

# Waikato Integrated Land Transport Strategy

## Foreword

Vision 2015 – 2045

“To provide a safe, integrated and resilient road network that meets the needs of people and business in the Waikato District.”

The Waikato Integrated Land Transport Strategy sets out the high level direction for our transport network over the next 30 years. The Waikato District has challenging road and roadside environments where driver behaviour and driver error result in a high number of fatal and serious injury crashes.

Also, some communities are growing so rapidly that the impact of planned and unplanned growth is leading to a reduced level of service on the transport network.

The construction of the Waikato Expressway is leading to changes in travel demands and patterns and an increase in the size of the local road network as a result of vested state highways. This is resulting in higher management costs.

Additionally, unplanned events can cause road closures resulting in loss of access and delays for the movement of people and goods.

The district has limited funding and therefore needs to have a strategic approach to the large operational and capital expenditure to maintain, replace and create new infrastructure assets. The strategy is also guided by the current Government Policy Statement on Land Transport (2015/16 – 2024/25), the Regional Land Transport Plan (2015 -2045) and the District Development Strategy (2015).

The strategy acknowledges that our transport system involves other modes of transport such as passenger transport, rail services, cycle ways and footpaths.

Over the next thirty years our priorities are safety, growth, maintenance costs and resilience. These priorities have associated benefits when implemented through a targeted infrastructure programme of actions included in the recently adopted Regional Land Transport Plan and the Regional Public Transport Plan (2015 - 2025). The strength of this strategy is to inform applications to the New Zealand Land Transport Agency for financial assistance and the District’s Long Term Plan.

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## Purpose of the Waikato Integrated Land Transport Strategy

The vision of the Waikato District Council (WDC) is “To be a recognised leader in creating a district that prides itself on economic excellence, local participation and sustainable communities”.

In order to support this vision, the purpose of the Waikato District Integrated Land Transport Strategy (WILTS) is to provide a clear and strategically planned approach to support the large investment by the New Zealand Transport Agency and the Waikato District ratepayers, on our road infrastructure by:

- providing a strategic planning and policy framework specific to road infrastructure management in the district;
- clearly identifying the problems the Waikato District Council faces in the management of its road infrastructure;
- understanding the cause of the problems and the consequences if no further action is taken to rectify the problems;
- identifying the benefits of managing the problems;
- identifying a strategic response to each problem through proper assessment; and
- aligning with our statutory requirements through national, regional, and district policies and plans.

The challenges of the operating environment for the Waikato Integrated Land Transport Strategy are:

1. A combination of challenging road and roadside environment and driver behaviours and mistakes which results in a high number of fatal and serious injury crashes;
2. The impact of planned and unplanned growth which leads to a reduced level of service on the transport network;
3. The completion of the Waikato Expressway is leading to an increase in the network size, with an increase in the associated maintenance and management costs, and also challenges to the transportation network capacity; and
4. Road closures caused by unplanned events resulting in loss of access for the movement of people and goods.

Road safety is the paramount issue for the rural road network of the Waikato District and there is a comprehensive Council safety planning exercise to match the vision of The

Ministry of Transport's Safer Journeys Strategy for 2010-2020<sup>1</sup> which aims for: "A safe road system increasingly free of death and serious injury". Waikato District has developed a risk-based prioritised list of safety improvements to fulfil their commitment to reducing fatal and serious crashes across their network.

Long term objectives sought from the safety management system are:

- Optimisation and transparency in the site prioritisation process;
- Proactive risk management for the Waikato District Council road network; and
- An ongoing process for the management of road network safety.

Waikato is experiencing fast paced growth in certain areas, most notably Pokeno. The growth is much more rapid than expected and this is causing a number of issues on the road network. Most notably there is an exceptionally high level of reactive maintenance to address in these areas as the roads are being damaged by construction traffic. There are also unplanned transportation effects, whereby previously adequate roads within and leading to the new development no longer meet the required level of service and will require upgrade immediately or in the near future.

The Waikato Expressway represents a major arterial through the district. The project, for which all sections will be complete by 2019, incorporates section of existing upgraded highway and section of completely new construction. Much of the existing state highway will be revoked to the Waikato local road network and with that responsibility will be the associated costs of maintaining those roads.

Every year the road network experiences road closures as a result of unforeseen events, such as floods or land slips. Restricted access can have a significant effect on commercial activity and, in certain locations on the network, the detour routes are unsafe and would require a much further travel time.

The WILTS recognises these challenges and demonstrates the strategic response.

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<sup>1</sup> Ministry of Transport "2020 Safer Journeys" New Zealand's Road safety Strategy 2010-2020

## District Overview

Everyday our road network performs a vital function in the growth of our district, region and nation. Our local communities and other users are growing in number, which places pressure on the level of service we can provide for road infrastructure.

The Waikato District is situated within the 'golden triangle' of Auckland, Hamilton and Tauranga and plays a significant role in transport connectivity for people and freight by road and rail. Within the 453,000 hectare district, there are 1,812km of sealed road and 608km of unsealed road. 209km of the roads are classified as urban. The district also has a variable topography, which ranges from flat low lying areas to rolling hills, where the roads present a challenging driving environment for motorists.

The road network represents diverse use, including urban centres, access to remote communities, connections to isolated settlements and is also the key transport link across the Waikato River, which divides the east and west parts of the road network. The rural road network also services a significant commercial vehicle fleet operating dairy and forestry interests.

Vehicle movement through the district is predominantly on State Highway 1 (SH1) (under development into the Waikato expressway) which forms a north to south corridor through the district.

Figure 1 provides an overview of the district boundaries and road network.

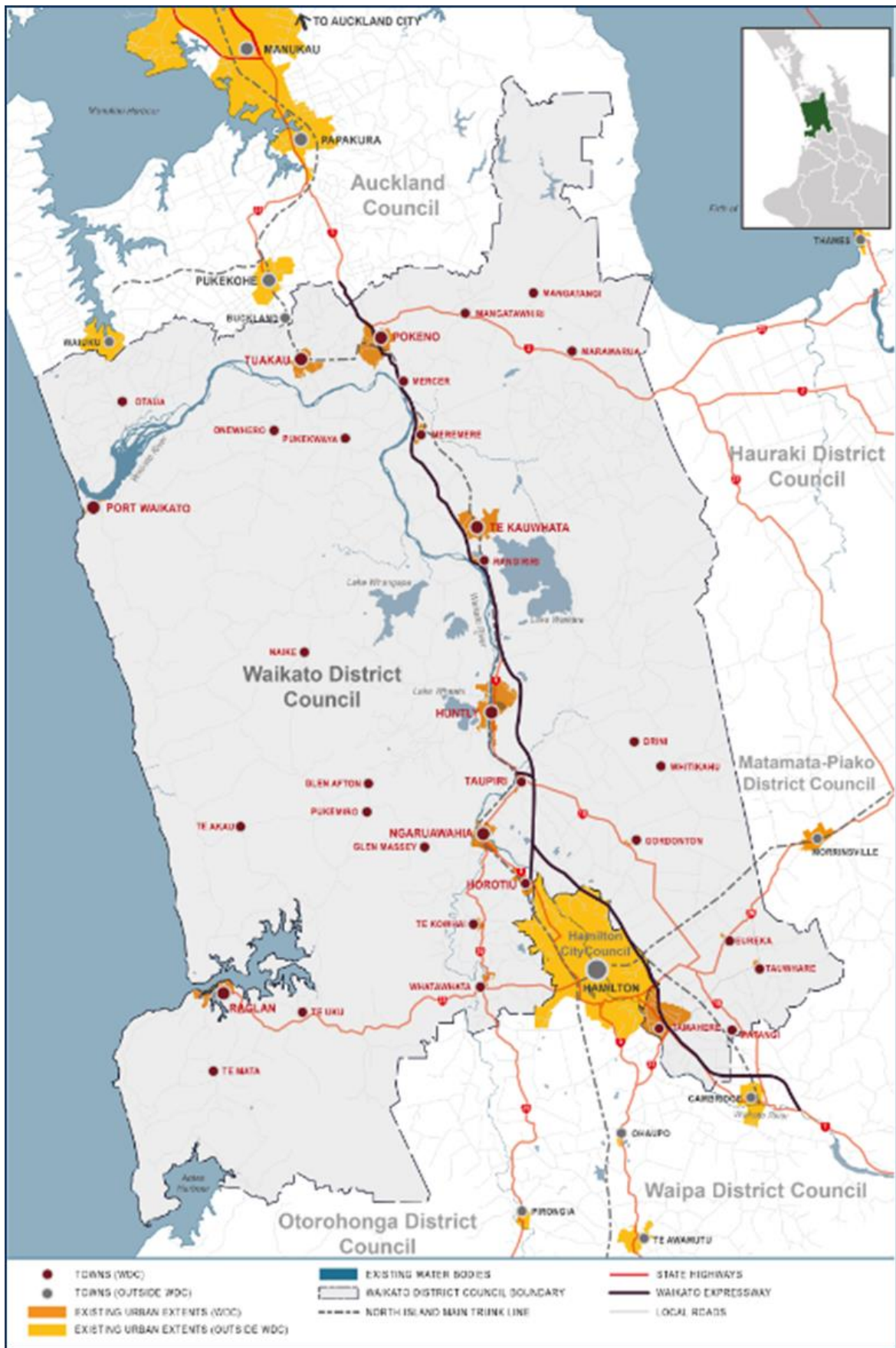


Figure 1: Waikato District Council overview map.

The NZTA One Network Road Classification (ONRC) further categorises the road network across the district. One of the key objectives of the ONRC is to inform the priorities for funding on the roading network. Priority is given to roads that have higher traffic volumes, a greater commercial vehicle presence and to roads that have critical links to transport hubs, such as ports and airports.

The Waikato District ONRC classification breakdown is shown below.

