

Tauriko Network Programme Business Case



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GLOSSARY OF TERMS

ACRONYM	DEFINITION
AADT	Annual Average Daily Traffic
BCR	Benefit Cost Ratio
WBoPDC	Western Bay of Plenty District Council
BoPRC	Bay of Plenty Regional Council
DSIs	Deaths and Serious Injuries
FLAG	Freight Logistics Action Group
GDP	Gross Domestic Product
IBC	Indicative Business Case
ILM	Investment Logic Mapping
KPIs	Key Performance Indicators
LTP	Long-term Plan
MCA	Multi-Criteria Analysis
MOU	Memorandum of Understanding
NLTF	National Land Transport Fund
NZTA	NZ Transport Agency
ONRC	One Network Road
PBC	Programme Business Case
PT	Public Transport
RMA	Resource Management Act
RPS	Regional Policy Statement
SH	State Highway
IBC	Indicative Business Case
TCC	Tauranga City Council
TDM	Travel Demand Management
TNPBC	Tauriko Network Programme Business Case
TTM	Tauranga Traffic Model
UGA	Urban Growth Area
UNIFS	Upper North Island Freight Story

EXECUTIVE SUMMARY

Overview

This Tauriko Network Programme Business Case (PBC) provides a vision and plan for the western corridor of Tauranga. State Highway 29 (SH29) lies within an area of urban expansion on a nationally strategic freight route connecting the Port of Tauranga and Tauranga City's Central Business District to New Zealand. Provision for up to 18,500 dwellings is in the SmartGrowth¹ long term horizon in this corridor with 350 hectares of industrial land and 44,000m² net leasable retail area.

The PBC proposes a set of transport investments (cycling, walking, public transport, local road, state highway) that protects SH29's strategic role as part of the preferred Auckland-Hamilton-Tauranga national high volume route whilst supporting the planned and sustainable development of the corridor.

On the main state highway:

- SH29 will be four-laned at specific growth trigger points
- Side access will be limited in accordance with the one network road classification (ONRC)
- Intersections will be rationalised to be grade-separated or left in and left out in accordance with the ONRC
- Road straightening and geometry corrections will be required.

The recommended programme addresses the problems identified by key stakeholders. It is expected to deliver the benefits and meets the investment objectives.

Tauriko network programme business case principles

Four important principles applied to the development of the Tauriko Network PBC.

1. The 'network' must function to give effect to the SmartGrowth western corridor settlement pattern over 10, 30 and 50 year time horizons. The Tauriko Network PBC includes existing and new local arterial roads and connections, public transport and demand management activities such as promoting active modes (i.e. walking and cycling), and state highway interventions.
2. At the outset of the Western Corridor Strategic Study the partners approached the problems and interventions within a paradigm of minimising the number of local connections to SH29. The focus was on providing local roads for local journeys and SH29 for regional journeys.
3. The programme will require ongoing collaborative effort from a wide set of stakeholders to promote liveability and freight movement objectives. Objectives, programmes and recommendations have been jointly agreed. The recommended programme enables staged levels of investment and planning commitment amongst the partners.
4. Future structure plans and infrastructure projects will need to remain consistent with the SmartGrowth land use settlement pattern and the preferred transport network established through the PBC.

These four principles working together enable a conceptual and practical contribution towards the SmartGrowth vision for the sub-region and the Transport Agency's policy and goals.

State Highway 29

SH29 is classified as a national high volume route which should provide a reliable and resilient freight route between Auckland, Hamilton and Tauranga. Approximately 40% of road freight to and from the Port of Tauranga travels on SH29 from the Waikato (north and south) and Auckland. Import and export activities at the port contribute around 9% of NZ Gross Domestic Product. The Transport Agency's adopted policy is to concentrate the

¹ SmartGrowth is a collaboration between Tauranga City Council, Western Bay of Plenty District Council, Bay of Plenty Regional Council and Tangata Whenua working in partnership with central Government (notably the Transport Agency), businesses, education groups, industry and the community to provide well-planned and integrated settlement development in the Western Bay of Plenty Sub-region. At the core of the new urban growth areas is the liveability principle of closely co-located opportunities to live, learn, work and play. SmartGrowth is about place-making and creating new communities where transport and land-use decisions are integrated over a longer term time horizon.

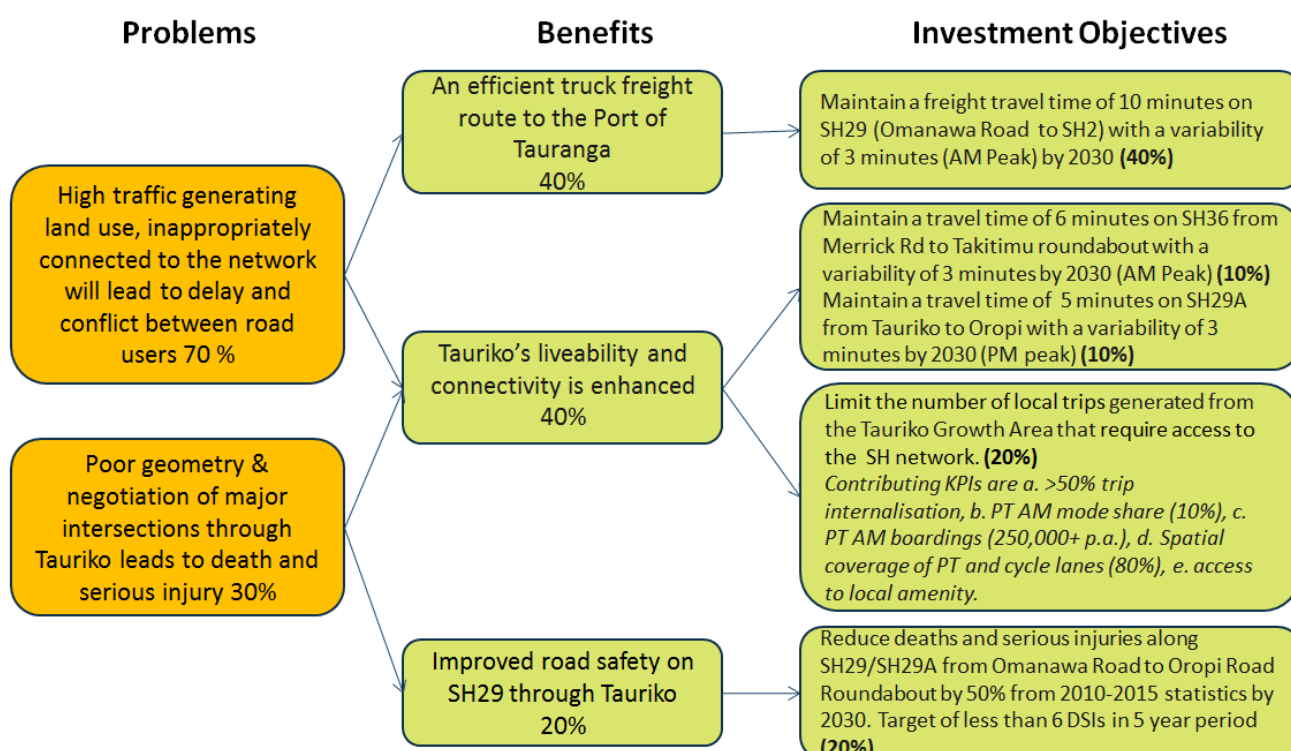
longer-distance traffic from Auckland to Tauranga on the SH1/SH29 route taking advantage of the investment in the Waikato Expressway.

The problems, benefits, and investment objectives

The western peri-urban area of Tauranga has new and forecast residential and commercial growth that has the potential to generate local traffic movements that could compromise the performance of SH29 as an efficient, safe freight route. The PBC presents a plan for the transport network which places the right traffic on the right roads while creating the best urban form and local transport provision in line with SmartGrowth objectives.

The PBC partners and stakeholders agreed the following problems, benefits and investment objectives, as outlined in Figure 1.

Figure 1, Problems, benefits and investment objectives agreed by the partners and stakeholders



The recommended programme

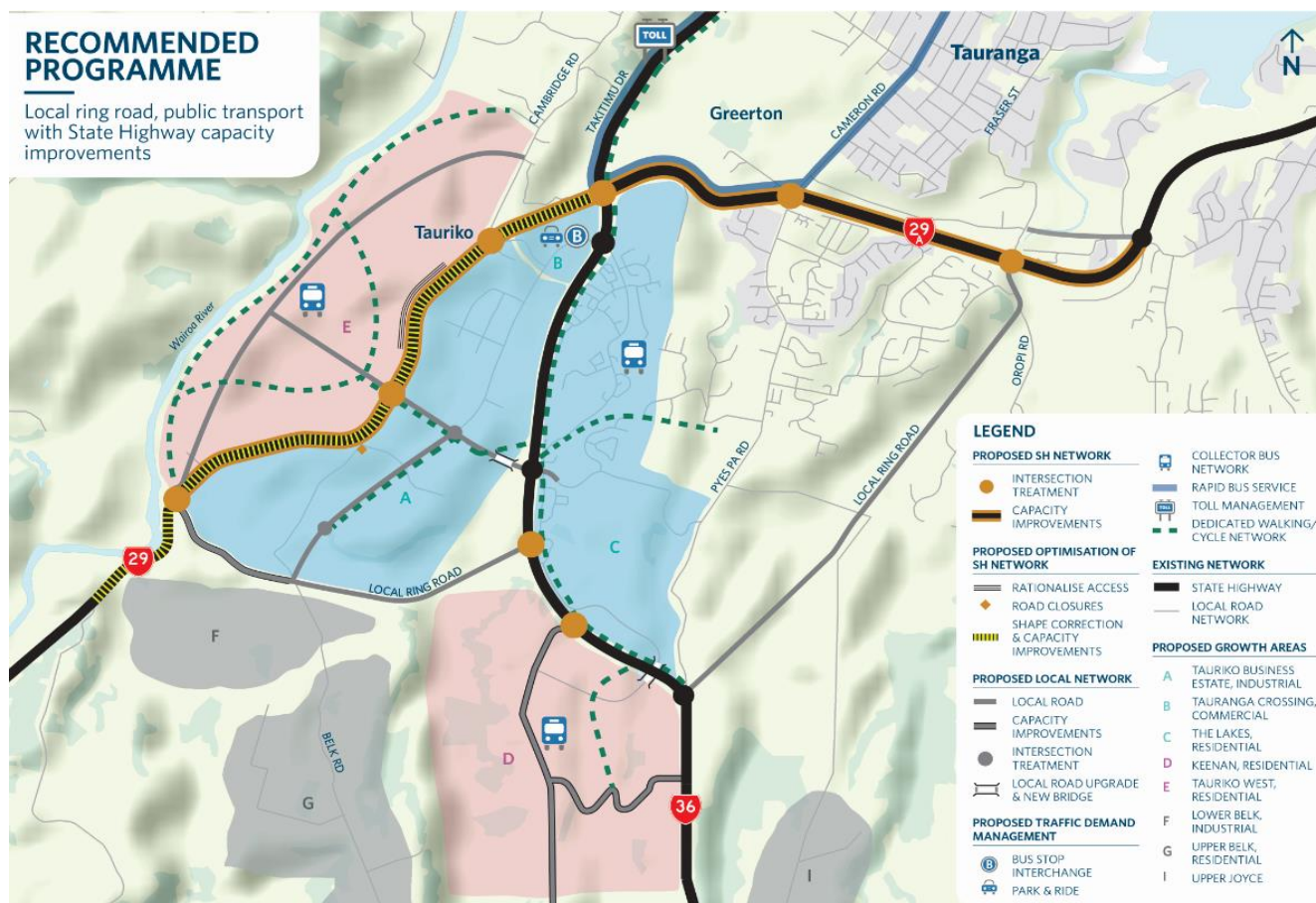
A total of 57 potential programme options were assessed in developing this PBC. Development of the options and selection of the recommended programme was undertaken with stakeholders.

The recommended programme is a network PBC that will support the growth in the Western Corridor and the function of the freight corridor.

The recommended programme includes capacity and safety improvements to the existing SH29 alignment. A new local ring road connecting SH29 to SH36 and then SH36 to SH29A at Oropi caters for local movements (separate from national/regional through traffic). Public transport and cycle ways provide an alternative to cars and enhance suburban connectivity.

The recommended programme performed well against all the objectives and had the lowest risk profile, including community severance risk. It had the best BCR rating and is resilient against a 50 year settlement pattern test.

Figure 2, The recommended programme



Cost estimate (upper and lower bound)
 Lower costs (capital + property) \$326M
 Upper costs (capital + property) \$651M

Benefit cost analysis
 Indicative BCR: 1.7
 Range: 1.4 - 2.2

Investment profile
 H/H/BCA1-3

Risk of Non-Investment

A 'do minimum' approach will result in lost opportunities to:

- Collaborate and provide an integrated approach to land use and transport planning on the Western Corridor network
- Jointly undertake statutory processes
- Manage the degradation in travel time along a national freight route
- Rapid development will limit the options for network improvements as required land will be developed for residential and industrial use.

	Recommended programme	Do minimum
Objective 1: Trucks		
SH29 (SH2 to Omanawa Road)		
Travel Time	7 mins	53 mins
Variability	+/- 3 mins	+/- 7 mins
Objective 2: People		
SH36 (Merrick Road to Takitimu Roundabout)		
Travel Time	6 mins	31 mins
Variability	+/- 2 mins	+/- 5 mins
SH29A (Takitimu Roundabout to Oropi Roundabout)		
Travel Time	3 mins	13 mins
Variability	+/- 2 mins	+/- 4 mins
Objective 3: People		
Internalisation	46%	51%
Objective 4: Safety		
Project star rating	3.89	3.00
Potential high-severity crashes in five years	1.60	3.64

Next Steps

One package is proposed for early action in 2017: Tauriko Network Indicative Business Case.

Tauriko Network Indicative Business Case \$3.8m

An Indicative Business Case (IBC) together with the fast-tracking of two detailed business cases addresses the timely need to continue with a network planning process in collaboration with SmartGrowth partners to deliver integrated network recommendations.

The next phase will involve:

1. Joint public engagement with SmartGrowth partners on the SmartGrowth settlement pattern review and the programme options.
2. The Transport Agency and the SmartGrowth partners will work in collaboration to agree triggers, responsibilities and develop principles for co-investment.
3. Delivery of the Tauriko Network IBC and DBC1 and DBC2. The Transport Agency will lead the SH treatments for SH29, whilst Tauranga City Council will lead the local roads and structure planning and the Bay of Plenty Regional Council will lead the public transport planning.

Successful delivery of this programme will involve ongoing collaboration with project partners throughout the life of the programme. It is important that the next phases are advanced conjointly with the Tauriko West structure planning. Joint notification of changes to Transport Agency designations, District Plan and Regional Policy Statement (RPS) will facilitate efficient and effective ongoing statutory processes.

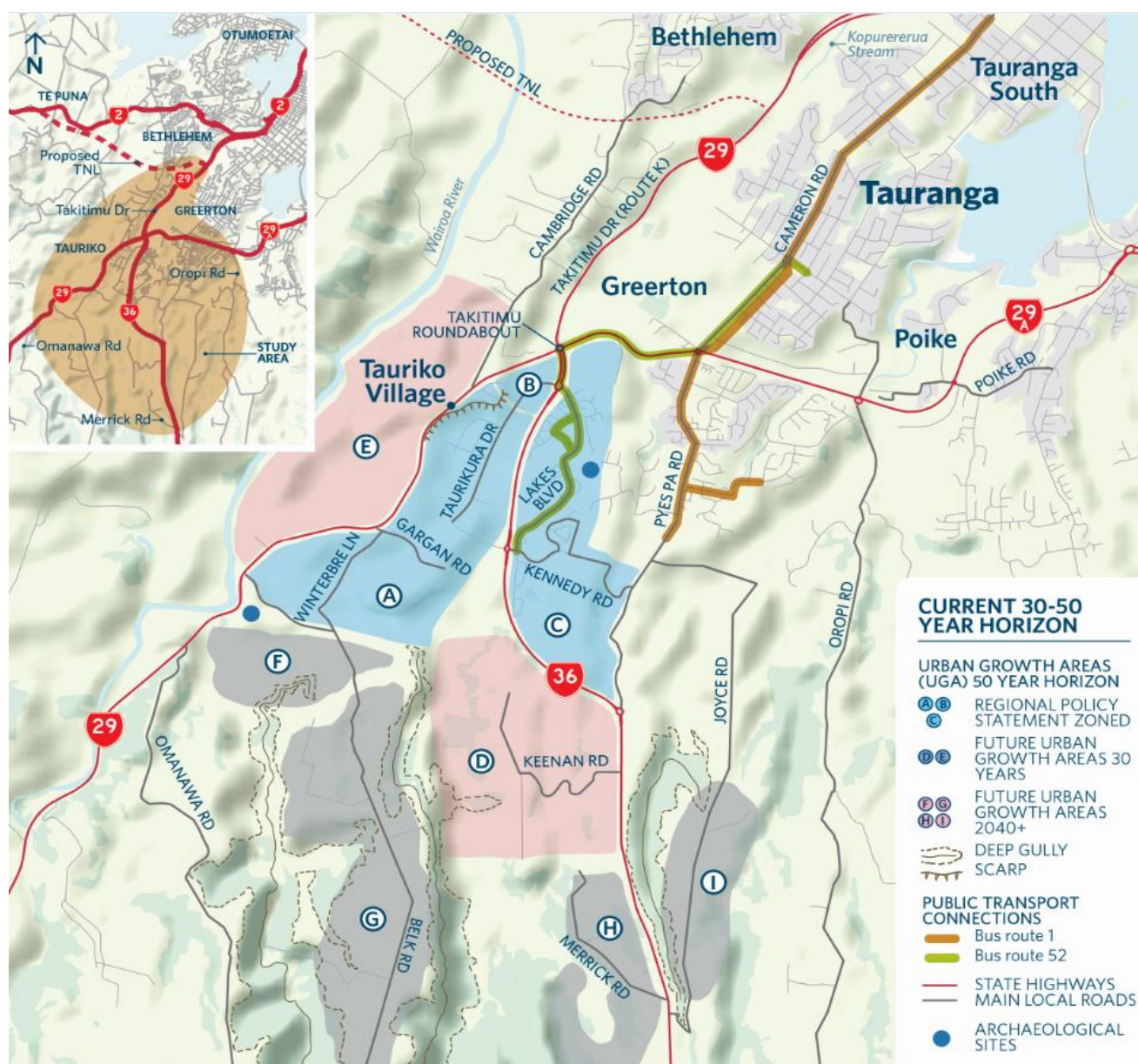
PART A – THE STRATEGIC CASE

1 Introduction

The purpose of the strategic case is to determine whether there is a compelling case for investing in the transport network of the Tauriko area particularly in the context of the Transport Agency’s policies for the relevant state highways and the continuing rapid growth of the City of Tauranga with urbanisation planned around Tauriko. The strategic case forms the first part of the PBC which demonstrates the scale and significance of existing and expected problems, benefits sought and objectives from transport intervention and investment.

This strategic case concludes that there is a need to plan appropriate responses to manage the competing needs of maintaining efficient freight access to the Port of Tauranga (on the key journey from Auckland to Tauranga via the Waikato) with sub-regional demands to accommodate growth in a safe and sustainable manner. In a 30 year timeframe, road use is predicted to increase by 110,000 trips per day in Tauriko. The study area is shown in Figure 3 in the context of other strategic corridors across the Western Bay of Plenty sub-region.

Figure 3, Tauriko network study area



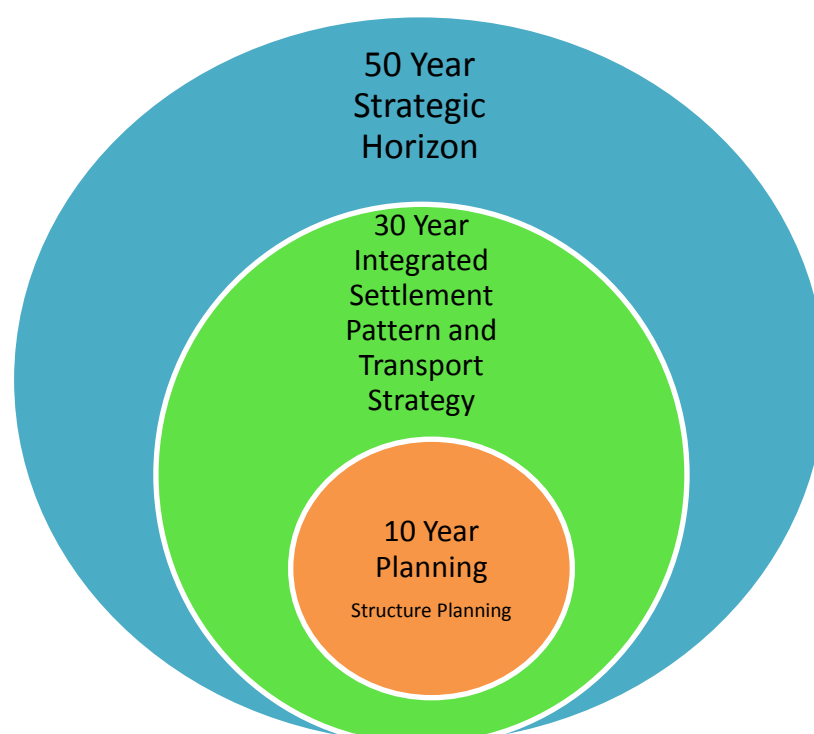
The strategic case has been prepared collaboratively by a wide set of stakeholders via the Western Corridor Group established under SmartGrowth – see Section 2.3.

Scope and time horizon

The PBC is a *network* PBC as it considers problems and interventions across land uses, local roads, public transport and the state highway network for the study area centred on Tauriko. The Tauriko Network PBC approach is about commitment from multiple parties for an integrated land use and transport network. It tests the resilience of its recommendations over a long time period to ensure short-term decisions do not result in long-term problems in the western corridor.

The Tauriko Network PBC seeks to integrate transport solutions with planning for residential and industrial growth within the western corridor over the next 30 years, whilst retaining a 50 year strategic horizon and following a 10 year plan.

Figure 4, Integration of transport solutions



The Tauriko Network PBC is integrated with, but does not include:

- The existing Tauranga Transport Strategy and draft Tauranga Strategic Case – particularly for Cameron Road and the Peninsula
- State Highway 2 (included in Waihi to Tauranga PBC)
- State Highway 29 from Piarere to Tauriko (SH29 PBC)
- The developing Public Transport Blueprint including wider public transport initiatives.

2 Programme Context

2.1 GEOGRAPHIC AND ENVIRONMENTAL CONTEXT

The Tauriko study area is bounded by the Wairoa River in the north-west and Kopurererua stream in the east where Takitimu Drive intersects with SH2. The land adjacent to the river rises to an escarpment on the existing SH29 alignment. The river and the escarpment provide geographical constraints when considering the possible transport interventions at Tauriko village.

Tauriko is a fast growing suburb with a significant business hub comprising industrial and commercial land alongside the Western Corridor (SH 29) on the south-western fringe of Tauranga. The Tauriko study area includes 'the Lakes' development and 'Pyes Pa West' residential development on either side of SH36. These development areas rise to Keenan Road in the south of the study area (see Figure 10). Streams drain the Keenan Road area creating multiple steep gullies and escarpments. The gullies provide challenging contours and geographical constraints on east-west transport interventions.

Grazing land, lifestyle blocks and areas of horticulture are located to the north of SH29 and in the south beyond the urban growth area.

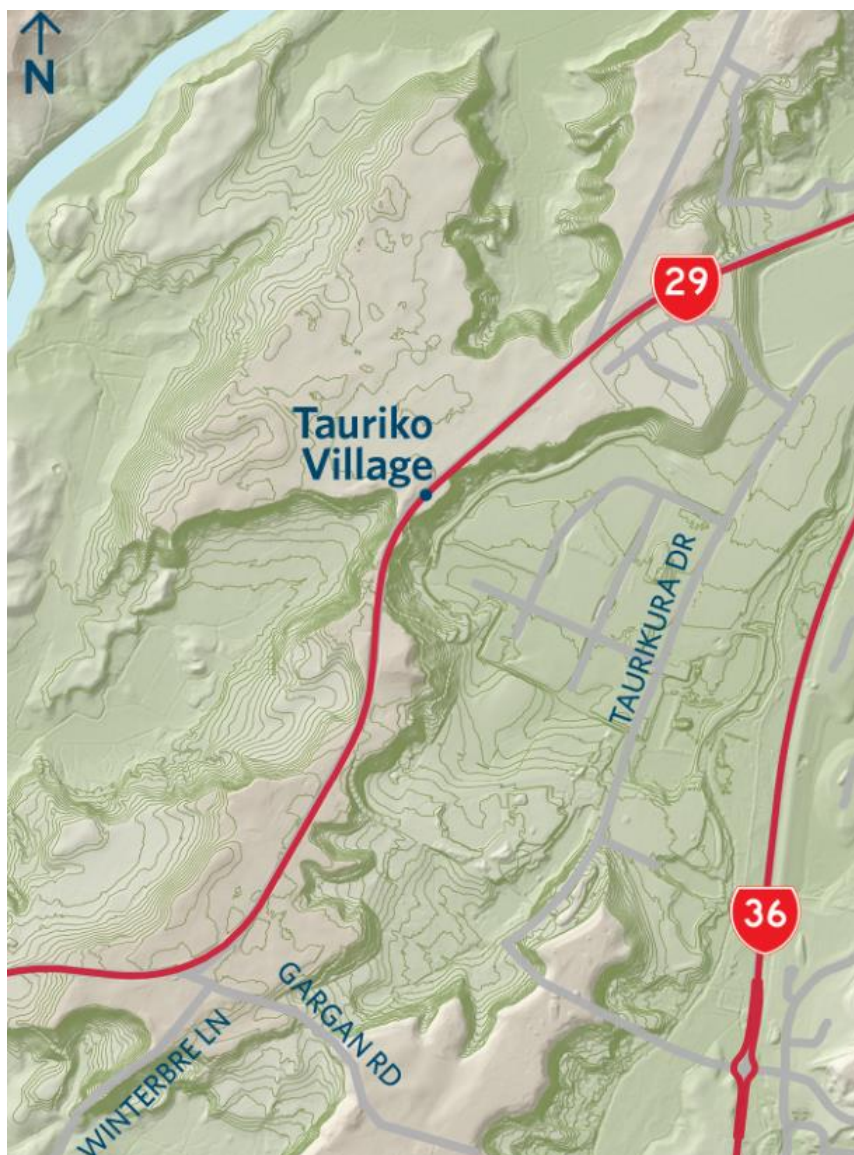
To the north-east is residential and commercial land use. Cameron Road provides an important arterial route into Tauranga CBD.

