



Wanganui District Council

Springvale Structure Plan

REVISED DRAFT April 2012



Executive Summary

Historically Wanganui has experienced low rates of residential development meaning there has been little need for urban growth management or a strategic approach towards residential development. This has resulted in development coming forward in a sporadic manner with relatively few constraints resulting in a range of negative effects that are now being realised, particularly in the 'restricted services' residential areas on the City's edge. These negative effects are being realised acutely in Springvale where infill development and increasing density have created problems with stormwater management as well as provision of other services. There is now a clear need to provide a Structure Plan to guide the development of Springvale to ensure residential development comes forward in a co-ordinated and sustainable manner.

This Structure Plan, prepared in collaboration with Wanganui District Council Officers, seeks to guide and inform the residential development of the Springvale Area. It determines an appropriate residential density for the area, addresses key development issues, and identifies and costs the infrastructure required to facilitate development. A conceptual layout is proposed based on the New Zealand Urban Design Protocol and the principles of sustainable development, and incorporates and acknowledges the area's unique topography and natural features. The Structure Plan also seeks to integrate residential development into the existing urban fabric and make efficient use of existing infrastructure networks.

Overall, it is considered that a high quality and desirable residential area can be created that will be a great place to live and play, and that will be resilient to natural hazards. A number of recommendations to further guide residential development in the Springvale Area are also made, including more detailed technical investigations and consultation with the public and key stakeholders.



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1. Introduction

- **Overview**

Historically Wanganui has experienced low rates of residential development meaning there has been little need for urban growth management or a strategic approach towards residential development. This has resulted in development coming forward in a sporadic manner with relatively few constraints, resulting in a range of negative effects that are now being realised, particularly in the 'restricted services' residential areas on the City's edge. These negative effects are being realised acutely in Springvale where infill development and increasing density have created problems with stormwater management as well as provision of other services. There is now a clear need to provide a Structure Plan to guide the development of Springvale to ensure residential development comes forward in a co-ordinated and sustainable manner.

- **What is a Structure Plan?**

A Structure Plan is a planning framework to guide the future development of a defined area. It sets out the key issues and matters to be considered in development and provides a comprehensive written and illustrative guide to how development should come forward along with identifying key infrastructure requirements. It also examines alternative development options and phasing.

- **Why develop a Structure Plan?**

A Structure Plan provides a co-ordinated and strategic approach to developing an area. This means that the community, developers, landowners, WDC and other key stakeholders have a shared input and understanding of how Springvale will be developed.

- **How will the Structure Plan come forward?**

The Springvale Structure Plan Report and Maps will form part of Phase Two of the Wanganui District Plan review process 'Shaping Wanganui' that has been underway since early 2011, and will be subject to a full statutory consultation process in accordance with Schedule 1 of the Resource Management Act 1991 (RMA). Subject to the outcome of consultation, the Structure Plan will also meet the requirements of Section 32 of the RMA in terms of the identification and assessment of alternative options for residential development.



2. Objectives

- **Purpose**

The purpose of the Structure Plan is to set out a co-ordinated and strategic approach to developing Springvale that will result in a sustainable, high quality residential area that integrates successfully with and compliments surrounding areas. The Structure Plan seeks to guide and inform the development of the Springvale Area, address key development issues and determine the key infrastructure requirements to facilitate development.

- **Key objectives:**

- ✓ Establish an appropriate density for residential development;
- ✓ Propose a street network that maximises connectivity, integrates seamlessly with the surrounding area and encourages walking and cycling;
- ✓ Create a layout and environment that is family friendly and encourages community interaction and inclusiveness;
- ✓ Identify key servicing and infrastructure requirements and the cost of provision;
- ✓ Provide an integrated network of open spaces that provides for a range of recreational activities;
- ✓ Protect and enhance the area's unique landscape and ecology;
- ✓ Integrate measures to reduce flood risk and attenuate stormwater flows.



3. Site Context

3.1 Overview

- **Springvale Structure Plan Area**

The Structure Plan area has been divided into two discreet study areas:

Study Area 4 – situated to the west of the existing residential area of Springvale south of Fitzherbert Avenue on largely undeveloped land. The area is bound to the north by sand dunes adjacent to Fitzherbert Avenue, existing residential zoned land in Springvale to the south and east, Titoki Wetland to the south west and Mosston Road to the West. The area is 53 hectares in size and zoned ‘Restricted Services Residential’ in the Wanganui District Plan.

Study Area 5 – situated west of the existing residential area of Springvale on largely undeveloped restricted services zoned land north of Fitzherbert Avenue. It is bound by Buxton Rd to the north, residential zoned land in Springvale to the east, Mosston Rd to the west. The area is 40 hectares in size and is currently zoned ‘Restricted Services Residential’ in the Wanganui District Plan.

The combined area of Study Area 4 and 5 is 93 hectares and is approximately 1.8km in length (running north-south) by between 500m to 900m in width (east-west). Collectively they are referred to as the ‘Study Area’.



Figure 1 – Site Context and Study Area

3.2 Strategic Context

- **Historic and Recent Development**

Historically Wanganui has been a relatively compact City of defined zoning and land use, with most development pre-1950's and located in Central Wanganui. In the 1960's and 1970's Springvale, parts of Wanganui East and Aramoho were developed creating a more sprawling urban isthmus. More recently, development has been concentrated in the St Johns Hill/Otamatea area, with secondary growth near the western end of Springvale Road. The development of these areas has come forward with relatively few constraints, with a market driven approach resulting in sporadic development with no clear forward planning to guide where residential development should occur.



Census figures reveal that the population of Wanganui has actually decreased slightly in recent years along with dwelling occupancy rate. Despite these population trends, there has still been on average 70 new residential dwellings built per year over the past eight years. WDC statistics show that over the last eight years 70% of this residential development has occurred within the urban area, and of this total 30% has been greenfield development.

- **2008 Wanganui Growth Strategy**

As a result of development pressures being experienced in Wanganui and an identified need to take a more strategic approach toward managing growth, in 2008 WDC prepared a draft Wanganui Growth Strategy. The strategy involved a review of factors contributing to current residential growth and applied an assessment process to determine the most appropriate areas for future greenfield residential development. The residential assessment included identification of blocks of land on the urban periphery that might be suitable for residential development including areas already zoned 'Restricted Services Residential' in the Wanganui District Plan including Springvale.