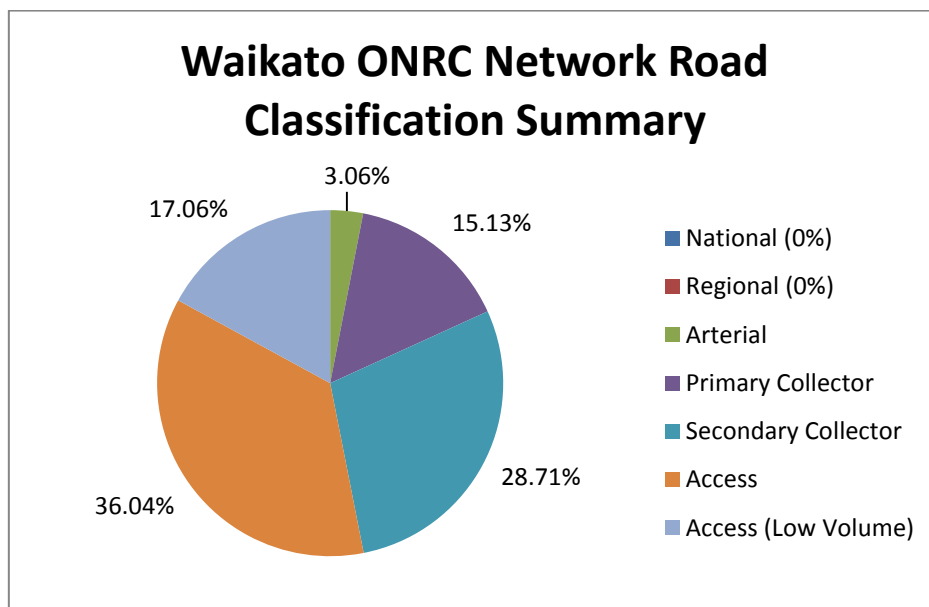


Figure 2: One Network Road Classification Summary for Waikato District

The table detailing the precise classification rules is included in Appendix A.

The classification demonstrates that there is a high percentage of low volumes roads across the district. These roads generate lower benefits when considering the transportation economics in prioritising expenditure on the road network. However, they perform a critical function to the livelihoods of people in those areas, particularly those involved in commercial industries such as dairy farming.

In terms of growth challenges, not only does the Waikato District form an important part of the northern growth corridor around Tuakau, Pokeno, Te Kauwhata, and to a lesser extent Port Waikato and Huntly, but in the south the Waikato District surrounds Hamilton City with settlements such as Eureka, Gordonton, Matangi, Te Kowhai, Whatawhata, Horsham Downs and Tamahere.

The influence of land use changes in the north and south of our district adds pressure to our road network in terms of safety, maintenance costs and transport capacity. Auckland, our northern neighbours, is New Zealand’s largest and fastest growing city. The Auckland proposal for southern growth nodes will add significantly to the volume of cross boundary traffic in the next couple of decades.



The growth of Hamilton will also affect the Waikato District road network. Some key issues regarding the Hamilton growth include:

- Hamilton is growing and its population is projected to nearly double in the next thirty years
- The proposed Ruakura inland port development will progress and have cross boundary effects on our roading infrastructure as freight moves through our district to the hub in Ruakura;
- The areas surrounding Hamilton will continue to be developed and affect the form and function of the adjacent district roads;
- There will be pressure for cross boundary rural residential development in the south and north of Hamilton which has the potential to affect local roading networks in terms of capacity and maintenance:
- There will be an effect on nearby rural towns and villages for commuter residential development.

In addition, by 2019, the Waikato will have the longest and busiest stretch of rural expressway in New Zealand. Many of the feeder roads for vehicles onto the expressway will be a part of the Waikato District local roading network.

The district contains a significant proportion of New Zealand's most important transport and energy corridors.

While being an important through route for commercial traffic, there are no major sea ports located within the district itself.

The Future Proof Strategy<sup>2</sup> which the WILTS takes into consideration identifies concentration of development in identified urban and industrial/business growth nodes that are now included in the Waikato Regional Policy Statement (November 2012). The District Council has to give effect to this growth pattern but have further refined the growth in those areas by the five key principles of:

- Identity and legibility;
- Integration and connection;
- Diversity and flexibility;
- Resilience and Sustainability; and
- Managed Growth.

There are other significant towns of Huntly, Ngaruawahia, Raglan, which have their own specific transport requirements, such as high peak demand and potential for changed land use as the Waikato Expressway is completed.

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<sup>2</sup> Future Proof is a sub-regional growth strategy developed in 2009 between Waikato and Waipa District Council, Waikato Regional Council and Hamilton City Council.

These issues will require:

- Strategic focus, tactical implementation and operational awareness of road safety;
- Assessment of impacts and management of infrastructure requirements for growth areas;
- Sound planning and decision making for capital, maintenance and operational expenditure; and
- Route resilience assessment and mitigation planning.

Key challenges facing the Waikato District:

- A high number of fatal and serious crashes on the road network;
- The impact of growth on levels of service for the transport network;
- The maintenance and management challenges associated with additional lengths of road as the Waikato Expressway sections in our district are completed and sections of state highway are revoked; and
- The impacts of unplanned events on our road network resulting in a loss of access for people and goods.

Therefore in terms of our key four challenges of safety, growth, Waikato Expressway and resilience Auckland's influence affects the Waikato Districts' transportation in the following manner:

- Auckland is the gateway for national and international people and goods;
- The city is growing much faster than the rest of New Zealand;
- There is new urban growth in the south around Drury, Karaka and Pukekohe;
- There is still uncertainty regarding the scale and rate of uptake in these new growth areas, as well as uncertainty regarding the transport infrastructure that will be provided to support them.
- Growth will spread into North Waikato –around Tuakau, Pokeno, Te Kauwhata and along State Highway 2 There will be a need for greater sharing of infrastructure and services because of the increased demand;
- Transportation of primary resources – water, food, forestry, energy, aggregate, cement lime and space for waste disposal; and
- Waikato is encouraging industry to locate within the District which will be reliant on transportation links and other associated infrastructure.

