sensitive activity in or partly in the Arapaepae Road Special Treatment Overlay.
- (c) Non-Notification
- (i) Under section 77D of the RMA, an activity requiring resource consent under Rule 15.7.1 shall not be publicly notified or limited notified, except where:
    - The Council decides special circumstances exist (pursuant to Section 95A(9); or
    - The applicant requests public notification (pursuant to Section 95A(3)(a))

### 15A.8.1.2 Subdivision (Refer to Rule 15A.3.1(a))

- (a) Matters of Discretion
  - (i) Consistency with Structure Plan 013.
  - (ii) For subdivisions within the medium density area, consistency with the Medium Density Residential Development Design Guide.
  - (iii) The design and layout of the subdivision, including the size, shape and position of any lot, as well as the future land use and development of each lot. In addition, connectivity and linkages (both within and beyond the subdivision).

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- (iv) Whether the subdivision contains a variety of lot sizes suitable for the area it is located within.
- (v) Whether the subdivision and likely future development will represent good urban design and will result in the level of amenity anticipated for the area.
- (vi) Provision of land for publically accessibly open space and recreation that is appropriately located and of a practicable size and shape, in accordance with Structure Plan 013.
- (vii) The provision of practicable street plantings.
- (viii) The provision of any new roads, cycleways, provision of linkages to existing roads, access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, parking and manoeuvring areas, and any necessary easements.
- (ix) The provision of access to sites, including passing bays, car parking and manoeuvring areas, and any necessary easements.
- (x) The management of traffic generated and potential adverse effects on the safety and efficiency of the street network.
- (xi) Minimise use of cul-de-sacs, particularly cul-de-sacs that are long or have poor visibility to or from the street they connect to.
- (xii) Consideration of Crime Prevention through Environmental Design Principles.
- (xiii) The provision of servicing, including water supply, wastewater systems, stormwater management and disposal, telecommunications, gas and electricity.
- (xiv) Effects on significant sites and features, including natural, cultural, archaeological and historical sites.
- (xv) Avoidance or mitigation of natural hazards.
- (xvi) Management of construction effects, including traffic movements, hours of operation, noise, earthworks and erosion and sediment control.
- (xvii) Whether tikanga and cultural protocols will be following during the construction phase, particularly when undertaking earthworks.
- (xviii) The staging of development and timing of works.
- (xix) Compliance with the Council's Subdivision and Development Principles and Requirements (Version: July 2014).



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- (xx) The potential effects of the development on the safe and efficient operation, upgrading, maintenance and replacement of existing lawfully established network utilities.

(b) Conditions

(i) Minimum Allotment Area and Shape

Each allotment shall comply with the following site area and shape factor standards for each settlement set out in Table 15A-3 below.

**Table 15A-3: Standards Applying to Subdivision and Residential Dwelling Units**

Residential Zone	Minimum Net Site Area	Maximum Net Site Area/Maximum Density	Minimum Shape Factor	Other Requirements	Road Frontage
Medium Density	Attached Units: 150m <sup>2</sup>	450m <sup>2</sup>	7m	Maximum street block length: 200m Must include building siting plan.*	All sites must have road frontage for at least 7m
	Detached Units: 225m <sup>2</sup> *	450m <sup>2</sup> *	10m	Maximum block length: 200m Must include building siting plan.*	
Standard Residential	330m <sup>2</sup>	-	13m	Maximum block length: 200m	
Low Density Residential	1000m <sup>2</sup>	-	18m	N/A	

\*The siting plan shall show the location, pedestrian entrances, and outdoor living areas for all future dwellings. Although the dwellings do not need to be built prior to s224 being issued, a condition will be imposed on the subdivision requiring the siting plan to be complied with at the time the site is developed. This outcome will be secured by consent notice.

(ii) Structure Plan

- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site that contains an infrastructure asset as indicated by Structure Plan 013 requiring the infrastructure asset to be constructed and vested with Council to the full extent indicated on the Structure Plan.

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- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site containing a park or reserve as shown on Structure Plan 013, requiring the site/part of the site containing the reserve to be vested within Council.

(iii) Water Supply, Wastewater and Other Services

All subdivisions shall comply with the requirements as specified set out in Chapter 24.

(iv) Roads and Access

All subdivisions shall comply with the requirements as specified in Chapter 21.

(v) Network Utilities

There shall be no minimum site area requirements for lots for network utility purposes.

### **15A.8.1.3 Non-Compliance with requirements for Rainwater Tank (Refer Rule 15A.6.2.1)**

(a) Matters of Discretion

- (i) The potential for increased volume stormwater discharge from the site.
- (ii) The proposed methods of managing the quality and quantity of storm water discharge from the site.

### **15A.8.1.4 Non-Compliance with Integral Garages (Refer Rule 15A.6.2.3)**

(a) Matters of Discretion

- (i) The extent to which the integral garage obscures the dwelling from view.
- (ii) The extent to which the integral garage reduces the opportunity for passive surveillance between the dwelling and the streetscape.
- (iii) The extent to which the integral garage detracts from the dwelling as the primary feature on the site.
- (iv) The effect of the integral garage's position on streetscape character and residential amenity.

### **15A.8.1.5 Non-Compliance with Fencing (Refer to Rule 15A.6.2.6)**

(a) Matters of Discretion

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- (i) The extent to which the fence reduces the opportunity for passive surveillance and social interaction between public and private space.