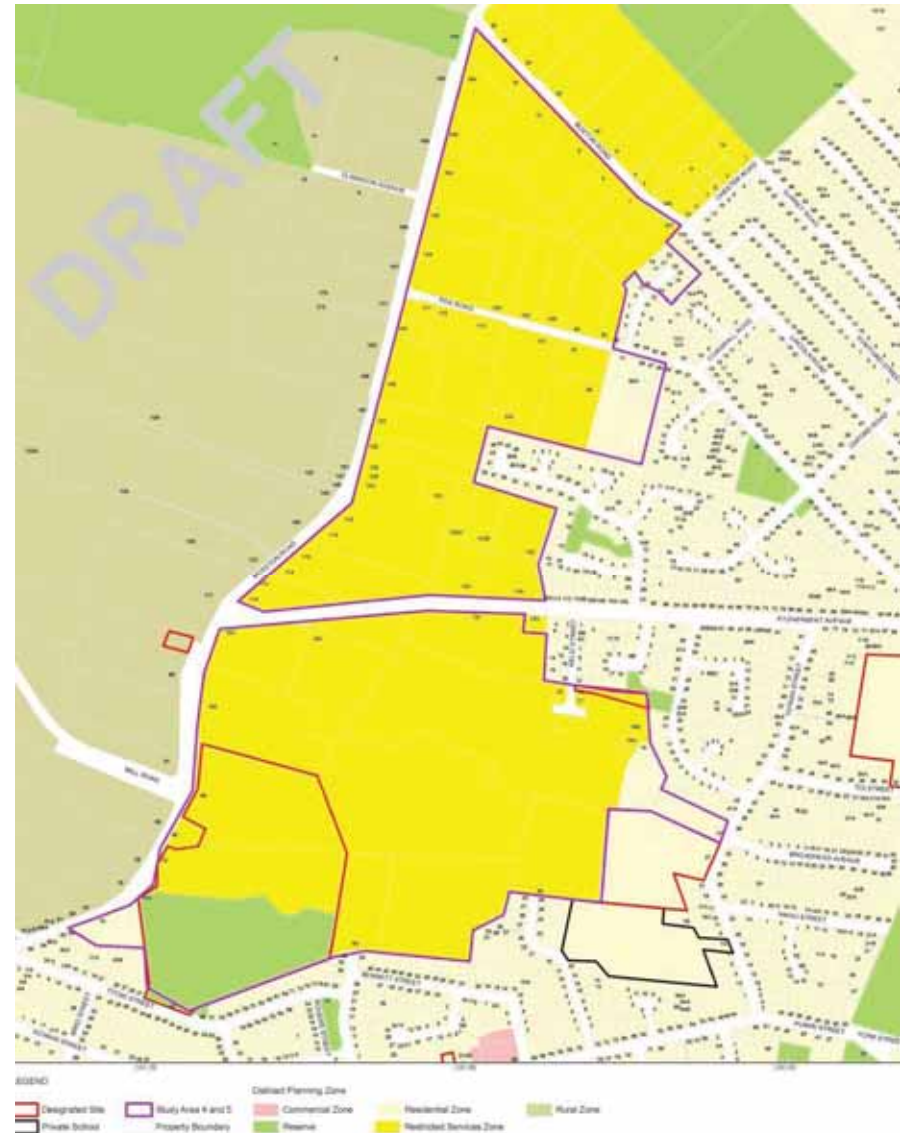
A total of 20 areas were identified as being potentially suitable for residential development and each area was scored against weighted criteria to determine the most suitable areas for residential development. The criteria used were as follows:

- *Impact on cultural and natural resources;*
- *Impact on landscape integrity;*
- *Accessibility to community activities and transport routes;*
- *Retention of rural land diversity;*
- *Supporting a range of housing needs;*
- *Logical development sequence;*
- *Ability to provide efficient and effective infrastructure; and*
- *Market demand.*

Of the 20 areas assessed, the 'Fitzherbert Avenue Extension' (Study Area 4) and 'Springvale South' (Study Area 5) scored the highest overall and were determined to be the most suitable areas for residential development. Although the 2008 Growth Strategy has not been adopted by WDC it provides useful background information and justification for developing a Structure Plan to guide residential development in Springvale.

▪ **Wanganui District Plan**

The Wanganui District Plan is a legally binding document prepared in accordance with the RMA and became operative in February 2004. It defines the way in which Wanganui District's natural and physical resources will be sustainably managed and is the Council's key statutory planning document. It also determines the zoning of all areas of the City and sets out objectives, policies and rules in relation to these zones. District Plan maps determine both Study Area 4 and 5 as being within the 'Restricted Services Residential Zone'.



**Figure 2 – Study Area 4 & 5 - Restricted Services Residential Zone
(Source: Wanganui District plan)**

Objective 1 of the District Plan relating to urban development is particularly relevant to the Structure Plan:

“Urban Development which is planned to minimise the adverse effects on the environment and maximise effective and efficient use of natural and physical resources”.

“Urban development shall recognise the importance of the soil resource, avoid pollution of groundwater systems and promote effective and efficient infrastructure services. It will also contribute to the overall structure of the city in a way that has regard for future generations and promotes high amenity standards”

Policy P1 in relation to Objective 1 is also of particular relevance to the Structure Plan:

“Promote a pattern of urban development that is cost-effective, efficient in the use of land and infrastructure services, and co-ordinated with a long term programme of infrastructure development”

WDC is currently undertaking a comprehensive review of all parts of the District Plan in a process named ‘Shaping Wanganui’, which will be subject to full public consultation and an assessment of alternatives in accordance with s32 and Schedule 1 of the RMA. The Structure Plan will be consulted on as part of the review of the residential provisions contained within the District Plan, and is scheduled for early 2012.

- **Wanganui District Council 10-year Plan (2009 – 2019)**

The 10-year Plan (or ‘Long term Council Community Plan’) has a number of functions including describing the type of district the community has told Council it would like, outlining the role the Council will play in achieving that vision, and identifying some of the key challenges facing the Council over the next 10 years.

It also provides an overview of each activity the Council will carry out and the services it will provide and determines how much the business of the Council will cost, and how it will be funded. Many of the policies within the 10-Year Plan are relevant to the Structure Plan, however Council’s vision of ‘family friendly Wanganui’ is particularly relevant.

▪ **Family-friendly Wanganui**

Council's vision is for a family-friendly Wanganui that is a preferred place to establish a family home, and the 10-year Plan sets out a number of strategies to realise this vision.