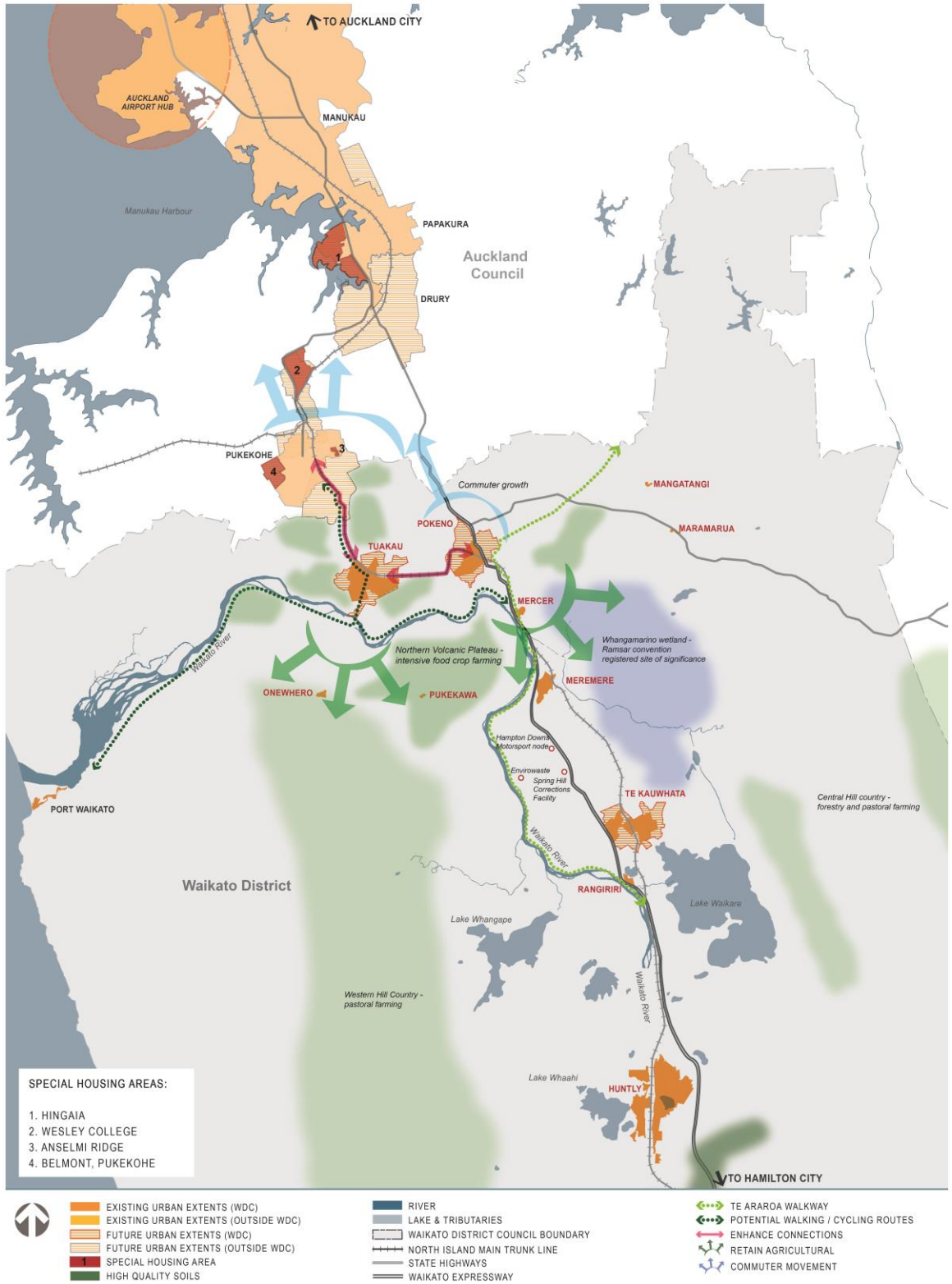


Figure 3: Map showing growth from Auckland into Waikato District

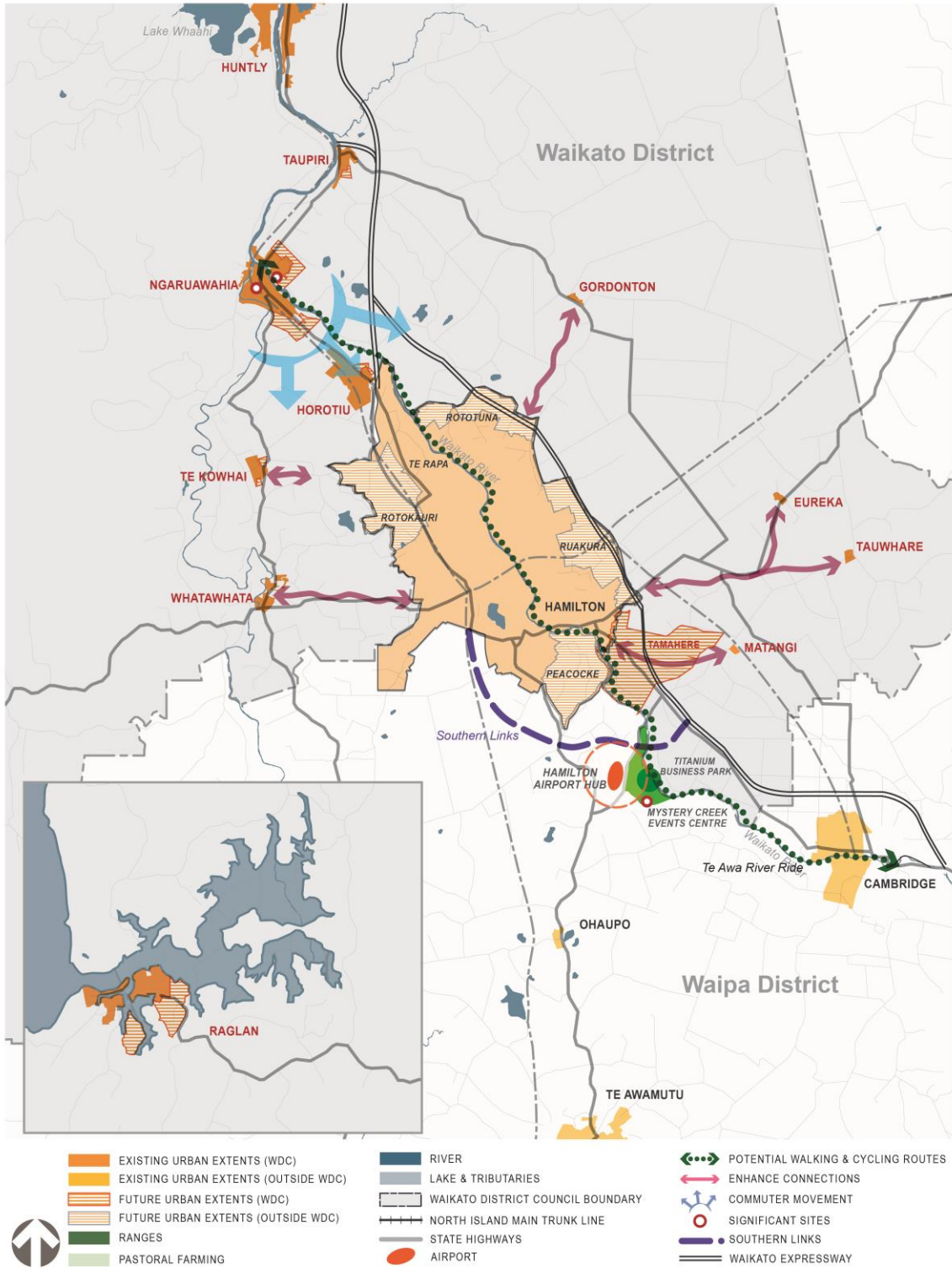


Figure 4: Map showing Hamilton and the Connections with Waikato District

The influence of the Waikato Expressway projects is through the upgrade of all the existing stretches of SH1 between Auckland and Cambridge. The expressway will increase capacity by delivering a four lane highway, as opposed to the two lanes currently on the majority of the route. The new route also avoids towns including Huntly and Ngaruawahia, in order to reduce congestion and introduce opportunities for more connected communities. It will also deliver quicker travel times between Auckland and Hamilton by at least 20 minutes, and is expected to bring significant safety improvements by attracting traffic from slower routes with lower engineering standards. The new expressway interchanges have been located and designed to ensure safe and efficient access to key areas for business and residential development.

Finally, almost 70km of previously designated state highway will be revoked to Waikato district to manage and maintain, by the time the Expressway is completed.

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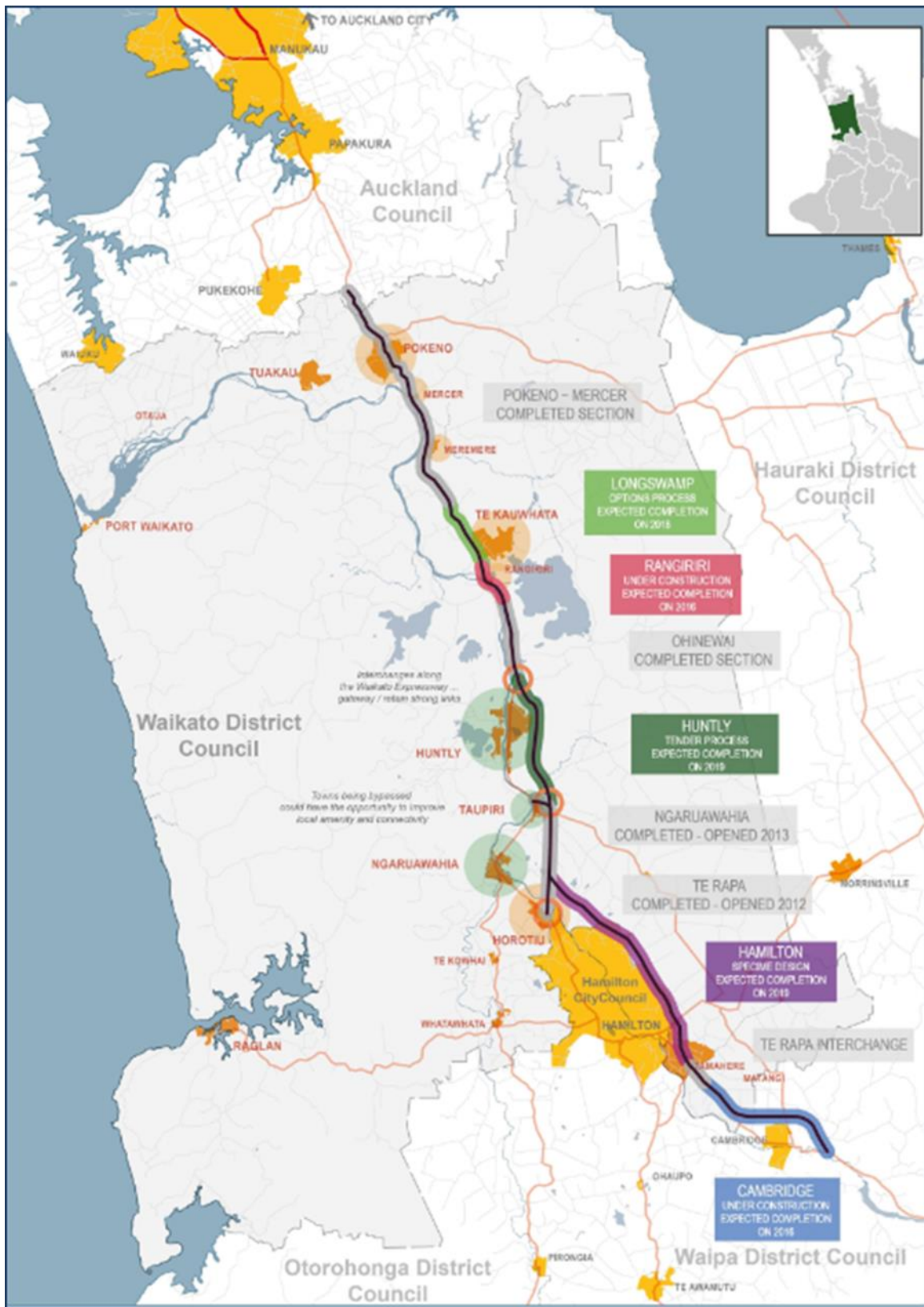


Figure 5: Map of the Waikato Expressway

All of the above information has led to the need for strategies to be pro-active and responsive including the Waikato Integrated Land Transport Strategy, to support the Waikato District vision and the requirements to give effect to the National Land Transport Plan and the Waikato Transport Plan policies and objectives.

The Waikato Integrated Land Transport strategy has been developed in order to demonstrate the strategic response to the issues faced by the Waikato transportation network.

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## Part A – The Strategic Case

### Introduction

The WILTS document supports the case for future road infrastructure maintenance and development investment by the Council and the New Zealand Transport Agency (NZTA) over the next thirty years. It is critical that every part of our road network functions efficiently and safely. This requires clear strategic priorities and direction for the operation, maintenance and development of any new road infrastructure in our district in order to maximise the large operational and capital expenditure involved. Important to the success of the WILTS is a collaborative working environment with our key partners and stakeholders, who include:

- New Zealand Transport Agency(NZTA)
- Waikato Regional Council (WRC)
- Future Proof Technical Implementation Group
- Upper North Island Strategic Alliance (UNISA)
- Heavy Transport Operators
- CCS Disability Action
- Cycle Action Waikato
- NZ Police
- Kiwirail

### Overview of Transport Network

The Waikato Road network consists of 1,812km of sealed road and 608km of unsealed road. 209km of the roads are classified as urban.

The network is predominantly rural, with urban centres spread through the district. The ONRC road classification is figure 6 below.