### 15A.8.2 Commercial Zone

#### 15A.8.2.1 New Buildings and Additions/Alterations to Building Frontage (Refer Rule 15A.3.3(a))

##### (a) Matters of Discretion

- (i) Building design and façade treatment should create a high amenity commercial environment that contributes positively to the public realm and enhances pedestrian experience by providing opportunity for interaction between shops front and the street. This includes but is not limited to:
  - Locating main building façades to address the primary street frontage.
  - Providing an interesting and varied building frontage that is not dominated by either featureless facades or glazing.
  - Including horizontal and/or vertical articulation design elements to add visual interest.
  - Designing building frontages that complement any existing adjoining buildings.
  - Locating doorways and entrances to buildings so they are easily identifiable.
- (ii) The building and site design and layout should prioritise pedestrians over vehicles. This includes but is not limited to:
  - Pedestrian entrances to shops are built right up to the footpath.
  - Any onsite carparking, services areas, and storage areas should be located the rear of the building. They should not be located between the street and the pedestrian entrance to the building.
  - If carparks, services areas, and storage areas are visible from the street, they should be well screened from the street by landscaping or similar.
- (iii) The provision of verandah that:
  - Provide weather protection to pedestrians
  - Contribute to the overall appearance and pleasantness of the street

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- (iv) The application of Crime Prevention through Environmental Design (CPTED) Principles, including:
  - Building design and layout.
  - Use of appropriate planting and landscaping.
- (v) Proposed methods of managing the quality and quantity of stormwater.
- (b) Conditions
  - (i) All buildings in the Commercial Zone (Taraika Precinct) must comply with the following:
    - No part of any building shall exceed a height of 15 metres.
    - All buildings shall be built to the front road boundary of the site.
    - All building shall be built up to the side boundaries (the boundary which is perpendicular to the primary road frontage).
    - All buildings shall have display windows along the ground floor road frontage. At least 50% of ground floor facade surface shall be display space or transparent window or doors. The minimum window area shall be kept clear and not be boarded up, painted or covered by signage.
    - No building shall have a continuous featureless façade/blank wall on the ground floor road frontage wider than 4 metres. A featureless façade or blank wall is a flat or curved wall surface without any openings, glazing or columns, recesses, niches or other architectural detailing
    - All buildings shall have a maximum ground floor road frontage width for individual tenancies of 15 metres.
    - All building frontages shall have a minimum height of 6 metres.
    - The above standards do not apply to service lane frontages.
  - (ii) All buildings in the Commercial Zone (Taraika Precinct) must contain a verandah and the verandah must comply with the following:
    - A minimum clearance of 2.5 metres directly above the footpath or formed ground surface.
    - A maximum clearance of 4 metres (measured at the base of the verandah fascia) directly above the footpath or from ground surface.
    - Extend for the full length of the building.
    - Extend outwards from the front of the building to the far side of the kerbing less than 450mm, or the verandah extends out 3 metres whichever is the lesser.



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- Provide continuous shelter with any adjoining verandah or pedestrian shelter.

### 15A.8.2.2 Supermarkets (Refer to Rule 15A.3.3(b))

#### (a) Matters of Discretion

- (i) Whether parking areas, vehicle access and servicing arrangements are designed and located in a manner that protects the visual amenity of the streetscape and pedestrian safety, including the use of landscaping, planting and lighting.
- (ii) Whether the design and layout of the site and buildings protects the visual amenity of the streetscape and pedestrian safety. For example:
  - The extent of featureless facades.
  - The extent of glazing.
  - The extent of signage.
  - The extent of window displays that prevent visibility into the store from the street.
- (iii) Whether effects arising from operation (for example, hours, location of service areas, waste disposal) will be compatible with any nearby residential zones.

#### (b) Conditions

- (i) Car parking (as required by Chapter 21) must be provided to the rear of the building.
- (ii) The main pedestrian entrance to the supermarket must front the street.

### 15A.8.2.3 Drive-Through Restaurants (Refer to Rule 15A.3.3(c))

#### (a) Matters of Discretion

- (i) Whether the design and layout of the site and buildings protects the visual amenity of the streetscape and pedestrian safety. For example:
  - The extent of featureless facades.
  - The extent of glazing.
  - The extent of signage.
  - The extent of window displays that prevent visibility into the store from the street.
  - Screening and/or landscaping of equipment, parking and service areas.
  - Whether the location of the drive-through detracts from pedestrian experience by creating a barrier between the building and the footpath.

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- (ii) Whether operating effects are compatible with surrounding land uses (particular residential areas). For example:
- Whether the activity, including parking areas and storage and servicing facilities, is adequately screened to protect the visual amenity of surrounding land uses.
  - Whether the activity, including parking areas and storage and servicing facilities, are located, designed and managed to avoid nuisance effects such as noise and odour on surrounding land uses.
  - The impact of adverse effects arising from the numbers of people and/or vehicles using the site.
  - The effects of the activity's operation on the existing and expected future amenity values of the surrounding area and any mitigation measures proposed.
- (iii) Whether the site is located, designed and laid out in a manner that avoids adverse effects on the safe and effective operation of the roading network, including pedestrians. For example:
- Whether the nature and scale of vehicle movements associated with the activity will have an adverse effect on road users.
  - Whether the drive through is positioned to provide sufficient off-road queuing space during peak times.
  - Whether the site is designed to allow a free flow of traffic from the road into the parking area.
  - Whether the activity is designed in such a manner that vehicles can manoeuvre on-site in a safe and efficient manner.
  - Whether sufficient vehicle (including service vehicles) and pedestrian access is provided to the site to minimise conflict between pedestrians and vehicles.

(b) Conditions

- (i) The main pedestrian entrance to the restaurant must front the street.
- (ii) Car parking (as required by Chapter 21) must be provided to the rear of the building.