Natural environment and historical context

A proportion of the gully network is in private ownership and is predominantly native vegetation cover that flanks the plateau streams, some of which connect into the culturally and environmentally sensitive Wairoa River. These gullies have ecologically sensitive areas. A number of private statutory conservation orders are in place to protect sections of them. Connectivity of these ecologically sensitive areas will be an important part of the land use and transport integration planning. Avoiding any works that drain into or affect the Wairoa River is also an important consideration of the option analysis.

There are two archaeological sites located within the wider Tauriko-Omanawa area primarily associated with pre-European contact period occupation. There is also evidence of late nineteenth century military occupation at Omanawa Redoubt.

Figure 5, Natural severance in current SH29 alignment



To the east of SH29 a natural barrier exists between SH29 and the new industrial area. This is represented by the darker green band of contour lines.

There are some properties with direct access onto SH29 that will be rationalised so access is from the new industrial and residential areas or purchased by the Agency as road side reserve.

Figure 6, escarpment between the new industrial area (foreground) and SH29 alignment (horizon)



2.2 SOCIAL CONTEXT

Tangata whenua

Tauranga has a rich Maori history. 17% of the Tauranga city’s population is Maori (2013 census). There are three main tribes in the district with the most prevalent in the Tauriko area being the Ngati Ranginui. The existing SH29 alignment, the area north of the state highway, Wairoa River and the Omanawa Stream are areas of particular cultural value to Ngati Hangarau Hapu and Ngati Kahu Hapu.

Tauriko village

Tauriko village is located centrally in the study area adjacent to SH29. It contains a primary school (Tauriko School) that has direct access on to SH29. This village existed prior to the level of development currently occurring in the western corridor. There may be an opportunity to consider a more appropriate access for the school when local issues are assessed in greater detail in the next phases in developing a business case. There are also commercial properties in Tauriko village and along the escarpment above the Tauriko valley that present a side friction issue for SH29.

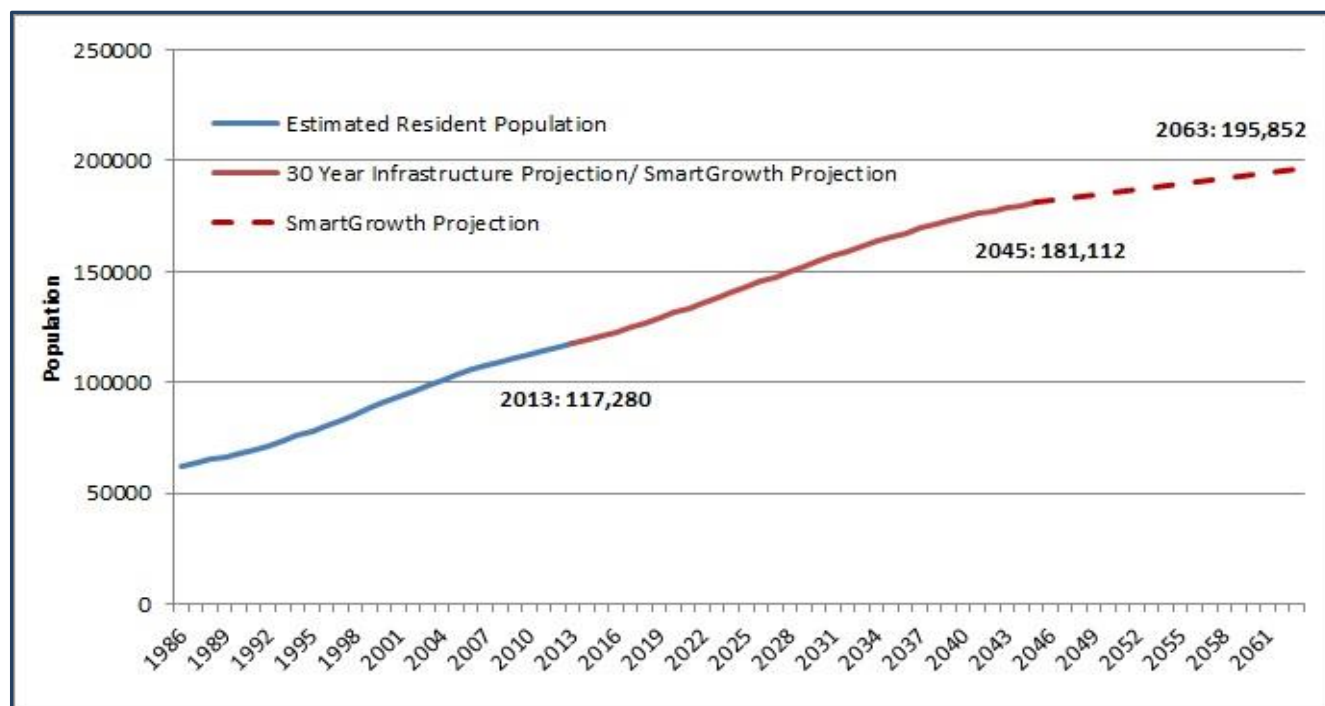
Population growth

The most significant social context for Tauriko is the rate of population growth in Tauriko and Tauranga City more generally.

Tauranga City has an urban population of 122,000 (2016 Tauranga City Council files). From 1996 to 2013, Tauranga City had 48% growth. Traditionally known as New Zealand’s retiree capital, predictions suggest that this trend will continue into the future and that the current population over 65 years of age will increase from approximately 20% currently to over 30% by 2033. Initiatives are now being progressed to encourage a more balanced population. The new university campus is one of a number of actions being taken to promote a better balanced demographic population growth. There is also an influx of families moving to Tauranga from Auckland and the rest of the Bay of Plenty region. The number of families is projected to increase by 80% (27,000 families) by 2063 (SmartGrowth 2014 Review - Demographic and Employment Projections 2013 – 2063).

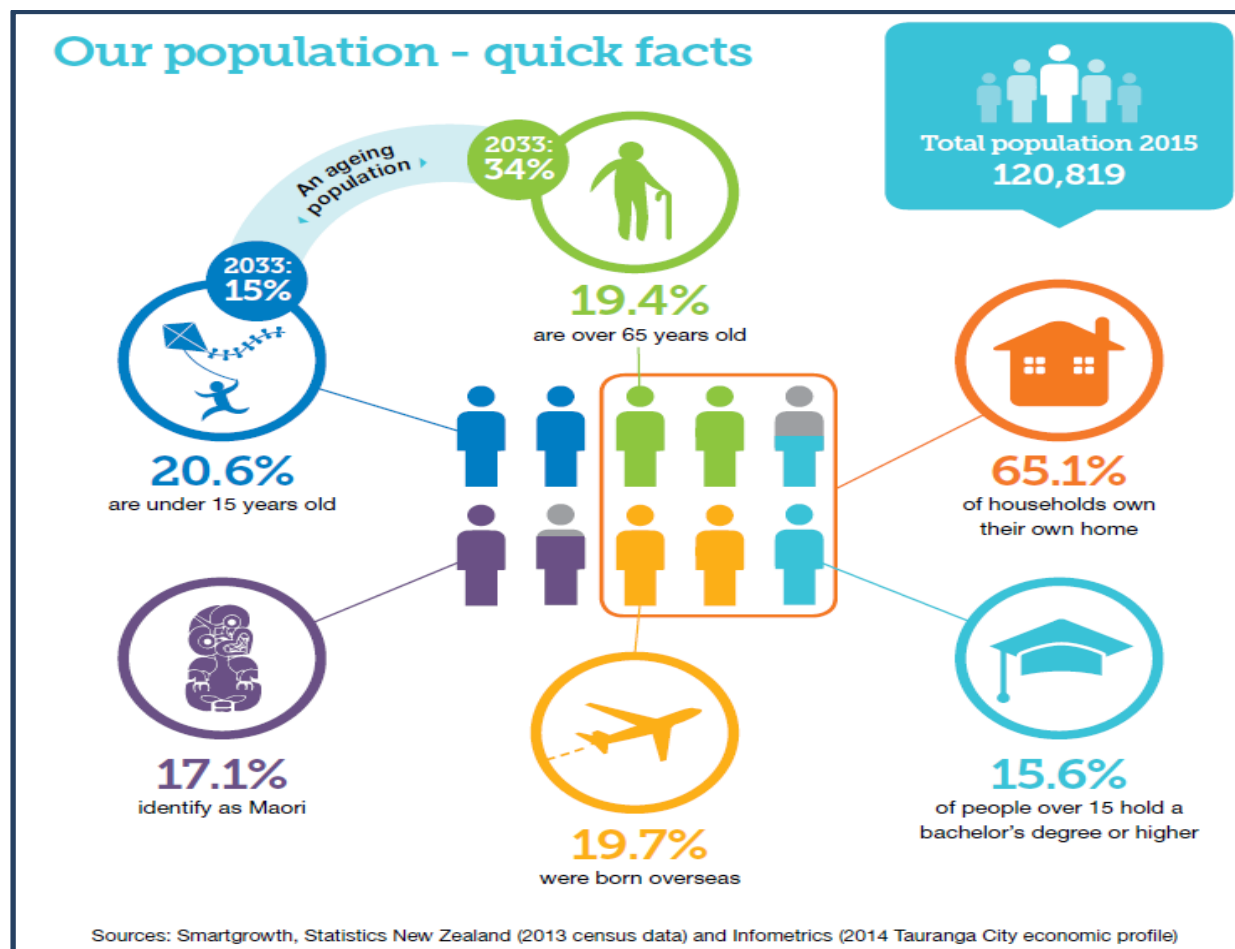
Figure 7 shows the population growth that the 30 year infrastructure and SmartGrowth settlement pattern use to forecast investment requirements.

Figure 7, Population growth Tauranga



Source: Tauranga City Long-term Plan 2015-25

Figure 8, Tauranga city population quick facts



Source: Tauranga City Long-term Plan 2015-25

In addition to Tauranga city growth, the Western Bay of Plenty population is projected to grow from 46,110 in 2013 to around 58,000 in 2033 (25%). This will increase traffic demand between the district and the city predominantly along state highways 2 and 29.

2.3 SMARTGROWTH AND THE WESTERN CORRIDOR

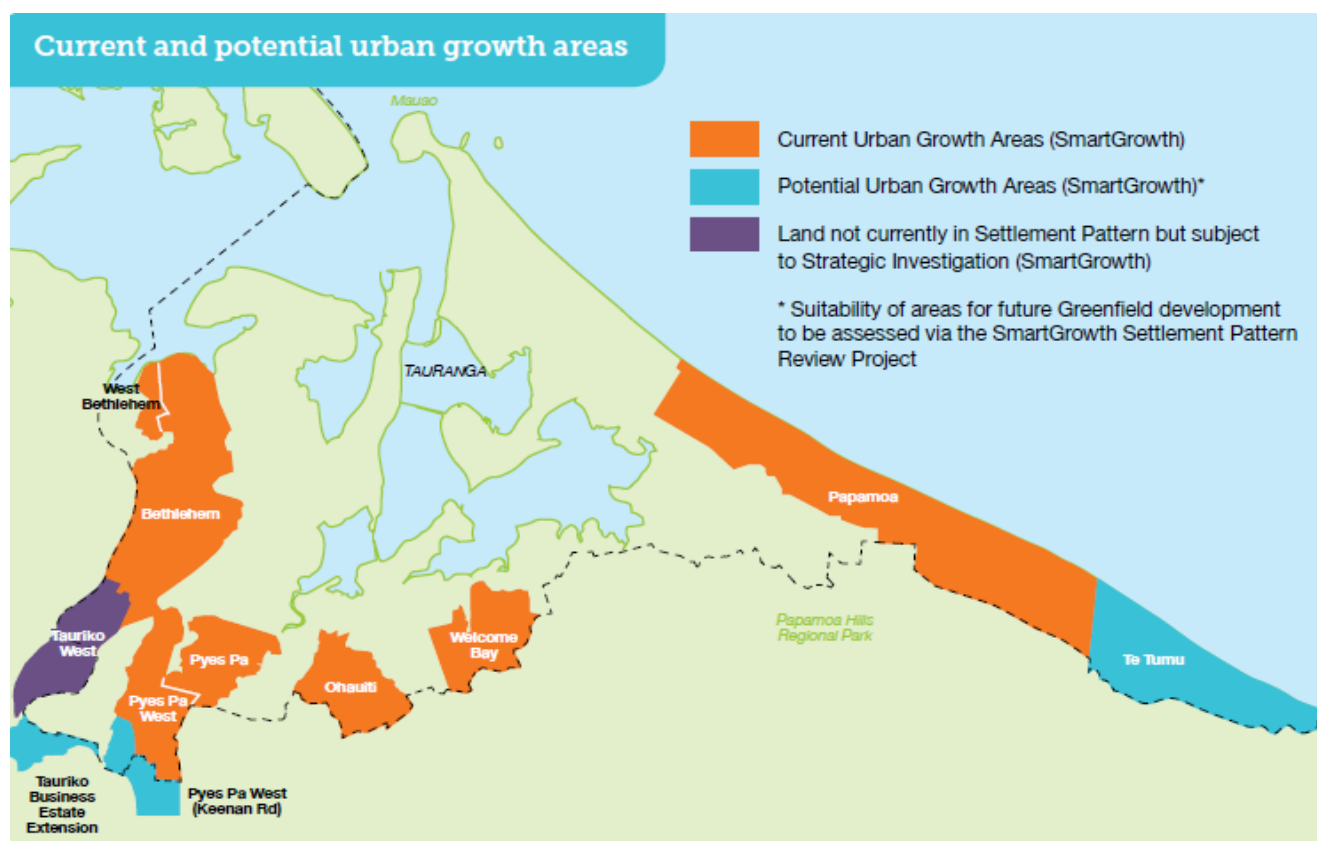
SmartGrowth Settlement Pattern Strategy

According to SmartGrowth projections, Tauranga City will require an additional 45,000 dwellings between 2016 and 2063. The total greenfield capacity combined with projected uptake of infill and intensification development is approximately 17,000 dwellings, which when deducted from the projected demand out to 2063 leaves a shortfall of 28,000 dwellings. Infill and intensification has accounted for approximately 17% of new dwellings in recent years. The SmartGrowth Compact City Project currently underway is taking a comprehensive study to find ways of increasing the share of growth delivered by way of infill and intensification and proposes increasing this contribution up to 30%.

The Te Tumu area in the eastern corridor is identified in the RPS as a post-2021 urban growth area following on from the Wairakei urban growth area (Papamoa). Taking constraints into consideration, the Study determined that if the area was developed at the conventional density of 15 dwellings a hectare, Te Tumu would yield approximately 4,000 dwellings. There are strong aspirations by the SmartGrowth partners and some land owners in Te Tumu to deliver a higher yield that would provide a total yield of approximately 8,000 dwellings. Taking this into consideration, the 28,000 dwelling shortfall out to 2063 could potentially reduce to 20,000.

The main focus of zoned greenfield growth is principally in the western corridor and Papamoa, as demonstrated in Figure 9.

Figure 9, Current and potential urban growth areas



Source: Tauranga City Long-term Plan 2015-25

The western corridor

The SmartGrowth Western Corridor Strategic Study is developing a 50 year spatial plan for 18,500 houses, a commercial centre and industrial estate. Grouping these land uses promotes the 'live, learn, work and play' pillar of the SmartGrowth Strategy. The Study report recommends that the western corridor is generally more suitable for urban development than the southern corridor, with the possible exception of the relatively small (<1,000 dwellings) Ohauti South area.

On 17 August 2016 the SmartGrowth Implementation Committee supported the Tauriko Network Plan at a concept level and the business case moving to the next stage, and agreed to letters of support being provided from partner Councils and SmartGrowth. The committee also agreed to start structure planning and Resource Management Act 1991 (RMA) processes required for the development of land in Tauriko West.

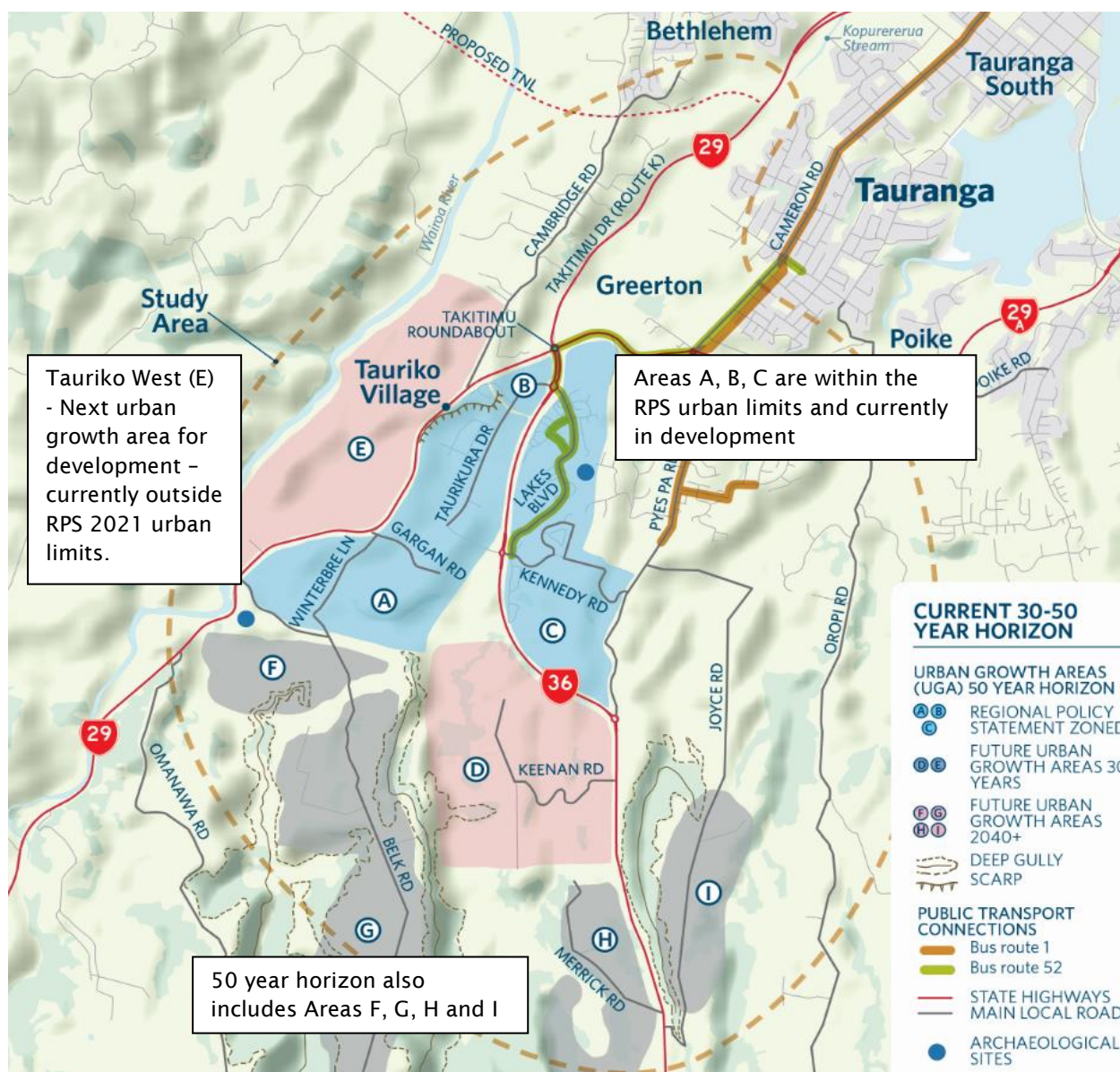
Most likely land use over a 30 year period

Figure 10 provides geographic location of existing and possible new urban areas within the western corridor. The Tauriko industrial estate (land use A) the commercial centre (land use B) and Pyes Pa West (land use C) are already zoned in the District Plan, included RPS and currently being developed.

The Tauriko Network PBC has been undertaken in parallel with the SmartGrowth Western Corridor Strategic Study. This has been of benefit to both work streams to determine an urban form integrated with the strategic transport network in the corridor.

The Tauriko Network PBC adopts the SmartGrowth Strategy planning horizons of 30 years and 50 years. The 30 year 'most likely' land use assumed for developing the PBC is the completion of Areas A to E based on growth projections, with possible progress of a further residential urban growth area. This 'most likely' future is based on estimates of growth trends and assumes that growth will occur contiguously and concentrically out from the existing urban zoned areas.

Figure 10, SmartGrowth 30 and 50 year horizon



The 30-year scenario has therefore been assumed to include the existing zoned areas (A, B, C) as well as the potential growth areas of Keenan Road (D) and Tauriko West (E).

Table 1, Land use, residential yield and trip generation in the Western corridor

AREA	AREA NAME	LAND USE	YIELD	DAILY TRIP GENERATION
A	Tauriko Business Estate	Industrial (zoned)	255ha industrial land	28860
B	Tauranga Crossing	Retail (zoned)	44,000m ² leasable retail area. 7ha bulk retail	33000
C	Pyes Pa West	Residential (zoned)	3,000 dwellings	18600
D	Keenan Rd	Residential (planning)	2,000 dwellings	9300
E	Tauriko West	Residential (possible)	3,000 dwellings	18600
F	Lower Belk Road	Industrial (future)	100ha developable	5550
G	Upper Belk	Residential (possible)	6,000 dwellings	37200
H	Merrick Road	Residential (possible)	2,500 dwellings	15500
I	Upper Joyce	Residential (possible)	2,000 dwellings	12400
	Total	Residential	18,500 dwellings	179,010

A 'most likely' scenario has been important for simplifying study area variables by providing more certainty and less risk around land use. Section 7.2 discusses how a 50 year sensitivity for a full build-out has tested the resilience of programme options in those circumstances. This also ensures that if higher (or lower) growth rates occur in the western corridor then the programme options remain suitable.

SmartGrowth will monitor growth demand and advance land use and infrastructure planning and the subsequent release of additional areas within the western corridor as required.

Tauriko West (land use E) is located adjacent to SH29 at Tauriko village and is recommended to be included in the RPS and District Plan for residential development. The SmartGrowth settlement pattern plan was confirmed in August 2016. Structure planning has already started and expected to continue with consultation for the next growth areas in 2017. It is proposed that plan change processes for RPS and City/District Plans will commence in 2017/2018 with infrastructure investment for Tauriko West included in 2018-28 LTP/Development Contributions Policy. Rezoning will be followed by development in 2020 onwards.

Detailed structure planning will require the Transport Agency to provide clarity to the alignment, high level design and designation of land for SH29 as a nationally strategic high volume freight route. Without progressing the Transport Agency's thinking for SH29 through the Tauriko area, development alongside the state highway will limit the Transport Agency's options for road straightening and improved intersection design. If Tauriko West is to progress in the next five years, there will need to be practical access solutions agreed between the councils and Transport Agency.

2.4 ECONOMIC CONTEXT

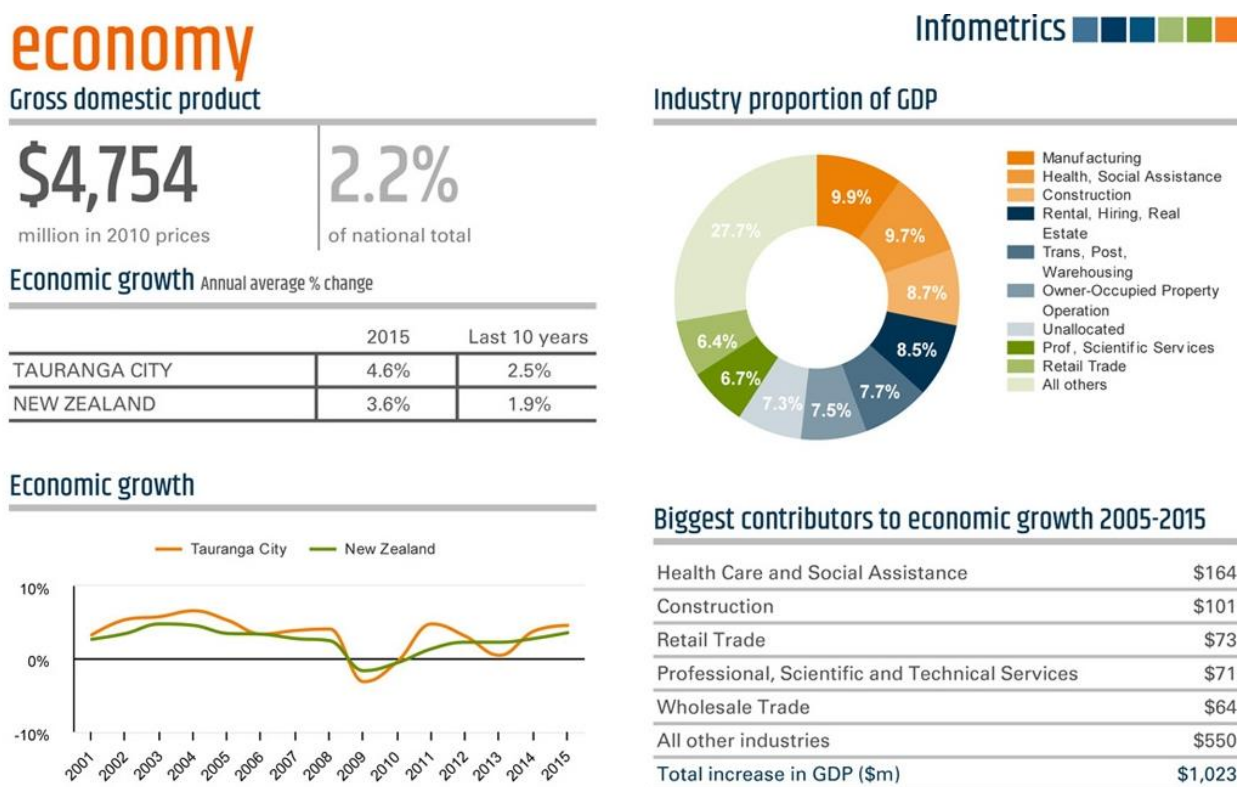
This section provides a local, regional and Upper North Island economic context.

Local context

The local economy is growing strongly. Population growth, which is linked to growth in local GDP, has been 2.5% compared to 1.9% nationally over the last ten years. Manufacturing, health-care and construction are well-established in the local economy and make the highest contribution to local GDP. Retail and wholesale trade have also been significant growth contributors over the last 10 years. This local context is important because the large and growing number of trips generated locally are heavily dependent on use of the urban state highway network.