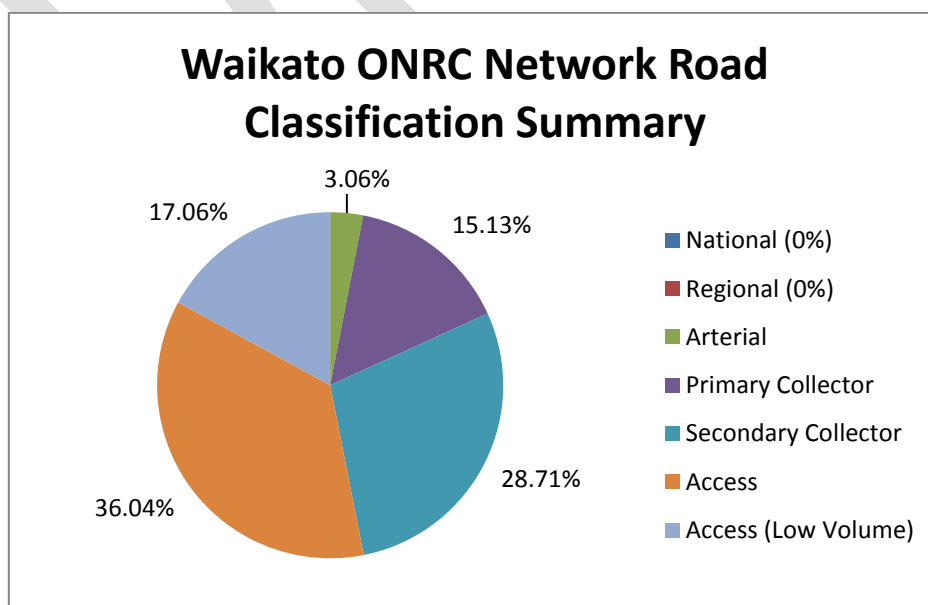




Figure 6: Waikato one network road classification

The classification captures the relatively high number of low volume access roads, that require maintenance and renewal, and hence demonstrates the challenges associated with ensuring network resilience in areas where transport benefits are more esoteric. The classification classes are described in Appendix A.

The road network represents diverse use, including urban centres, access to remote communities, connections to isolated settlements and is also the key transport link across the Waikato River, which divides the east and west parts of the road network. The rural road network also services a significant commercial vehicle fleet operating dairy and forestry interests.

Vehicle movement through the district is predominantly on SH1 (under development into the Waikato expressway) which forms a north to south corridor.

In addition, the network contains several major bridges, such as:

- The Waikato River Bridges at Horotiu, Ngaruawahia, Huntly, Rangiriri, Mercer and Tuakau,
- The Waipa River Bridge at Ngaruawahia; and
- The Wainui Bridge – Raglan.

## Public Transport

### Bus services

Passenger transport services (while usage is currently considered to be low) continue to grow in our district, especially to and from our satellite towns and villages such as Huntly, Ngaruawahia, Pokeno, Raglan, Te Kauwhata and Tuakau. These services support safe travel for school and commuter passengers and provide a valuable alternative to the use of private vehicles on the road network.

The District Council recognises potential to expand these services around some of our villages such as Matangi, Tamahere and Te Kowhai, if the demand is available. Recently the new 30 year Waikato Regional Public Transport Plan identified six focus areas of:

- Network and service provisions
- Fares and ticketing
- Branding and marketing
- Aligning services, infrastructure and land use planning
- Procurement and contract management
- Funding and investment

This work supports the principle of integrating public transport with the district's land use, economic development and working proactively with developers.

### **Train Services**

As north Waikato and South Auckland are predicted to achieve major growth in the next 30 years, there is a need to consider the transport links between the 2 areas. It is not a resilient approach to only rely on the Waikato Expressway to provide this connectivity. Other road connection and means of transport should form a part of the long term strategy. This includes consideration of:

- The improvement of bus passenger services between north Waikato townships and South Auckland;
- The improvement of strategic road corridors;
- The improvement of train services between Auckland and Hamilton;
- The upgrade of local road links to the Waikato Expressway.

### **Walking and cycling**

The District has a vision of “ being a walking and cycling District where a variety of safe, easily accessible and attractive cycling paths and walkways as part of the integrated transport network to small town centres and help make the waikato District a desirable place to visit and live in”.<sup>3</sup>

The programme is one of:

- Providing and promoting safe, pleasant and convenient walking and cycling options throughout the district;
- To continue improving pedestrian and cycle safety throughout the district;
- To provide a network of walking and cycle routes across the district;
- To provide high amenity routes linking key destinations through and around town centres and transport;
- To continue to support walking and cycling for health and leisure; and
- To increase walking and cycling promotion and education in the district.

A good example of this commitment has been the increase in new footpaths in places such as Glen Afton, Glen Massey, Ngaruawahia, Tamahere, Taupiri, Te Kauwhata and the substantial financial commitment, over three years, to the Te Awa National cycleway that runs from Karapiro to Ngaruawahia.

## **Part B - Strategic Assessment, Outlining the Need for Investment**

Facilitated workshops identified four problems and examined them against the benefits to determine:

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<sup>3</sup> Waikato District Council 'Walking and Cycling Strategy – 2009-2019' Published 30.01.08

- a. If they are valid; and
- b. Their priority ranking for future funding.

### **Defining the Problems**

The four problems identified were given percentage weightings (noted in brackets in the problem statement) which indicate their relative significance at this time. This helps to make sure we focus our resources on addressing the problems with the greatest negative impact on our district.

#### **Problem one: A combination of challenging road and roadside environment, driver behaviours and errors which results in a high number of fatal and serious injury crashes. (50%)**

Safer Journeys 2010 – 2020 is a national strategy which outlines a vision to provide a safe road system increasingly free of death and serious injury through introduction of a Safe System approach.

In the five-year period between the 2010 – 2014, the Waikato District had the second highest (169) Fatal and Serious (FSi) Injury crashes in the wider Waikato region. This accounts for approximately 11% of the total crashes on local roads (excluding State Highways) in the Waikato District.

Personal and Collective risk is used to compare different road sections and networks. Collective risk is a measure of the number of FSi crashes that have occurred per kilometer of road per year. Figure 7 below shows that the Waikato District has the 4<sup>th</sup> highest collective risk in the wider Waikato Region.

Personal Risk is a measure of the FSi crashes per 100 million vehicles travelled and therefore it takes into account the traffic volumes, as well as the length of the road. The Waikato District is indicated to have the 5<sup>th</sup> highest Personal risk.

Overall, it is considered that the both Collective and Personal risk are high due to accommodating the 2<sup>nd</sup> highest traffic volumes on the road network and being the largest District in the region covering 2500+ km of road network compared to the rest of the region.

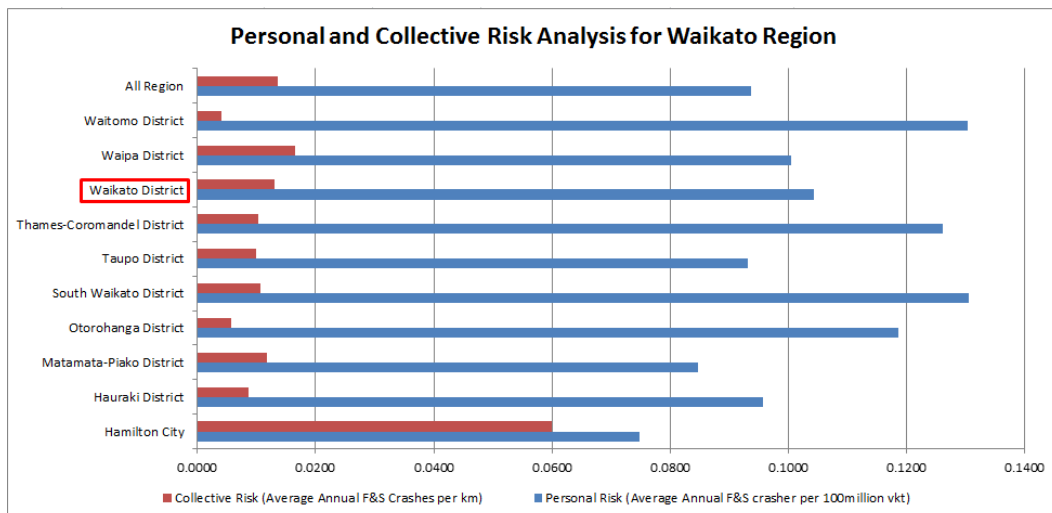


Figure 7: Personal and Collective Risk Analysis for Waikato Region.

The higher risk rural routes form just 13% of the total road network but account for 51% of FSI crashes. The primary cause of FSI crashes is loss-of-control, which predominantly occurs on bends and almost three-quarters of these crashes have struck an object, such as power poles, fences, ditches, cliff banks and trees. The key contributing factors in all FSI crashes are poor handling, alcohol, speed, and poor observation. A minority of the FSI crashes (17%) involved road factors as one of the causes.

The focus of the strategy needs to be placed on investigation and treatment of higher risk routes, intersections and black spots to reduce the frequency and severity of loss of control crashes. This includes treatments such as resealing higher risk bends to provide greater skid resistance, installing guardrails to protect road users from roadside features such as power poles, improving signage etc.

Police enforcement and driver education are also key focus areas with alcohol and speed related crashes prominent in the crash statistics.

**Problem two: The impact of planned and unplanned growth leads to a reduced level of service on the transport network. (35%)**

Problem two reflects the rapid growth in places like Pokeno where growth has taken place faster than was anticipated through the Structure Plan.

Some serious negative effects have triggered in high growth areas as a result of the unplanned growth. These problems are broadly be categorised as:

- **Less than optimal access to growth areas.** Growth areas are services by a transportation network that requires adequate links, in terms of capacity and safety. The provision of efficient transport has wide ranging economic and social benefits.

- **Inefficient financial planning.** The requirement for Council funded infrastructure to support areas of the development where development contributions do not capture funds can be very high. Without a long-term outlook of this requirements there are unforeseen spikes required in funding for capital investment, which are inevitably passed onto the district's ratepayers.
- **Damage to existing roads.** The construction traffic in and around areas of high growth damages the roads, which were not built to withstand this high level of traffic load. This necessitates early and unforeseen maintenance, which results in a higher funding requirement and a diversion of funds that would normally be allocated to other parts of the network. In severe cases of pavement deterioration road user safety can be compromised;

While it is acknowledged that growth areas bring positive benefits to the district over the long term; the need to coordinated and planned infrastructure roll out during construction periods is essential to reduce the negative impacts.

The road network in the high growth areas (Pokeno in particular) has experienced severe degradation, as a result of the construction activities. This has caused the need for expensive reactive maintenance to occur. Long-term solutions also require that funds that would normally be allocated to the whole of the maintenance of the Waikato District road network, are diverted to these areas. This inevitably results in the need for higher levels of funding in order to maintain the level of service of the road network.

Therefore, this has required greater emphasis on the requirement for forward coordinated planning of land use, infrastructure provision and infrastructure investment.

Failing to respond in a planned and coordinated way to growth will mean increasing traffic levels on the existing road network, leading to a reduction in the levels of service around growth areas. In places like the North Waikato or around the Hamilton periphery, there is also a high risk that this will impact on levels of service on regionally significant infrastructure, including the Waikato Expressway. Similar risks exist regarding public transport networks and services, including road and rail.