### 15A.8.2.4 Subdivision (Refer to Rule 15A.3.1(a))

(a) Matters of Discretion

- (i) Consistency with Structure Plan 013.

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- (ii) The design and layout of the subdivision, including the size, shape and position of any lot, including the future land use and development of each lot. In addition, the location of building sites, separation distances, orientation of buildings, and screening/landscape treatment.
  - (iii) The amalgamation of any proposed allotments or balance areas to existing titles of land.
  - (iv) The provision of any new roads, cycleways, footpaths, provision of linkages to existing roads, access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, parking and manoeuvring areas, and any necessary easements.
  - (v) The provision of servicing, including water supply, wastewater systems, stormwater management and disposal, streetlighting, telecommunications and electricity and, where applicable gas.
  - (vi) Provision of reserves, esplanade reserves, esplanade strips and access strips, including connections to existing and future reserves.
  - (vii) Effects on significant sites and features, including natural, ecological, cultural, archaeological and historical sites.
  - (viii) Site contamination remediation measures and works.
  - (ix) Avoidance or mitigation of natural hazards.
  - (x) Management of construction effects, including traffic movements, hours of operation, noise, earthworks and erosion and sediment control.
  - (xi) Whether tikanga and cultural protocols will be following during the construction phase, particularly when undertaking earthworks.
  - (xii) Staging of the subdivision.
  - (xiii) Compliance with the Councils Subdivision and Development Principles and Requirements (Version: July 2014).
  - (xiv) Those matters described in Sections 108 and 220 of the RMA.
- (b) Conditions
- (i) All lots shall demonstrate compliance with the relevant permitted activity conditions, except no minimum lot area requirement applies.
  - (ii) Structure Plan

## 15A RULES: TARAIIKA MULTI-ZONE PRECINCT

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- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site that contains an infrastructure asset as indicated by Structure Plan 013 requiring the infrastructure asset to be constructed and vested with Council to the full extent indicated on the Structure Plan.
- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site containing a park or reserve as shown on Structure Plan 013, requiring the site/part of the site containing the reserve to be vested within Council.

(iii) Water Supply, Wastewater and Other Services

All subdivisions shall comply with the requirements as specified set out in Chapter 24.

(iv) Roads and Access

All subdivisions shall comply with the requirements as specified in Chapter 21.

(v) Network Utilities

There shall be no minimum site area requirements for lots for network utility purposes.

(c) Non-Notification

- (i) Under section 77D of the RMA, an activity requiring resource consent under Rule 15.7.1 shall not be publicly notified or limited notified, except where:
- The Council decides special circumstances exist (pursuant to Section 95A(9); or
  - The applicant requests public notification (pursuant to Section 95A(3)(a))

### 15A.8.3 Open Space Zone

#### 15A.8.3.1 Subdivision (Refer to Rule 15A.3.1(a))

(a) Matters of Discretion

- (i) Consistency with Structure Plan 013.
- (ii) The design and layout of the subdivision, including the size, shape and position of any lot, including the future land use and development of each lot. In addition, the location of building sites, separation distances, orientation of buildings, and screening/landscape treatment.
- (iii) The amalgamation of any proposed allotments or balance areas to existing titles of land.



## 15A RULES: TARAIKA MULTI-ZONE PRECINCT

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- (iv) The provision of any new roads, cycleways, footpaths, provision of linkages to existing roads, access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, parking and manoeuvring areas, and any necessary easements.
  - (v) The provision of servicing, including water supply, wastewater systems, stormwater management and disposal, street lighting, telecommunications and electricity and, where applicable gas.
  - (vi) Provision of reserves, esplanade reserves, esplanade strips and access strips, including connections to existing and future reserves.
  - (vii) Effects on significant sites and features, including natural, ecological, cultural, archaeological and historical sites.
  - (viii) Site contamination remediation measures and works.
  - (ix) Avoidance or mitigation of natural hazards. (Note: Refer to the “Risks and Responsibilities: Report of the Manawatu-Wanganui Regional Lifelines Project” (No. 2005/EXT/622) prepared by the Manawatu-Wanganui CDEM Group for information about natural hazards that may be relevant to the subject site).
  - (x) Management of construction effects, including traffic movements, hours of operation, noise, earthworks and erosion and sediment control.
  - (xi) Whether tikanga and cultural protocols will be following during the construction phase, particularly when undertaking earthworks.
  - (xii) Staging of the subdivision.
  - (xiii) Compliance with the Councils Subdivision and Development Principles and Requirements (Version: July 2014).
  - (xiv) Those matters described in Sections 108 and 220 of the RMA.
- (b) Conditions
- (i) All lots shall demonstrate compliance with the relevant permitted activity conditions, except no minimum lot area requirement applies.
  - (ii) Structure Plan
    - A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site that contains an infrastructure asset as indicated by Structure Plan 013 requiring the infrastructure asset to be constructed and vested with Council to the full extent indicated on the Structure Plan.

## 15A RULES: TARAIIKA MULTI-ZONE PRECINCT

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- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site containing a park or reserve as shown on Structure Plan 013, requiring the site/part of the site containing the reserve to be vested within Council.

(iii) Water Supply, Wastewater and Other Services

All subdivisions shall comply with the requirements as specified set out in Chapter 24.

(iv) Roads and Access

All subdivisions shall comply with the requirements as specified in Chapter 21.

(v) Network Utilities

There shall be no minimum site area requirements for lots for network utility purposes.