Elderly residential care is also a well-established and growing industry in Tauranga. A large number of new residents are from surrounding regions that have chosen Tauranga as a place to retire. It is predicted that this demographic trend will continue.

Figure 11, Tauranga Infometrics



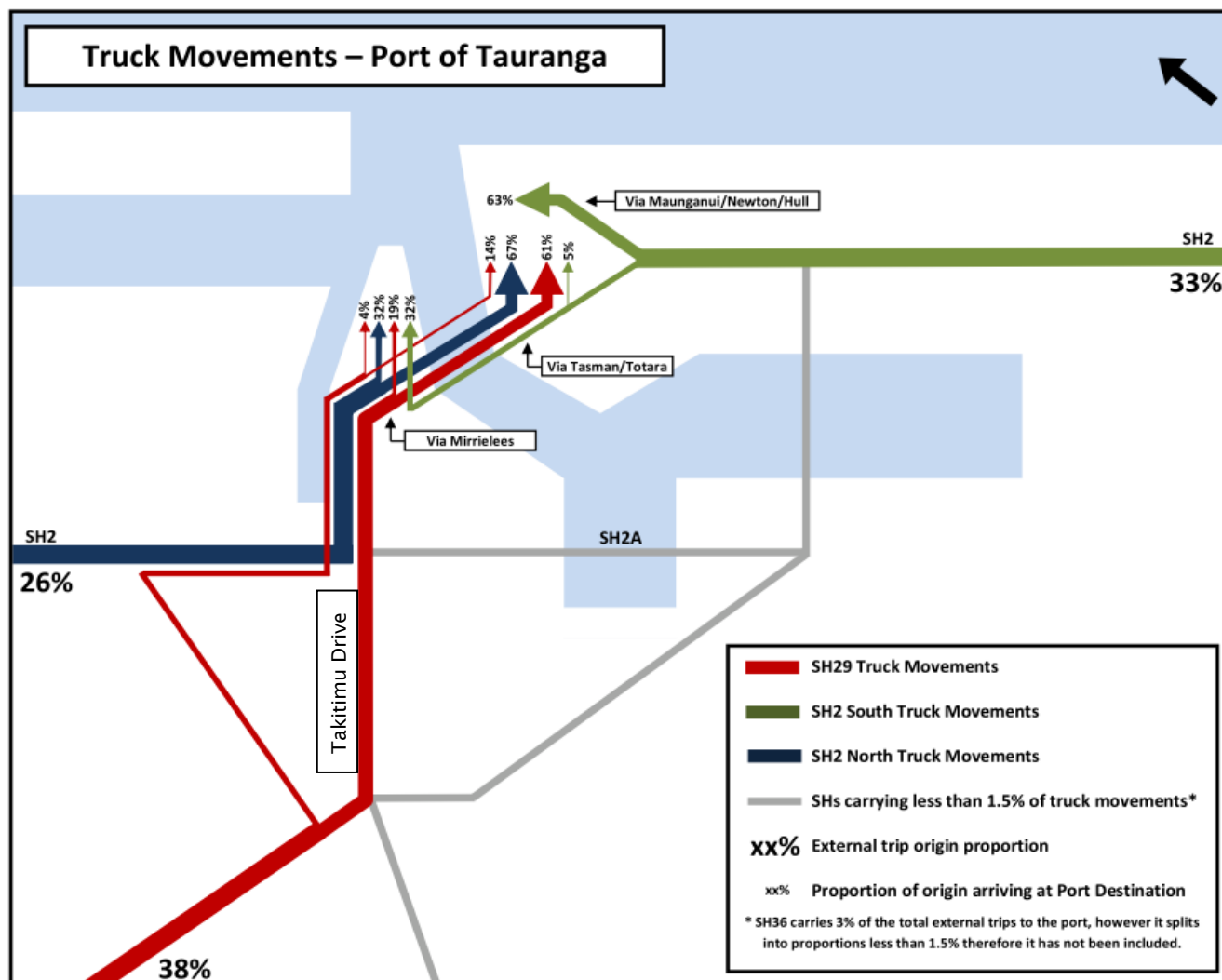
Source: Tauranga Priority 1

Port of Tauranga

The Port of Tauranga is New Zealand's largest export port by volume. Exports increased over the first half of the 2016 financial year to nearly 6.5 million tonnes. Processed forestry products saw some growth including square lumber. Kiwifruit exports increased 23% to 413,000 tonnes. Dairy product exports increased 29% compared with the previous year. Port of Tauranga's diverse operations, locations and income streams continue to provide some protection from fluctuating cargo volumes in commodities such as log exports. SH29 is important to the port as a national strategic high volume freight route connecting to the Waikato and Auckland.

Figure 12 below shows the main movements into the port with the largest proportion on SH29.

Figure 12, Truck movements - Port of Tauranga sourced from the TTS 2012



Bay of Plenty regional economy

The regional economic context provides a wider economic base from which over \$10 billion of GDP is generated (5.2% of New Zealand total GDP - Statistics NZ, 2013). The Bay of Plenty economy is dominated by horticultural production, forestry and logging. Much of this product is exported and transported via the state highway network to the Port of Tauranga. Imports/exports from Port of Tauranga contribute 9% of New Zealand’s GDP.

Tourism is another major source of income, particularly in Rotorua, one of the country’s premier tourist destinations. Interregional trips occur between Tauranga and Rotorua for cruise ship and other international tourists who visit the Bay of Plenty. Although SH2/SH33 and SH29/SH36 provide the main tourist routes, SH29 is used by tourists travelling between the Waikato and the Bay of Plenty.

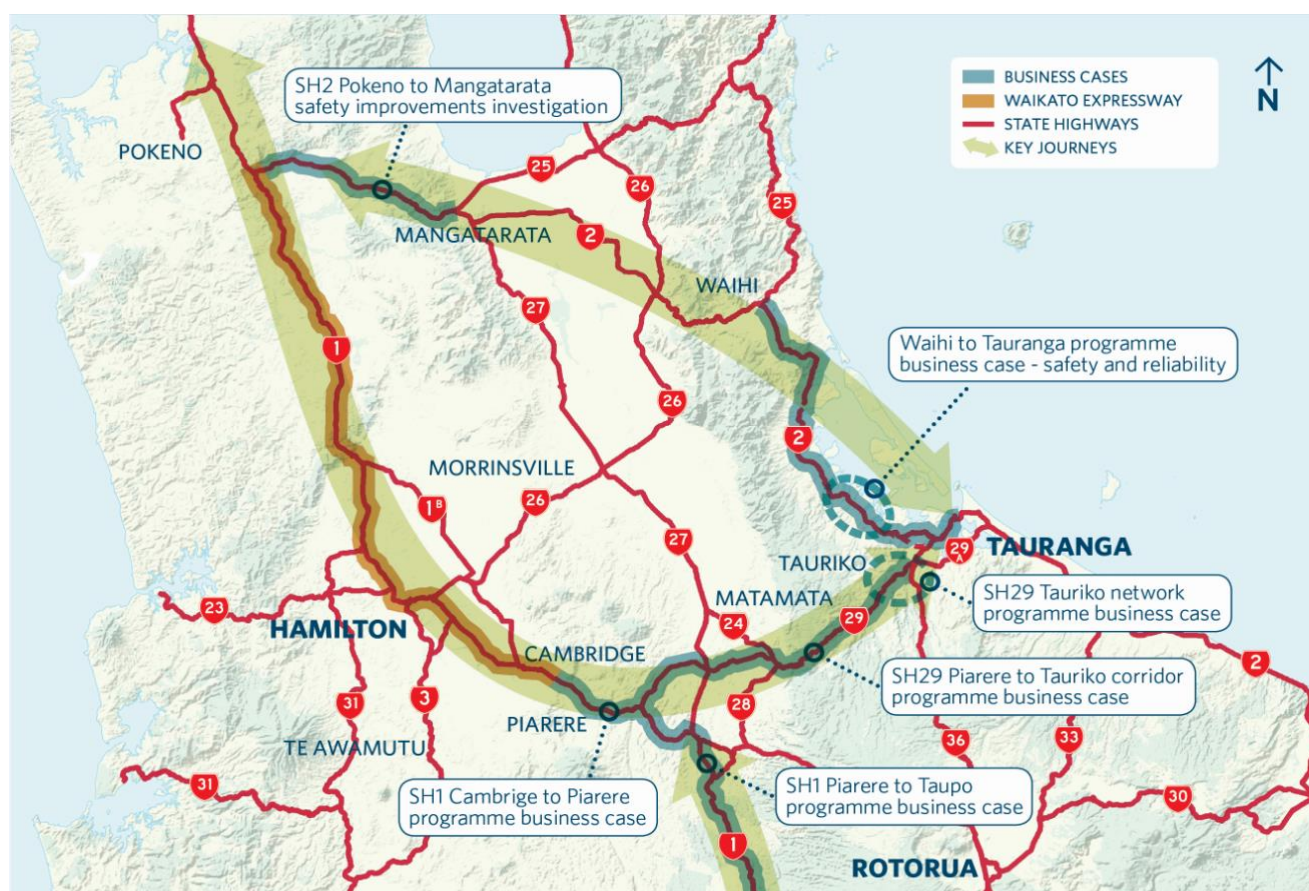
Upper North Island Economic Context

The Upper North Island (UNI) generates approximately 52% of national GDP (Statistics NZ, 2013) and includes Bay of Plenty regional revenues and export earnings. Tauranga supports the UNI economy including a high tonnage port facility and efficient connections to trading partners in the Waikato and Auckland. It also provides a large number of secondary industry benefits to locally based export business and industry based in Tauranga and the Western Bay of Plenty.

2.5 TRANSPORT CONTEXT

Upper North Island context

Figure 13, Bay of Plenty – Waikato and Auckland Key Journeys



SH29 through Tauriko is part of the Auckland – Hamilton – Tauranga Key Journey, a nationally strategic freight route under the ONRC. About 15% of the traffic crossing the Kaimai range from the Waikato on SH29 is interregional freight.

The Transport Agency has recently confirmed (Board Meeting 1 April 2016) that SH1/SH29 will remain the preferred freight route/key journey between Auckland and Tauranga. The SH29 Piarere to Tauriko PBC has further endorsed the routing east of SH1. In the Tauriko study area this focus will need to continue into the Tauranga peri-urban environment whilst also planning for the increased travel demand generated from urban growth.

SH29 Piarere to Tauriko PBC and Tauriko Network PBC

A boundary at Omanawa Road at Tauriko provides a transition point.

Both PBCs:

- Recognise that any disruption of SH29 impacts the nationally strategic freight route.
- Recognise that a continuous reliable trip across both study areas for freight is important.
- Identify safety as a key investment objective.

The PBCs are different in that:

- SH29 PBC concentrates on resilience and Tauriko recognises road use conflict created by urban growth.
- Tauriko PBC protects the strategic route and provides for liveability in the urban zone.
- Tauriko PBC is a network PBC including local roads and public transport whilst SH29 is a corridor study of approximately 70km.

The relationship between road and rail

The split between road and rail freight is an approximate 50% / 50% split from the Waikato which is not predicted to change. Both road and rail are infrastructure strengths in the Bay of Plenty as identified in the UNI freight story. The Tauriko Network PBC needs to focus on maintaining the road freight route as a competitive journey option. This PBC recognises that both road and rail efficiency are important and each is part of the strategic UNI freight story.

Local transport context

SH 29

SH29 northbound between Omanawa Road and Takitimu Drive Roundabout generally has a speed limit of 100km/hr although the vertical and horizontal alignment of the road largely provides for a design speed of 70km/hr to 80km/hr. The speed limit is reduced through the settlement of Tauriko to 70km/hr.

On SH29 southbound from Cambridge Road to and through Tauriko Settlement (900m) there is a restricted speed of 70km/h. From Tauriko village to Gargan Road (900m) the speed limit returns to 100km/h.

This section of SH29 comprises a two lane carriage way with turning provisions at key intersections.

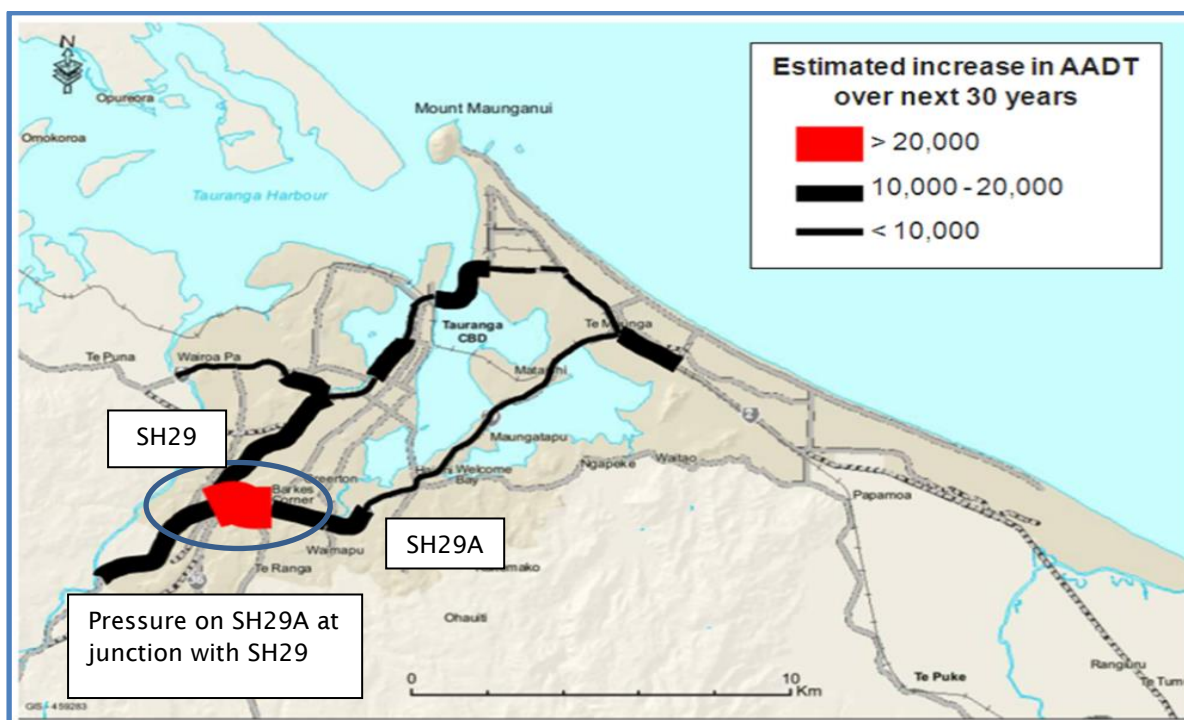
SH2 Waihi to Tauranga

The Tauriko Network PBC study area ends where Takitimu Drive toll road (former Route K) joins the proposed Tauranga Northern Link (TNL). The Cambridge Road local arterial road overlaps these study areas and will provide an alternative local route between the north and west of Tauranga city. Options for Cambridge Road connection to SH29 will consider the impact of tolling the new TNL. By retaining a connection to allow a north-west connection, tolling will be possible on the TNL if this is the desired strategy.

SH29A

Previous studies have shown that travel choice to use the freight route (SH29) will increase if SH29A fails to perform. SH29A provides an easterly ‘around the harbour’ alternative to SH29 via the harbour bridge. Figure 14 indicates in red that the functioning of this alternative may come under considerable pressure if the Tauriko Network plan fails to address SH29A. This is evidenced in the Tauranga Transport Strategy.

Figure 14, SH29A AADT across the Tauranga strategic network (TTS 2012)

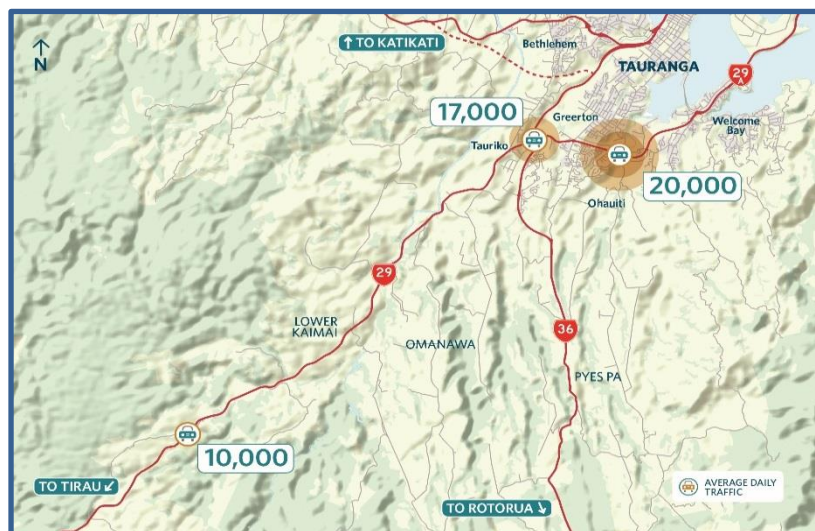


Source: Tauranga Transport Strategy 2012

SH36

SH36 between Tauriko and Rotorua enables movement of people between these cities although in Tauranga it principally serves as an urban roading route. It provides an important part of the local network and reduces the pressure on local trips on SH29. Growth on SH36 is anticipated by opening of Tauranga Crossing late 2016, particularly at the intersection of SH29 where shoppers and employees will access the site. It also provides connection to Pyes Pa Road that offers an alternative local road connection to the city.

Figure 15, Annual average daily traffic



The impact of the urban population growth is represented by increasing annual average daily traffic flows. At the Kaimai Range summit, daily traffic on SH29 is 10,000 which increases to 17,000 at the Tauriko Roundabout. Traffic heading around Tauranga Harbour on SH29A exceeds 20,000, as demonstrated in Figure 15.

Approximately 50% of the traffic that arrives at Takitimu Roundabout is regional traffic.

Public Transport and the Public Transport Blueprint

A consistent theme across Tauranga City is that a significant transformation needs to occur in the share of trips made via the private motor vehicle. This recognises that given the amount of growth potentially able to be provided for in the city, including the western corridor, the transport network would not be able to sustainably provide for the current travel mode profile of Tauranga’s residents (see Table 2). Travel demand management (TDM) (i.e. reducing the need for car travel or distance travelled) can achieve this end, in part, and is an approach that aligns closely with the ‘live, learn, work, play’ pillar of SmartGrowth. A transformation in the share of trips made via public transport will be important. These requirements also emphasise the importance of place-making in the western corridor, especially provision for easy access to an attractive public transport service.

Table 2, Tauranga travel mode share compared to other centres (2009 -2012 average)

City	Travel Mode			
	Private Vehicle	Public Transport	Cycling	Walking
Tauranga	98%	<1%	<1%	2%
Auckland	89%	6%	1%	3%
Hamilton	89%	3%	3%	5%
Wellington	65%	19%	3%	11%
Christchurch	78%	5%	8%	8%
Dunedin	83%	4%	4%	9%

Mode share by the public bus network is increasing. However, incremental changes to public transport will result in positive but only small mode shifts in the study area. The *Public Transport Blueprint*, an initiative by the Regional Council, provides a 10 year activity business case for public transport in Tauranga. The business case is a collaborative effort including the Transport Agency, the City Council and the Western Bay of Plenty District Council.

The benefits sought from the Public Transport Blueprint are:

- Benefit one: Improved optimisation of the transport network
- Benefit two: Improved travel choice
- Benefit three: Greater alignment of planning and investment.

At the end of 2017 the Regional Council's contracts for Tauranga urban and school bus services end. Prior to letting new contracts, a business case for investment in Western Bay's public transport network will be developed to ensure that any investment in the network achieves the best outcomes for the Western Bay transport network and aligns with the views of participating organisations. The forward thinking in the Tauriko Network PBC with respect to public transport will need to complement and support this initiative.

The Tauranga Transport Strategy and draft Tauranga Strategic Case

In 2014 the Tauranga Transport Strategy (TTS) was adopted by Tauranga City Council and approved by the Transport Agency Board as the Strategic Case for Tauranga. The draft Tauranga Strategic Case looks to reconfirm the TTS using a Business Case approach and define the next steps for programme development. The Tauriko PBC has been brought ahead of the draft Tauranga Strategic Case to enable integrated land use and transport planning in the Western corridor, recognising its rapid growth

The Tauriko Network PBC forms an input to the wider draft Tauranga Strategic Case review. Key considerations include public transport, treatment of Cambridge Road and suburban connectivity to the network, and the performance of the remaining section of the freight journey to the Port of Tauranga (between 15th Avenue and Totara Street) including Elizabeth Street intersection with SH2. The Tauranga Strategic Case does not replace or conflict with the scope or recommended programme for Tauriko.

The future TNL intersection treatment with Cambridge road forms a part of the Tauriko Network IBC and the Tauranga to Waihi PBC. The Tauranga Strategic Case will consider the down flow effects of the treatment options on the freight efficiency for the remaining section of the national freight route to the Port of Tauranga.

2.6 INVESTMENT PARTNERS

The Tauriko Network PBC has been developed and is supported by the following organisations.

NZ Transport Agency

The Transport Agency is responsible for planning, investing, improving, managing, and operating the state highways network. The Transport Agency also invests in some activities on local roads and public transport through the National Land Transport Fund (NLTF).

The Transport Agency's primary role is:

- Plan and invest in State Highway and local road networks through the NLTF
- Network planning, build, maintenance and operations.

The Transport Agency is also a delivery partner to the SmartGrowth sub-regional partnership.

SmartGrowth

SmartGrowth is a collaboration between the local authorities and Tangata Whenua in partnership with central Government and multiple wider interests. It sets the strategic vision and collective direction for the growth and development of the Western Bay of Plenty, on key issues across the spectrum of social, environmental, economic and cultural objectives. SmartGrowth is a mechanism to harness the collective impact of local government, iwi, business, central Government agencies, key industries and the community. It provides a shared pathway toward a single vision - making the Western Bay a great place to live, learn, work and play.

Tauranga City Council

Tauranga City Council (TCC) plans, constructs, operates and maintains the local transport network within the urban boundary as well as managing traffic signals on the state highway network on behalf of the Transport Agency. TCC is responsible for managing and structure planning all residential and commercial growth areas within the city boundary as well as being a key partner in developing the SmartGrowth sub-regional growth strategy. TCC is responsible for the statutory District Plan under the Resource Management Act 1991 (RMA) that gives statutory effect to the planning.

Western Bay of Plenty District Council

Western Bay of Plenty District Council (WBoPDC) similarly plans, constructs, operates and maintains the local transport network within the district boundary and is responsible for managing and structure planning residential and commercial growth areas within the district boundary. It is also a key partner in developing the SmartGrowth sub-regional growth strategy and its own District Plan.

Bay of Plenty Regional Council

The Bay of Plenty Regional Council (BoPRC) is responsible for planning and developing the Bay of Plenty public transport system. The Regional Council also prioritises investments in the land transport system through the Bay of Plenty Regional Land Transport Plan and develops the overarching RPS under the RMA.

Other Stakeholders

The following bodies have contributed to the development of this business case:

- Freight Logistics Action Group (FLAG) – primary role is the research and development of the freight logistics sector as a contributor to New Zealand's economy
- Port of Tauranga: Port of Tauranga is a major trip generator in the study area
- Developers and organisations with commercial and economic land development interests in the area
- Local land owners who rely on the Tauriko transport network.

3 Strategic Assessment – Outlining the Need for Investment

3.1 DEFINING THE PROBLEM

A facilitated investment logic mapping (ILM) workshop was held on 3 October 2013 with the stakeholders to identify and agree a common understanding of the priority problems and the benefits sought by addressing them. Following this workshop, data collection and supporting evidence collected during 2015 and 2016 provided greater clarity around the problem statements. Problem statement one was reconfirmed and problem statement two was refined based on evidence that poor geometry and the negotiation of intersections was the main reason for deaths and serious injuries (DSIs), rather than too much direct access to the state highway as suggested in the first version of the problem statement. The refined ILM, benefits mapping and objectives were agreed by the Western Corridor Group (a representative group of SmartGrowth) on 4 March 2016.

Problem one: High traffic generating land use, inappropriately connected to the network will lead to delay and conflict between road users.

Problem one captures the concern that traffic growth through Tauriko is not adequately planned for. Full scale development of up to 18,500 houses, 60,000 m² retail and 310 hectares of industrial development is under consideration.

The nationally significant SH29 (under the ONRC) bisects the area and is expected to provide efficient road freight between the Port of Tauranga and the Auckland/Waikato regions. Current interregional traffic volumes on SH29 over the Kaimai ranges is approximately 10,000 vehicles a day of which 15% is freight. At Takitimu Roundabout traffic demand has reached 17,000 vehicles per day.

Problem one evidence

The data referenced below provides the evidence for the expected increasing conflict between different road users resulting from local traffic demand pressure and implications for the performance of the state highway network. As the problem is forward looking the evidence is largely drawn from traffic modelling using the inputs cited in Table 3.

Table 3, Evidence data sources and key outputs

DATA SOURCE	KEY OUTPUTS
Land use growth projections and growth rate sensitivities	Indicate yields, likely order and rates for each of the planned urban growth areas. The full scale of development (50 years) could generate around 179,000 extra journeys per day, whilst areas A-E (the 30 year projection) could generate 108,000 extra vehicle trips per day on the network (both state highway and local networks).
Bliptrack monitoring Determined current baselines:	SH29 Omanawa Rd to Takitimu Roundabout: travel time 10 mins variation: +/- 3 minutes (AM) SH36 Study area travel time: 6 minutes +/- 3 minutes (AM) SH29A Study area travel time: 5 minutes +/- 3 minutes (PM)
Estimated travel times based on congestion speeds – do minimum	SH29 Omanawa Rd to Takitimu Roundabout: travel time 35 to 71 minutes; SH36 Study area travel time: 20 minutes to 41 minutes (AM) SH29A Study area travel time 8 minutes to 17 minutes (PM)
Tauranga traffic model (TTM) predictions	Based on whole of network impact from traffic growth and interventions. Demonstrates a Level of Service F for the base case (Do minimum) scenario not just in Tauriko, but also network flow-on effects to other parts of the city.
Public transport uptake and projections	Public transport uptake in base case and no rapid services currently planned to service the new growth. Current uptake at Tauriko is 14,000 trips p.a.

Appendix XXVI provides the links to these documents should they be requested. A summary of these findings is provided below in Figure 16 and Figure 17.

Under current development, it takes 12.3 minutes for trucks to travel between Cambridge Road on SH29 in Tauriko and Totara Street (Port of Tauranga), with a 4.8 minute variation.

Traffic demand growth (based on the TTM) has been plotted to show capacity trigger points (years when AADT capacity for a two-lane road is exceeded) in the study area, as presented in Figure 17.