### **Problem three: The completion of the Waikato Expressway leads to increased lengths of road in the Waikato District resulting in higher management and maintenance costs. (10%)**

As sections of the Waikato Expressway are completed, Waikato District will inherit sections of state highway under the revocation process and sections of new road constructed to service the expressway. The costs of maintaining these additional sections of road will add to the financial pressures of maintaining the districts' road network.

Over the next 4 years, Waikato District Council will receive approximately an additional 70km of road to manage. This level of growth for a road network is not generally catered

for. Waikato District Council receives a 52% subsidy from NZTA for the maintenance of its road network, with the remaining funds received from rates funding.

These roads will require additional funding for routine annual maintenance and also for renewal when the pavements deteriorate to an unacceptable level of service over time.

Problem three relates to the changing environment as a result of the construction of the Waikato Expressway. Waikato district will have an increased length of network to maintain; this will result in increased maintenance costs for the Waikato District over time.

#### **Problem four: Road closures caused by natural or unplanned events results in loss of access and delays for the movement of people and goods. (5%)**

Problem four reminds everyone that we experience extreme weather events or other unforeseen events can cause loss of access on road routes. There is a need to understand our critical routes and manage the risk associated with loss of access.<sup>4</sup>

### **The Benefits of Investment**

- **Benefit one: Improved safety (50%)**
- **Benefit two: Maintain/improve accessibility to areas of growth and reduce negative impacts of unplanned growth (35%)**
- **Benefit three: Provides network resilience and an alternative route; and supports existing nodes of growth and major urban areas (10%)**
- **Benefit four: Improve/maintain availability of road network (5%)**

#### **Benefit one: (50%)**

Improved safety would reduce the risk of Fatal and Serious injuries on our network. As a result this will:

- Improve the overall health and wellbeing of the Waikato road users;
- Reduce the social costs of road trauma
- Reduce the personal and economic cost to individuals and New Zealand society associated with the high number of fatalities and serious injuries that occur in the district.

Two investment benefits have been identified for safety: a reduction of deaths and serious injuries on our road network, and a reduction in the levels of collective and personal risk

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<sup>4</sup> See Appendix ? for the ILM maps

that road users are exposed to. Measures for these benefits have been identified at a strategic level, including:

- Deaths & serious injuries, by mode
- Crashes with death or serious injury, by type
- Personal & collective risk rates

For development of programmes and individual activities, more specific measures may be used.

The strategic actions to achieve this benefit are described in Part C.

### **Benefit two: (35%)**

Improving the planned response to the effects of growth areas on the road network will result in reduced negative impacts as a result of:

- An inefficient transport network to service the growth nodes;
- The higher costs associated with reactive maintenance;
- Less efficient financial planning;
- The potential for road safety to be compromised;
- Increased maintenance costs for the whole Waikato Network;
- Increased costs to ratepayers and other funding agencies;
- Reduced levels of service on the road network.

Improving and providing accessibility to areas of growth will give members of those communities' reliable and efficient infrastructure services that are able to cope well with increased traffic volumes as a result of growth, increased economic and tourism activities.

Addressing the impacts of growth on transport networks is expected to achieve the following investment benefits:

- Increased reliability
- Increased throughput
- Increased availability and access.

Our aim is to retain customer levels of service at a level consistent with road classification and function, and to do so as growth occurs and road functions change over time.

### **Benefit three: (10%)**

Is interconnected to Benefit one and two and supports the Council's growth objectives.

### **Benefit four: (5%)**

Improve/maintain availability of the road network allows disruption to users travel expectations to be minimised during an extreme weather, slip or accident event resulting in road closures.

## Status of the Evidence Base

### Problem one – Road Safety

In 2014, Waikato District Council commissioned a safety study of the rural roading network. The study highlighted. A statistical analysis of the fatal and serious crash data for the Waikato roading network has highlighted the areas of focus for future mitigation.

Some of the key outputs of the study include the following:

- 88% of all fatal and serious crashes (FSi) occur in the rural environment;
- 90% of FSi occur in mid-block sections i.e. between intersections;
- Vehicles running off on bends are by far the greatest type of accident;
- The primary contributing factors to FSi crashes are:
  - Poor handling;
  - Too fast;
  - Alcohol.
- Head on FSi crashes across the district are lower (14%) than the national average (21%), which is an indication of the lower traffic volume type network.

A particularly noticeable fact is that 51% of the FSi crashes in the Waikato District occur on just 13% of the road network. This provides a target for the implementation of mitigation measures.

The study analysed data associated with *Collective Risk* and *Personal Risk*. Collective risk routes are typically routes with high traffic volumes, where risk is increased because of the interaction with other vehicles. Personal risk routes are often roads with lower traffic volumes, but where the driving environment is challenging because of the geometric alignment or roadside hazards, for instance.

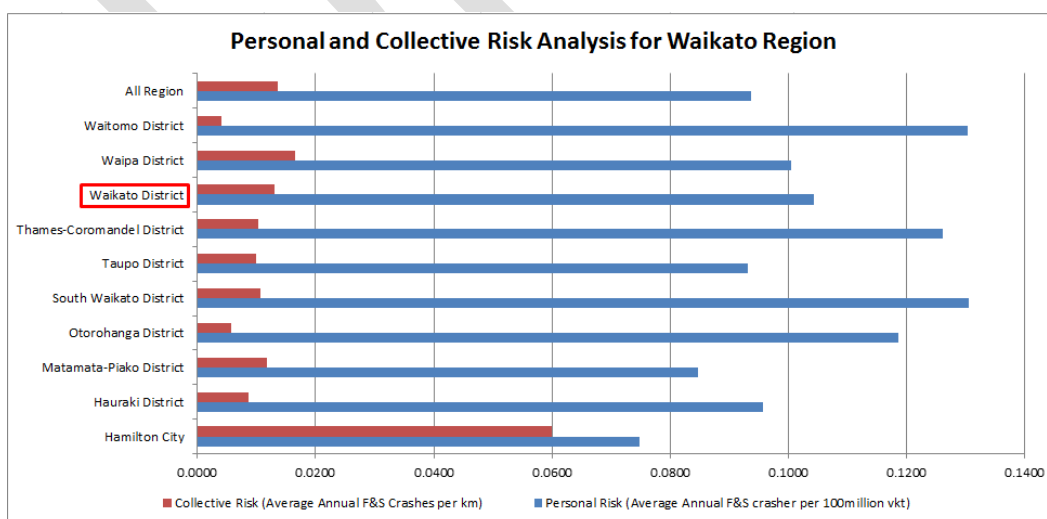


Figure 8: Personal and Collective Risk Analysis for Waikato Region.



Overall, it is considered that the both Collective and Personal risk are high due to accommodating the 2nd highest traffic volumes on the road network and being the largest District in the region covering 2,400+ km of road network compared to the rest of the region.

The high risk routes are shown in the diagram below. The diagram shows the roads with the highest combined collective and personal risk.

Overall, there has been a downward trend in the overall number of injury crashes on the network in the past five years. However, the FSi crashes have remained consistent, thereby becoming a statistically greater proportion of the total injury crashes year on year.

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Figure 9: Waikato District council risk rating bands (2014).

## Problem two - Growth Planning

The Waikato District is a mix of urban, rural and coastal settlements with 66,000 residents (2015). There has been an increase of 5,796 people, or 10.1 percent, from 2006 - 2013 (Census 2013).

The population is expected to continue to increase in:

- North Waikato (Tuakau, Pokeno and Te Kauwhata) due to the proximity to Auckland, changes to Auckland Unitary Plan to facilitate housing stock increases and intensification, completion of the Waikato Expressway, and other proposed development; and
- Hamilton City fringe-settlements due to the high demand for properties and increased subdivision in the country living and rural zoned areas within 20km of Hamilton

Residential Growth Figure 10 shows the population projections for the Waikato District over the next 30 year period. The growth rate between 2015 and 2045 is expected to be higher than previous rates.

In Figure 10 the black line marks Councils Planned growth as per the LTP. This is significantly lower than NIDEA in Pokeno and Higher than NIDEA in Tuakau. This is due to a completed Structure Plan in Tuakau and the upcoming release of additional land and then capacity issues in Pokeno by 2031. Council will have the opportunity to look at these figures and revised them during the review of Future Proof.

The Waikato District population is projected to be 100,000 around 2040. The highest growth is currently being experienced and is predicted to continue in the urban areas of Tuakau and Pokeno.

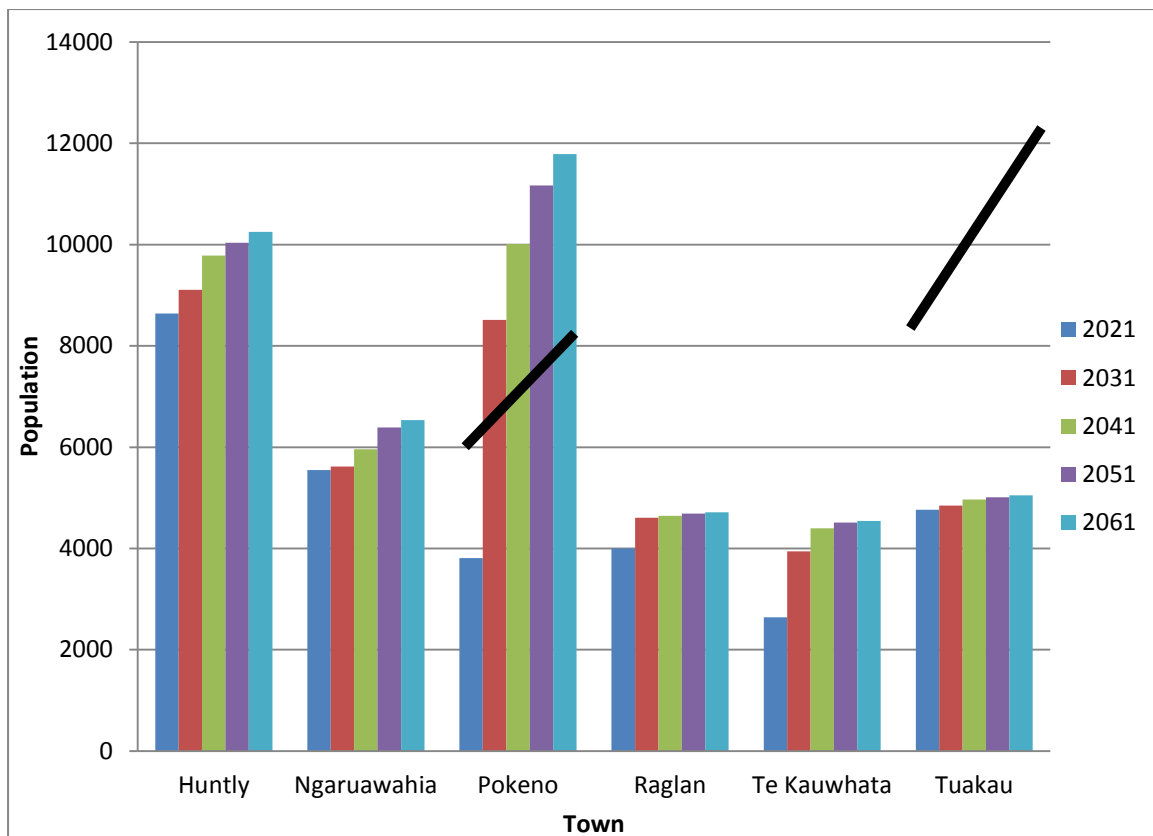


Figure 10: Waikato District Population Projection Larger Towns<sup>5</sup>.