Connectivity, quality and affordable housing in contemporary neighbourhoods, and access to recreational and cultural activities are all aspects of the family-friendly vision set out in the 10-Year Plan that can be directly advanced through the Structure Plan:

“Connectivity:

- *Facilitate good urban design;*
- *Provide pathways to ensure safe cycling and walking routes; and*
- *Provide an efficient transportation network to residents and promote economic development.*

Quality and affordable housing in contemporary family neighbourhoods:

- *Collaborate on healthy housing initiatives;*
- *Ensure District Plan zoning and rules advance family-friendly interests; and*
- *Encourage environmental sustainability of neighbourhoods.*

Access to recreational and cultural activities:

- *Provide and maintain parks, recreational and sporting amenities and facilities that meet the needs of all age groups and abilities.”*



3.3 Site Description and Land Use

- **Physical Characteristics and Ecology**

Both Study Area 4 and 5 feature morphology typical of their near-coastal setting along with other natural and physical features unique to the area.

Study Area 4 features a number of prominent remnant dunes formed through aeolian (wind) based transport of sand by the prevailing westerly wind, with one prominent dune and associated minor dunes running east to west in the northern area of Study Area 4 a dominant feature of the local landscape. Parts of both study areas have hummocky topography typical of dune systems although both study areas also feature large areas of flat to rolling topography. Low lying areas within both study areas are prone to become boggy in winter and during high rainfall events commonly feature open water.

Titoki Wetland, situated in the south west of Study Area 4, is a remnant dune wetland typical of coastal dune systems type that would have historically been commonplace throughout the area. Titoki Wetland has been protected and restored in recent years and features a locally significant area of open water along with regenerating native vegetation typical of coastal dune/wetland assemblages and provides habitat for a variety of aquatic life and bird life. Karaka, *Cordyline*, *Tenax* and various *Coprosma* species are well represented in the Wetland and the surrounding area.

Aside from the native vegetation within and immediately adjacent to Titoki Wetland there is almost no remaining native vegetation aside from a small pocket on the large remnant dune in Study Area 4. Both study areas are characterised by mixed grasses and planted exotic and native trees and shrubs typically associated with rural, rural-residential and residential activities.



Figure 3 – Study Area Aerial Photo Overlay

- **Geology and Geomorphology**

Geological records indicate the area as being underlain by loose, poorly consolidated sand mainly in fixed dunes of Holocene Age and undifferentiated late Quaternary river gravel, sand and fan deposits of Holocene/Pleistocene Age. In accordance with the WDC's Soil Map, the area is indicated as being underlain by yellow/brown wind-blown sand.

The topography of the area, close proximity to the coast, recent aerial information and ground conditions indicate that the area is dominated by wind-blown sand dune morphology. The ridges and hollows appear to be approximately aligned with the coastline. The raised section of the central-southern area indicates typical sand dune morphology with steeper slope angles on the coast (southern) side, with shallower angles on the lee (northern) side. Hollows within the ridges appear waterlogged and boggy indicating poor drainage within the area and high groundwater levels beneath the area.

- **Current Land Use**

Study Area 4 is largely undeveloped featuring the Titoki Wetland, the large east-west running dune and associated minor dunes (all of which are vegetated), a large area of flat and swampy pasture area and a small amount of residential and rural-residential activity (there are a total of five dwellings within the study area). The area also contains Broadview Retirement Home which is currently being expanded to include a further 20 stand-alone residential care homes in addition to the current care home building. The new stand-alone care homes are contained within a lot situated in the north-west corner of the study area and are being constructed as a permitted activity under the District Plan.

Study Area 5 features approximately 40 properties of predominantly rural-residential activity although several larger lots are more rural in character. There are also a small number of residential sized properties adjacent to the existing road end of Fitzherbert Avenue and on Fox Road and Buxton Road adjacent to established residential areas. There are also a small number of light industrial type activities fronting Mosston Road.





Figure 4 – Study Area Digital Terrain Model

3.4 Surrounding context

- **Character analysis**

There is strong variation in the character of areas surrounding the study area and these have been categorised under the following headings:

Rural - The area to the west of Mosston Road features pre-dominantly rural type land uses and is distinctly rural in character, although is interspersed with residential and rural-residential activity.

Rural Residential – The area west of Mosston Road and the area north of Buxton Road feature a number of rural residential/lifestyle blocks, and the area immediately north of Buxton Road on Study Area 4 is distinctly rural residential in character.

Residential/Urban – The area to the west and south of both Study Area 4 and 5 is residential in character, with recent residential development within Springvale prominent along the western boundary of both study areas. Springvale features other activities typical of residential zones that contribute to its urban character including schools, open space, churches, commercial and retail activities and support services.

Industrial – There is a small industrial estate situated on Mill Road to the west of Study Area 4 although it is largely obscured from the Study Area.

Wetland and Open Space – Titoki Wetland and associated open space is prominent in the south west corner of Study Area 4, and although situated within the Study Area there is no proposal for this area to be developed. Given its size and close proximity it provides a strong ecological and open space focal point to Study Area 4.

Coastal Setting – Given the presence of coastal dunes within both study areas there is a strong coastal character underlying the area, with the coastal marine area 1.7km to the south and south west of Study Area 4.



3.5 Transport and Accessibility

- **Existing Road Network**

The existing road network surrounding the Study Area comprises an arterial road, two collector roads and a number of residential access roads. Mosston Road forms the western boundary of the Study Area and is a key arterial route linking areas to the south of the City including the residential suburb of Castlecliff and the Heads Road Industrial Area to the north of the City including State Highway 3. Mosston Road forms a junction with Fox Rd in Study Area 5 which acts as a collector road providing access to Springvale and the Central City. Buxton Road provides access to the north of Study Area 5 and also links the area with Springvale although there is no through vehicle access on to Mosston Road. Several residential roads provide access into Study Area 4; Rogers Street, Tawhero Road, Kelsi St and Fitzherbert Avenue. As a result of cul-de-sac-type development adjacent to Study Area 5 there are few roads providing direct access aside from Mosston Road, Buxton Road, Fox Road and Fitzherbert Avenue.

- **Public Transport Network**

Figure 8 shows existing and proposed bus routes in Wanganui. There is currently only one bus route operating in proximity to the study area along Totara Street to the east of Study Area 4 before heading eastward along Fitzherbert Avenue toward the central city. There is also a separate service to the north of the Study Area serving the existing Springvale Area. Figure 8 also shows the potential for a demand responsive shuttle transport option serving Study Area 5 along with a further Castlecliff service (based on the findings of the Wanganui Urban Transportation Strategy (2011) (WUTS).