The conclusion is that there is strong evidence supporting the problem statement. Without significant intervention traffic conditions will deteriorate unacceptably for both the through element on the key inter-regional journey and for local movement in the growth areas.

Problem two: Poor geometry and negotiation of major intersections through Tauriko leads to death and serious injury.

Evidence

Evidence from the Transport Agency's Crash Analysis System (CAS) suggests:

- Poor geometry of the state highway e.g. sharp curves, poor visibility and challenging gradients present an unforgiving road environment when drivers make mistakes.
- Negotiation of major intersections is a significant cause of DSI.

Sight distance at intersections seems to be an issue particularly around Belk Road and Redwood Lane (refer to Figure 18).

Data used is outlined in Table 4.

Table 4, Evidence data and findings

DATA	FINDINGS
Year, location and cause of serious injury or fatality	Poor geometry and negotiation of major intersections is a repeated cause of crashes as shown in Figure 17.
DSI rate for a national and regional strategic road	The DSI rate along SH29 in the study area is higher than national averages. 10 actual DSIs compared to an expected baseline of less than 6 over a 5 year period.
Actual and expected SH29 star rating at Tauriko	Actual rating is below expected rating. The expected rating is 3 for regional and 4 for national routes. The current rating is 2.7 for the national route (SH29) and 2.8 for the regional route (SH29A).

Location of DSIs along the corridor over the last five years closely correlates to sections of high risk. More actual DSIs than predicted DSIs, and a higher than predicted risk rating for both the national high volume route and the regional route, indicate improved safety treatments along the corridor are required in the programmes.

Where the actual star rating is lower than the predicted star rating expected for a nationally strategic state highway, safety treatments along the corridor are required to bring it up to a national high volume route standard. Increasing the Kiwi RAP Star Rating through specific measures is expected to reduce DSIs.

A summary is provided in Figure 18 and Figure 19 that shows the higher than expected DSIs and the common causes of DSI.

Figure 16, Problem 1 summary AADT



Figure 17, Problem 1 years to exceedance of capacity threshold

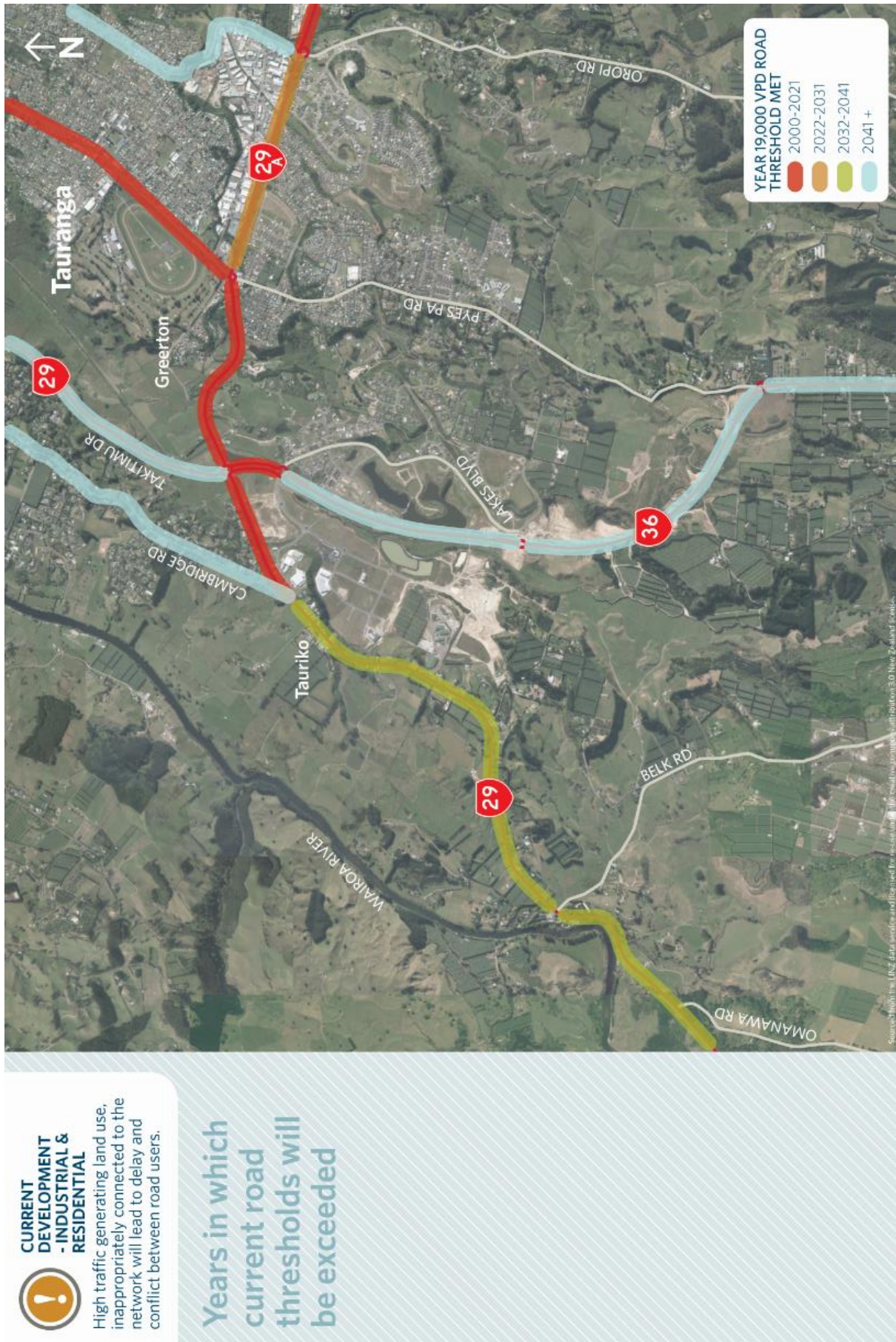


Figure 18, Grouping the causes of DSI at locations

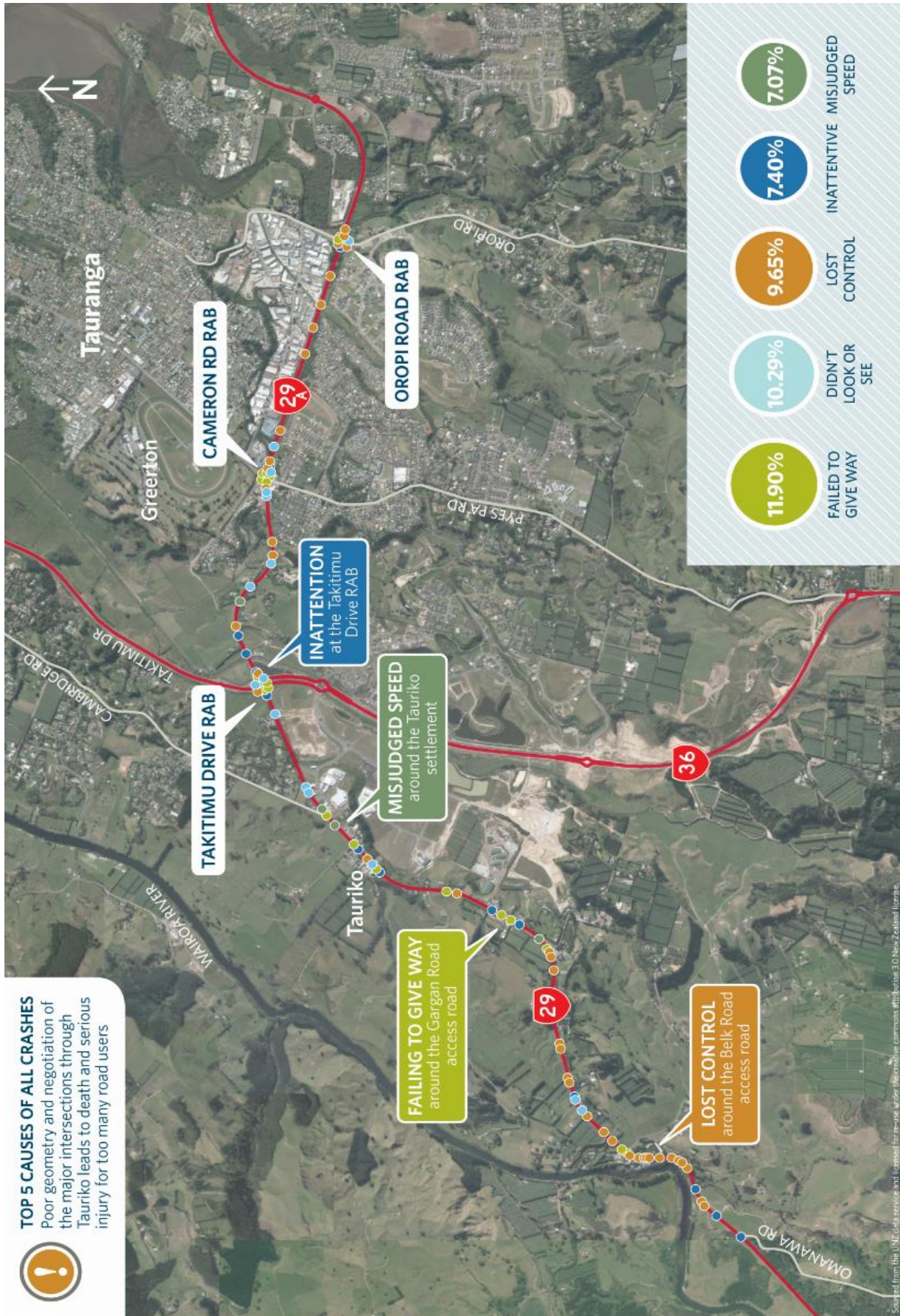
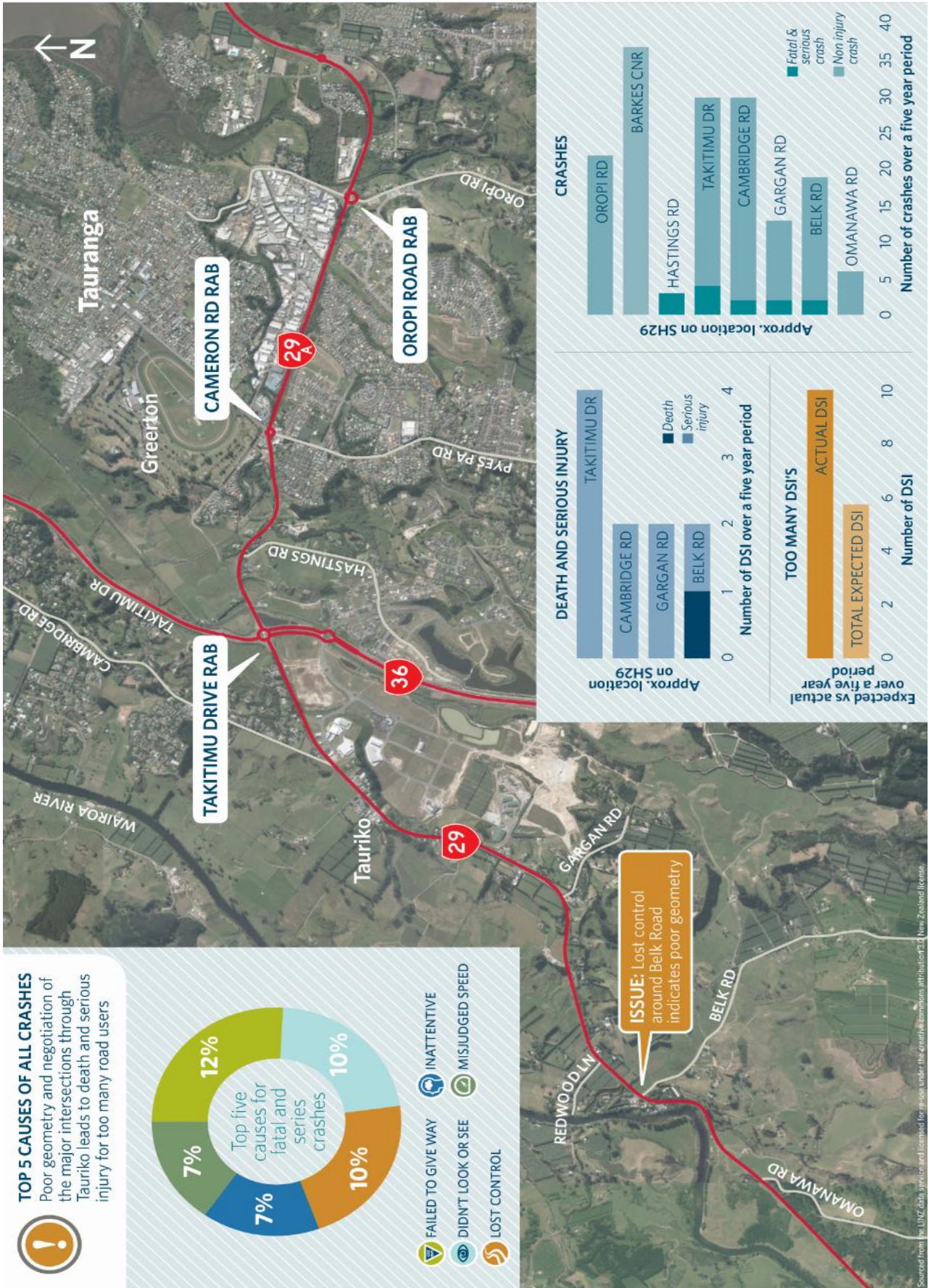


Figure 19, Causes of DSI



3.2 THE BENEFITS

Three benefits are sought from the investment strategy.

Benefit 1: An efficient truck freight route to the Port of Tauranga

This benefit recognises that maintaining efficient and resilient road freight access to the port through Tauriko is an important contribution to New Zealand's economy. SH29 is the source of around 19% of all freight traffic to/from the port. Import and export activities at the port contribute around 9% of New Zealand's GDP.

Unreliable freight access to the port through Tauriko would impact economic growth. Poor network planning for future growth in Tauriko will result in degradation to the overall reliability of SH29.

Benefit 2: Tauriko's liveability and connectivity is enhanced

This benefit captures urban development liveability objectives. It is related to connectivity to community amenities by local roads and public transport, and measured by the proportion of local trips on SH29. Contributing KPIs include providing better mode choice in the form of public transport, walking and cycling, providing local connections to amenities, and integrated network planning.

Benefit 3: Improved road safety on the state highways through Tauriko²

This benefit captures the need to improve road safety through the study area by reducing DSIs by 50%. This is consistent with the KiwiRAP star rating and aims to reduce deaths and serious injuries.

3.3 DEVELOPMENT OF THE SMART INVESTMENT OBJECTIVES

The investment objectives were jointly decided by the Western Corridor Group. The travel time and variability metric for investment objectives 1 and 2 provides 60% of the investment objective total. Of this total, two thirds is allocated to the effective functioning of SH29 as a nationally strategic freight route.

The Western Corridor Group identified urban "people" journeys as important to the liveability of the new developments in the western corridor and the travel time and variability metric can be applied to SH29A and SH36. Although these journeys are important in the sub-regional context, the weightings reflect these journeys are not as important as those on SH29.

Investment objective three contains a principal metric to encourage internalisation (to take local journeys off the SH network) and a number of contributing KPIs. Contributing KPIs include mode shift, public transport patronage, public transport and cycleway coverage, and access to local amenities. These KPIs were selected from the Transport Agency planning and investment KPIs.

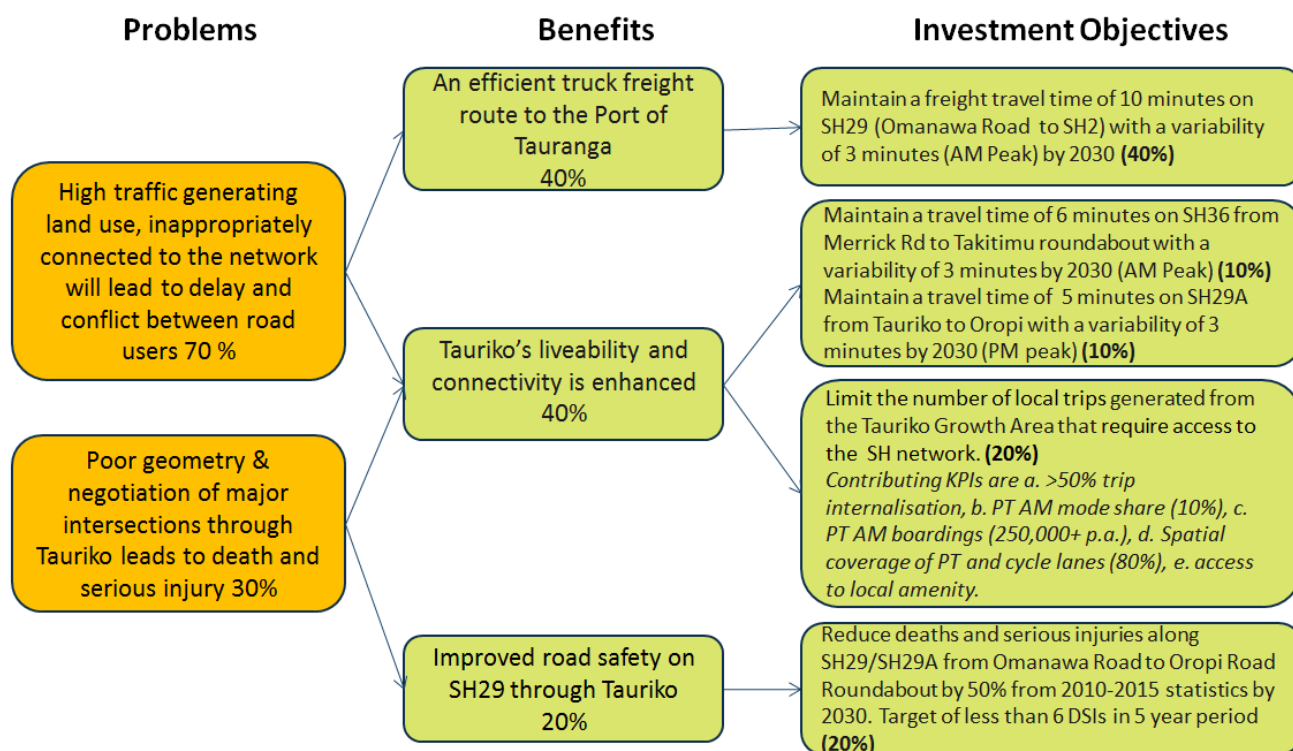
The final objective provides a line-of-sight back to problem statement one that poor geometry and negotiation of major intersections through Tauriko leads to death and serious injury. Improving the Kiwi RAP Star Rating has predictable improvements to expected DSIs and will be used as a proxy.

3.4 THE PROBLEMS, BENEFITS SOUGHT AND INVESTMENT OBJECTIVES

Figure 20 summarises the problems, benefits and SMART investment objectives for the PBC.

² Safety on the rest of the network will be included in the proposed Tauranga PBC - including in the Tauriko study area

Figure 20, Problems, benefits and SMART objectives



3.5 ALIGNMENT TO EXISTING STRATEGIES/ORGANISATIONAL GOALS

Table 5 identifies how this strategic case aligns to other directly relevant organisational strategies.

Table 5, Strategic Case alignment

ORGANISATION	STRATEGIC DOCUMENT	ISSUES AND PRIORITIES	ALIGNMENT
Upper North Island Strategic Alliance ³	UNI 30 Year view	Tauriko is one of the inter-regional road corridors ranked High in terms of the scale of benefits for UNI partner focus.	Maintaining efficient freight access along SH29 through Tauriko
New Zealand Transport Agency	SH Activity Management Plan (SHAMP)	The SHAMP incorporates programme business cases for safer and more resilient state highways. A safer, more resilient SH29 is identified as a priority 1 for implementation between 2018 and 2021.	Better safety outcomes is an aim of this PBC
SmartGrowth	SmartGrowth strategy 2013	Enhance the liveability and balanced growth of the Western Bay of Plenty through a shared vision of the future. Tauriko is part of the western corridor within the strategy.	The Tauriko Network PBC seeks to enhance Tauriko's liveability and necessary state highway improvements.
Regional Council	Regional Land Transport Plan 2015 to 2045	Land use change in Tauriko have the potential to impact on the strategic transport function of SH29 and placing pressure on the existing road network. Priority projects include a long-term solution for SH29 through Tauriko.	The issues in the RLTP for the Tauriko area are supported by the Tauriko Network PBC.

³ Northland Regional Council, Whangarei District Council, Auckland Council, Waikato Regional Council, Hamilton City Council, Bay of Plenty Regional Council and Tauranga City Council in collaboration with Auckland Transport, KiwiRail and the Transport Agency

ORGANISATION	STRATEGIC DOCUMENT	ISSUES AND PRIORITIES	ALIGNMENT
TCC	Tauranga Transport Strategy (TTS)	<p>Growth: Traffic generated by growth is undermining efficient access to the port along SH29/Takitimu Drive</p> <p>Safety: High collective risk SH29 Tauriko to Takitimu Drive. SH29/Cambridge Road Intersection</p> <p>Resilience: SH29 - Poripori Road to Takitimu Drive alternative</p> <p>Non-car travel: Distance of southern growth areas from key destinations</p> <p>Accessibility: Lack of key facilities</p>	The same issues of growth, the need to maintain the efficiency of SH29, safety and liveability have been identified in this Tauriko Network PBC.

3.6 ISSUES AND CONSTRAINTS

An uncertainty log has been prepared for the Tauriko PBC. This is provided in Appendix IV. References to growth areas A - I are as per Figure 10. A summary of the key items is provided below in Table 6:

Table 6, Uncertainty Log

Factor	Indicative Timeframe	Uncertainty	Impact on programme	Comments
Factors affecting demand				
Tauriko Business Estate (A & B) and 'The Lakes' (C)	2016-2061	Near certain	Medium	Residential and commercial areas likely complete within 10 years, industrial activity capacity for 45 years
Keenan Road (D) and Tauriko West (E)	2021-2046	More than likely	Medium	5,000 dwellings likely to start and complete within next 30 years
Lower Belk Road (F) and Merrick Road (H)	2031 -2061	Likely	Low	100ha industrial development and extension to Keenan Road UGA into adjoining area
Upper Belk Road (G) and Upper Joyce Road (I)	2046+	Possible	Low	Largely beyond time horizon of PBC. 8,000 dwellings.
Tauranga Northern Link (TNL)	2022	Near certain	Medium	Construction is likely to take five years.
SmartGrowth Settlement Plan		More than likely	High	SmartGrowth are recommending which UGAs (land use options) will be switched on and when
Factors affecting supply				
SH29	2025	Near Certain	Medium	Timing of the improvements to SH29 Piarere to Tauriko will likely improve overall safety of the corridor
Upgrading Kaimai Rail Tunnel	2025	More than likely	Medium	Proposed upgrade on the Kaimai Rail Tunnel may increase rail reliability, encouraging HCV off SH29
Factors affecting cost				
Alternative and Option Costing inaccuracies lead to wrong choice of programme		Possible	Medium	Costs taken from previous projects where similar alternatives and options have been constructed. Where alternatives and options have not been used, a cost has been carefully considered and estimated

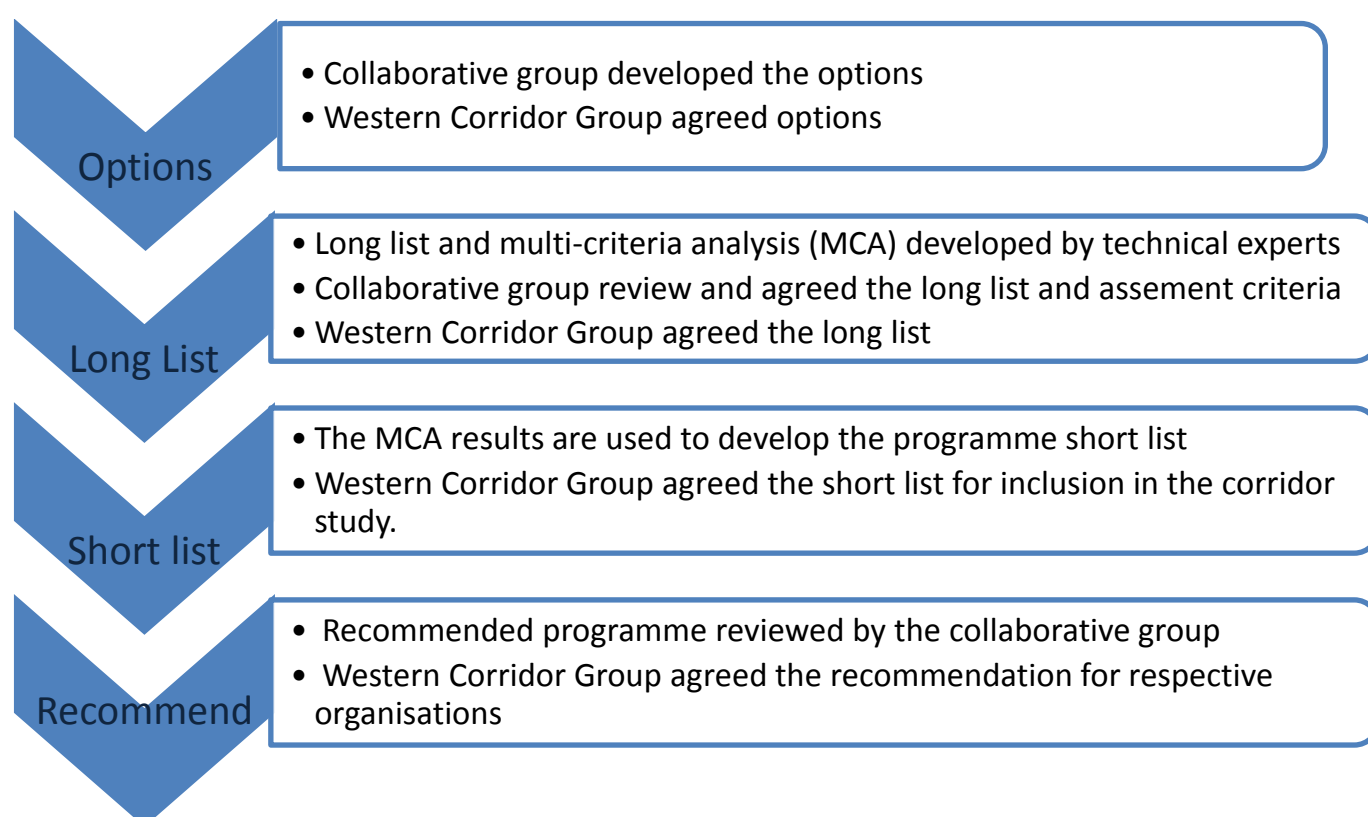
PART B – DEVELOPING THE PROGRAMME

Process and principles

The alternatives and options for the Tauriko Network PBC were developed collaboratively with TCC, WBoPDC, and the Regional Council (the Western Corridor Group). Whole-of-network solutions were modelled with the partners being able to consider the implications of different interventions for the respective organisation. It enabled joined-up thinking for different intervention combinations alongside each partner taking responsibility for its potential contribution.