Migration trends in the last five year are at record levels both nationally and across the Waikato. The consequence of this is population and household estimates are projected to reach both higher numbers and at earlier time frames then previously calculated.

The overall population growth for the Waikato District is sourced from Waikato University NIDEA 2015 population Projections. These are based on the cohort-component method of projecting population change. The population projections utilised at the Area Unit are sourced from NIDEA and Waikato Regional Council Land Use Change modelling (WISE). In this model the population distribution of calculated based on the land use changes. These two models have been adopted and utilised cross the Waikato Region and specifically the Future Proof area.

Local effects are difficult to account for in wide scale models. Once an area, such as Pokeno changes outside its past trend it becomes particularly difficult to project either a population size or it's time scale. Once an area develops a growth momentum, its growth trajectory can be significantly altered. In Waikato Districts Long Term Plan Projection, Pokeno is expected to develop at 72 households per annum. Following two years of sustained growth the lead developer Pokeno Land Company (PLC) has revised their growth and infrastructure to an average of 138 households per annum (NOTE; PLC excludes other

<sup>5</sup> Source NIDEA, 2015

development occurring outside their land holdings). 121 and 190 building consents were issued in 2014 and 2015 respectively.

YEAR	NIDEA 2015	RESIDENTIAL	BUILDING CONSENTS
2013	92	96	65
2014	94	125	121
2015	93	167	190
2016	94	271	
2017	94	268	
2018	93	242	
2019	94	234	
2020	93	188	
2021	94	134	
2022	191	130	
2023	191	90	
2024	190	65	
2025	191	60	
2026	191	42	
2027	191	35	
2028	191	30	
<b>TOTAL</b>	<b>2,177</b>	<b>2,177</b>	<b>376</b>

Figure 11: Shows the difference in timing between the Land Developers infrastructure plan and the NIDEA 2015 Household Projection for Pokeno.

For the villages and rural communities the highest growth areas are expected to be Gordonton, Matangi, Tamahere Country Living (CLZ), Te Kowhai, Whatawhata<sup>6</sup>.

Despite being a predominantly rural area the Waikato District has industrial zoned areas in Horotiu (150ha), Pokeno (92ha), Tuakau (116ha), and local serving industrial zones in Huntly (area yet to be determined) and Te Kauwhata.

### Problem three: Road Maintenance Costs

The Waikato Expressway will provide 102km of continuous divided four-lane highway and reduce the length of State Highway 1 by 6km. It will provide a further 12km of new or upgraded links and a new bridge over the Waikato River north of Hamilton.

Figure 12 shows the stages, route and expected completion dates.<sup>7</sup>

<sup>6</sup> Page 7, Waikato Infrastructure Strategy (2015 – 2025).

<sup>7</sup> Source <http://www.nzta.govt.nz/projects/waikato-expressway/publications.html>



Figure 12: Map of the Waikato Expressway by sections<sup>8</sup>.

The Expressway will improve economic growth and productivity for Auckland, Waikato, and the Bay of Plenty through more efficient movement of people and freight. Increased capacity will make the route safer and will move through traffic away from smaller communities, like Huntly and Ngaruawahia.

<sup>8</sup> Source <http://www.nzta.govt.nz/projects/waikato-expressway/publications.html>

The objectives for the Waikato Expressway, that are supported by Waikato District Council, are:

- To enhance inter regional and national economic growth and productivity;
- Improve journey time reliability and relieve congestion through the main urban centres along SH1;
- Improve safety and reduce crashes on regional arterials including SH1;
- Focus freight movement onto SH1 rather than upgrading alternative routes; and
- To provide improved local network operation and opportunities for improved urban design, travel choice and community connectivity within the major urban areas bypassed by the expressway.

This will reduce congestion in those townships and provide journey time savings to through traffic of up to 35 minutes between Auckland and Tirau.

As a result of the Waikato Expressway once complete Council will have an additional 70 km of road network to maintain and upgrade. This results in an increase of maintenance costs of approximately \$1m per year. There could also be an increase in demand of access onto the former SH1 roads as development occurs. This has already occurred in Ngaruawahia and Horotui as Great South Road (former SH1) is experiencing significant levels of both residential and commercial development.

#### **Problem four: Resilience, Road closures due to natural or unplanned events**

A range of events and emergency situations including floods and slips, road crashes, earthquakes, and tsunamis can impact on the transport network.

The Waikato is a relatively benign region in terms of the impact of natural events, however with nationally significant road and rail corridors running through the heart of the district there are a number of risks that need planning and close consideration.

From a network resilience perspective, the following risks have been identified for the Waikato District<sup>9</sup>:

- Extreme Natural Hazards – Earthquake, tsunami and volcanic
- Natural Hazards – Landslips and major storm events
- Hazardous Environments (toxic substances)
- Bridge and culvert failure

#### *Natural hazards*

There are no volcanoes within the district although fallout from those in the Taupo Volcanic Zone may impact on the District's transportation network with ash falls and earthquakes.

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<sup>9</sup> Waikato District Council Asset Management Plan, 2014

The fault lines bordering the North and East of the district along the Bombay Hills and Hauraki Plains are considered active; whilst historically the Waikato has been considered relatively stable.

There are large areas around the east and north of the district that would be prone to ground liquefaction in the event of a major event. These tend to coincide with rivers and estuaries where there are deep silt deposits.

Areas of steep terrain along the western and central hill country will be at risk of slips and landslides during an event.

Off shore earthquakes are not uncommon and there is a risk of inundation in coastal areas and along estuaries in the event of a major tsunami.

Large tropical storms, cyclones and “weather bombs” deposit high intensity rainfall, sometimes up to hundreds of millimetres within a short period of time. This causes localised flooding, particularly in low lying areas and around rivers.

Coastal flooding is a risk with storm surge from major storms or from tide locked river mouths.

Land slips can occur when steep slopes become waterlogged and fail. Similarly, rivers and streams when in flood can cause rapid erosion of banks and structural foundations such as bridge abutments.

#### *Unplanned Events*

A major derailment on the North Island Main Trunk (NIMT) or East Coast Main Trunk (ECMT) railways would close this essential network for some time requiring the transport of freight on the road network. This could equate to around 100 extra trucks per train cancellation.

In areas where the main road corridor runs parallel to the rail track a derailment could also impact on the road.

A serious, multiple vehicles or hazardous road crash could close a major arterial for a considerable period of time, particularly if essential infrastructure, such as a bridge, was affected.

#### *Route Security*

An assessment of risks associated with the principal infrastructure and corridors within the district indicates that there are no extreme risks to infrastructure within the region except for:

- State Highway 1 bridges over the Waikato River managed by the NZTA



- Rotowaro Branch Railway Bridge over the Waikato River at Huntly managed by KiwiRail.

Incident management and monitoring are considered an effective level of mitigation within the Asset Management Plan<sup>10</sup>.

Emergency response and disaster management is co-ordinated through the Civil Defence Emergency Management Group (CDEMG).

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<sup>10</sup> Waikato District Council Asset Management Plan 2014

## Part C - Strategic Context

This chapter integrates the strategies and goals of the key legislative and stakeholder organisations to the four identified problems and benefits. Figure 13 illustrates the key national and regional policy drivers that direct and inform the WILTS.

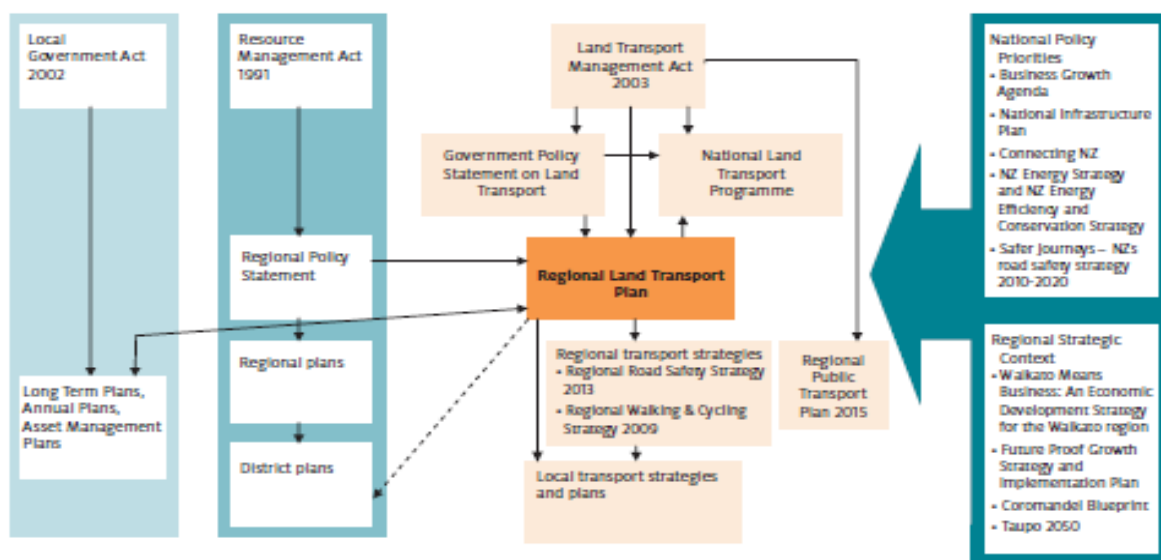


Figure 13: National and regional policy drivers

Figure 13: Key National and Regional Drivers.