(c) Non-Notification

(i) Under section 77D of the RMA, an activity requiring resource consent under Rule 15.7.1 shall not be publicly notified or limited notified, except where:

- The Council decides special circumstances exist (pursuant to Section 95A(9); or
- The applicant requests public notification (pursuant to Section 95A(3)(a))

### 15A.8.4 Greenbelt Residential

#### 15A.8.4.1 Subdivision (Refer to Rule 15A.3.1(a))

(a) Matters of Discretion

(i) Consistency with Structure Plan 013.

(ii) The design and layout of the subdivision, including the size, shape and position of any lot, as well as the future land use and development of each lot. In addition, connectivity and linkages (both within and beyond the subdivision).

(iii) Whether the subdivision contains a variety of lot sizes suitable for the area it is located within.

(iv) Whether the subdivision and likely future development will represent good urban design and will result in the level of amenity anticipated for the area.

(v) Provision of land for publically accessibly open space and recreation that is appropriately located and of a practicable size and shape.

(vi) The provision of practicable street plantings.

## 15A RULES: TARAIKA MULTI-ZONE PRECINCT

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- (vii) The provision of any new roads, cycleways, footpaths, provision of linkages to existing roads, access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, parking and manoeuvring areas, and any necessary easements.
  - (viii) The provision of access to sites, including passing bays, car parking and manoeuvring areas, and any necessary easements.
  - (ix) The management of traffic generated and potential adverse effects on the safety and efficiency of the street network.
  - (x) Minimise use of cul-de-sacs, particularly cul-de-sacs that are long or have poor visibility.
  - (xi) Consideration of Crime Prevention through Environmental Design Principles.
  - (xii) The provision of servicing, including water supply, wastewater systems, stormwater management and disposal, telecommunications, gas and electricity.
  - (xiii) Effects on significant sites and features, including natural, cultural, archaeological and historical sites.
  - (xiv) The protection and enhancement of any natural habitat of indigenous species within the subdivision
  - (xv) Avoidance or mitigation of natural hazards.
  - (xvi) Management of construction effects, including traffic movements, hours of operation, noise, earthworks and erosion and sediment control.
  - (xvii) Whether tikanga and cultural protocols will be following during the construction phase, particularly when undertaking earthworks.
  - (xviii) The staging of development and timing of works
  - (xix) Compliance with the Council's Subdivision and Development Principles and Requirements (Version: July 2014).
  - (xx) The potential effects of the development on the safe and efficient operation, upgrading, maintenance and replacement of existing lawfully established network utilities.
- (b) Conditions
- (i) Minimum Allotment Area and Shape
    - Each allotment shall comply with the following site area and shape factor standards in Table 15A-4

# 15A RULES: TARAİKA MULTI-ZONE PRECINCT

**Table 15A-4: Standards Applying to Subdivision and Residential Dwelling Units**

Type of Allotment, or Subdivision	Minimum Area Per Allotment/Site	Minimum Shape Factor
Greenbelt Residential General Serviced	2000 square metres	20 metres diameter
Greenbelt Residential General Unserviced	5000 square metres	20 metres diameter

(ii) Structure Plan

- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site that contains an infrastructure asset as indicated by Structure Plan 013 requiring the infrastructure asset to be constructed and vested with Council to the full extent indicated on the Structure Plan.
- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site containing a park or reserve as shown on Structure Plan 013, requiring the site/part of the site containing the reserve to be vested within Council.

(iii) Water Supply, Wastewater and Other Services

All subdivisions shall comply with the requirements as specified set out in Chapter 24.

(iv) Roads and Access

All subdivisions shall comply with the requirements as specified in Chapter 21.

(v) Network Utilities

There shall be no minimum site area requirements for lots for network utility purposes.

(c) Non-Notification

- (i) Under section 77D of the RMA, an activity requiring resource consent under Rule 15.7.1 shall not be publicly notified or limited notified, except where:
- The Council decides special circumstances exist (pursuant to Section 95A(9); or
  - The applicant requests public notification (pursuant to Section 95A(3)(a)



***Appendix 10 – Horowhenua Growth Projections – Sense Partners – June 2020***



# Horowhenua Socio-Economic projections

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## Summary and methods

Projections update report, May 2020



**SENSE PARTNERS**  
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# Summary of projections

This update report presents long term population and economic projections for Horowhenua District.

## Strong growth expected

Horowhenua's population is projected to grow:

- by 1.8% per year, over the next 10 years
- more quickly than the national population (1.2% per year)
- more quickly than the average of the past 10 years (1.5% per year)
- more slowly than the average of the past 6 years (2.1% per year).
- substantially more quickly than in our previous projections (0.5% per year).

TABLE 1: POPULATION PROJECTIONS<sup>1</sup>

Population					
	5th percentile	25th percentile	50th percentile	75th percentile	95th percentile
2019	34,956	34,956	34,956	34,956	34,956
2029	39,983	41,022	41,896	42,941	44,968
2039	40,822	44,138	47,006	50,913	59,010
2049	39,542	45,188	51,862	59,250	79,243
2059	37,741	45,443	55,626	69,501	105,044
2068	35,301	45,185	59,172	78,168	131,741

Population growth, compound annual average growth rate					
	5th percentile	25th percentile	50th percentile	75th percentile	95th percentile
2019					
2029	1.4%	1.6%	1.8%	2.1%	2.6%
2039	0.2%	0.7%	1.2%	1.7%	2.8%
2049	-0.3%	0.2%	1.0%	1.5%	3.0%
2059	-0.5%	0.1%	0.7%	1.6%	2.9%
2068	-0.7%	-0.1%	0.6%	1.2%	2.3%

<sup>1</sup> The percentiles presented in Table 1, and elsewhere in the report, are calculated by simulating population change while varying the main drivers of population growth, such as immigration rates. These simulations are calibrated based on historical variations. This produces a range of results which is summarised by ranking the projections and presenting them according to their ranking or percentile.