Figure 5 – Existing Heavy Vehicle Routes and Proposed Fitzherbert Ave Extension. (Source: WUTS)



Figure 6 – Existing and Proposed Bus Routes (Source: WUTS)

- **Pedestrian and Cycle Network**

The surrounding road network to the south and east of the Study Area features an integrated and well-connected network of footpaths and pedestrian facilities although crossing facilities on busy roads such as Totara Street could be safer and provide a higher level of service. Mosston Road, Fox Road and Buxton Road do not feature dedicated pedestrian footpaths or crossing facilities and offer a generally poor level of service for pedestrians.

Wanganui has an identified cycle network and has made significant progress in creating cycle lanes and facilities on many of the City's busiest roads. The WDC Cycling Strategy Implementation Plan (2007) aims to reduce traffic volumes and speed in specific locations, along with consideration of alternative cycle routes in accordance with the widely adopted 'Hierarchy of provisions for cyclists'. Figure 9 shows the updated Cycling Network Implementation Plan with a proposed cycle route along Mosston Road and the proposed Fitzherbert Avenue extension.

The Wanganui Shared Pathways Strategy was adopted in April 2012 and envisions a family friendly district with pathways that are safe, convenient, interconnected, accessible, attractive and expressive. The Structure Plan will seek to fully implement the Shared Pathways Strategy through the design of the transport network.

- **Wanganui Urban Transportation Strategy 2011 (WUTS)**

The WUTS identifies key transport objectives and actions the Council and community will take to reach Wanganui's wider strategic goals. It sets out key objectives and actions under the following five themes:

- Theme 1 – Wayfinding is Easy
- Theme 2 – A Vibrant central Area
- Theme 3 – Riverfront Enhancement
- Theme 4 – Enhancing Freight Movement
- Theme 5 – Real Transport Choices

- Theme 6 – Integrating Land Use and Transport Processes

The following excerpts from Theme 5 'Enhancing Freight Movement' are of particular relevance to the Structure Plan:

“Council is considering proposals to encourage residential development and lifestyle blocks along Mosston Road in the future. This land use will conflict with the use of Mosston Road and Montgomery Road as a truck route. The District Plan review will need to address this issue to ensure the safety and efficiency of this heavy vehicle route is not further compromised. Provision of new direct road access to properties onto Mosston Road should be minimised or ideally prohibited. ...Structure Plans for the future development of these areas will ensure future land use is integrated with the transport network...”

“The Strategy promotes the extension of Fitzherbert Avenue to Mosston Road to link with Manuka Street as high priorities. Together these actions will facilitate more efficient movement of freight to/from the Mill Road Industrial Area”



Figure 7 – Cycling network Implementation Plan (2010) (Source: WUTS)

3.6 Existing Services

- **Stormwater**

The drainage and Water services map included as Figure 10 below shows the extent of existing reticulated water services in the wider Springvale Area. There is very little reticulated service provision within the Study Area although there are water pipes running along Fox Road and the majority of the Fitzherbert Avenue Extension, with a stormwater pipe also extending along Fox Road. Well known capacity constraints exist to the north of the Study Area in conjunction with the Churton Creek stormwater system which is piped through the northern section of Study Area 5.

- **Utilities**

The Combined Services Map included as Figure 13 shows the extent of existing electricity, gas, and telecommunications lines serving the Springvale Area.