### Assessing the problems and benefits in a National Context

In setting the context for the Waikato District Integrated land Transport Strategy it is important to understand the national and regional context that sets the framework for the strategy. The purpose of the Land Transport Management Act 2003 (the Act) is:

“To contribute to an effective, efficient, and safe land transport system in the public interest” with key focus areas on:

- economic growth;
- value for money; and
- road safety

To follow from that is the Government Policy Statement on Land Transport 2015/16-2024/25<sup>11</sup> (GPS) which has as its purpose a land transport system that is:

- **Effective**, where it moves people and freight where they need to go in a timely manner

<sup>11</sup> Government Policy Statement on Land Transport 2015/16 – 2024/25, 24 June 2014 New Zealand Government

- **Efficient**, where it delivers the right infrastructure and services to the right level at the best cost
- **Safe**, where it reduces the harms from land transport
- **In the public interest**, where it supports economic, social, cultural and environmental wellbeing.

In addition to the Act and the GPS, central government have published New Zealand's Road Safety Strategy<sup>12</sup> (Safer Journeys) and the State Highway Asset Management Plan 2012-2015<sup>13</sup> (SHAMP).

The vision for Safer Journeys is:

*“A safe road system increasingly free of death and serious injury”.*<sup>14</sup>

This vision is supported by a 'Safe System' approach to road safety which has identified the first actions as:

- Increasing the safety of young drivers;
- Reducing alcohol/drug impaired driving;
- Safe roads and road sides; and
- Increasing the safety of motorcycling.

It is acknowledged by the Safer Journeys strategy that all road crashes are not preventable but the number of fatalities and serious injuries can be decreased through:

- safe roads and roadsides;
- safe speeds;
- safe vehicles; and
- safe road use.

Further the two priority areas relate to high risk rural roads and high risk intersections. Accidents in these two areas have significant personal and economic costs.

All of these documents assist in guiding the four identified problems and benefits in the Waikato District Integrated Land Transport Strategy and provide a local focus for identification and treatment of high risk crashes and locations on the WDC road network.

#### 4.2 Assessing the problems and benefits in a Regional Context

The Waikato Regional Land Transport Plan 2015-2025 and the Regional Public Transport Plan 2015-2025 having recently been reviewed and submissions closed on 15 December 2014 and the hearings are scheduled for February 2015.

<sup>12</sup> Ministry of Transport “2020 Safer Journeys” New Zealand’s Road Safety Strategy 2010-2020

<sup>13</sup> NZ Transport Agency, the State Highway Asset Management Plan 2012-2015, October 2011

<sup>14</sup> Ministry of Transport “2020 Safer Journeys” New Zealand’s Road Safety Strategy 2010 - 2020

The plans build upon the strategic approach adopted in previous strategies whereby the focus is:

- strategic corridors and wider network connectivity improvements;
- road safety; and
- managing demand and transport choices.

The objectives include:

- integration and forward planning;
- facilitating economic development;
- road safety;
- affordability; and
- access and mobility; and environmental sustainability and resilience.

As an operational delivery mechanism to the Waikato Regional Land Transport Plan 2015-2025 and the Regional Public Transport Plan 2015-2025 goal for public transport is:

*“A growing and affordable public transport system that contributes to the economic and social vitality of the region.”<sup>15</sup>*

As transportation demand changes, particularly in growth areas, public transport presents an opportunity to fulfil the needs of those communities. Increasingly there is an expectation from central and local government that there are improved outcomes from investment in the transport network and public transport

In the case of WDC public transport provides a valuable connection between its satellite services and Hamilton.

Assessing the problems and benefits in a Waikato District Context

Following on from the key legislative and stakeholder policies and strategies, WDC has its own Long Term Plan (LTP) the community outcomes state;

- To ensure that the district is easy and safe to get around and alternative transport options are available
- To ensure that transport infrastructure is planned at a rate to consider growth and demand in a cost effective manner.
- To ensure that the network is well maintained and negative environmental effects are mitigated.

The implementation for the LTP is through the Activity Management Plan<sup>16</sup> to provide a level of service where:

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<sup>15</sup> Regional Public Transport Plan 2015-2025

<sup>16</sup> Waikato Council Infrastructure Strategy 2015 - 2025

- the district is safe and easy to get around and opportunities for the use of public transport are provided;
- transport infrastructure is developed at a rate to keep pace with growth and, demand and opportunities; and
- the road network is well maintained and helps protect the environment.<sup>17</sup>

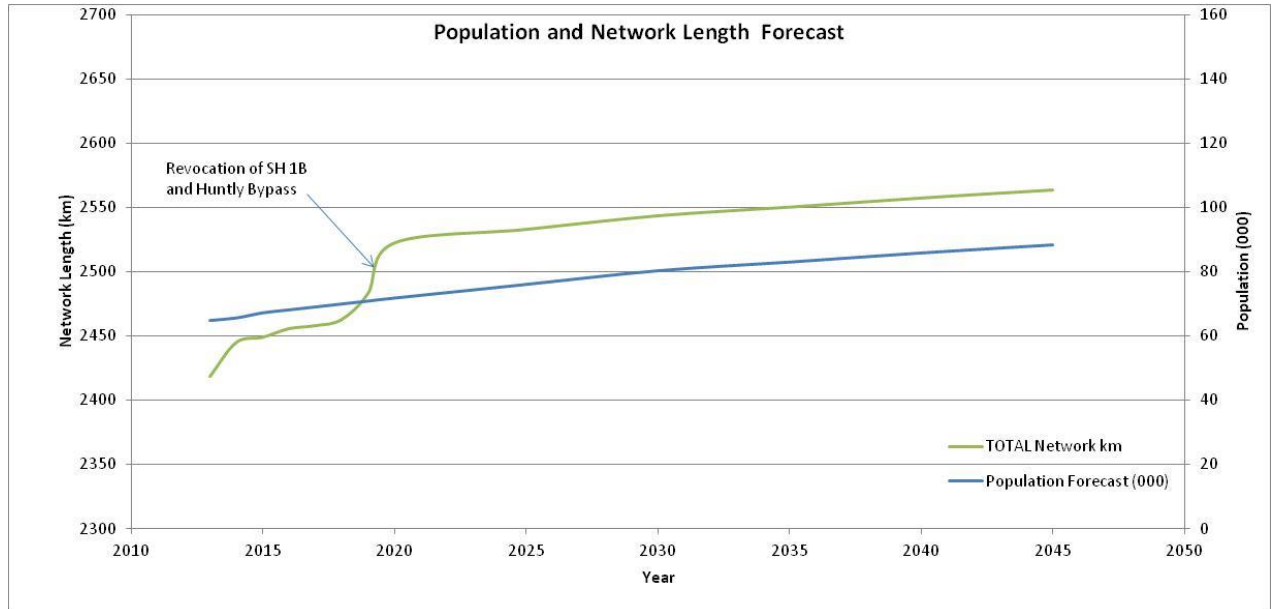


Figure 14 shows the forecasted network growth - 2015-2045<sup>18</sup>

The WDC have adopted a corporate level risk management framework using the AS/NZS 4360: Risk Management as a basis. Key risks that have been identified for transport and that are being actively managed are:

- Crashes with road factors as contributory cause
- Structural failures due to inadequate maintenance or natural hazard;
- Asset damage by third parties;
- Decrease in funding from NZ Transport Agency;
- Loss of services due to system failure; and
- Lack of internal skilled resources.

Future Proof and the District Plan both encourage compact residential areas. This will constrain the length of new roads required to service residential growth areas. The walking and cycling strategy will increase the number of short trips by active modes, but the demographic shift to an aging population will counteract that somewhat. The newly introduced 50MAX and HPMV heavy vehicle categories will help to restrict the numbers of

<sup>17</sup> Page 2 and 3, Executive Summary – Transport AMP Version September 2014

<sup>18</sup> Page 6, Executive Summary - Transport AMP Version September 2014

trucks using the roads and the rail turnaround plan will encourage modal shift for freight. Capacity to cope with volumes of traffic may become an issue in urban areas and will be responded to by upgrading intersections. Volume capacity is very unlikely to be a problem on the rural network.

Finally, growth in the residential areas will require new roads, most of which will be provided by developers but Council will have to construct or contribute towards collector and arterial roads. The timing of this expenditure will depend on actual development programme. A programme of minor improvement works of about \$3m per year is forecast to continue. These works will include improvements at renewal sites and district wide safety improvements.

An additional amount of \$25 million has been allowed for in 2041-2045 to strengthen or replace the Tuakau Bridge.

## Strategic Response

**Problem one: A combination of challenging road and roadside environment, driver behaviours and errors which results in a high number of fatal and serious injury crashes. (50%)**

The Waikato District Council recognises safety as it's number one priority on the road network. The response to this issue involves planning, road engineering and driver education. This captures the issues associated with the road environment and driver behaviour.

Council has undertaken a significant planning exercise in order to prioritise safety expenditure on its road network. As part of that planning, we have identified the routes with the highest risk of serious crashes and adopted a also method of assessing and prioritising intersections for risk.

As a result of that work, Council has developed programmes of safety improvements to the high risk routes and, beginning in 2015, has started implementing those improvements on an annual basis.

Council has increased its driver education programme budget and is intensifying its efforts in young driver training and in driver awareness around key issues, such as fatigue. Council regularly attends public events to and has an ongoing school education programme to reach young drivers with it's safer driving message.

Safety in design is a routine part of our road design philosophy. New roads undergo a series of safety audits and rehabilitated roads take into consideration safety improvements on existing roads.

Council holds a substantial and accurate database of its road assets that makes significant contributions to the safe management of the road network. Planning and delivering the renewal and upgrade of safety related infrastructure depends on this information. Council is implementing a higher standard of data collection that will allow a better accuracy in forward planning and will also provide improved information on road defects which affect safety.