## Growth driven by strong domestic immigration

Horowhenua's strong population growth is driven by a continued substantial inflow of migrants from other parts of New Zealand.

We are forecasting a net inflow of 650 domestic migrants per year over the next 10 year. This is a substantial upward revision, from 270 migrants per year in our 2019 forecasts.

In our 2019 forecasts we noted that

*"it appears that domestic migration into Horowhenua has been higher than we or other experts, such as Statistics New Zealand, would have predicted three or four years ago. This is likely to be due to a combination of factors including:*

- *improved accessibility from the expressways that have been built to the south of the District*
- *increased costs of living, especially house price inflation, in most urban centres including Palmerston North and Wellington*

We also noted that we did not yet have sufficient up-to-date data, such as from the census, to account for observed increases in domestic migration.

Since the 2018 census data has become available and estimates of Horowhenua's population have been revised up yet again, it has become even more apparent that we needed to revise our projection methods and so we have done this.<sup>2</sup>

Our forecasts of Horowhenua's population growth are also affected by assumptions about the effects of border closures on outward international migration. An extended period of border closures is expected to boost Horowhenua's population growth as fewer people leave the district to move overseas.

## COVID-19 brings new sources of uncertainty

While our previous projections were subject to several significant sources of uncertainty, such as policy change and a deficit of data<sup>3</sup>, these 2020 projections must contend with the effects of a global pandemic.

Our forecasts assume the following effects from COVID-19:

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<sup>2</sup> The census led to substantial increase in estimates of Horowhenua's population. Although, ironically, our new projections of domestic migration are only partly based on census data. The census data on internal migration has been rated as "very poor", after the question relating to prior address was dropped from the census in favour of linking data between censuses.

<sup>3</sup> At the time of our previous update (July 2019) problems with the 2018 census meant that data from the census was not yet available. Even now, a substantial amount of census data has not been publicly released, even though it has been more than 2 years since the census. This means that estimates and forecasts of the following variables should be considered provisional and subject to revisions once census data is available: households (number and type), labour force status (i.e. labour force participation and unemployment status), household incomes.





- international borders closed to migrants for the 12 months to March 2021<sup>4</sup>
- a sharp but reasonably short-lived economic shock, based on the New Zealand Treasury's Budget Economic and Fiscal Update (May 2020), where:
  - the national unemployment rate rises to 8.3% in June 2020, from 4.0% in 2019, and then falls to 7.6% in the June quarter 2021
  - real GDP growth falls 4.6% in the year to June 2020 and -1.0% in the year to June 2021 before recovering in 2022

We tend to the view that these economic assumptions are optimistic. However, as they are Budget numbers, they provide a useful benchmark – especially at a time when forecasters are revising their views daily.

These economic shocks are expected to cause average household incomes to decline, on average, over the next 10 years.

TABLE 1: GROWTH IN AVERAGE HOUSEHOLD INCOMES, AFTER INFLATION

<b>Annual average growth between dates</b>					
	5th percentile	25th percentile	50th percentile	75th percentile	95th percentile
2019	--	--	--	--	--
2029	-1.5%	-0.8%	-0.4%	-0.1%	0.5%
2039	0.7%	0.9%	1.0%	1.1%	1.2%
2049	0.1%	0.3%	0.4%	0.4%	0.4%
2059	0.7%	1.0%	1.0%	0.7%	1.1%
2068	0.5%	0.2%	0.4%	0.7%	0.6%

It is quite possible that these COVID-related economic shocks, or larger ones, could cause a significant shift in population growth dynamics in Horowhenua and throughout New Zealand. Importantly, the uncertainty ranges in our projections do not account for the possibility of such shifts. That being so, the level of uncertainty quantified in our near-term projections is under-stated.

Given this unquantified uncertainty it would be unwise to speculate about potential further positive effects on population growth from transport projects (such as Transmission Gully and the Otaki to Levin link) – as was done in our previous projections.

That said, our revised projections are higher than previous forecasts that accounted for the effects of transport projects. Recent population growth in Horowhenua has, at least partly, results from increased accessibility due to roading projects. This lift in attraction to Horowhenua is now factored directly into the population growth forecasts.

<sup>4</sup> We assume closure to 95% of all migrant flows i.e. immigrants to New Zealand and emigrants from New Zealand.



Our 2020 forecasts for Horowhenua will feed into the development of scenarios for future growth and economic development. These scenarios, which are yet to be produced, will consider the potential for alternative futures for Horowhenua based on economic trends and the potential for positive or negative economic shocks.



# Comparisons against Statistics New Zealand projections

The population projections presented in this report are higher than Statistics New Zealand projections for the Horowhenua released in 2017. The differences are summarized in Table 5.

**TABLE 5: COMPARISON WITH STATISTICS NEW ZEALAND PROJECTIONS  
POPULATION PROJECTIONS ('MEDIUM' SCENARIOS)**

	Year	Age: 0-14	Age:15-39	Age:40-64	Age:65+	All ages
Statistics New Zealand	2013	6,020	7,490	10,380	7,280	31,170
	2018	5,900	8,060	10,250	8,050	32,260
	2023	5,800	8,050	9,660	8,920	32,430
	2028	5,680	7,940	8,950	10,000	32,570
	2033	5,580	7,320	8,660	10,860	32,420
	2038	5,310	6,850	8,580	11,310	32,050
	2043	4,990	6,630	8,520	11,350	31,490
Sense Partners	2013	6,020	7,490	10,380	7,280	31,170
	2018	6,300	8,500	11,000	8,500	34,300
	2023	7,270	10,045	11,306	9,319	37,940
	2028	8,298	11,002	11,536	10,437	41,273
	2033	9,088	11,395	12,288	11,441	44,211
	2038	9,169	11,966	13,116	12,333	46,583
	2043	9,045	12,874	14,143	12,868	48,929