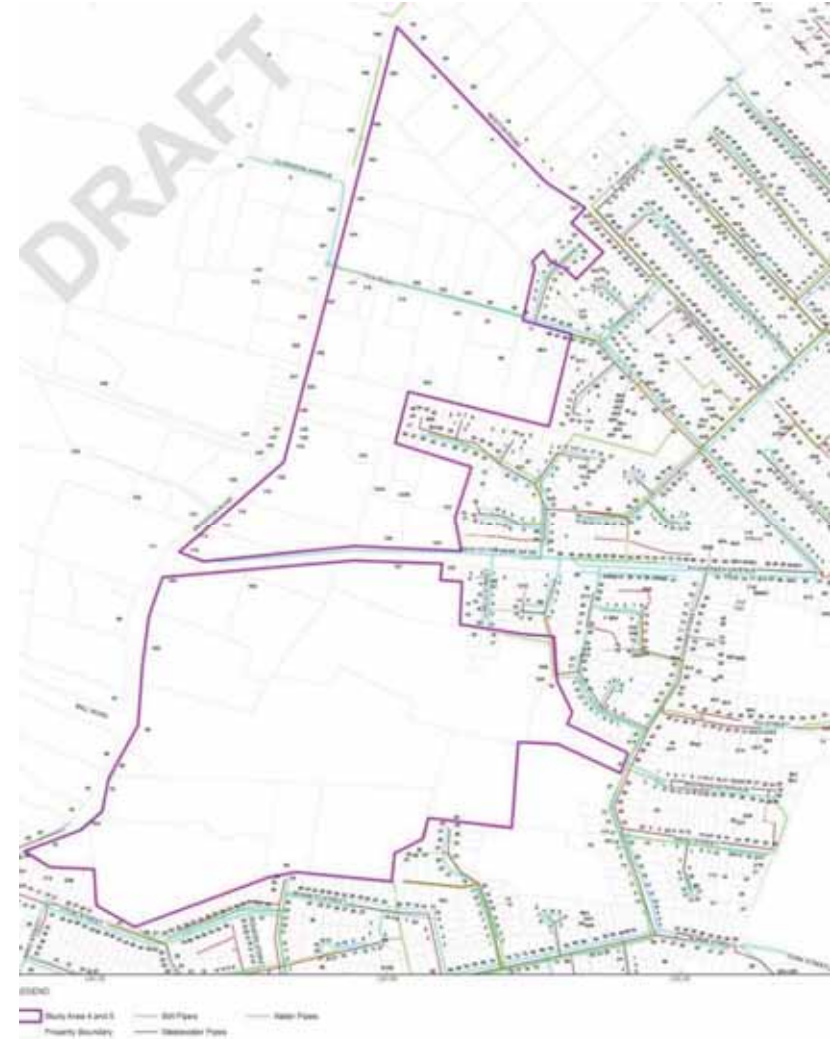


Figure 8 - Water Services Map



Figure 9 – Existing stormwater attenuation west of the Study Area



Figure 10 – High water table and open water within Study Area 5

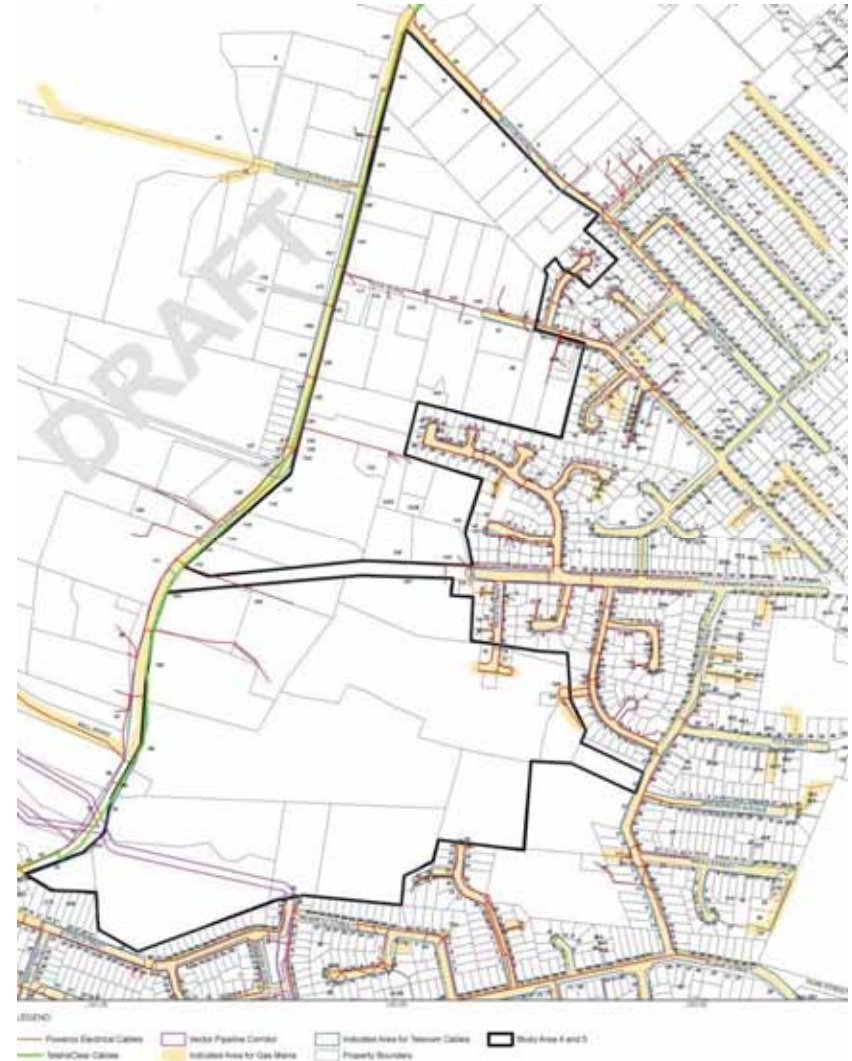


Figure 11 – Utilities Map

3.7 Socio-economic Conditions

- **Demographics**

The 2006 census showed a decline in Wanganui's population between 2001 and 2006 of 633 people (-1.5%), but a gain of 333 dwellings (2%) or 70 households per year. This reflects the long-term national trend of decreased numbers of occupants per dwelling. Statistics New Zealand population projections, based on current circumstances, are that Wanganui's total population will decline by 3400 (7.8%) by 2031 as a result of net outward migration exceeding natural increase, although after the early 2020's deaths are projected to exceed births.

Population aging is occurring, with the 15 to 39 age bracket down 3000 (22%) between 1996 and 2006, and the 65+ up 600 (9%). A further 22% decline in ages 15 to 39 is projected by 2031, and a 63% increase in 65+. The median age is expected to increase from 39.5 in 2006 to 47.1 in 2031. The population of Springvale is expected to reflect these trends.

- **Economic Indicators**

The Wanganui Economy has been through brief periods of recession from 2009 reflecting the global and national recession although has recently returned to a slow rate of economic growth.

The number of people receiving the unemployment benefit has risen slightly during 2009, as has the number receiving invalid benefits, although job advertisements in the December 2008 quarter were down 27% on the same quarter for the previous year. There is no recent socio-economic information available for the Springvale Area.

4. Structure Plan Features

4.1 Urban Design Principles

- **Urban Design Protocol**

The vision and objectives of the Structure Plan are based on a number of key principles and design guidelines. These follow on from the high level urban design guidance Council received from Kobus Mentz when commencing the Structure Plan, the scope of works, and the '7 C's' of the New Zealand Urban Design Protocol (MfE 2005), included below as follows:

Context: Seeing that buildings, places and spaces are part of the whole town or city.

Character: Reflecting and enhancing the distinctive character, heritage and identity of our urban environment.

Choice: Ensuring diversity and choice for people.

Connections: Enhancing how different networks link together for people.

Creativity: Encouraging innovative and imaginative solutions.

Custodianship: Ensuring design is environmentally sustainable, safe and healthy.

Collaboration: Communicating and sharing knowledge across sectors.

- **Guiding Design Principles**

The Structure Plan shall:

- ✓ Use Low Impact Design stormwater infrastructure to support the development and that connects into a main north-south swale. This will also provide an attractive pedestrian and cycle route and calm traffic at appropriate points.
- ✓ Retain and develop areas of ecological, natural and historic interest into quality public space.
- ✓ Create a series of inter-connecting and self-explaining streets that provide north-south access (between Structure Plan area and existing areas of residential) and east-west access to amenities and town centre.
- ✓ Adopt CPTED and Universal Access principles within its design;
- ✓ Be predominantly residential with ancillary uses. Other commercial uses that support the local/rural economy may be appropriate in certain locations
- ✓ Contain a range of lot sizes to create a diversity of housing size and affordability that are adaptable to changes in use and intensity over time.

4.2 Open Space and Attenuation Areas

▪ Open Space and Ecology

Three significant new areas of open space are proposed to the south of Fitzherbert Avenue. Titoki Wetland reserve will be retained and enhanced as part of the development and will form part of the transition to rural/residential character to the west of the Swale Road in addition to providing recreational opportunities for local residents. North-west of Titoki Wetland a small park for leisure activities and children's play space is proposed that integrates with the wetland and the proposed Swale Road.