The SmartGrowth Western Corridor Group agreed the decisions at key stages. Key stages outlined in Figure 21 included: generating options and alternatives, developing long list of programmes, short listing of programmes, selecting a recommended programme.

Figure 21, Key stages of the collective forum (the SmartGrowth Western Corridor Group)



Right traffic on the right road

At the outset of the Western Corridor Strategic Study the partners approached the problems and interventions within a paradigm of minimising the number of local connections to SH29.

In addition, it was agreed that attention would be paid to a strong set of local east-west routes to distribute any traffic loads across the existing north-south arterial routes: SH29A; Cambridge Road, SH36, Cameron-Pyes Pa Road, Oropi Road-Fraser Street. This approach relieves pressure on SH29 and helps to connect communities by providing local roads for local trips.

The network approach

The 'network' functionality through the lens of the SmartGrowth western corridor settlement pattern review considered the full suite of intervention options. The 'network' includes existing and new local arterial roads and

connections, public transport and demand management activities, and state highway interventions. Network programmes have been modelled over the 30 and 50 year SmartGrowth time horizons.

Stakeholder collaboration in developing options and programmes

The SmartGrowth forum promotes a collaborative effort of a wide set of stakeholders. This has significant benefits in promoting liveability and freight movement objectives to determine an urban form integrated with the strategic transport network in the corridor. Objectives, programmes and recommendations have been jointly agreed. It also enables staged levels of investment and planning commitment amongst the partners.

Planning constraints

SmartGrowth settlement pattern choices in the western corridor were progressed at the same time as developing this PBC. A planning constraints study and specific iwi consultation for the settlement pattern review were undertaken by the Western Corridor Group. The consultation feedback and planning constraints informed the assessment of transport options, alternatives and programmes.

Considering costs in programme development

Costs and co-investment were not considered during the long-listing or short-listing process. The most effective networks (short list) were established first before considering co-investment and costs. This is standard practice in the development of a PBC. The process represents a level of commitment and agreement to invest from the participating parties. This commitment is confirmed in a heads of agreement between the parties.

4 Alternatives and Options

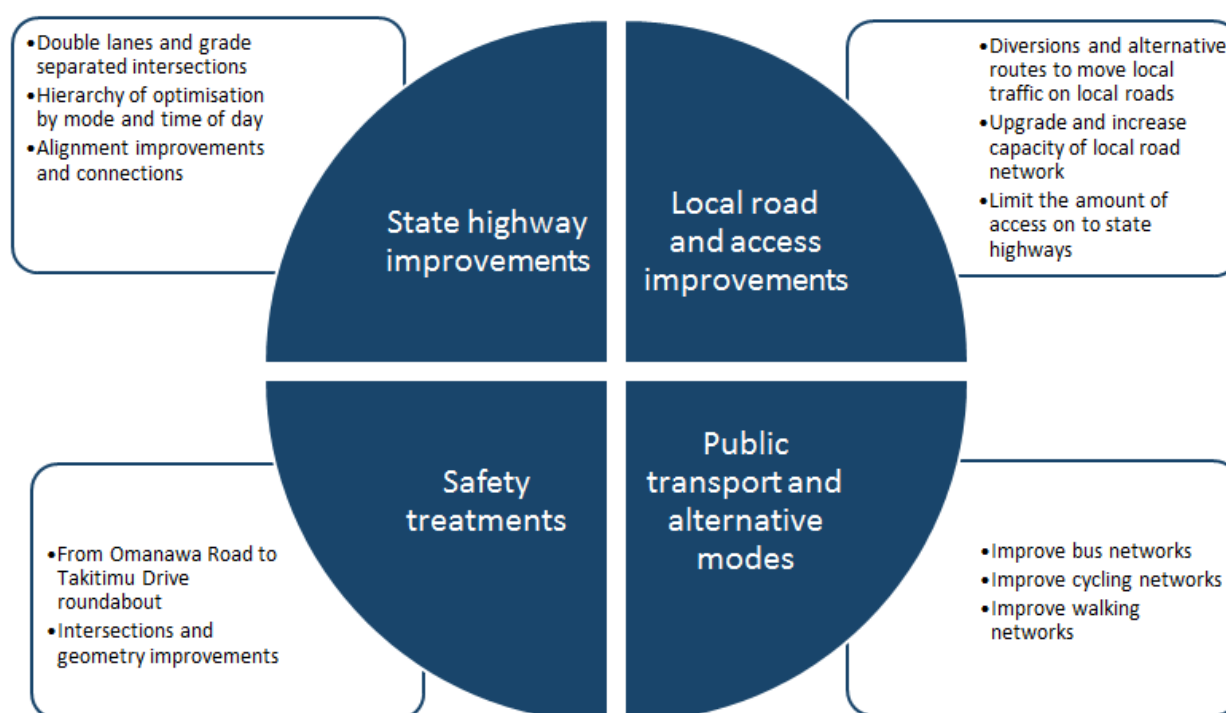
4.1 ALTERNATIVE AND OPTION GENERATION

Strategic responses were developed to address the two problems identified in section 3.

Intervention options were developed with a 30 year view. For example, public transport may not have a significant impact on traffic demand in the early stages of development, but the more mature development may require an effective public transport system.

Options considered

Figure 22, Alternatives and Options Considered



A long list of 57 options was developed across a range of alternatives. The complete options long list for assessment can be found in Appendix VII.

4.2 ALTERNATIVE AND OPTION ASSESSMENT

An options short list was generated by assessing the long list against the following criteria:

- Alignment with Investment Objectives
- Any fatal flaws such as impracticality, infeasibility, and significant cultural impacts.

Options not taken forward to the short list included:

- Price toll to encourage 50 max freight (lower prices for 50 max freight)
- Invest in the use of rail freight movements (road to rail transfer)
- Planning constraints (limit growth)
- Public transport by rail.

Qualitative evaluation by the partners agreed that these options were either inconsistent with the adopted strategic framework (e.g. limiting growth) or were unlikely to have a useful impact on the problems (e.g. further investing in rail for freight or public transport). The complete detailed options assessment can be found in Appendix VI together with the rationale for bringing forward or excluding options. On the following page is an illustrative extract of the detailed options assessment.

5 Programme Development and Assessment

5.1 PROGRAMME DEVELOPMENT

The programmes were developed by applying an increasing level of intervention in the NZTA hierarchy of interventions⁴. Each programme moves up the hierarchy of intervention.

- Programmes 1 and 2 were developed as ‘optimisation’ programmes which follow an increasing level of intervention but do not add capacity. The purpose of these programmes is to test if optimisation interventions are sufficient for the predicted traffic demand.
- Programmes 3, 4, and 5 add SH capacity either to the existing alignment (3) a northern bypass (4) or southern bypass (5). These three programmes tested the performance against the freight objective and safety objective (1) whilst providing demand management under objectives 2 and 3.
- Programmes 6 and 7 are capacity heavy state highway programmes. These programmes have a strong focus on the freight and people journeys (objectives 1, 2 and 4) but limited demand management, local road connectivity and spatial coverage of public transport and cycling.
- Programme 8 is a combination of Programme 3 interventions with the local ring road added.

Table 7 provides the selection criteria and key themes for each programme. The programme intent and indicative options is provided in section 5.2.

Table 7, Programme summary and selection / testing criteria

PROGRAMME	PROGRAMME SELECTION CRITERIA	PROGRAMME THEMES
1 PT and Optimisation	Tests SH optimisation with demand management ⁵	Public transport, local ring road, and reduced access to SH29
2 PT, Optimisation and Priority Lanes	Tests SH optimisation with freight priority and demand management	Public transport, local ring road, reduced access to SH29, and additional freight priority lane on existing alignment.
3 State highway capacity improvements	Assesses performance improvement with added SH capacity. Existing alignment with demand management.	Public transport, reduced access to SH29, and double lanes on SH29 and SH29A
4 SH29 Northern Bypass	Assess performance improvement with SH bypass. New alignment north with demand management.	Public transport, local ring road, and SH29 Northern Bypass
5 SH29 Southern Bypass	Assess performance improvement with SH bypass. New alignment south with demand management.	Public transport, local ring road, and SH29 Southern Bypass
6 State highway capacity and Northern Bypass	Tests heavy capacity build on SH network	SH capacity improvement on the existing alignment and Northern Bypass
7 State highway capacity and Southern Bypass	Tests heavy capacity build on SH network	SH capacity improvement on the existing alignment and Southern Bypass
8 Local ring road, PT with state highway capacity improvements	Tests Programme 3 with local road connections added	Public transport, reduced access to SH29, and double lanes on SH29 and SH29A. Local east west ring road.

⁴ · Firstly, planning and developing an integrated land use and transport pattern that stages growth to coincide with available capacity on the network

· Then identifying opportunities to manage traffic growth to utilise the network more efficiently and provide appropriate mode choice.

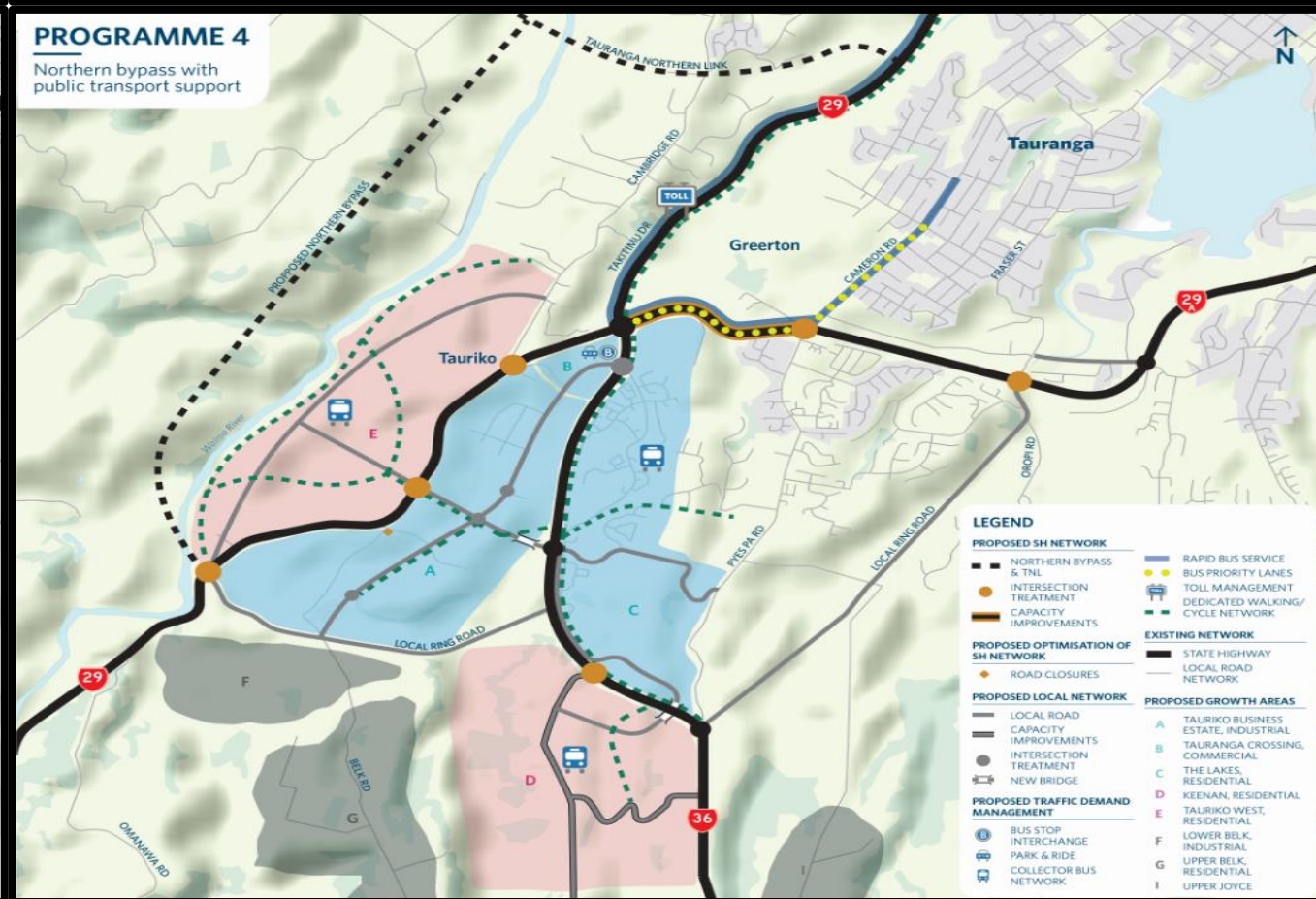
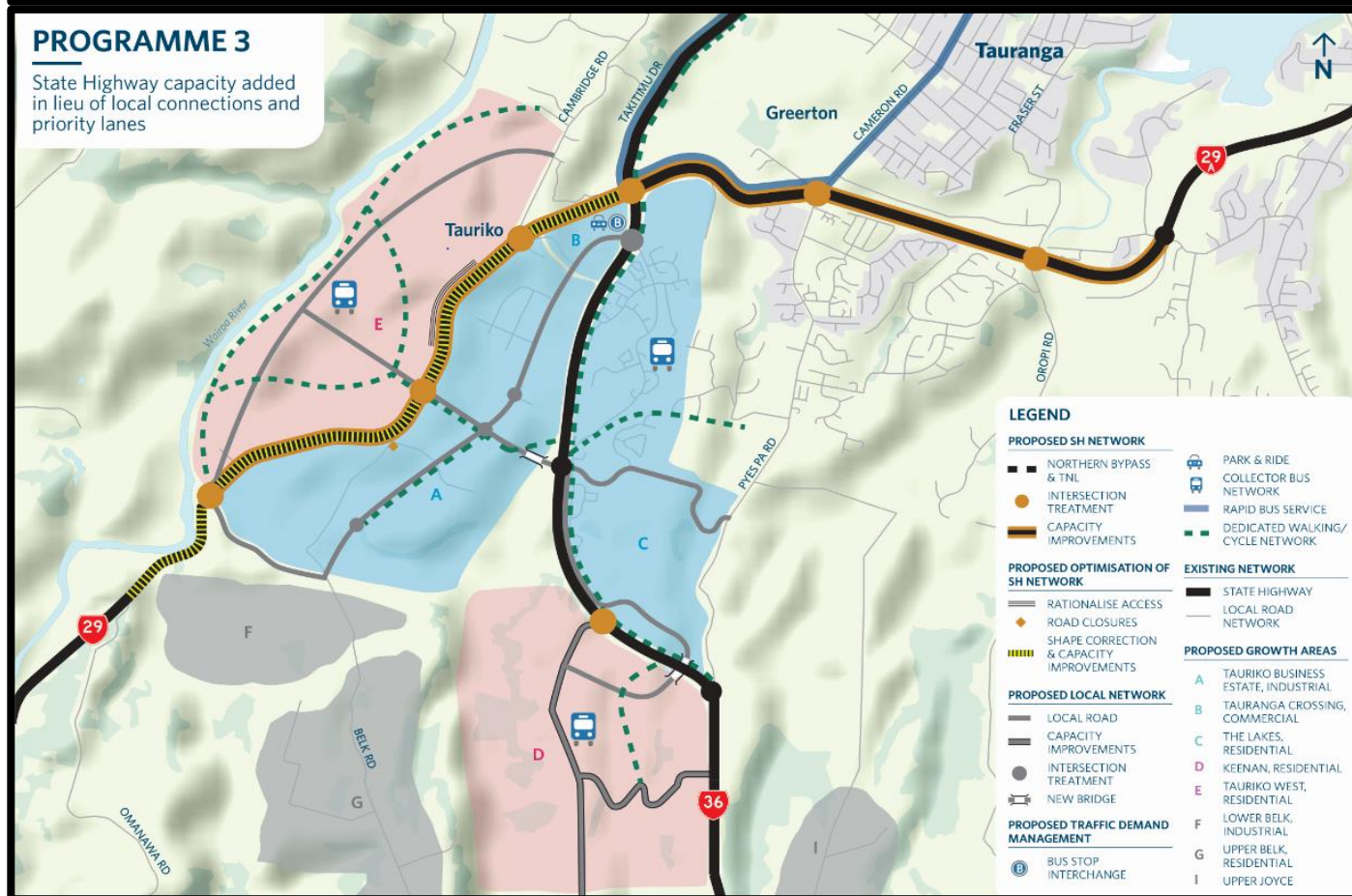
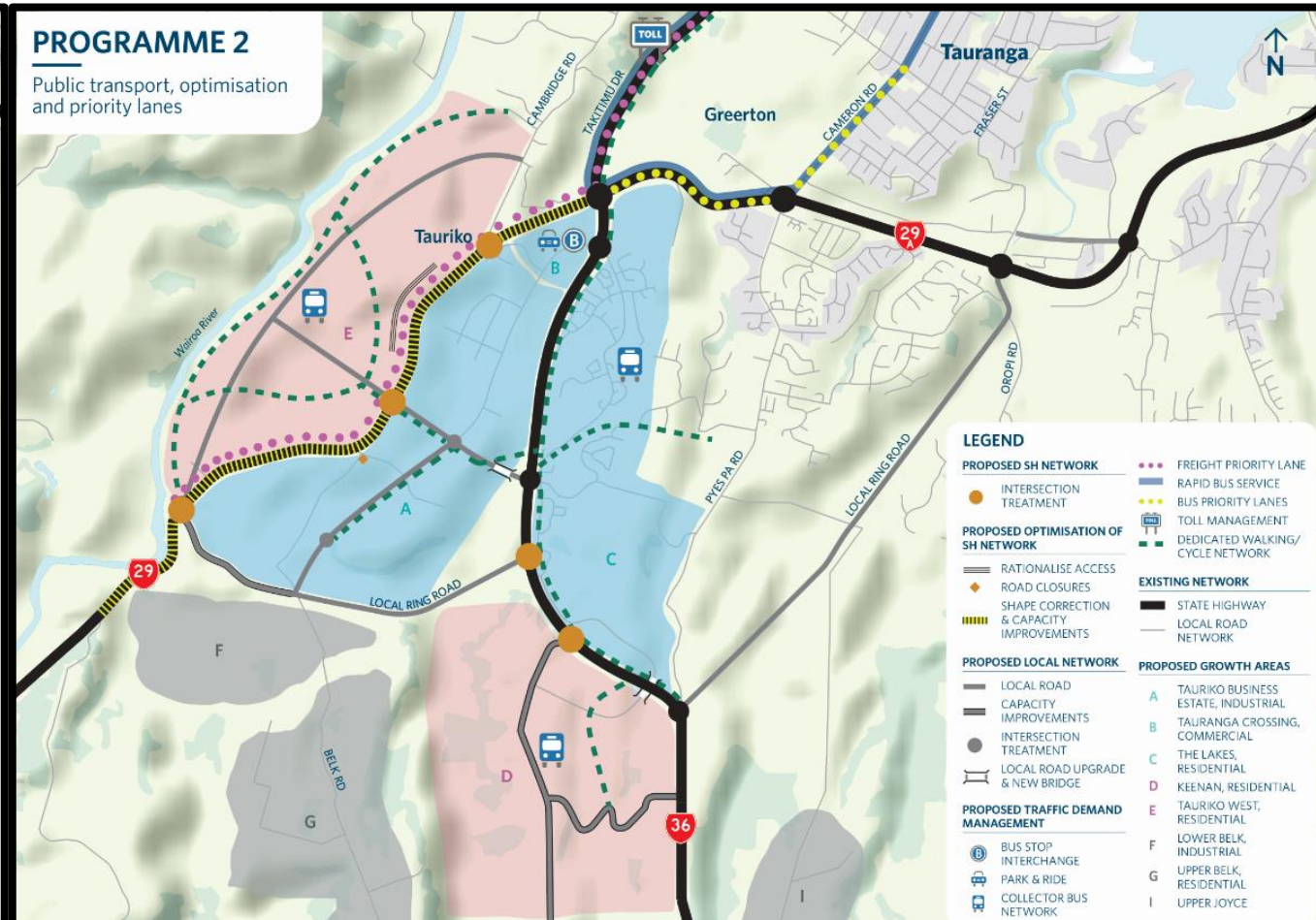
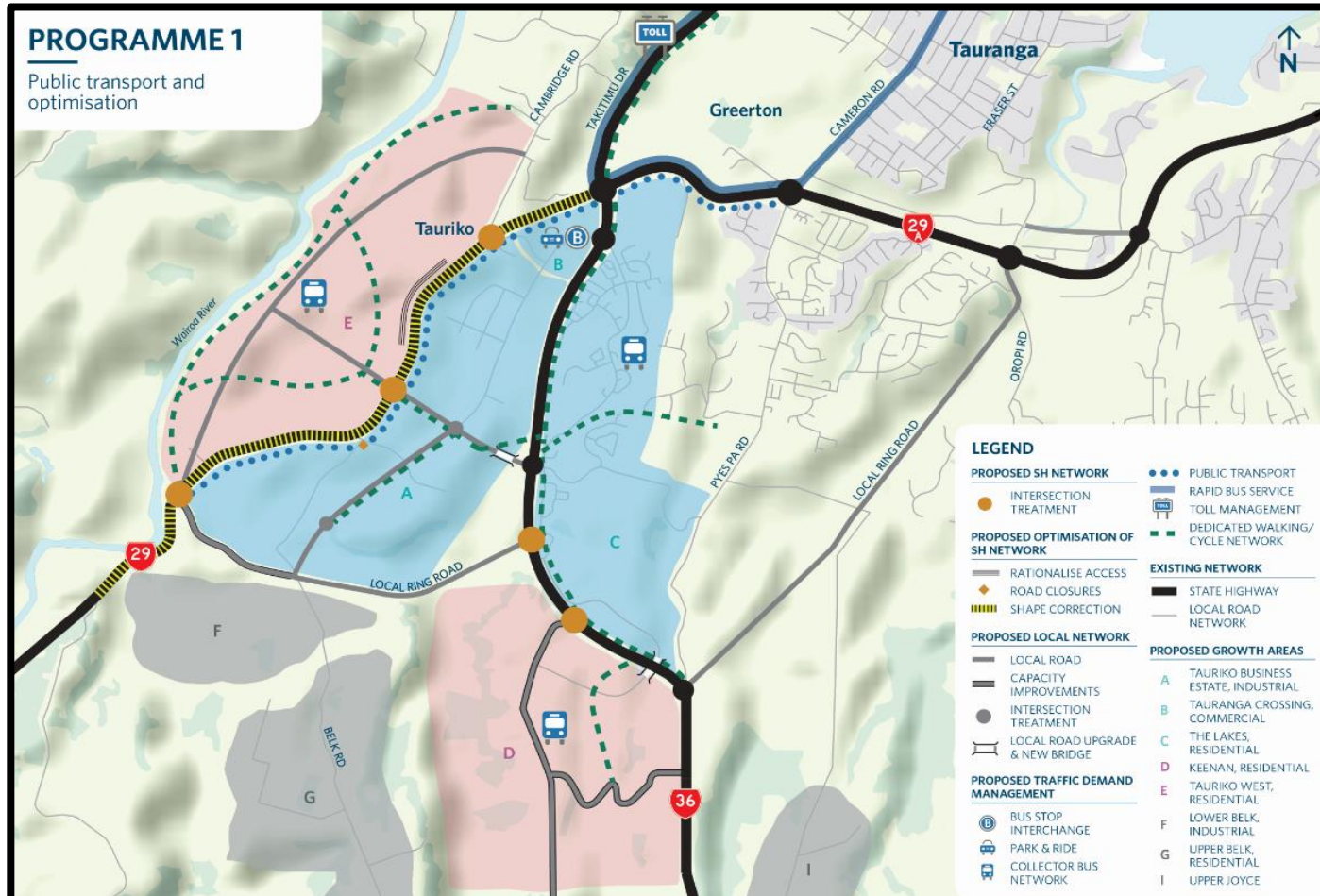
· Then optimising the use of the existing network through road marking, signage, phasing of signals, ramp metering, etc