## ANNUAL AVERAGE GROWTH RATES

	5 Years to:	Age: 0-14	Age:15-39	Age:40-64	Age:65+	All ages
Statistics New Zealand	2018	-0.4%	1.5%	-0.3%	2.0%	0.7%
	2023	-0.3%	0.0%	-1.2%	2.1%	0.1%
	2028	-0.4%	-0.3%	-1.5%	2.3%	0.1%
	2033	-0.4%	-1.6%	-0.7%	1.7%	-0.1%
	2038	-1.0%	-1.3%	-0.2%	0.8%	-0.2%
	2043	-1.2%	-0.7%	-0.1%	0.1%	-0.4%
Sense Partners	2018	1.0%	2.5%	1.1%	3.1%	1.9%
	2023	3.0%	3.3%	0.5%	1.8%	2.0%
	2028	2.6%	1.9%	0.4%	2.3%	1.7%
	2033	1.9%	0.7%	1.4%	1.9%	1.4%
	2038	0.2%	1.0%	1.3%	1.5%	1.1%
	2043	-0.4%	1.5%	1.5%	1.0%	1.0%

The difference between Sense projections and Statistics New Zealand's projections are differences in views about international migration and different assumptions regarding rates of domestic migration into Horowhenua. Our assumptions about fertility and mortality rates are very similar.



# Method

These projections should be interpreted as potentials. The projections do not, for example, take account of national or local policy changes which can affect actual population and economic growth.

## Demographics

The method used to produce the population projections is a conventional population projection model, with a few relatively novel aspects.

The model simulates populations by age, by sex by District.

Fertility and mortality rates are projected using the same methods that Statistics New Zealand uses to project age- and sex-specific mortality rates.<sup>5,6</sup>

International migration is predicted at the national level using a model of migration which accounts for trends and patterns in growth in arrivals from different types of countries in conjunction with changes in outward migration and economic conditions in New Zealand and Australia (unemployment rates and real exchange rates).<sup>7</sup>

Ages of migrants and domestic destinations of international migrants are determined based on observed historical probabilities that migrants are of a given age and the propensities these migrants must move to particular parts of New Zealand (in this case Districts).

Internal domestic migration is based on age- and origin- and destination-specific probabilities of observed migration in each of the censuses from 2001 to 2013<sup>8</sup> and experimental origin-destination domestic migration data for the period 2013-2017. So, each District's inward domestic migration reflects the size and age distribution of other Districts from which it traditionally sources migrants.

At the household level, living arrangements are based on methods used by Statistics New Zealand. Each age and gender has an observed historical (Census-based) probability of residing in a different household type. The probabilities used here are national-level probabilities.<sup>9</sup>

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<sup>5</sup> Demography package for R, by Rob J Hyndman with contributions from Heather Booth, Leonie Tickle and John Maindonald.

<sup>6</sup> Actual data on age-specific rates at the district level are limited and so these are inferred using splines to interpolate between ages where age-group data is available.

<sup>7</sup> To be precise, the model is a mean of forecasts from 3 different types of models: a set of univariate time series model, a vector-autoregression, and a vector-error correction model with economic components. The latter includes cluster analysis of arrivals from different countries which allows grouping of countries into 4 different groups which tend to move together.

<sup>8</sup> The number of observations here is limited but the probabilities have proved to remain remarkably stable over time.

<sup>9</sup> Except that, in the national context, projections for Auckland include adjustments to reflect the large numbers of multi-family households in Auckland. This overall approach, using national 'living arrangement





## Economic projections

The economic projections are based on a 'growth accounting' method, whereby growth is predicted based on growth in the working age population, labour force participation rates, unemployment rates, and productivity.

Here labour force participation rates are modelled at the national level and district rates are estimated based on typical age-specific deviations from national rates.<sup>10</sup>

Unemployment rates are also modelled at the national level and age-specific deviations from national rates are used to model persistent differences in unemployment rates at different ages in different districts.

The model used to predict unemployment rates at the national level takes account of changes in labour force growth and other economic factors on unemployment rates. It also includes a measure of labour productivity.<sup>11</sup> Predictions of productivity growth come from this model.

There is no attempt to model district-level productivity growth, rather districts are assumed to face random fluctuations in productivity which move around the national average.

Industry projections are based on a model of trends in industry shares of GDP. At the district level, industry output is then projected using historical correlations between movements in national output and district output. So, the district's fortunes are attached to national trends, but also reflect local cycles and comparative advantages.

## Randomness

To run simulations and produce ranges for projections we use the observed errors in our models and underlying variation in the variables we are modelling to produce 'prediction intervals'. In each simulation, we draw randomly from these prediction intervals.

Not all variables are subject to this randomness directly<sup>12</sup> and some variables do not fluctuate a great deal. The most volatile components of the projections are: migration, productivity, and industry GDP growth shares.

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type rates' is a weakness in this modelling method but is accepted for the time being in the absence of better data to discriminate 'living arrangement type rates' by district.

<sup>10</sup> The national rates are modelled using logistic growth curves which help to capture the rising, but ultimately limited, rates of participation of older age groups.

<sup>11</sup> The national model of unemployment rates is a vector auto-regression of unemployment, CPI, labour force, interest rates, and earnings per hour ('labour productivity'). The use of vector auto-regressions helps ensure that we extract underlying trends in variables and means that the model can capture the effects of economic cycles over a 1- to 2-year horizon. After that the model reverts to trends. Although randomness is added to reflect uncertainty, there are no economic cycles in the model beyond the first 1 to 2 years.