Immediately east of Titoki Wetland and the Swale Road an open space and stormwater attenuation area is proposed which compliments the park and wetland and will provide further recreation opportunities and amenity within this part of the residential area.

North of Titoki Wetland, the significant sand dune presents a wonderful opportunity for open space suitable for active and passive recreation whilst also improving connectivity and reinforcing a sense of place. The proposal maximises these opportunities by creating an attractive public space featuring look-out points towards the ocean at the top of the dune and creating a strong east-west green link that integrates with the established residential area of Springvale to the east.



Figure 12 – Green Network

The dune open space also provides a unique opportunity to re-establish the once rich and diverse dune ecology and connect it with the Titoki Wetland and other open spaces via the swale road.

North of Fitzherbert Avenue one major area of open space is proposed suitable for a range of recreation activities including potentially a small sports field. Two smaller green spaces are proposed along with a linear green space running perpendicular to the Swale Road along the line of Churton Creek that will also act as a localised stormwater attenuation area.

- **Stormwater Attenuation Areas**

Stormwater attenuation areas are noted on Figure 15 and have a primary function to provide storage areas for stormwater following rain events both from within the study area and from the catchment above the study area. Stormwater is proposed to drain to the attenuation areas where it is stored before being released into the swale and downstream piped stormwater network at a measured rate whilst also allowing stormwater to infiltrate the soil and sub-soil. Attenuation areas are proposed to be attractive, landscaped vegetated areas with small areas of wetland and/or open water.

- **Swale Road**

The Swale Road is discussed further with respect to the proposed street network and stormwater services but in summary is a wide (up to 30m and no less than 20m), multi-functional transport corridor integrating a vegetated swale to collect, attenuate and distribute stormwater flows whilst also allowing stormwater to infiltrate the soil and sub-soil. It will also provide a green corridor linking the network of open spaces and promote and enhance ecology and biodiversity.



Figure 13 – Blue Network

4.3 Connectivity

- **Street network**

The Structure Plan sets out a logical and inter-connecting network of streets that integrate well with its context. The two principal streets within the development are; Fitzherbert Avenue, the principal east-west axis road linking the development to the east and providing direct connections to the city centre, and; the Swale Road/Collector Road, the principal north-south axis road linking communities to the north and south of the Study Area. Fox Road and to a lesser extent Buxton Road also provide an east-west function through the study area.

The secondary streets within the development have been laid out to create viable development parcels of approximately 100m by 70m (this varies where the Study Area interfaces with existing residential areas or accommodates existing features to be retained, such as the large dune). In addition, several streets have been aligned to take advantage of views of open space and distinctive features within the area in order to reinforce a 'sense of place' and establish a legible movement network for the area.

Three intersections are proposed to connect the Study Area with Mosston Road (Fitzherbert Avenue, Fox Road, and a new intersection providing direct access from Study Area 4). Along a length of approximately 1.8km this is considered the minimum number of intersections required to provide sufficient choice and minimise travel time between any part of the proposal and Mosston Road without compromising traffic safety. The intersections have been deliberately placed on sections of Mosston Road offering good sight visibility. The existing designation for Fitzherbert Avenue is proposed to be amended which significantly improves the safety of this intersection and is further discussed below.

The proposed residential street network in the north of Study Area 5 intersects with Fox Road and Buxton Road at regular intervals to fully integrate these roads with the proposed street network, with the spacing of



Figure 14 – Roading Hierachy

intersections at appropriate distances to create suitable block depth and create a sense of residential character along these roads.

- **Fitzherbert Avenue Extension**

The extension of Fitzherbert Avenue is crucial to the Study Area being developed in an integrated and co-ordinated manner. It currently adjoins the Study Area to the east where it finishes, approximately 600m from Mosston Road. Once extended it will create a strategically significant route for the area and city and will have multiple benefits. Although it has been identified in WUTS as a strategic and arterial route, it is considered important that it remains residential in character to integrate it with the existing residential section of Fitzherbert Avenue, and to reflect the proposed residential land use along the extension area. A series of residential streets are proposed to intersect with Fitzherbert Avenue extension to reinforce the residential character of the area although residential lots fronting Fitzherbert Avenue will have rear access to minimise access safety issues. It is considered important that the proposed residential area not ‘turn its back’ on the Fitzherbert Ave extension and it is fully integrated as part of the study area.

- **Realignment of Fitzherbert Avenue Designation**

The existing designation intersects with Mosston Road further south than the proposed intersection. This alignment is considered less than ideal given the presence of the sand dune which will greatly reduce sight distances to the south and create a traffic safety hazard. It is therefore proposed to realign Fitzherbert Ave northward so that it intersects with Mosston Road at right angles and is sufficiently north of the dune to ensure adequate sight distances to the south along Mosston Road are attained. Safe junction design is clearly vital to ensure that future traffic flows are safely accommodated. The junction of Fitzherbert Avenue and Totara Street currently prioritises traffic turning from Totara Street onto Fitzherbert Avenue but will need to be re-prioritised in favour of traffic heading in both directions along Fitzherbert Avenue.



Figure 15 – Fitzherbert Ave/Totara St Intersection



Figure 16 –Reprioritisation of traffic flows will be required

- **Mosston Road – Limited Access**

As per the recommendation from WUTS, it is proposed that access onto Mosston Road from lifestyle blocks fronting Mosston Road be prohibited by legal mechanism, with all future access proposed via the swale road. This will provide both safety benefits to residents and avoid exacerbation of existing safety issues along Mosston Road. It will also provide enhanced amenity to the lifestyle blocks.

- **Walking and Cycling**

All roads are proposed to be designed to NZS 4404 Standard or better and will incorporate design features to ensure a high level of service for both pedestrians and cyclists, with all roads providing adequate width and safety features to encourage cycling. Fitzherbert Avenue has been targeted as a future cycle route in the Wanganui Cycling Strategy Implementation Plan (updated 2011) and is proposed to be designed with mandatory cycle lanes to ensure its integration with existing cycling routes.

The Swale Road will be of sufficient width to ensure a walking/cycling track can be established in conjunction with the road, providing a direct link to larger areas of open space. The proposed swale road is further discussed with respect to stormwater attenuation.

- **Public Transport**

Connectivity and walking distance to bus stops will be improved through the proposed street network, network of footpaths and pedestrian crossing facilities. The proposed street network will also allow the seamless integration of existing bus routes into the Study Area, possibly utilising Mosston Road and Fitzherbert Ave and potentially the Swale Road.