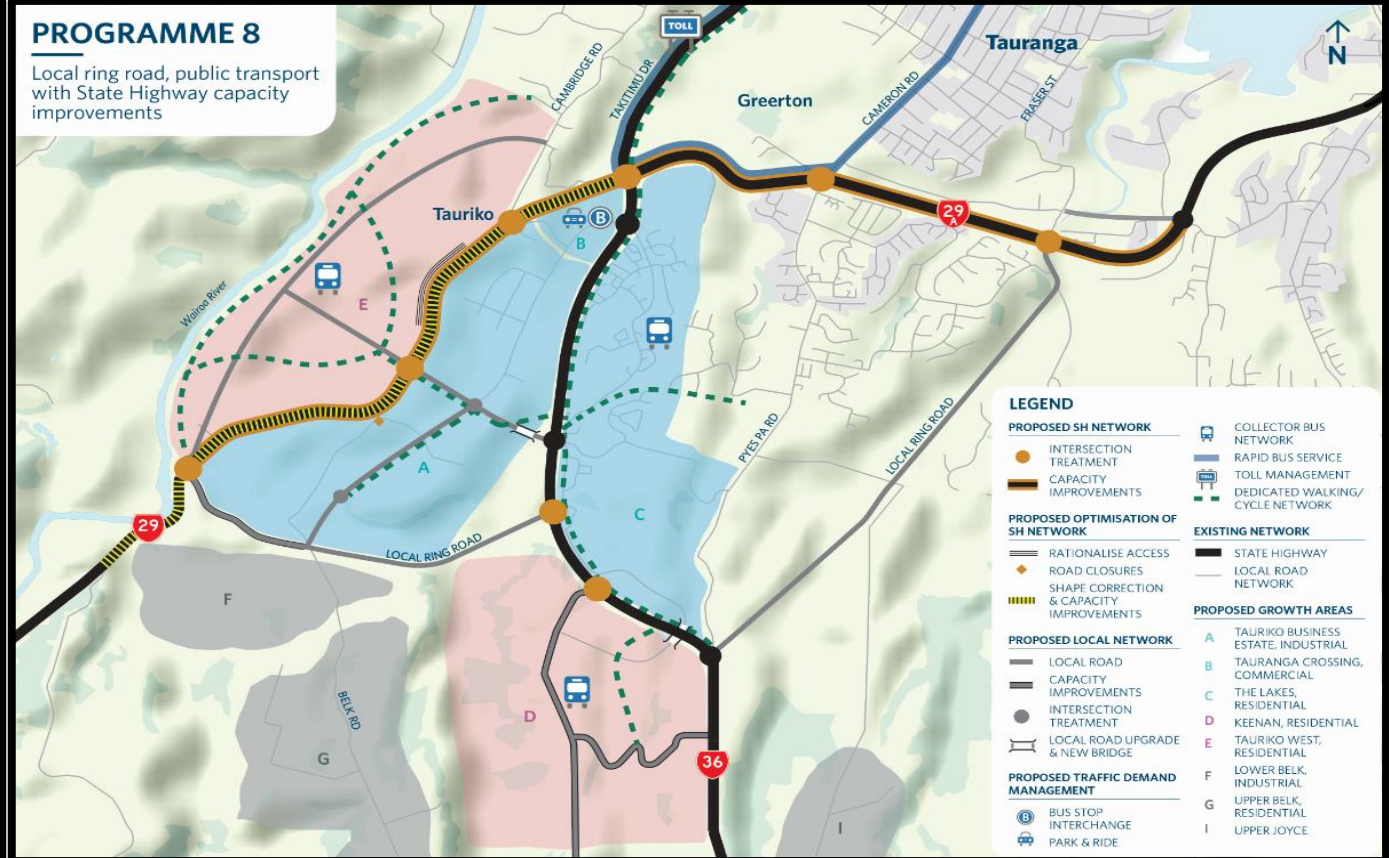
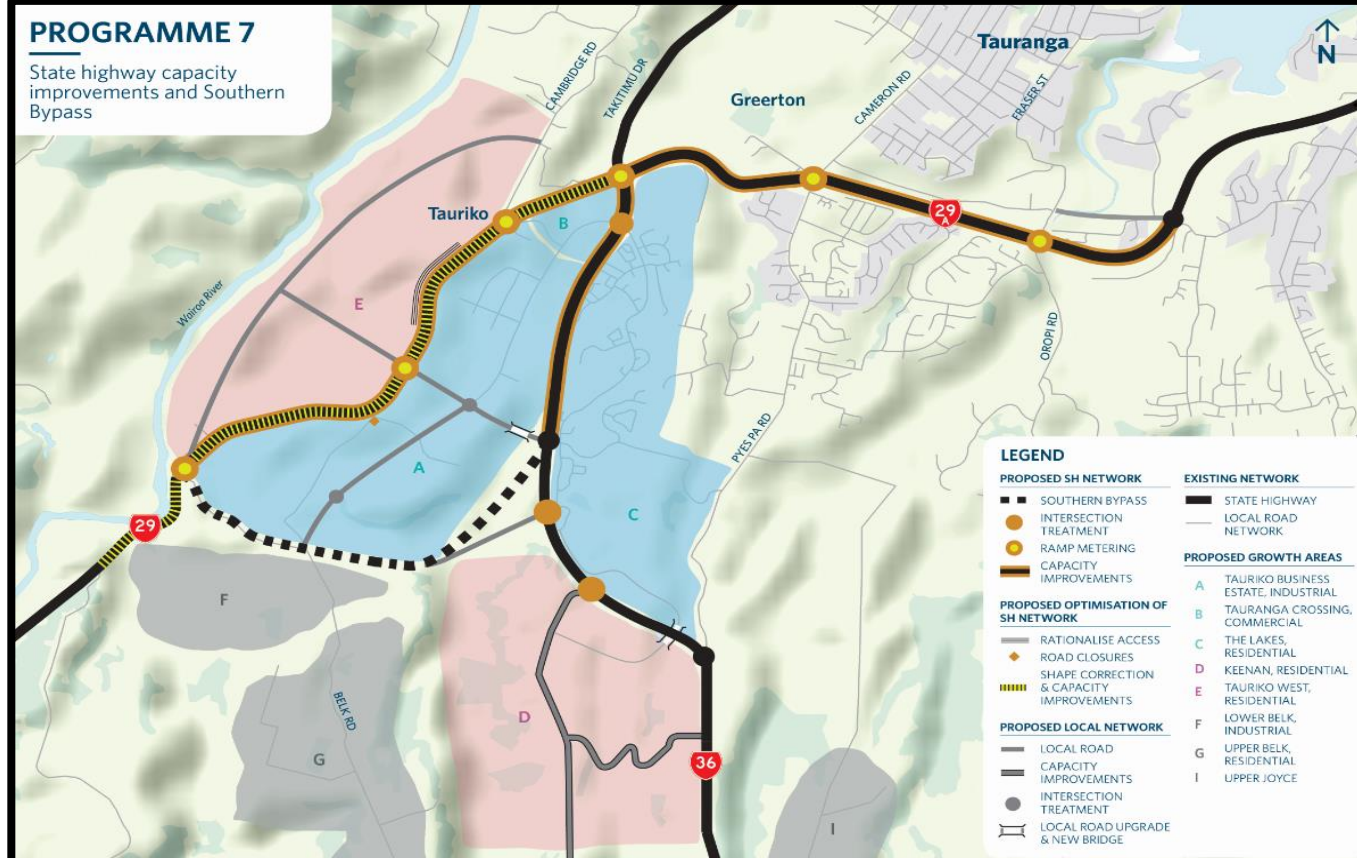
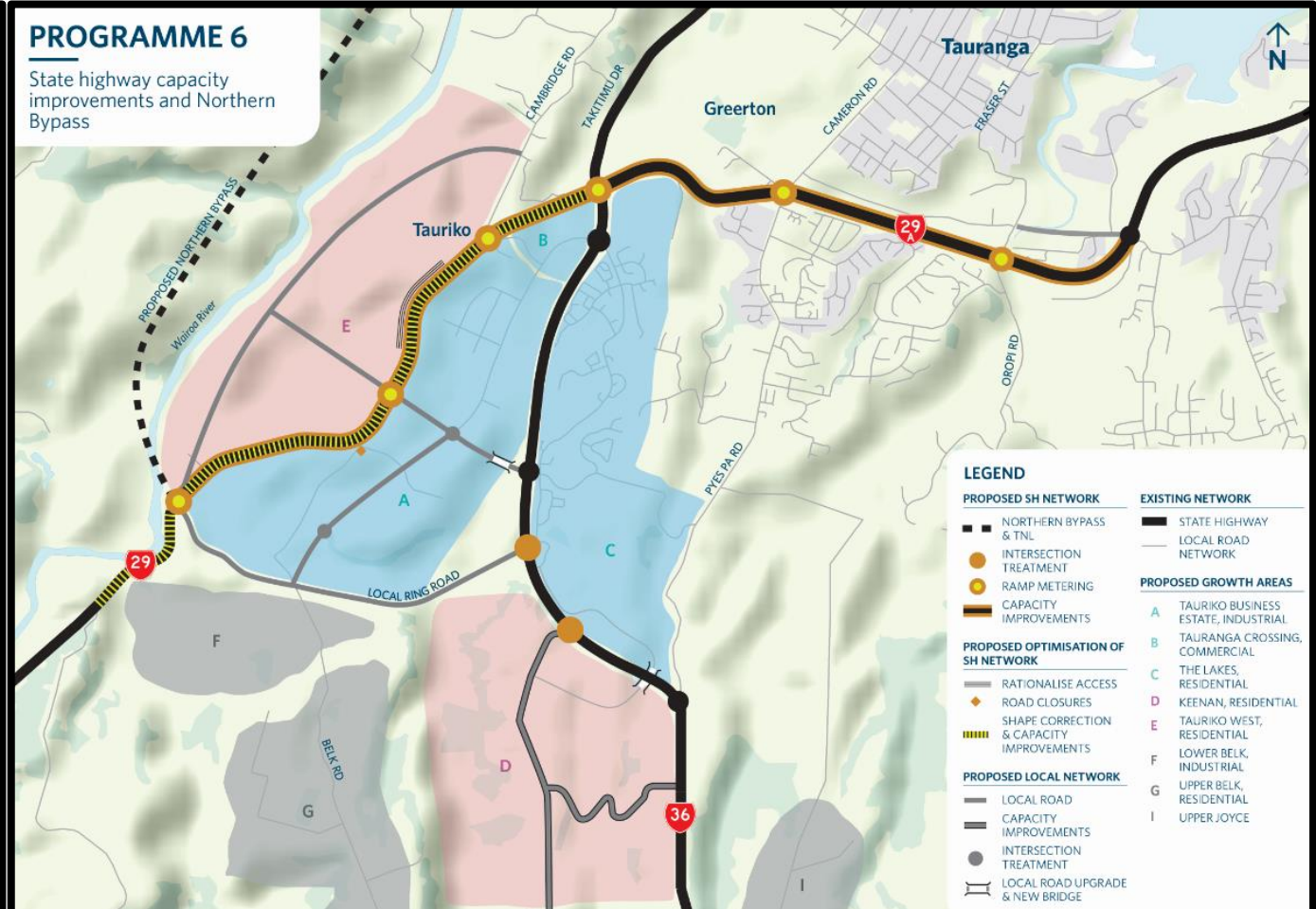
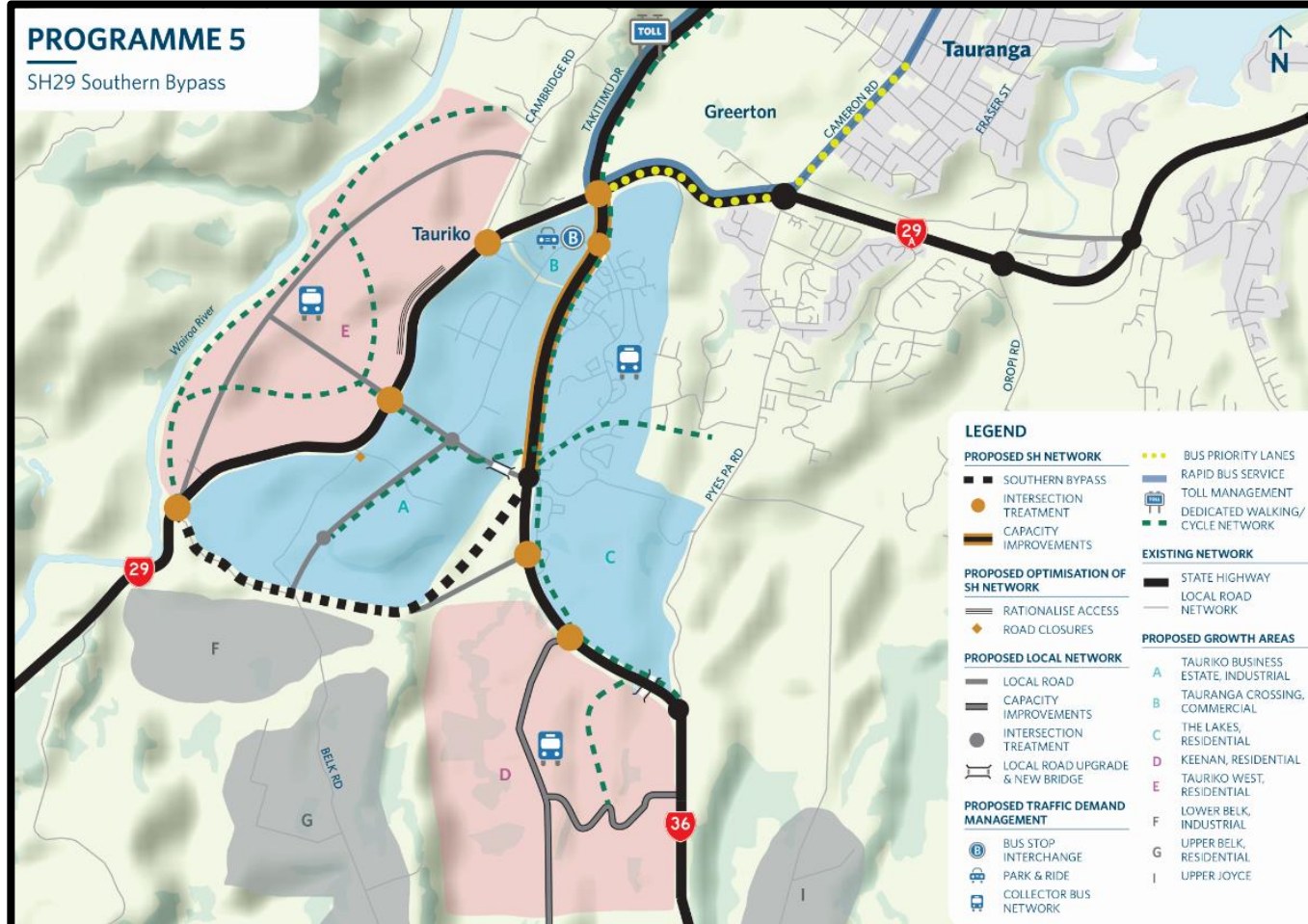
· And finally, considering investment in new infrastructure, matching the levels of service provided against affordability and realistic need.

⁵ Demand management has the objective of encouraging motor vehicle users to use alternative means of transport when appropriate while also reducing total vehicle kilometres travelled.

5.2 PROGRAMME LONG LIST

Eight programmes were developed for the long list. A graphic summary of these programmes can be found in this section with greater detail provided in Appendix IX.





5.3 DO MINIMUM OPTION

The ‘do minimum option’ includes:

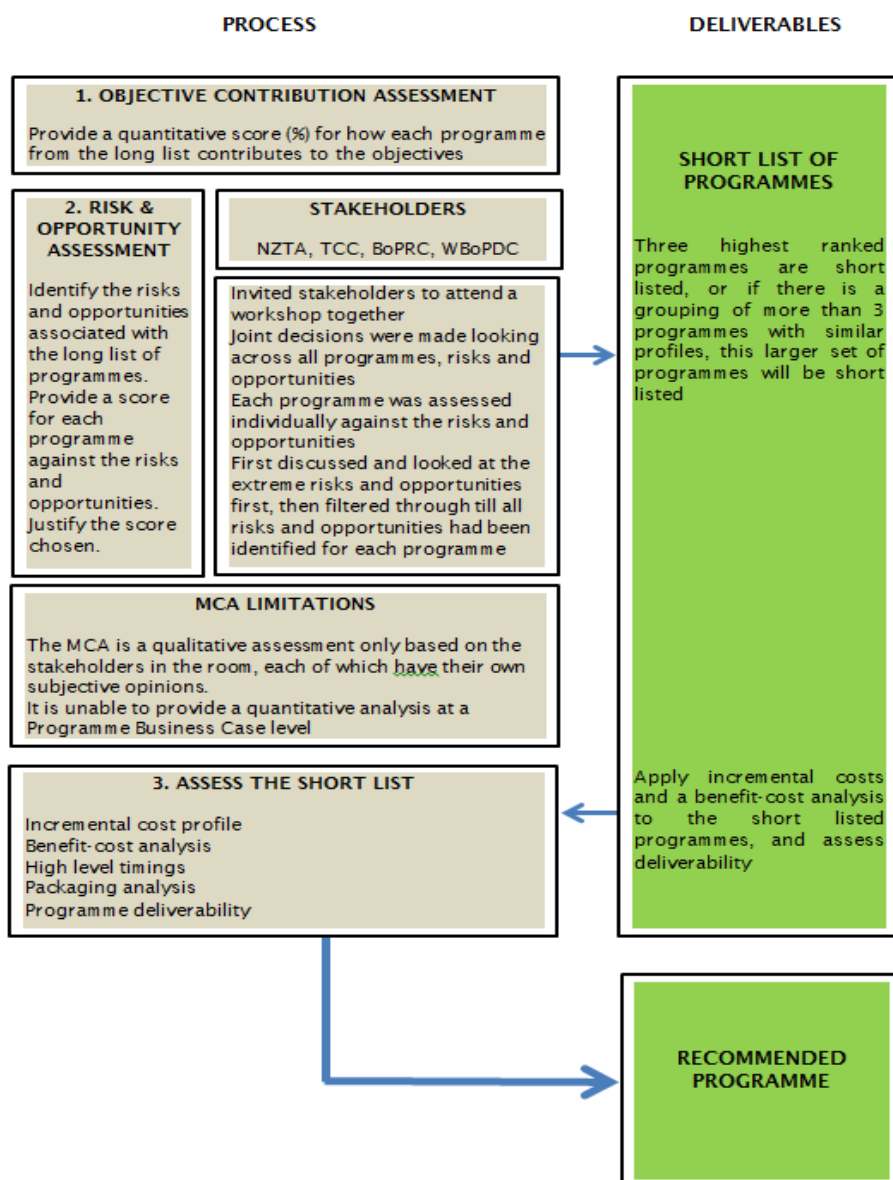
1. Allow current land use areas to build out to completion: UGA A, B and C
2. Upgrade Kennedy Road to a collector standard from SH36 to Taurikura Drive
3. SH36 and Kennedy Road intersection upgrade to a bridge, linking Pyes Pa West (C) and Tauriko Business Estate (A)
4. Kennedy Road upgrade to a collector standard from Pyes Pa Road to SH36
5. Construction of Takitimu Drive slip lanes
6. Upgrade of Takitimu Drive Roundabout and Taurikura Drive Roundabout to three approach lanes roundabouts.

5.4 PROGRAMME ASSESSMENT

A multi-criteria analysis (MCA) was developed for the assessment of the long list of programmes to determine:

- the performance of the programmes relative to the investment objectives;
- the risks and opportunities of each programme.

Figure 23, Full Multi-Criteria Analysis process



Objectives were assessed as follows:

Investment objectives 1 and 2: Travel time and journey time variability

Investment objectives 1 and 2 relate to the journey time variability on SH29, SH29A and SH36. The methodology for this assessment was:

- Determine volume/capacity ratio for each link in each programme, for freight and urban journey routes
- Determine average speed
- Determine travel time for each link
- Determine reliability (variability) based on standard relationship between congested speed and standard deviation of travel time.

Note that 'over achievement' (journey time) has been assessed negatively in the MCA, although the outcome actually performs well against the target (i.e. some programmes that provide a better journey time for the nationally strategic freight route get a negative performance rating). The negative assessment arises as the over achievement may induce additional traffic and may represent premature investment.

Investment Objective 3: Internalisation and contributing KPIS

Predicted internalisation (non-SH trips) of trips based on the level of infrastructure to encourage non-car modes, connectivity to amenities and network capacity. Contributing KPIS: a. mode choice, b. PT boardings, c. spatial coverage of cycling and PT, and d. access to local amenity.

- TDM strategies implemented for each programme - more TDM measures improves the contributions to the objective
- Capacity and state highway improvements implemented for each programme - where network design encourages local journeys to use the state highway decreases the contributions to the objective.

Investment Objective 4: Improved road safety on SH29 through Tauriko

- Using Kiwi RAP Star Rating as a proxy for numbers of DSIs
- Determine weighted average star rating for each midblock and intersection for each programme.

The complete multi-criteria analysis can be found in Appendix XI. Note that economic analysis was applied to the short-listed programmes rather than the long list. Each programme was assessed against the investment objectives and assigned a score. A five scale scoring system was used where 5 means it did not contribute and 1 means it contributed most.

The summary result of the MCA is outlined in the following page. Table 8 outlines link numbers as referenced in the MCA.

Table 8, Link number and associated descriptions

	Link	Location Description
External Network	1	South of Belk Road
	2	Cambridge Road
	3	North of Takitimu Drive Roundabout
	4	Cameron Road
	5	North of Oropi Road Roundabout
	6	East of Oropi Road Roundabout
	7	South of Pyes Pa Roundabout
Internal Network	8	Between Belk Road and Cambridge Road
	9	Between Cambridge Road and Takitimu Drive Roundabout
	10	Between Takitimu Drive Roundabout and Cameron Road Roundabout
	11	Between Cameron Road Roundabout and Oropi Road Roundabout
	12	Between Takitimu Drive Roundabout and Taurikura Drive Roundabout
	13	Between Taurikura Drive Roundabout and Kennedy Road Roundabout
	14	Between Kennedy Road Roundabout and Pyes Pa Road Roundabout

Outcome: Network Performance & Capability			Programme 1	Programme 2	Programme 3	Programme 4	Programme 5	Programme 6	Programme 7	Programme 8
Indicative Treatments			SH Optimisation + Local Road Improvements + TDM	As per P1 + SH Priority Lanes	SH Capacity Improvements + TDM	Northern Bypass + Local Road Improvements + TDM	Southern Bypass + Local Road Improvements	Northern Bypass + SH Capacity Improvements	Southern Bypass + SH Capacity Improvements	Programme 3 + Programme 1 +/- Oropi Road Link
Objective 1	Maintain a freight travel time of 10 minutes with a variability of 3 minutes (AM Peak) by 2030	40%	5.00	5.00	3.00	1.00	3.00	1.00	3.00	2.00
Objective 1 Justification			Even with an assumed 30% moving to local roads, Links 1 and 8 would be nearing capacity and link 9 would be double	Better than programme 1 as taking some vehicles off but car traffic alone forecast to exceed 2 lane capacity along this route and large % of external traffic will be unaffected by TDM measures	Route likely provides capacity to take expected traffic. Queries link 9 which may be nearing 4 lane capacity. So confirm if moved into next stage	New route tying directly into TNL for traffic aiming to go into port would likely exceed travel time and reliability requirements. Also option to travel via Takitimu Road	Tauranga Crossing will likely exhibit high levels of congestion. Partially mitigated by twin flyover	As per programme 4 but with additional capacity improvements along SH29A, volumes likely to be well under capacity	As per Programme 5 with additional capacity improvements along SH29A Slightly affected by additional traffic from lakes and TBE entering SH	As per Programme 3 but taking additional pressure off highway by offering local road connections
Objective 2	Maintain a people travel time of 6 minutes on SH36 from Merrick Rd to Tauriko Roundabout with a variability of 3 minute by 2025 (AM Peak) Maintain a people travel time of 5 minutes on SH29A from Tauriko Roundabout to Oropi Roundabout with a variability of 3 mins by 2030 (PM)	20%	5.00	5.00	2.00	3.00	4.00	3.00	1.00	1.00
Objective 2 Justification			Forecast demand on links 12 and 10 would easily double current travel time when assessing against v/c ratio	Barkes corner slightly improved with bus lane but even with 20% PT uptake, still assumed to well exceed capacity	Removal of Port traffic and increase of capacity along SH29A will likely ease congestion. Tauranga Crossing traffic increases	As per 2 but assumed slightly improved as 2/3 traffic (standard bypass) coming off SH29. and also some benefits for local link	Assumed slight improvement with flyover of twin roundabouts, offset by sending additional traffic down from SH29/36 merge	As per programme 3 with increased capacity but lack of PT expected to have negative impact forcing additional vehicles on to the SH	As per programme 6 but increase in capacity of both SH29 and SH36 provides choice to SH29 users	As per programme 3 but increased local connections in conjunction with TDM measures assumed to provide the best balance.
Objective 3	Limit the number of local trips generated from the Tauriko Growth Area that require access to the SH network. Maintain ratio of <1 from 2016	20%	2.00	1.00	4.00	3.00	4.00	5.00	5.00	3.00
Objective 3 Justification			TDM measures and likely additional congestion on network expected to promote more internal movements	TDM measures and likely additional congestion on network expected to promote more internal movements. Further reinforced by lanes for PT	Additional lanes for cars may have less of an incentive for car users to have internal trips only	As per 3, but improved local connections likely to assist in keeping traffic off SH	As per 3	Lack of PT and over-supply of road capacity will have little incentive for residents to have internal movements	as per 6	as per 3 but improved local connections likely to assist in keeping traffic off SH
Objective 4	Reduce deaths and serious injuries by 50% from 2015 statistics by 2030	20%	5.00	5.00	4.00	4.00	4.00	1.00	2.00	3.00
Objective 4 Justification			Optimisation likely to improve Star rating between Omanawa to Takitimu, but limited work at RABs still leave high risk	As per 1 but priority lanes further take traffic off road, and separate turning facility at Takitimu Roundabout removes some of the risk	Upgrade works proposed at all intersections, separating traffic and median protection likely to greatly improve DSIs and Star Rating	Takes some traffic off on to new high star road, but remainder has dangerous intersections and alignments so SH problem remains	As per 4 but additionally merging 2 SH traffic streams increasing risk. Grade separation on twin RABs mitigates some risk	Upgrades of existing as well as new alternate route combined with intersection upgrades provide high assumed star and DSI savings	As per 6 although combining 2 SH traffic together creates another conflict point	As per 3 supplemented with local traffic taken off SH

Risks and Opportunities

How the risks and opportunities can inhibit or assist the overall project outcome was assessed on a graduated scale. For example, the more each risk inhibits the project outcome for each programme, the greater the risk rating.

Each programme was rated against assessment criteria covering the risks and opportunities outlined in Table 9.

Table 9, Identified risks and opportunities

CRITERIA	EVALUATION
Design	How innovative and complex is the design of the programme and associated options?
Resilience	How will the programme operate during an event on a given section once implemented?
Operability	How will the programme operate under normal conditions?
Supporting the SmartGrowth settlement plan	How will the programme support the optimal location and sequencing of urban growth areas identified in the settlement pattern?
Natural environment	How will the natural environment be impacted by each programme?
Community severance	How will the programme affect community severance?
Cultural	How will the delivery of each programme be delayed by important cultural sites such as iwi land and heritage sites?
Promoting Public Transport Share	Will the programme risk modal uptake of public transport (infrastructure, operations and capital investment)?
Promoting Active Modes for Local Trips	How will the programme risk, limit or encourage active modes for local trips (infrastructure and capital investment)?
Constructability	How difficult is the programme and associated options to build?
Functioning network during construction	How is the traffic flow affected during construction of an online solution?
Multi-party co-investment	How likely are contributions from co-investment sources other than the Transport Agency?
Stakeholder acceptance	How likely will there be resistance from key stakeholders to the proposed programmes?

There are limits to what a MCA can achieve at the PBC phase. For example, there are high level assessments about community severance, urban form based on stakeholder consultation, partner collaboration, existing reports, recent dialogue and new studies.