<sup>12</sup> All age-specific probabilities used in the model are fixed, for example.



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***Appendix 11 - Proposed Plan Change Provision Assessment Reference Table***

## Assessment of Plan Change Objectives and Provisions – s32 Report Reference Table

Provision Number	Provision Type	Provision Description	Assessment Location in s32 Report
<b>Objective 6A.1</b>	Objective	Well-Functioning Urban Environments, Iwi and Cultural Considerations, and Cohesive, Logical Urban Form and Layout	6.4.1 - Overarching Plan Change Objective
<b>Policy 6A.1.1</b>	Policy	Cohesive, Logical Urban Form and Layout	6.5.3.1 - Structure Plan
<b>Policy 6A.1.2</b>	Policy	Iwi and Cultural Considerations	6.5.4.1 - Cultural Acknowledgement and Referencing and Environmental Outcomes
<b>Policy 6A.1.3</b>	Policy	Well-Functioning Urban Environments	6.5.1.3 - Residential Amenity
<b>Policy 6A.1.4</b>	Policy	Well-Functioning Urban Environments	6.5.1.4 - Non-Residential Activities
<b>Policy 6A.1.5</b>	Policy	Well-Functioning Urban Environments	6.5.1.2 - Transport and 6.5.1.3 - Residential Amenity
<b>Objective 6A.2</b>	Objective	Efficient and Sustainable Infrastructure and Servicing	6.4.3 - Efficient and Sustainable Infrastructure and Servicing
<b>Policy 6A2.1</b>	Policy	Well-Functioning Urban Environments	6.5.1.1. - Housing Yield and Choice
<b>Policy 6A2.2</b>	Policy	Efficient and Sustainable Infrastructure and Servicing	6.5.2.1 - Integrated Stormwater Management and Water Supply &



<b>Provision Number</b>	<b>Provision Type</b>	<b>Provision Description</b>	<b>Assessment Location in s32 Report</b>
			Waste Water, 6.5.3.1 - Structure Plan and Zoning
<b>Policy 6A2.3</b>	Policy	Efficient and Sustainable Infrastructure and Servicing	6.5.2.1 - Integrated Stormwater Management and Water Supply & Waste Water, 6.5.3.1 - Structure Plan and Zoning
<b>Objective 6A.3</b>	Objective	Efficient and Sustainable Infrastructure and Servicing	6.4.3 - Efficient and Sustainable Infrastructure and Servicing
<b>Policy 6A.3.1</b>	Policy	Iwi and Cultural Considerations, Efficient and Sustainable Infrastructure and Servicing	6.5.4.1 - Cultural Acknowledgement and Referencing and Environmental Outcomes, 6.5.2.1 Integrated Stormwater Management and Water Supply & Waste water
<b>Policy 6A.3.2</b>	Policy	Iwi and Cultural Considerations, Efficient and Sustainable Infrastructure and Servicing	6.5.4.1 - Cultural Acknowledgement and Referencing and Environmental Outcomes, 6.5.2.1 Integrated Stormwater Management and Water Supply & Waste water

<b>Provision Number</b>	<b>Provision Type</b>	<b>Provision Description</b>	<b>Assessment Location in s32 Report</b>
<b>Policy 6A.3.3</b>	Policy	Efficient and Sustainable Infrastructure and Servicing	6.5.2.1 Integrated Stormwater Management and Water Supply & Waste water
<b>Objective 6A.4</b>	Objective	Efficient and Sustainable Infrastructure and Servicing	6.4.2 - Well-Functioning Urban Environments and Cohesive, Logical Urban Form and Layout
<b>Policy 6A.4.1</b>	Policy	Cohesive, Logical Urban Form and Layout	6.5.3.1 - Structure Plan and Zoning
<b>Policy 6A.4.2</b>	Policy	Cohesive, Logical Urban Form and Layout, Well-Functioning Urban Environments	6.5.3.1 - Structure Plan and Zoning, 6.5.1.1 Housing Yield and Choice
<b>Policy 6A.4.3</b>	Policy	Cohesive, Logical Urban Form and Layout, Well-Functioning Urban Environments	6.5.3.1 - Structure Plan and Zoning, 6.5.1.1 Housing Yield and Choice
<b>Objective 6A.5</b>	Objective	Well-Functioning Urban Environments and Cohesive, Logical Urban Form	6.4.2 - Well-Functioning Urban Environments and Cohesive, Logical Urban Form and Layout
<b>Policy 6A.5.1</b>	Policy	Well-Functioning Urban Environments	6.5.1.4 - Non-Residential Activities
<b>Policy 6A.5.2</b>	Policy	Well-Functioning Urban Environments	6.5.1.4 - Non-Residential Activities
<b>Policy 6A.5.3</b>	Policy	Well-Functioning Urban Environments	6.5.1.4 - Non-Residential Activities