Figure 17 – Poor sight distances evident along Mosston Road



Figure 18 – Proposed location of access into Study Area 5

4.4 Secure by Design

▪ Crime Prevention Through Environmental Design

The following principles have been followed in developing the Structure Plan.

- ✓ Lots have been positioned to allow fronts to face the street and backs to face backs to maximise passive surveillance and minimise the risk of crime. Care has been taken to position the backs of proposed lots against the backs of existing lots to protect the privacy and safety of residents.
- ✓ Public will be overlooked by building fronts and/or streets and have a choice of entrance and exit points. A number of lots have been positioned within the dune system to maximise the development potential of the area and take advantage of views. However, these have been positioned to ensure there are no parts of the public space that are not accessible from a public street or visible from lot frontages. The backs of the proposed lots set into the public space will be largely protected by the topography and vegetation in the dunes.
- ✓ Devices to slow vehicle speeds at likely crossing points for pedestrians and outside shops and schools are suggested. These traffic calming measures could include changes to the surface treatment or volume of planting within the road reserve (particularly where the Swale Road intersects these crossing points) providing a continuous visual link between areas of green space.
- ✓ The design of the street network and the suggested position of the local retail area ensures that the majority of residents have walkable access to a corner dairy or bus stop within an 800m (10 mins walk), which provides those in the community who cannot or do not drive (e.g. the young or elderly) with access to essential amenities.

- ✓ All streets have been designed with a 20 metre road reserve to ensure sufficient space for the provision of footpaths and berms.

4.5 Services

▪ Low Impact Design Stormwater Infrastructure

It is proposed to minimise impact on the existing downstream stormwater infrastructure by utilising low impact stormwater features. The result is a network of swales and stormwater attenuation ponds that collect stormwater within the development and distribute it gradually into the existing stormwater system, thereby minimising the impact caused by extreme stormwater events. The Swale Road will contain the principal swale linking the network of attenuation areas and will be a prominent feature within the road reserve and will have a number of functions and benefits:

- ✓ Collects, distributes and attenuates stormwater from within the area and distributes stormwater from areas to the north.
- ✓ Allows infiltration of stormwater flows into the soil and sub-soil
- ✓ Marks a transition between suburban and rural character.
- ✓ Creates a safe recreational route for walkers and cyclists
- ✓ Enhances aesthetic values and provides amenity to the residential area.
- ✓ Creates a green corridor linking the various open spaces with Titoki wetland, promoting ecology and bio-diversity.
- ✓ Forms part of an integrated, multi-modal and multi-functional transport corridor.



Figure 19 – Typical Swale Road Cross Section - North Shore



Figure 20 – Road with central swale - Auckland

- **Utility Connections**

More detailed studies are required to determine exact service requirements, however preliminary studies have determined that existing reticulated networks are able to be extended into the study area. High level costs for all required infrastructure are set out in Section 4.8 below.

4.6 Site Constraints

- **Geotechnical Investigation**

A desktop investigation and site walkover have been conducted to gain initial geotechnical and geomorphological knowledge of the area. Combined with previous knowledge and anecdotal evidence, this provides the basis for identification of geotechnical hazards that may have the potential to affect the area.

By utilising standard earthworks techniques and an area-wide development strategy, it is likely that most geotechnical hazards can be suitably mitigated. It is considered that based on an initial assessment, and by following the recommendations of the geotechnical investigation, that the area will have no greater geotechnical risk than the established residential areas of Wanganui.

Dynamic compaction and the importation of fill material may be required to facilitate residential development and will help reduce the impact of seismically-induced ground movement including liquefaction.

- **Archaeological Investigation**

A high level archaeological investigation of the study area has been undertaken as part of the Structure Plan process and concludes that there is



Figure 21 – Liquefaction Hazard Map

a comparatively low risk of archaeological remains being present. Whilst some archaeological remains can be expected to be present within the area it is unlikely that any major or extensive prehistoric or historic archaeological sites will be present.

The sand dunes across the Study Area have the highest potential for discovery of buried prehistoric and historic remains; in particular it is considered the area in the vicinity of Buxton and Fox Roads has the highest potential for archaeological remains. Historic remains can be expected to be present and prehistoric remains may be present.



Figure 22 – Known Archaeological Sites, Protected trees, Survey Marks and Heritage Features

4.7 Land Use

Residential Land Use

The proposed land use is predominantly residential with rural/residential properties fronting Mosston Road. A significant amount of open space is also proposed. Consideration has been given to alternative land use in parts of the Study Area however given the strategic fit with existing residential areas and the efficient manner in which residential infrastructure can be provided through extension of existing networks, residential use is considered the most efficient and practical use of the land resource.

Lot size and diversity

A range of residential lot sizes are proposed to facilitate a diversity of housing sizes and affordability. To the west of the Swale Road, larger lot sizes of 1000m² and above have been provided, which reinforces the transition from suburban to rural character. It is anticipated that larger lot sizes will provide for large family homes set within significant private open space. To the east of the Swale Road, lot sizes of between 500m² -700m² have been provided. The majority of lots within the area are this size, which also reflects the current market demand in Wanganui.



Figure 23 – Proposed Land Use

Along Fitzherbert Avenue a residential lot size of 350m² to 500m² has been provided to encourage smaller housing sizes and therefore a more affordable option for future residents

The total number of lots proposed in the Study Area is as follows:

- **558 residential lots (500m² - 700m²)**
- **116 lifestyle lots (1,000m²)**
- **674 lots in total**

- **Commercial Land Use**

A small area of 500m² of commercial/retail zoned land is proposed on Fitzherbert Ave to provide for the day to day needs of residents. A convenience store or other small scale type retail service activity is anticipated in this area.

- **Existing land parcels and dwellings**

The proposed roading layout and development blocks have been integrated with existing land parcels and dwellings where possible ensuring the majority of dwellings will be unaffected. Further sensitivity analysis and refinement of the proposed layout will further improve the integration with existing land parcels and dwellings.