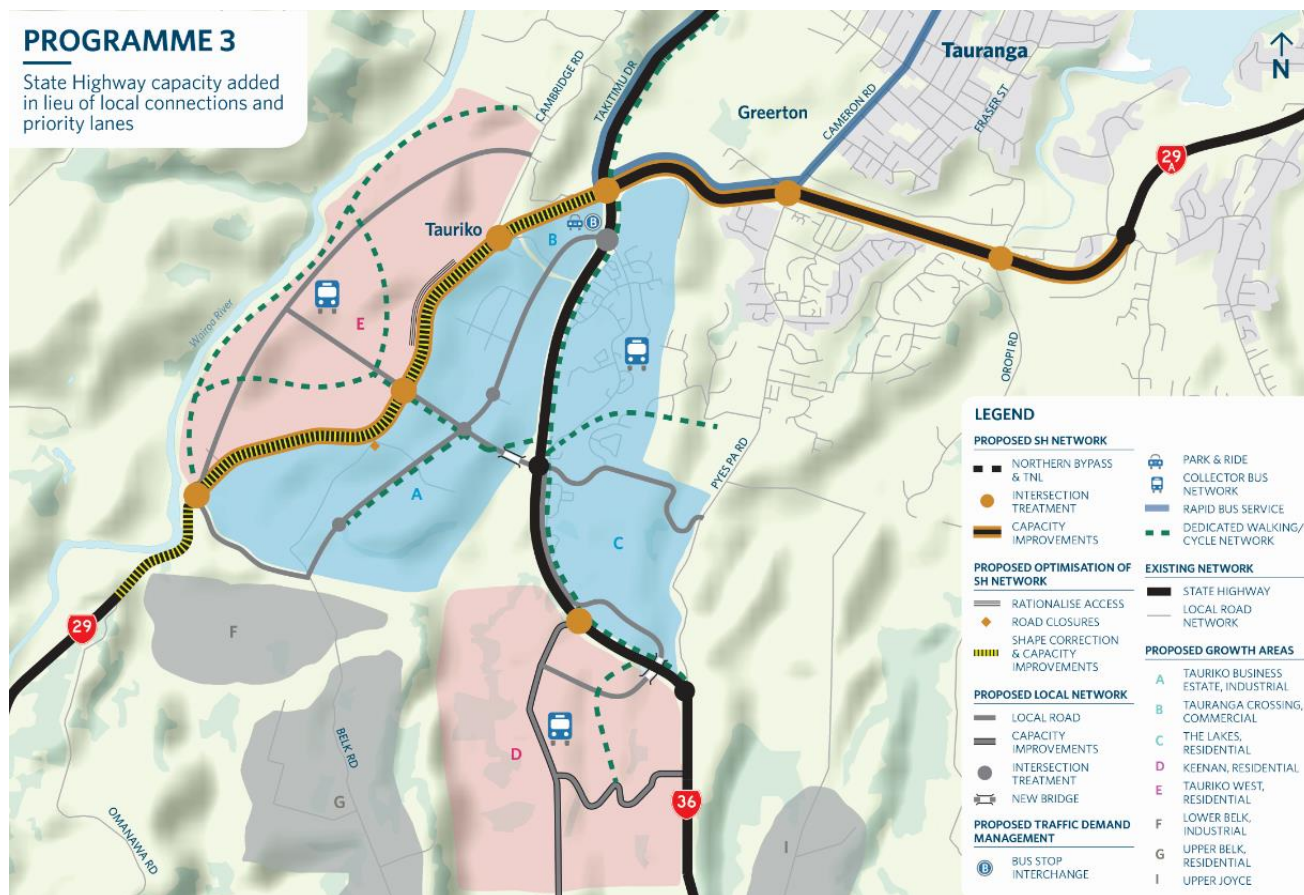
Based on developing high level design alternatives, the next phase of the project will provide greater scope for alternative assessment against the RMA Part 2 principles. Once high level design alternatives are considered, public consultation and stakeholder engagement will be undertaken that may provide further feedback and clarity for the MCA. There will be an opportunity to update the MCA as an outcome of the next phase.

MCA MATRIX	PROGRAMMES							
RISKS/OPPORTUNITIES	1	2	3	4	5	6	7	8
Design				Topography and major river crossing	Existing corridor constraints to find alignment, assuming decision is not made prior to development progressing	Topography and major river crossing	Existing corridor constraints to find alignment, assuming decision is not made prior to development progressing	
Constructability	Building the ring road	Building the ring road, adding additional lanes to existing SH	Narrow points, already slipping	Topography and major river crossing	Existing corridor constraints to find alignment, assuming decision is not made prior to development progressing	Topography and major river crossing	Existing corridor constraints to find alignment, assuming decision is not made prior to development progressing. Narrow points on existing already slipping	Narrow points, already slipping
Functioning Network During Construction	Minimum disruption to SH network		Significant works on the SH, potential to install local connections to minimise disruption by providing alternative routes (i.e. Belk road), some minor realignments could be done offline	Very little to existing state highway, majority offline	Affecting urban journeys but other local connections can help mitigate	Significant works on the SH, potential to install local connections to minimise disruption by providing alternative routes (i.e. Belk road), some minor realignments could be done offline	Significant works on the SH, potential to install local connections to minimise disruption by providing alternative routes (i.e. Belk road), some minor realignments could be done offline	Significant works on the SH, potential to install local connections to minimise disruption by providing alternative routes (i.e. Belk road), some minor realignments could be done offline
Operability	Inability to cater for expected growth.	Inability to cater for traffic congestion	Improved with capacity upgrades	Could accept congestion if freight gone. Do not address current issues SH29A	Capacity significant risk as bringing local and regional traffic together	Issues on SH29A removed	Significant capacity improvement	Resilience provided through local connections
Resilience	Inability to cater for expected growth.	Slightly improved with priority lanes	Resilience reduced due to reduction in local connections, though some still exist	Add resilience as alternate route	Alternate route	Alternate route	Alternate route	Resilience provided through local connections
Multi-Party co-investment	One party can't bear cost if expensive	One party can't bear cost if expensive	One party can't bear cost if expensive	One party can't bear cost if expensive	One party can't bear cost if expensive	NZTA heavy co-investment	NZTA heavy co-investment	One party can't bear cost if expensive
Stakeholder Acceptance	Drop in LOS complaints from local residents, local businesses, port etc.	Drop in LOS complaints from travellers not in priority lane etc. Improved for local journeys with Bus priority lane		Iwi potential, for north bypass. Local residents and businesses complaints for SH29A	Local Lakes community concern?, Disruption for Tauranga Crossing	Iwi potential concern?, for north bypass.	Local Lakes community, Disruption for Tauranga Crossing	
Supporting the SmartGrowth Settlement Plan	No Capacity for proposed land use accounted for in SH. Risk proposed land use doesn't happen. There are however opportunities for adjoining communities connectivity, traffic congestion relief. Assuming uptake of PT is low.	Limited Capacity for proposed land use accounted for on SH. Test level at which adding priority lane adds capacity of the network. Risk proposed land use doesn't happen. There are however opportunities for adjoining communities connectivity, traffic congestion relief. Assuming uptake of PT is low.	Enables capacity for development but query if it promotes the desired form of development	Not likely to provide capacity for full proposed roll out	Option provides more capacity in network. Removing industrial access, resulting in industrial on both sides of SH. Only developing industrial area in city	Enables capacity for development	Enables capacity for development. Significant impact on TBE and lakes	Enables capacity for development but query if it promotes the desired form of development
Natural Environment	Greenfields Belk, Pyes Pa, Oropi and stream crossing	Greenfields Belk, Pyes Pa, Oropi and stream crossing	Not going over stream, down valley etc.	Likely to be constructed near river, with river crossing		Likely to be constructed near river, with river crossing		Greenfields Belk, Pyes Pa, Oropi and stream crossing
Cultural	Potential cultural areas and battle site in general location	Potential cultural areas and battle site in general location	Staying generally on current less uncertain	Likely to be constructed near river, with river crossing. Potentially crossing Maori land	No major issues noted for TBE	Likely to be constructed near river, with river crossing. Potentially crossing Maori land	No major issues noted for TBE	Potential cultural areas and battle site in general location
Promoting Active Modes for Local Trips	Congestion on SH further incentive for active modes	Congestion on SH further incentive for active modes	lowering congestion, may lower incentive	Congestion on SH further incentive for active modes	Good existing trips for SH29.	No alternative modes offered	No alternative modes offered	lowering congestion, may lower incentive
Promoting Public Transport Share	connecting local roads, gives scope for other bus routes	Connecting local roads, gives scope for other bus routes. Further encouragement with additional lane	Removal of local ring road	Connecting local roads, gives scope for other bus routes. Further encouragement with additional lane		Removal of local ring road. Added capacity will not incentivise the use of PT	Removal of local ring road. Added capacity will not incentivise the use of PT	Connecting local roads, gives scope for other bus routes. Further encouragement with additional lane
Community Severance	Staying on existing alignment as already natural severance	Staying on existing alignment as already natural severance	Some existing local severance but options would need to consider ways to incorporate local communities into new land use	Removes major route into Port through Tauriko	Severs Lakes from TBE. Visual and noise issues.	Some existing local severance but options would need to consider ways to incorporate local communities into new land use	Severs Lakes from TBE. Visual and noise issues.	Staying on existing alignment as already natural severance, connects other communities.

5.5 PROGRAMME SHORT-LISTING

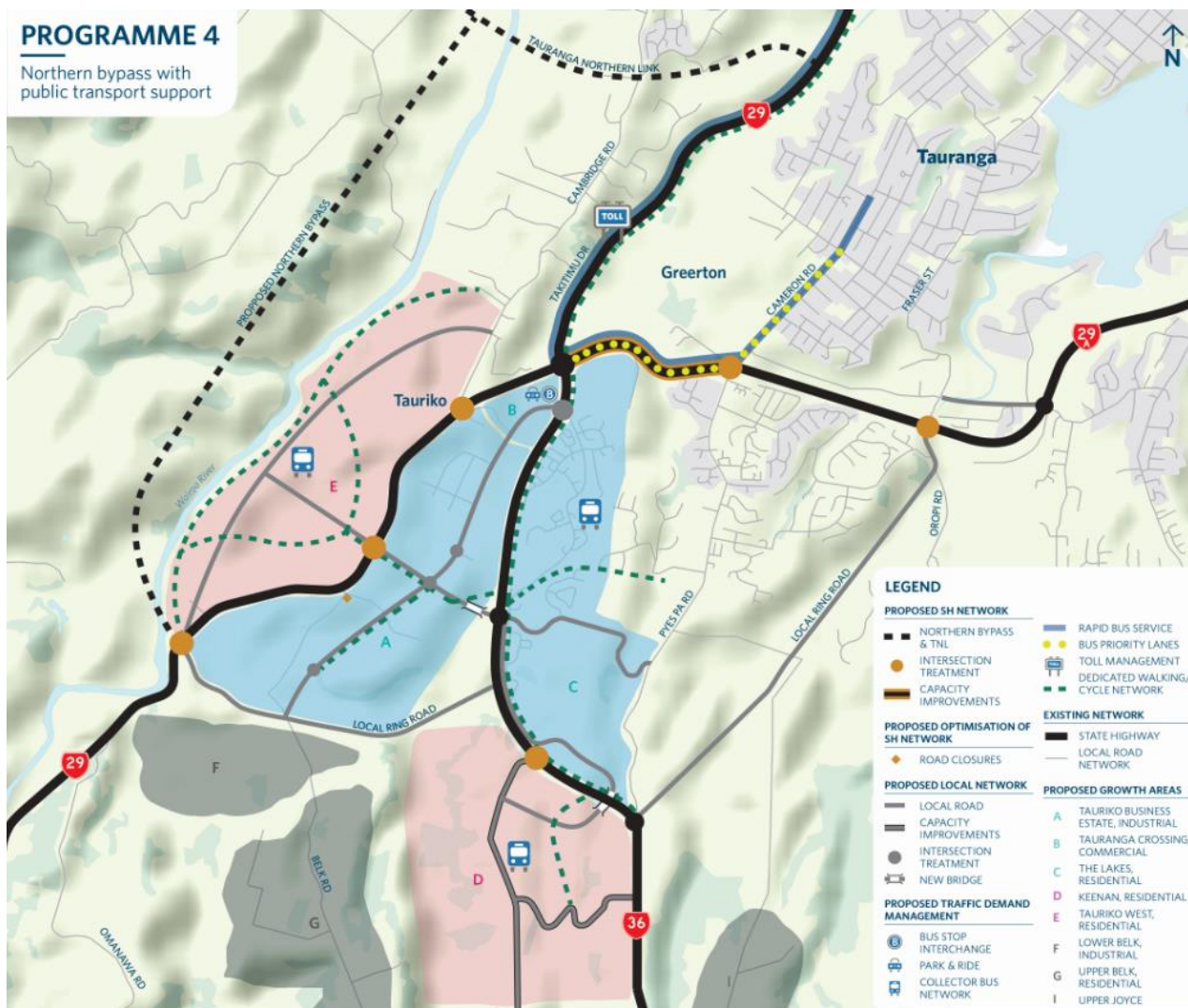
The programme short-listing was undertaken through a collaborative approach and aligned with the proposed Western Corridor land use pattern. The MCA workshop identified three programmes to proceed to the short list, which has been agreed by all stakeholders as programmes 3, 4, and 8.

Figure 24, Programme 3



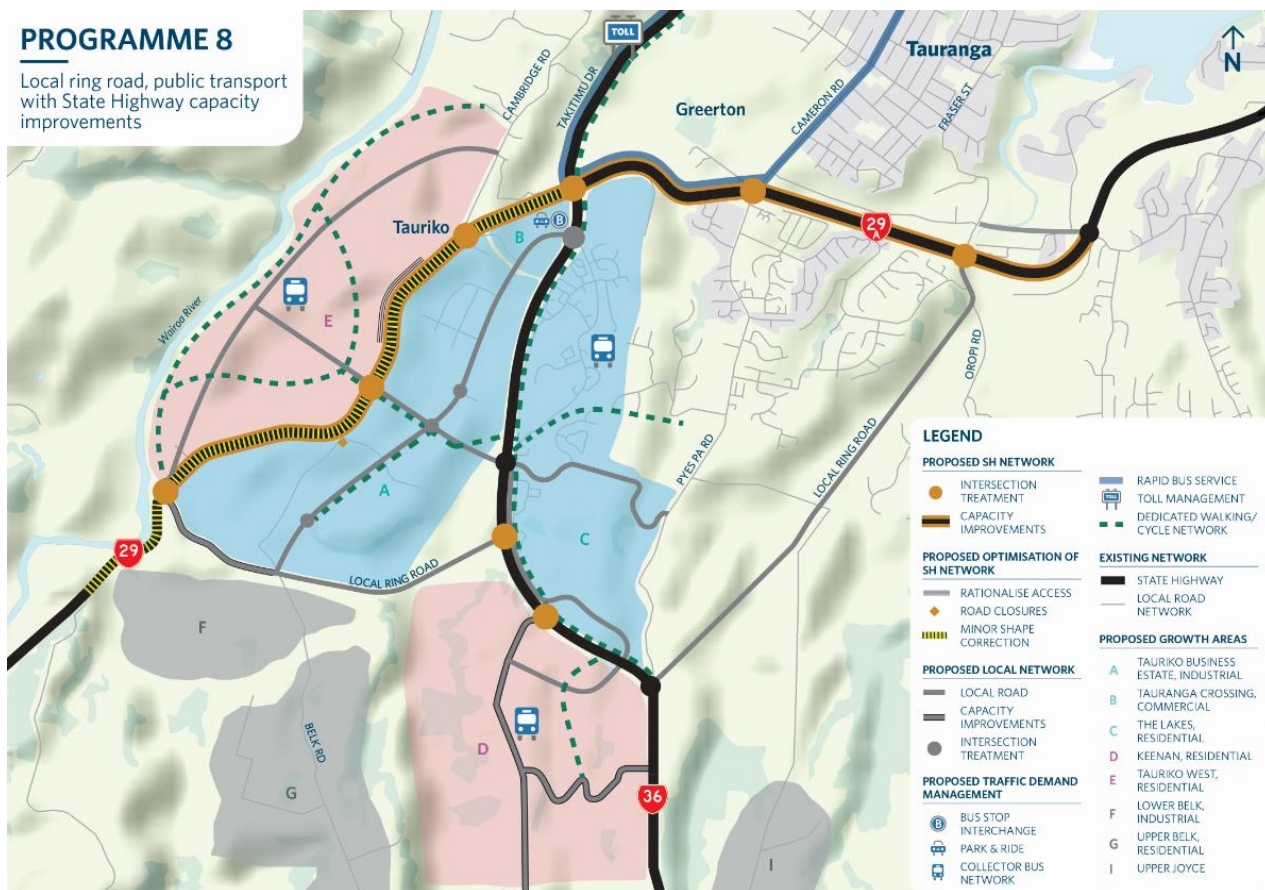
Programme 3: State highway capacity improvements	
Programme Intent	Additional lanes added to state highway. Increased local connections. PT
Indicative Options	SH29/A capacity improvements
	Shape corrections with horizontal and vertical improvements on SH29
	Rationalise access on SH29
	Minor local road network improvements
	TDM as per Programme 1 minus Toll Management

Figure 25, Programme 4



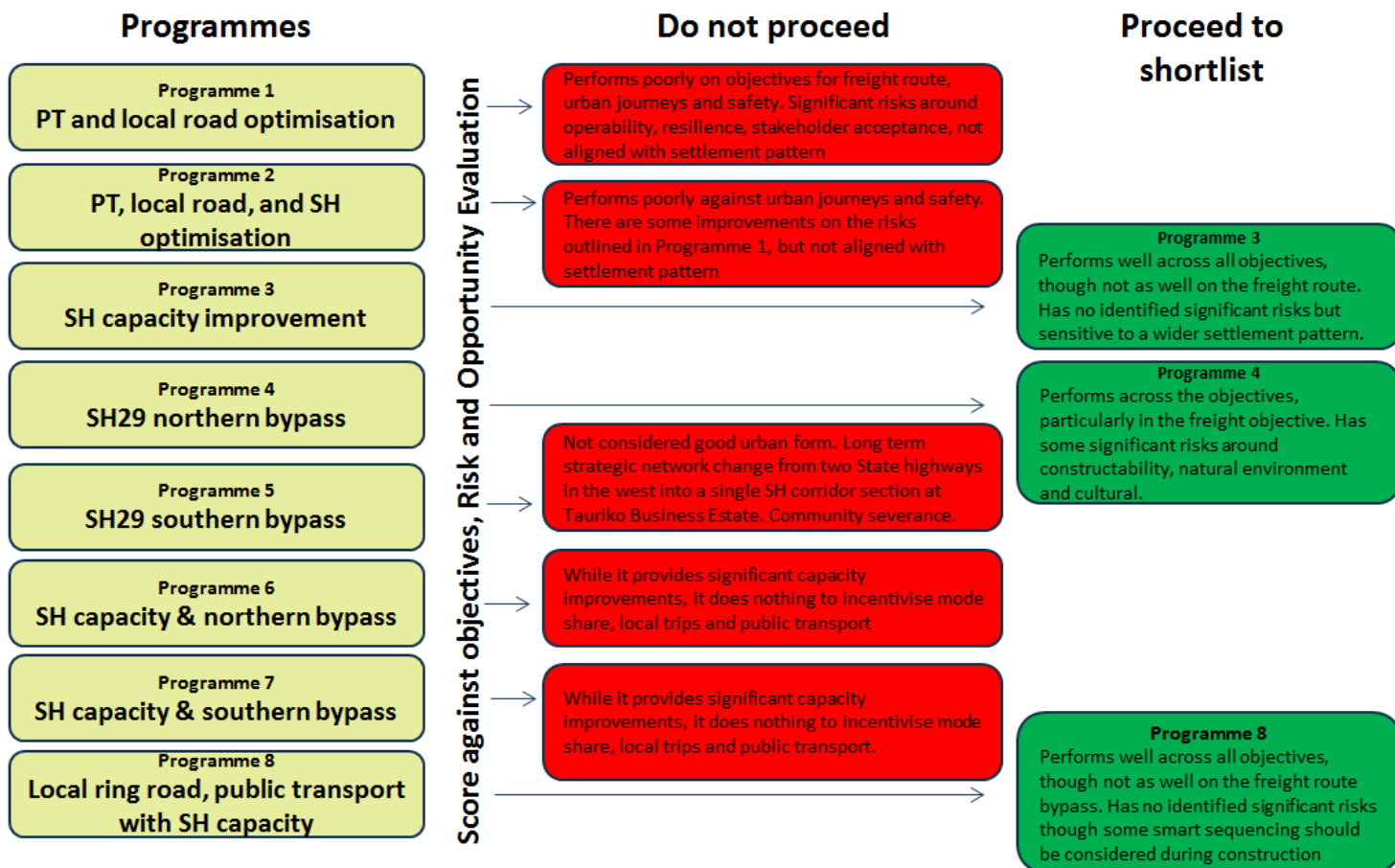
Programme 4: SH29 Northern Bypass	
Programme Intent	Bypass SH29, still keeping existing SH. Priority bus lanes into town. Increased local connections. PT
Indicative Options	Northern Bypass
	SH29A capacity improvements
	New local network improvements (including the ring road)
	TDM as per Programme 1 + Bus priority lanes

Figure 26, Programme 8



Programme 8: Local ring road, PT with state highway capacity improvements	
Programme Intent	Additional lanes added to SH. Increased local connections.
Indicative Options	SH29/A capacity improvements
	Shape corrections with horizontal and vertical improvements
	Rationalise access on SH
	New local network improvements (including the ring road)
	TDM - New collector bus services, Integrated smart ticketing, Real time travel information, Cycle and walking networks, Park and ride, School and workplace plans, Remove off-street parking legislation.

Figure 27, Programme short-listing process



5.6 SHORT LIST ASSESSMENT

Short-listing was based on the most effective programmes that achieved the objectives and had a low risk profile.

The MCA:

- Gave an overall programme score and included a network benefit cost ratio
- Included predicted performance of programmes against investment objectives
- Took account of the risk and opportunity profiles for the options.

Table 10, Programme short-listing assessment outcome

OBJECTIVE ASSESSMENT			PROGRAMME 3	PROGRAMME 4	PROGRAMME 8
Objective 1	SH29 Freight	Travel Time (mins)	7.14	8.42	7.13
		Variability (+/-) (mins)	2.67	2.90	2.67
Objective 2	SH36	Travel Time (mins)	5.08	5.46	5.60
		Variability (+/-) (mins)	2.25	2.34	2.37
	SH29A	Travel Time (mins)	2.65	2.58	2.61
		Variability (+/-) (mins)	1.63	1.61	1.62
Objective 3	Internalisation	Average	47%	46%	46%
	Contributing KPIs	Mode, PT, Coverage, local connectivity	Medium	Medium	High
Objective 4	Contributed Star Rating		3.89	3.30	3.89
	Potential High-Severity Crashes in 5 yrs		1.60	2.76	1.60
RISK PROFILE			MEDIUM	HIGH	LOW
BENEFIT COST RATIO			1.7	1.2	1.7
RECOMMENDED PROGRAMME			2	3	1

Notes to the results

- The BCR is a 'national' BCR including development contributions. The 'Government' BCR with costs covered by development contributions removed, will provide an improved BCR uniformly across the programmes (but with greater preference to programmes 3 and 8).
- Short-listed programmes were assessed against the risks and opportunities in Table 11. Of the three programmes, it was considered that programme 8 provided the most opportunities and Programme 4 provides the greatest risk. The reason that Programme 4 scored poorly is that the existing SH29 safety issues would not be resolved even though a new state highway bypass would be built.
- The results for internalisation of trips (objective 3) is comparative across the programmes and less effective than the 'do nothing'. The reason for this is that longer journey times in the TTM model result in fewer trips generated outside the study area and more internalisation, i.e. longer SH journey times encourage more internalisation.

Table 11, Programme risks and opportunities summary

Programme 3: SH Capacity in lieu of local road connections	
<i>Significant risk</i>	
Operability	High operability risk as east west connections are not provided
Resilience	High resilience risk as east west connections are not provided
Functioning network during construction	Significant works on the SH, potential to install local connections to minimise disruption i.e. Belk Road for land use E, some minor realignments could be done offline
Programme 4: Northern bypass to PT support	
<i>Significant opportunity</i>	
Functioning network during construction	Very little work required on the existing state highway, majority of works are offline
Promoting public transport mode share	Connecting local roads, gives scope for multiple bus routes. Further encouragement with priority bus lane
Community severance	Removes major route into port through Tauriko
<i>Significant risk</i>	
Design	Topography issues required to be overcome to start construction of Oropi link, Belk Road extension, Northern Bypass and a major Wairoa River crossing
Constructability	Difficult topography and terrain along proposed Northern Bypass alignment and major Wairoa River crossing at Belk Road
Natural environment	Likely to be constructed near river, with Wairoa River crossing. Construction through greenfield areas – Belk Road, Pyes Pa, Oropi link
Cultural	Likely to be constructed near river, with Wairoa River crossing. Potentially crossing Maori land
Programme 8: local ring road, PT support and SH capacity improvements	
<i>Significant opportunity</i>	
Operability	Good operability provided through local connections and capacity improvements
Resilience	Resilience provided through local connections and capacity improvements
Supporting the SmartGrowth settlement plan	Enables capacity for development but may not promote the desired form of development
Promoting public transport share	Connecting local roads, gives scope for multiple bus routes
Community severance	Staying on existing alignment as already natural severance from embankment, connects other communities via local ring road. Reverse sensitivity can be applied to reduce community impact. (Including community connectivity off the state highway).
<i>Significant risk</i>	
Functioning network during construction	Significant works on the state highway, potential to install local connections to minimise disruption (e.g. Belk Road for land use E), some minor realignments could be carried out offline

6 Recommended Programme

6.1 PROGRAMME OVERVIEW

The recommended programme for the Tauriko Network PBC is Programme 8.

The main findings of modelling include:

- An upgraded SH29 on or near the existing alignment, complemented with an enhanced local network, greater public transport share and effective travel demand management will cater for full growth in the corridor over the next 30 years.
- Significant transport interventions are needed for the network to function, including substantial capacity improvements along the links and grade separation of intersections.

An east/west connection from Belk Road through to Keenan Road/The Lakes/SH36 removes some of the pressure from local traffic on the SH29/SH36 roundabouts and can be further complemented by a connection through to Oropi Road from SH36 to foster an alternative local connection to Fraser Street, the southern suburbs and the eastern corridor.

On the main state highway:

- SH29 will be four-laned at specific trigger points
- Side access will be severely limited
- Intersections will be rationalised to be grade-separated or left in and left out
- Road straightening and geometry corrections will be required, at Belk Road in particular

The 30-year scenario has been accompanied by sensitivity testing by the Transport Agency and confirmed that if higher (or lower) growth rates occur in the western corridor then the programme options remain suitable. Programme 8 is still the recommended option. Likewise, analysis out to a 50-year horizon was undertaken to appreciate the demands on the network that may arise and the resilience of Programme 8 has been validated.

The recommended programme in Figure 28, has undergone targeted consultation with the SmartGrowth Western Corridor Group, Tauriko School, the Freight Logistic Action Group (FLAG), Port of Tauranga and the AA.