<b>Provision Number</b>	<b>Provision Type</b>	<b>Provision Description</b>	<b>Assessment Location in s32 Report</b>
<b>Policy 6A.5.4</b>	Policy	Well-Functioning Urban Environments	6.5.1.4 - Non-Residential Activities
<b>Policy 6A.5.5</b>	Policy	Well-Functioning Urban Environments	6.5.1.4 - Non-Residential Activities
<b>Objective 6A.6</b>	Objective	Well-Functioning Urban Environments and Cohesive, Logical Urban Form	6.4.2 - Well-Functioning Urban Environments and Cohesive, Logical Urban Form and Layout
<b>Policy 6A.6.1</b>	Policy	Cohesive, Logical Urban Form and Layout, Well-Functioning Urban Environments	6.5.3.1 - Structure Plan and Zoning
<b>Policy 6A.6.2</b>	Policy	Cohesive, Logical Urban Form and Layout, Well-Functioning Urban Environments	6.5.3.1 - Structure Plan and Zoning
<b>Policy 6A.6.3</b>	Policy	Cohesive, Logical Urban Form and Layout, Well-Functioning Urban Environments	6.5.3.1 - Structure Plan and Zoning, 6.5.1.4 - Non-Residential Activities
<b>15A.1.1 (and subparts)</b>	Rule	Permitted activities in all zones	Existing District Plan provisions, no further assessment required
<b>15A.1.2 (and subparts)</b>	Rule	Permitted activities in commercial zone	6.5.1.4 - Non-Residential Activities
<b>15A.2 (and subparts)</b>	Rule	Controlled activities in all zones	Existing District Plan provisions, no further assessment required

<b>Provision Number</b>	<b>Provision Type</b>	<b>Provision Description</b>	<b>Assessment Location in s32 Report</b>
<b>15A.3.1(a)</b>	Rule	Subdivision of land as a restricted discretionary activity	6.5.1.1 - Housing Yield and Choice
<b>15A.3.1(b)-(e)</b>	Rule	Other restricted discretionary activities (not subdivision) in all zones	Existing District Plan provisions, no further assessment required
<b>15A.3.2(a)</b>	Rule	Arapaepae Road special treatment overlay	6.5.1.3 - Residential Amenity
<b>15A.3.3(a)</b>	Rule	New commercial buildings and external additions/alterations to commercial buildings as a restricted discretionary activity	6.5.1.4 - Non-Residential Activities
<b>15A.3.3(b)</b>	Rule	Supermarkets as a restricted discretionary activity	6.5.1.4 - Non-Residential Activities
<b>15A.3.3(c)</b>	Rule	Drive-through restaurants as a restricted discretionary activity	6.5.1.4 - Non-Residential Activities
<b>15A.4.1 (and subparts)</b>	Rule	Discretionary activities in all zones	Existing District Plan provisions, no further assessment required
<b>15A.4.2(a)</b>	Rule	Subdivision of land that does not comply with minimum or maximum site areas as a discretionary activity	6.5.1.1 - Housing Yield and Choice
<b>15A.4.3(a)</b>	Rule	Commercial activities that do not comply with floor area limits	6.5.1.4 - Non-Residential Activities
<b>15A.4.3(b)</b>	Rule	New commercial buildings and external additions/alterations to commercial buildings that	6.5.1.4 - Non-Residential Activities



Provision Number	Provision Type	Provision Description	Assessment Location in s32 Report
		do not comply with restricted discretionary conditions as a discretionary activity	
<b>15A.5.1(a)-(d)</b>	Rule	Non-complying activities in all zones	Existing District Plan provisions, no further assessment required
<b>15A.5.1(e)-(f)</b>	Rule	Non-compliance with structure plan or structure plan rules as a non-complying activity	6.5.3.1 - Structure Plan and Zoning
<b>15A.5.1(g)</b>	Rule	Non-compliance with strategic cycle ways as a non-complying activity	6.5.1.2 - Transport
<b>15A.5.1(h)-(i)</b>	Rule	Industrial and large format retailing activities as a non-complying activity	6.5.1.4 - Non-Residential Activities
<b>15A.6.1.1</b>	Permitted Activity Condition	Vehicle access in strategic cycleway	6.5.1.2 Transport
<b>15A.6.2.2-15A.6.2.6</b>	Permitted Activity Condition	Residential amenity, bulk and location	6.5.1.3 Residential Amenity
<b>15A.6.3.1</b>	Permitted Activity Condition	Signs in commercial zone	6.5.1.4 Non-Residential Activities
<b>15.7</b>	Matter of Control	-	Existing District Plan provisions, no further assessment required
<b>15A.8.1.1</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	Development within Arapaepae Road special treatment overlay	6.5.1.3 - Residential Amenity

<b>Provision Number</b>	<b>Provision Type</b>	<b>Provision Description</b>	<b>Assessment Location in s32 Report</b>
<b>15A.8.1.2</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	Subdivision in residential zone	6.5.1.1 - Housing Yield and Choice
<b>15A.8.1.3</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	Non-compliance with rainwater tank requirement	6.5.2.1 - Well-Functioning Urban Environments and Cohesive, Logical Urban Form and Layout
<b>15A.8.1.4- 15A.8.1.5</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	Non-compliance with residential amenity, bulk, and location standards	6.5.1.3 - Residential Amenity
<b>15A.8.2.1</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	New buildings and external additions and alterations to buildings in commercial zone	6.5.1.4 - Non-Residential Activities
<b>15A.8.2.2</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	Supermarkets	6.5.1.4 - Non-Residential Activities
<b>15A.8.2.3</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	Drive-through restaurants	6.5.1.4 - Non-Residential Activities
<b>15A.8.2.4</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	Subdivision in commercial zone	6.5.1.1 - Housing Yield and Choice

<b>Provision Number</b>	<b>Provision Type</b>	<b>Provision Description</b>	<b>Assessment Location in s32 Report</b>
<b>15A.8.3.1</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	Subdivision in open space zone	6.5.1.1 - Housing Yield and Choice
<b>15A.8.3.1</b>	Matters of Discretion and Conditions for Restricted Discretionary Activity	Subdivision in greenbelt residential zone	6.5.1.1 - Housing Yield and Choice