District Plan Review. Council currently operates under 2 set of design standards, as a result of the amalgamation of the ex-Franklin and Waikato districts. The ongoing District Plan Review process presents an opportunity to integrate the most appropriate sections of the codes and also to review the specifics of the design and development guideline standards to bring them in line with best practice. The District Plan review also presents an opportunity to stipulate planning requirements for safety strategy.

**Problem two: The impact of planned and unplanned growth leads to a reduced level of service on the transport network. (35%)**

Council have identified the areas where there are gains to be made in the management of the high growth areas. The principal issues are high levels of reactive maintenance, as a result of high levels of construction traffic and the risk of road corridors that are unsuitable for a sudden substantial increase in traffic volumes.

The structure planning process presents an opportunity for consideration of future infrastructure requirements to meet new development aspirations. The required infrastructure is stipulated in the LTP.

Council is working on the production of a planning tool to assist in the management of road maintenance issues associated with the high growth areas. The proposal is to coordinate projects between the various infrastructure

Council has also increased its internal resources in order to manage the accelerated growth in the district. This ensures that there is a robust assessment of applications, including engineering standards, and monitoring of ongoing works. While council will promote growth in the district it is also required to protect the interests of the districts residents as a whole. Negotiations with major developers are therefore done with the support of all the relevant branches of Council.

**Problem three: The completion of the Waikato Expressway leads to increased lengths of road in the Waikato District resulting in higher management and maintenance costs. (10%)**

When sections of the ex-state highway are assigned to Council's roading network, there is a revocation process that considers the new form and function of the road and also ensures that the road is delivered in good physical condition. This reduces the need for any substantial early maintenance and the associated cost. In addition, the road is in a form that will serve its new function in the road network. It will have reduced traffic and new consideration around the use of the road for local access (previously not possible) for possible residential and commercial development is considered.

Maintenance funding for additional sections of road are included in the Long Term Planning process as part of the growth to the district. This often necessitates a corresponding increase in cost to the rate payer, however by ensuring that the future network funding requirements are catered for early, there is a reduced financial impact.

**Problem four: Road closures caused by natural or unplanned events results in loss of access and delays for the movement of people and goods. (5%)**

Council have an in-house emergency response unit that is continuously trained for major unplanned events that have significant impacts on the community, particularly the threat to life and property. The unit has good resources for undertaking emergency planning works and regularly coordinates with internal and external contractors and emergency works services to foster a close working relationship.

Council have a procedure in place to deal with the loss of road access as a result of an unplanned event, such as a flood or land slip. The effect of the event and the proposal for re-instatement of access is considered based on effect and associated cost. There is often a compromise in this regard as certain events, such as major land slips, have very high costs for repair.

Council has an emergency works budget that is reviewed every 3 years during LTP planning.



# One network road classification - functional classification

ROAD & STREET CATEGORIES/CRITERIA	FUNCTIONAL CRITERIA AND THRESHOLDS									
	MOVEMENT OF PEOPLE & GOODS					ECONOMIC AND SOCIAL				
	LINK		PLACE			LINK		PLACE		
	TYPICAL DAILY TRAFFIC (AADT) <sup>1</sup>	HEAVY COMMERCIAL VEHICLES <sup>2</sup> (daily flows)	BUSES (urban peak) <sup>3</sup>	ACTIVE MODES <sup>4</sup>	LINKING PLACES	CONNECTIVITY	FREIGHT - INLAND PORTS/PORTS (per annum)	AIRPORT PASSENGER NUMBERS (per annum) <sup>5</sup>	TOURISM <sup>6</sup>	HOSPITALS
<b>NATIONAL</b> Meet 3 criteria (incl. at least 1 of Typical Daily Traffic, HCV or Buses & 1 economic or social)	U <sup>7</sup> : > 25,000 R: > 15,000	>800	> 40 buses or 2000 people per hour		>100,000 population <sup>8</sup>		>2 million tonnes (or >\$3 billion) <sup>9</sup>	>3 million <sup>10</sup>		
<b>(HIGH VOLUME)</b> Meet at least 1 high volume (Typical Daily Traffic or HCV)	U: > 35,000 R: > 20,000	>1200								
<b>REGIONAL</b> Meet 2 criteria (incl. at least 1 of Typical Daily Traffic, HCV or Buses & 1 economic or social)	U: > 15,000 R: > 10,000	>400	> 40 buses or 2000 people per hour		>30,000 population <sup>8</sup>	Linking remote regions (regional councils) or sole connectivity in urban areas	>1 million tonnes <sup>9</sup>	>500,000 <sup>10</sup>	Top 5 tourist destinations	Access to tertiary hospitals
<b>ARTERIAL</b> Meet 2 criteria (incl. at least 1 of Typical Daily Traffic, HCV or Buses)	U: > 5,000 R: > 3,000	>300	> 15 buses or 750 people per hour		>10,000 population <sup>8</sup>	Critical Connectivity (no alternative routes)		>250,000 <sup>10</sup>		Access to regional hospitals
<b>PRIMARY COLLECTOR</b> Meet 1 criteria (incl. at least 1 of Typical Daily Traffic, HCV or Buses)	U: > 3,000 R: > 1,000	>150	> 6 buses or 300 people per hour	Significant numbers of pedestrians and cyclists (urban peak) or part of identified cycling or walking network	>2,000 population				Regionally or locally significant tourist destinations or significant scenic routes	
<b>SECONDARY COLLECTOR</b> Meet 1 criteria (incl. at least 1 of Typical Daily Traffic or HCV)	U: > 1,000 R: > 200	>25			>250 population		< 1 million tonnes	<250,000		
<b>ACCESS</b> All other roads	U: < 1,000 R: < 200				<250 population					
<b>(LOW VOLUME)</b> Meet low volume Typical Daily Traffic	U: < 200 R: < 50	<25								

**Functional Classification**

There are criteria and thresholds for each category, based on the functions the road performs within the network. To be included in a particular category a road must meet the agreed criteria and thresholds, including at least one of either - typical daily traffic (AADT), heavy commercial vehicles (HCV), or bus (urban peak) as appropriate.

**The six functional categories are:**

- National:** These are roads that make the largest contribution to the social and economic wellbeing of New Zealand by connecting major population centres, major ports or international airports and have high volumes of heavy commercial vehicles or general traffic. They must meet the thresholds for 3 criteria, including at least one of the following movement criteria (Typical Daily Traffic, Heavy Commercial Vehicles or Buses, Urban Peak) and at least one of the economic and social criteria (i.e. 3 in total). To be included in the high volume subset a road must meet one of the high volume criteria for typical daily traffic or HCVs.
- Regional:** These roads make a major contribution to the social and economic wellbeing of a region and connect to regionally significant places, industries, ports or airports. They are also major connectors between regions and in urban areas may have substantial passenger transport movements. As well as meeting at least one of the following movement criteria (Typical Daily Traffic, Heavy Commercial Vehicles

or Buses, Urban Peak) these roads need to meet at least one of the economic and social criteria (i.e. 2 in total).

- Arterial:** These roads make a significant contribution to social and economic wellbeing, link regionally significant places, industries, ports or airports and may be the only route available to some places within the region (i.e. they may perform a significant lifeline function). In urban areas they may have significant passenger transport movements and numbers of cyclists and pedestrians using the road. As well as meeting at least one of the following movement criteria (Typical Daily Traffic, Heavy Commercial Vehicles or Buses Urban Peak) they also need to meet at least 1 other criteria (i.e. 2 in total). The other criteria should then be considered to provide a local 'ground truthing' check, and in some instances by considering these this may result in a road moving up or down a category to reflect the function of the road.
- Primary Collector:** These are locally important roads that provide a primary distributor/collector function, linking significant local economic areas or areas of population. They may be the only route available to some places within the region and in urban areas they may have moderate passenger transport movements and numbers of cyclists and pedestrians using the road. These roads need to meet at least one of the movement criteria (Typical Daily Traffic, Heavy Commercial Vehicles or Buses Urban Peak - (i.e. 1 in total). The other

criteria are then be considered to provide a local 'ground truthing' check, and in some instances by considering these criteria, this may result in a road moving up or down a category to reflect the function of the road.

- Secondary Collector:** These are roads that provide a secondary distributor/collector function, linking local areas of population and economic sites and may be the only route available to some places within this local area. These roads need to meet at least one of the movement criteria (Typical Daily Traffic or Heavy Commercial Vehicles - i.e. 1 in total). The other criteria are then be considered to provide a local 'ground truthing' check, and in some instances by considering these criteria, this may result in a road moving up or down a category to reflect the function of the road.
- Access:** These are all other roads. Low volume roads within this category will fall into the low volume subset.

In the Primary/Secondary Collector and Access road categories we propose that the criteria other than the Typical Daily Traffic, Heavy Commercial Vehicles, Bus Urban Peak can be used to move a road up a category on the basis of local knowledge. For example, an Access road may provide critical connectivity or provide access to a regionally or locally significant tourist destination warranting it moving up a category Secondary Collector even though it does not conform to the movement criteria for that category.

- Proxy for traffic generators with both economic and social dimensions such as employment, shopping areas and schools/tertiary institutions
- Proxy for economic productivity - connecting major industrial/commercial and distribution centres to markets.
- Proxy for bus link and density of 'achange' place function
- Proxy for density of 'achange' place function
- Proxy for economic productivity
- Proxy for economic productivity
- U - Urban, R - Rural
- Top 7 cities as defined in the Transport Agency Planning Policy and Funding Manual - Auckland, Hamilton, Tauranga, Napier/Hastings, Wellington, Christchurch, Dunedin.
- Top 8 ports - Tauranga, Auckland, Christchurch, New Plymouth, Marsden, Dunedin, Wellington, Napier plus Auckland International Airport. Break point in tonnage/values.
- Top 7 airports - Auckland, Wellington, Christchurch. Break points in data.
- Statistics NZ definition of main urban area
- Next 3 ports - Picton, Nelson, Bluff
- Next 2 airports - Queenstown, Nelson
- Statistics NZ definition - secondary urban area
- Next 5 airports - Dunedin, Palmerston North, Hamilton, Rotorua, Napier