4.8 Development Blocks and Infrastructure Phasing

- **Development Blocks**

The Structure Plan proposes an integrated approach to development, however recognises that development will come forward as a series of discrete development blocks over a long period of time. The phasing of residential development is not considered critical to the implementation of the Structure Plan provided key roading and stormwater infrastructure is protected through designation and/or constructed, and that strategic open space and attenuation areas are identified and protected. Provided development is undertaken in accordance with the principles and general layout of the Structure Plan to ensure future connectivity, development blocks can come forward in a flexible manner. Phasing may also depend on downstream infrastructure costs and other constraints. Figure 26 identifies the seven development blocks and possible phasing as follows:

Development Blocks (north to south)	Possible Phasing
Buxton	Phase 3
Fox 1	Phase 4
Fox 2	Phase 5
Fitzherbert Ave North	Phase 2
Fitzherbert Ave South	Phase 1
Mosston	Phase 6
Titoki	Phase 7



Figure 24 – Development Blocks and Phasing

- **Key Infrastructure Phasing**

The phasing of infrastructure is critical to ensuring development comes forward in an integrated and co-ordinated manner and in accordance with the principles and general layout of the Structure Plan. The following key infrastructure identified on Figure 26 is recommended to be designated and/or constructed as soon as funding and the statutory planning process allows:

1. **Designation of the Swale Road route;**
2. **Alteration of designation and construction of Fitzherbert Ave Extension and associated junction works;**
3. **Designation of strategic open space and stormwater attenuation areas; and**
4. **Designation of the road head into the Titoki development block from Mosston Road.**



Figure 25 – Key Infrastructure

4.9 Infrastructure Costs

▪ High Level Approach

The following key infrastructure costs have been estimated on the basis of the proposed layout applying current cost rates and industry best practice and design standards. Note the infrastructure costs do not include land purchase or costs associated with planning and designation processes.

▪ Roothing

The estimate of roading costs has been based on NZS 4404 typical road design and includes the extension of Fitzherbert Avenue.

Type of Road	Quantity	Cost
Secondary Arterial (Fitzherbert Avenue) workings. 15m carriageway.	0.470km of proposed section @ \$1,278,920 per km	\$601,092.40
Residential Collector workings. 14m carriageway with major cycleway route.	2.150km of proposed section @ \$1,165,380 per km	\$2,505,567.00
Local Residential workings. 11m carriageway.	6.500km of proposed section @ \$1,023,530 per km	\$6,652,945.00
Cul-de-sac workings. 6m carriageway.	0.150kmm of proposed section @ \$104,790 per km	\$104,790.00
Total (excluding GST) includes 10% contingency		\$9,864,394.40

Table 1 – High level cost estimate for Roothing Infrastructure

▪ Water Supply

Description	Quantity (m)	Rate	Cost
225 mm Main From Mill Road Stub	1060	\$ 285	\$ 302,100
225 mm Retic with rider mains	1950	\$ 420	\$ 819,000
150 mm Retic with rider mains	1600	\$ 375	\$ 600,000
100 mm Retic with rider mains	6040	\$ 355	\$ 2,144,200
Total (excluding GST)			\$ 3,865,300

Table 2 – High level cost estimate for Water Supply Infrastructure

- **Wastewater**

Description	Quantity (m)	Rate	Cost
New 150 mm Retic mains	9040	\$ 240	\$ 2,169,600
New 200 mm Retic mains	0	\$ 270	-
Upgrade existing main to 200 mm	700	\$ 320	\$ 224,000
Upgrade existing main to 300 mm	220	\$ 390	\$ 85,800
New 300 mm trunk main to Beach Road P/S	1900	\$ 340	\$ 646,000
Total (excluding GST)			\$3,125,400

Table 3 – High level cost estimate for Wastewater Infrastructure

- **Stormwater**

Description	Unit	Quantity (m)	Rate	Cost
Springvale Swale north of sandhill (1150 m)	m ³	5520	\$ 16.0	\$ 88,320
Springvale Swale south of sandhill (480 m)	m ³	899	\$ 16.0	\$ 14,377
675 mm Culvert through sandhill	m	150	\$ 2,500	\$ 375,000
Road culverts across Springvale Swale	each	5	\$ 60,000	\$ 300,000
300 mm SW main	m	2700	\$ 340	\$ 918,000
450 mm SW main	m	1090	\$ 410	\$ 446,900
600 mm SW main	m	360	\$ 540	\$ 194,400
Ponds - 7 in total - total service area = 36,900m ²	m ³	62700	\$ 14	\$ 877,800
Total				\$3,214,797

Table 4 – High level cost estimate for Stormwater Infrastructure

5. Recommendations

5.1 Suitability for Residential development

Preparation of the Structure Plan has allowed an in-depth investigation of factors determining the suitability or otherwise of the Study Area for residential development. Based on the key findings it is concluded that the Study Area is suitable for residential development, and that if developed in accordance with the principles set out and incorporating key infrastructure as highlighted will result in a high quality and desirable residential area. More detailed investigations along with consultation will need to be undertaken to determine how the identified development blocks come forward.

5.2 Next Steps

The following steps are recommended to facilitate implementation of the Structure Plan and provide further guidance for residential development in the Study Area:

1. Consultation Strategy

Although the Structure Plan feeds directly into the District Plan review and will be subject to a statutory public consultation process, a three-pronged consultation strategy is recommended to be implemented to ensure all relevant parties are engaged, namely:

- The public and local communities
- Landowners;
- Key stakeholders, including developers, iwi groups, statutory organisations and other key interest groups and individuals; and

2. Detailed Infrastructure Study

Further refinement and development of the infrastructure study is required, particularly in terms of the swale road, roading layout and associated costs.

3. Land Purchase and Designation of Swale Road and Open Space

The swale road route should be designated as soon as practicable and the land purchase process associated with securing the route initiated. A notice of requirement for the swale route should be drafted.

4. Scheme Assessment for Fitzherbert Ave Extension

A traffic scoping study and scheme assessment should be initiated for the Fitzherbert Ave extension including detailed investigations of the junctions with Mosston Road and Totara St. The outcome should be preferred options for the extension and junctions.

5. Residential Design Guide

A detailed residential design guide would assist in applying the principles of the Structure Plan and guide the establishment of lots, building design, streetscape and open space.

6. Development Contribution Study

Once the costs associated with implementing the Structure Plan are known, a study to determine an appropriate development contribution levy for residential development should be initiated. The outcome will be a guide to development contributions for the Study Area.


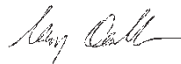

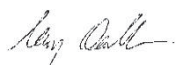
GHD Limited

Level 11, Guardian Trust House
15 Willeston Street, Wellington
T: 64 4 472 0799 F: 64 4 472 0833 E: wellington_mail@ghd.co.nz

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