Stakeholder Feedback

The Port of Tauranga, Freight Logistics Action Group, Automobile Association, and Road Transport Association had a preference for the existing alignment and want to see SH29 maintained as an efficient freight route to the Port and don't want to see transport routes to the Port closed off. The Port of Tauranga emphasised the economic and expansion constraints on the Ports of Auckland and the impacts that would have on the Port of Tauranga and the use of inland ports in the Waikato.

The Bay of Plenty Regional Council, Tauranga City Council and Western Bay of Plenty District Council support the recommended programme. Balancing freight route (which they viewed as the most important objective) with the SmartGrowth liveability objectives was commended. Tauriko primary school raised concern about the current safety issue and capacity of access off SH29. Development of Tauriko West was seen as an opportunity to either take access off the SH or relocate the school.

The recommendation is subject to successful public consultation aligned with the SmartGrowth partners' settlement pattern consultation in 2017.

Figure 28, Recommended Programme

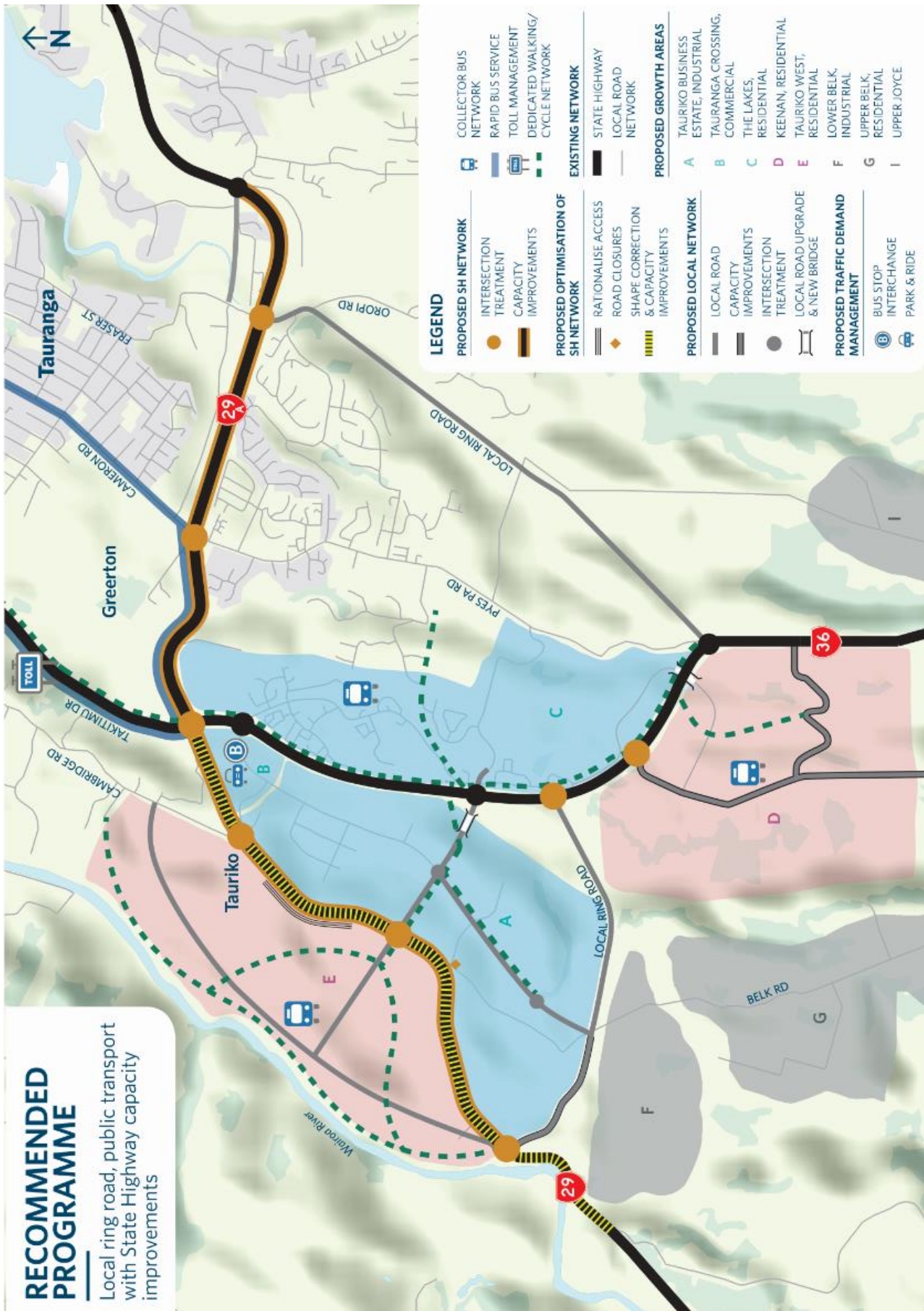


Table 12, Recommended Programme Options

THE RECOMMENDED PROGRAMME	
CORE OPTIONS	
Do Minimum	Kennedy Road bridge to link Pyes Pa West to Tauriko Business Estate
	Kennedy Road upgrade to collector standard from Pyes Pa Road to SH36
	Takitimu Drive slip lane and upgrade of Takitimu Drive Roundabout and Taurikura Roundabout to 2 lane roundabout with 3 lane approach
Land Use	Develop current land use areas A, B, C to completion
	Develop new land use area D
	Develop new land use area E
Local Ring Road	New collector road from Belk Road to SH36
	Arterial connection from SH36 to Oropi Road roundabout
Traffic demand, mode shift and public transport	New collector bus network for all UGAs in Tauriko - Tauriko Business Estate, Pyes Pa West, Tauranga Crossing, Tauriko West (D), Keenan Road (E)
	Park and ride, integrated smart ticketing, real time travel information, dedicated walking and cycling tracks, transport interchange/hub, school and workplace network, remove off-street parking legislation
	Toll management
Optimisation state highway National Strategic Route	Shape correction with horizontal and vertical improvements
	Rationalise access
Improve capacity of existing state highway National Strategic and Regional routes	Belk Road to Takitimu Drive
	Takitimu Drive to Cameron Road
	Oropi Road to Poike Road
	Cameron Road to Oropi Road
Major state highway intersection treatments	Belk Road/SH29
	Keenan Road/SH36
	Cameron Road/SH29A
	Takitimu Drive/SH29/SH29A
	Oropi Road/SH29A
	Cambridge Road/SH29
Local Road improvements	New local road from SH36 to Belk Road
	Belk Road upgrade
	Closure of Gargan Road/SH29
	Internal connections within Tauriko Business Estate
	Southern collector in Pyes Pa West
	Underpass from Pyes Pa West to Keenan UGA
	Upgrade of Keenan Road
	Upgrade of Gasson Lane
	New collector road through Tauriko West from SH29 at Belk Road to Cambridge Road
	New local access connection between Poike Road and Oropi Road

6.2 PROGRAMME IMPLEMENTATION STRATEGY AND TRIGGER POINTS

The essential elements in Programme 8 that may mitigate current traffic demand issues are likely to be constructed and implemented at different times over the 30 year period. The trigger points are considered in three groupings:

Tauriko SH29 upgrade

Table 13, SH29, SH29A from Takitimu Roundabout to Barkes Corner

Trigger & timing	Intervention / Stage	Trigger	Deliverables
2017	<ul style="list-style-type: none"> Public Consultation 	<ul style="list-style-type: none"> SmartGrowth consultation 2017 	<ul style="list-style-type: none"> Recommended programme
2017-	<ul style="list-style-type: none"> IBC & DBC Rationalise Access 	<ul style="list-style-type: none"> Tauriko West structure planning 2017 Regional Policy Statement (RPS) and City/District Plans changes 2018. 	<ul style="list-style-type: none"> Concept design Consenting and property
2018-2030	<ul style="list-style-type: none"> Cambridge Road to Takitimu Roundabout Tauriko West Interim access 	<ul style="list-style-type: none"> Tauriko West development from 2020 LoS Failure of Takitimu Roundabout and/or 19,000 AADT capacity threshold DSI Safety Cambridge Road 	<ul style="list-style-type: none"> Detailed design and road improvements
2018-2046	<ul style="list-style-type: none"> SH29 Omanawa Road to Cambridge Road 	<ul style="list-style-type: none"> Capacity threshold 19,000 AADT Belk Road and Tauriko West access requirements 	<ul style="list-style-type: none"> Detailed design and road improvements
2018-2046	<ul style="list-style-type: none"> Takitimu Roundabout to Barkes corner 	<ul style="list-style-type: none"> LoS Failure of Takitimu Roundabout and/or congestion threshold 	<ul style="list-style-type: none"> Detailed design and road improvements

Multi-modal urban journeys

Table 14, Local ring road, SH36, SH29A from Barkes Corner to Poike, Demand Management including Public Transport

Trigger & timing	Intervention / Stage	Trigger	Deliverables
2017	<ul style="list-style-type: none"> Public Consultation 	<ul style="list-style-type: none"> SmartGrowth consultation 2017 	<ul style="list-style-type: none"> Recommended programme
2017-	<ul style="list-style-type: none"> IBC & pre-implementation for ring road and multi-modal interchange Demand management including rapid bus services 	<ul style="list-style-type: none"> Development of Tauranga Crossing RPS and City/District Plans changes 2018 	<ul style="list-style-type: none"> Concept design Consenting and property PT network improvement
2018-2046	<ul style="list-style-type: none"> SH29A and SH36 Oropi Roundabout 	<ul style="list-style-type: none"> Congestion threshold Demand management failure LoS Failure of Oropi roundabout 	<ul style="list-style-type: none"> Detailed design and road improvements
2018-2046	<ul style="list-style-type: none"> Local Ring Road 	<ul style="list-style-type: none"> Keenan road development / twin Roundabout LoS failure 	<ul style="list-style-type: none"> Detailed design and road improvements

Land-use and associated transport elements

Table 15, Internal roads, Demand management, and land use planning specific to each growth area

Trigger & timing	Intervention / Stage	Trigger	Deliverables
For each Urban growth area (Tauriko West from 2020)	<ul style="list-style-type: none"> Local arterials Cycling and walking Public transport collector services Land use Intensification Alternative access disconnected from SH29 	<ul style="list-style-type: none"> SmartGrowth consultation 2017 for Tauriko West Structure planning Urban growth area development Land use areas A, B, C underway 2016 onwards 	<ul style="list-style-type: none"> Detailed design, modal shift and transport improvements

7 Recommended Programme – Assessment

7.1 ECONOMIC ANALYSIS – VALUE FOR MONEY

All shortlisted programmes were analysed against the Do Minimum.

Benefits were calculated using the following assessments:

- Travel time and vehicle operating costs were determined using global network outputs from the Tauranga Traffic Model (TTM) for year 2031
- All assessed programmes were run within the TTM for AM, PM and IP periods and expanded to represent a daily value using factors provided by the model operators
- Crash costs were calculated using the crash prediction model with the Transport Agency’s Economic Evaluation Manual (EEM) and the year 2031 traffic flow.
- An indicative BCR was calculated
- An incremental BCR was calculated to determine which programme is more economically viable based on their relative benefits and costs

Capital, maintenance and property costs were calculated for each option in the shortlisted programmes.

Table 16, Indicative BCR Summary

	Programme 3 (\$000)	Programme 4 (\$000)	Programme 8 (\$000)
PV of Net Benefits			
Travel Time Cost	\$552,240	\$581,881	\$605,994
Vehicle Operating Cost	-\$72,415	-\$111,897	-\$57,220
Crash Cost	\$34,389	\$9,391	\$27,170
CO2	-\$3,621	-\$5,595	-\$2,861
PV Total Benefits	\$510,593	\$473,781	\$573,083
PV of Net Costs			
Fees	\$2,915	\$4,310	\$3,333
Property	\$57,803	\$92,019	\$88,465
Construction	\$169,835	\$242,315	\$191,551
Maintenance	\$63,670	\$65,386	\$64,980
PV Total Costs	294,223	404,030	348,328
Indicative BCR	1.7	1.2	1.7

Indicative BCR Summary:

- BCR is the present value of net benefits divided by the present value of net costs
- All programmes are considered economic as the BCRs are greater than 1.0, that is, the present value of benefits are greater than the present value of costs
- Programmes 3 and 8 provide a better indicative BCR of 1.7.

Table 17, Incremental BCR Summary

Base Option for Comparison			Next Higher Cost Option			Incremental Analysis		
Option	Costs	Benefits	Option	Costs	Benefits	Cost	Benefits	IBCR
3	294,223	510,593	8	348,328	573,083	\$54,106	\$62,490	1.2
8	348,328	573,083	4	404,030	473,780	\$55,702	-\$99,302	-1.8

Incremental BCR Summary:

- The minimum incremental BCR should be 1.0, in order to ensure that additional spending to invest in a higher cost project option rather than a lower cost option is economically efficient
- Incremental BCR indicates whether the incremental cost of higher-cost alternatives and options is justified by the incremental benefits gained
- Conversely, an incremental analysis will identify whether a lower cost alternative or option that realises proportionally more benefits is a better solution
- Starting with the lowest cost option, comparing against the next highest cost option
 - » A positive IBCR indicates that the higher cost option provides a better economic return
 - » A negative IBCR indicates that the lower cost option provides a better economic return
- Programme 8 has an incremental BCR of 1.2 over Programme 3, indicating that there is a small economic return on the extra investment
- Programme 4 is the most expensive and provides the least benefits based on the results.

See Appendix XVII Tauriko Network Economic Assessment.

7.2 SENSITIVITY ANALYSIS

Congestion Costs

Full network congestion costs were not included in the main indicative BCR calculation comparing programme options as the V/C ratio had not been provided for the overall road network.

By including the congestion costs within the economic evaluation, the BCRs improve significantly, but the ranking does not change:

- Programme 3 increases from 1.7 to 2.4
- Programme 4 increases from 1.2 to 1.6
- Programme 8 increases from 1.7 to 2.2.

Although Programme 3 has a higher BCR, it would not change the overall ranking as programme 8 provides a better performance against risks and objectives including connectivity via east-west road connections that alleviate travel demand on SH29.

Construction Costs

- Sensitivity test based on decreasing and increasing the costs (construction, property and maintenance) by 20%. The outcome of this sensitivity was no change in the programme recommendation, as outlined in Table 18.

Table 18, Construction Sensitivity Analysis

Construction Cost ±20% (Values in NPV)						
	Base Case		Lower Bound -20%		Upper Bound +20%	
	Value (\$000)	BCR	Value (\$000)	BCR	Value (\$000)	BCR
Programme 3	294,223	1.7	235,378	2.2	353,067	1.4
Programme 4	404,030	1.2	323,224	1.5	484,836	1
Programme 8	348,328	1.7	278,662	2.1	417,993	1.4

Land Use Sensitivity

Sensitivity testing based on increasing the level of land use, assessed how the recommended programme - Programme 8 - would respond to increased land use and demand. All Tauriko growth area land uses were assumed in the modelling with 15,000 residential dwellings. The modelling demonstrated that additional works might be required to supplement Programme 8 beyond the 30 year window, but that Programme 8 is still recommended. Additional works could involve the northern bypass (30-50 year window).

See Appendix XVIII Land Use Sensitivity Analysis.

Government and national BCR

The BCR is a 'national' BCR allowing for costs covered by development contributions. This BCR approach is recommended for a network including local roading and demand management and is aligned with a one network approach. The 'Government' BCR with development contributions removed, will provide an improved BCR uniformly across the programmes (but with greater preference to programme 3 and 8).

Traffic demand Sensitivity

A desktop analysis was undertaken by Opus to consider traffic demand based on existing traffic growth generated from the development and hypothetical traffic demand generation from land use development. These predictions supported TTM and the provided capacity breakpoints that were in advance of the TTM predictions. If this occurs, treatments will be triggered earlier than expected.

Objective weighting and target sensitivity

Higher weighting or a quicker travel time of objective 1 (Freight travel time and variability) would favour programme 8 (the recommended programme). Higher weighting of the safety component would favour programme 3 and 8. A higher weighting of objective 2 (SH29A and SH36 people travel time and variability) would favour programme 3.

7.3 PROGRAMME OUTCOMES

The programme outcomes sought are provided in the investment objectives section 3. A summary of how the shortlisted programmes achieve these objectives is provided in section 0 'The short list assessment'.

Programme 8 achieves the investment objectives as outlined in Table 19.

Table 19, Programme 8 investment objectives and outcomes (expressed in minutes)

OBJECTIVE	ROUTE	MEASURE	INVESTMENT TARGET	DO MINIMUM RANGE	RECOMMENDED PROGRAMME
Investment Objective 1 SH29	SH29 (Freight) (AM)	Travel Time	10	35- 71	7
		Variability (+/-)	3	6 - 8	3
Investment Objective 2 SH36 and 29A	Merrick/ SH36 (Urban) (AM)	Travel Time	6	20 - 41	6
		Variability (+/-)	3	4 - 6	2
	SH29A (Urban) (PM)	Travel Time	5	8 - 17	3
		Variability (+/-)	3	3 - 4	2

OBJECTIVE 3 LIVEABILITY	MEASURE	DO MINIMUM	RECOMMENDED PROGRAMME
Internalisation*	Limit the number of local trips generated from the Tauriko Growth Area that require access to the SH network.	Internalisation achieved 51%	Internalisation achieved 46%
Mode share	% mode share AM peak - PT and active	Less than 1%	Greater than 10%
PT uptake	Patronage	14,600 p.a.	250,000+ p.a.
Spatial coverage	600m of a bus stop or cycle lane	17%	80%
Access to local amenity	Base social infrastructure and services in each UGA and community social infrastructure for the Tauriko community	60%	80%

*Modelling results indicate that the expected degradation of key journeys on SH29, SH29A and SH36 will promote more internalisation in the do minimum option, i.e. people will choose not to travel owing to the degradation of journey times and journey time reliability.

OBJECTIVE 4	MEASURE	DO MINIMUM	RECOMMENDED PROGRAMME
Safety on SH29 and SH29A	Reduce deaths and serious injuries along SH29 from Omanawa Road to Oropi Road by 50% from 2015 statistics by 2030. A proxy for this KPI is Star Rating Improvement.	Number of Potential High-Severity Crashes (Resulting in DSIs) 3.92 in 5 years	Number of Potential High-Severity Crashes (Resulting in DSIs) 1.60 in 5 years

Programme 8 can therefore be seen to be highly successful in delivering against the investment objectives.

7.4 PROGRAMME RISK

The detailed Risk profile is included in the full MCA as appended to this PBC. The most significant risks are outlined in Table 20.

Table 20, Significant Programme Risks

CATEGORY	RISK
Design	Topography issues constructing Oropi Link and Belk Road extension
Constructability	Narrow points along SH29 between Belk Road and Tauriko village, SH already slipping on embankment below Tauriko village
Functioning Network During Construction	Significant works on the SH, potential to install local connections to minimise disruption (i.e. Belk road alternative route), some minor realignments could be done offline
Multi-Party co-investment	Establishing the principles, triggers and agreements for appropriate cost-sharing
Natural Environment	Construction around greenfields - Belk Road, Pyes Pa, Oropi with construction of stream crossing
Cultural	Potential for cultural areas and battle site in general location of Oropi Link and Belk Road extension being affected
Consultation and RMA Part 2	Public consultation will be undertaken in the first stage of the Indicative Business Case. Consultation and statutory processes will be aligned with the Settlement Pattern Review and RMA Part 2 requirements. There is a risk that public consultation may raise new or additional concerns. However, early engagement with partners, stakeholder engagement, alternatives assessments and consideration of wider benefits are part of the process that was undertaken in developing the Tauriko Network PBC. All the partners to the project including SmartGrowth, local authorities, BoPRC, developer and freight representatives support the recommended programme and the alignment of the next phase of consultation.

7.5 ASSESSMENT PROFILE

An assessment profile of **H/H/BCA1-3** has been determined for the programme using the Transport Agency's Investment Assessment Framework as detailed below:

Strategic fit of the problem, issue or opportunity that is being addressed:

H

- The activity is focussed on significant change in predicted transport demand due to projected growth (residential and business) within the Tauranga area. The 'do minimum' option will impact on the viability of the SH29 nationally strategic freight route. The programme provides a set of interventions that deliver an important part of the freight journey performance on key strategic parts of the transport network including those that travel through urban Tauranga (e.g. SH29 which connects the Port of Tauranga with the Waikato and Upper North Island).
- Tauriko Network PBC provides a balanced suite of investments that also deliver liveability KPIs including journeys for employment, access to social and economic opportunities and tourism.
- The Transport Agency is taking a co-ordinated approach with relevant stakeholders including Tauranga City Council, Western Bay of Plenty District Council, Bay of Plenty Regional Council and SmartGrowth to develop the business case that will align with the Settlement Pattern Review.
- It is appropriate to develop a programme business case at this time. Also, the timing of the activity assists integration of this work with other land use and transport planning in the area (refer Readiness section).
- Public transport currently represents around 1% of all journeys taken within Tauranga. The activity will look to identify alternative programmes to improve the public transport mode share of trips. This has the potential to make better use of existing transport capacity, better manage transport network performance and capability, and contribute to avoiding severe congestion, manage journey time reliability and deliver optimised levels of service on the network.
- Within the study area, the proposed works improve the Kiwi RAP Star Rating on sections of SH29 and SH29A.

Effectiveness of the proposed solution:

H

Outcomes focused - H

- The PBC has identified clear problems and the potential benefits from addressing them at this time.
- Alternative programmes have been developed and tested against their ability to deliver the investment objectives and address the identified problems.
- The identified preferred programmes have support as an agreed activity across stakeholders (but need to be taken to further consultation). The coordinated approach with stakeholders will assist the business case to continue to develop consistently with other land use and transport planning.

Integrated - H

- The PBC has been developed in a partnership approach with the SmartGrowth's western corridor plan and wider settlement pattern.
- Also consistent with the PT Blueprint encouraging an increase in uptake of PT and aligns with the national strategic form and function for SH29 as part of the upper north island freight journey.
- The coordinated approach with relevant stakeholders including SmartGrowth will assist the business case to continue to develop consistently with current and future land use and transport planning.

The Programme Business Case is considered to be appropriately scoped, affordable and timely.

Benefit and cost appraisal:

BCA1-3

- An indicative BCR has been prepared for the Programme Business Case. The BCR evaluations have been developed using the EEM
- A National BCR was calculated on the three shortlisted programmes with ranges of 1.2 to 1.7, including development contributions. This is aligned with a One Network approach. The "Government" BCR with costs covered by development contributions removed, will provide an improved BCR uniformly across the programmes. Therefore economic efficiency fit is within the BCR range 1 - 3
- The BCRs will be developed further through the next phases of the business case. This will include taking into account whole-of-life costs, sensitivity analysis, and a peer review of the evaluation to confirm the assessment.

8 Programme Financial Case

8.1 INDICATIVE COST

Table 21, Recommended Programme Indicative Costs

RECOMMENDED PROGRAMME	MINIMUM	MAXIMUM
Total Indicative Capital Cost	\$233m	\$519m
Total Indicative Property Cost	\$93m	\$132m
Total Indicative Cost	\$326m	\$651m

Note that the above costs are for implementation and property. IBC, PBC and Pre-implementation costs bring the total range to \$337-\$670M. Maintenance and operations range from \$5.5M to \$10M per annum.

8.2 FUNDING ARRANGEMENTS

The expected programme BCR is above the minimum threshold. With an expected cost of between \$156M and \$397M for the Transport Agency, the programme represents a prioritisation risk, with respect to the potentially limited funds available through the NLTF. It is, however, likely that construction would be staged over multiple years. The full programme is not expected to be completed for 30 years.

Further, detailed analysis is required to confirm these co-investment arrangements, as projects are developed in more detail through the next phases.

Co-investment will need to be confirmed through the inclusion of individual components of the programme in the 2018-2021 National Land Transport Programme.

Aspects of the programme will require implementation by other parties. The details of these co-investment arrangements are outlined in Table 22. These are high level indicative estimates yet to be agreed with partners at the IBC stage. Co-investment will be considered through the Transport Agency beneficiary pays principles.

Table 22, Indicative Programme co-investment arrangements (to be confirmed in IBC)

RECOMMENDED PROGRAMME	MINIMUM	MAXIMUM
Total Indicative Capital + Property Costs of Programme 8 for the Transport Agency	\$160m	\$400m
Total Indicative Capital + Property Costs of Programme 8 for TCC/ Developer	\$162m	\$223m
Total Indicative Capital + Property Costs of Programme 8 for the Regional Council	\$9m	\$18m

Programme activities that may need to be jointly funded between the Transport Agency and TCC are:

- Arterial connection from SH36 to Oropi Road
- Intersection Upgrades:
 - » Belk Road/SH29 to Roundabout
 - » Keenan Road/SH36 to Roundabout
 - » Oropi Road
- Cambridge Road/SH29
- Rationalise Access in Tauriko along SH29
- New Belk Road Extension to SH36
- New local connection between Poike Road and Oropi Road
- New local connection between SH36 and Oropi Road

8.3 AFFORDABILITY

As indicated above, it is considered that the recommended programme will be efficient and fundable through the NLTF. Implementation would be staged over several years so that priority packages can be triggered first where the 'do minimum' leads to a loss of performance.

The Tauriko Network PBC provides a network solution to support the Western Corridor growth area as identified in the SmartGrowth Settlement Pattern Review. The intervention hierarchy will be used to optimise and stage interventions using a network approach. Agencies will need to work together to achieve this in an affordable manner.

The current network can be optimised through the use of triggers and staging. This is likely to include planning the timing of four-laning sections of the SH network, less critical intersection treatments on the urban journey and local ring road building (construction is not triggered until further urban growth areas beyond area E are developed).

This requires a high level of commitment between SmartGrowth partners, developers and the Transport Agency. Some elements of co-investment have been feasibility tested, including against the beneficiary pays principle. There is awareness amongst the project partners that cost sharing will be discussed and agreed in more detail in the next stage.

It may be necessary to secure corridors through designation and/or land purchase given limited alignment options and limited debt capacity of local authorities. If this does not occur, there is a risk that the route could be built out through development and subdivision, as well as creating uncertainty for structure planning of a key urban growth area and result in additional reverse sensitivity issues in the future.

For several local and state highway components of the programme, the proposed Housing Infrastructure Fund may also provide some assistance to local authorities in terms of their share of the total cost. There may be further opportunities for direct central government investment if respective components are shown to directly benefit supply of development capacity for housing.

PART C – DELIVERING AND MONITORING THE PROGRAMME

9 Management Case

9.1 PROGRAMME DELIVERY

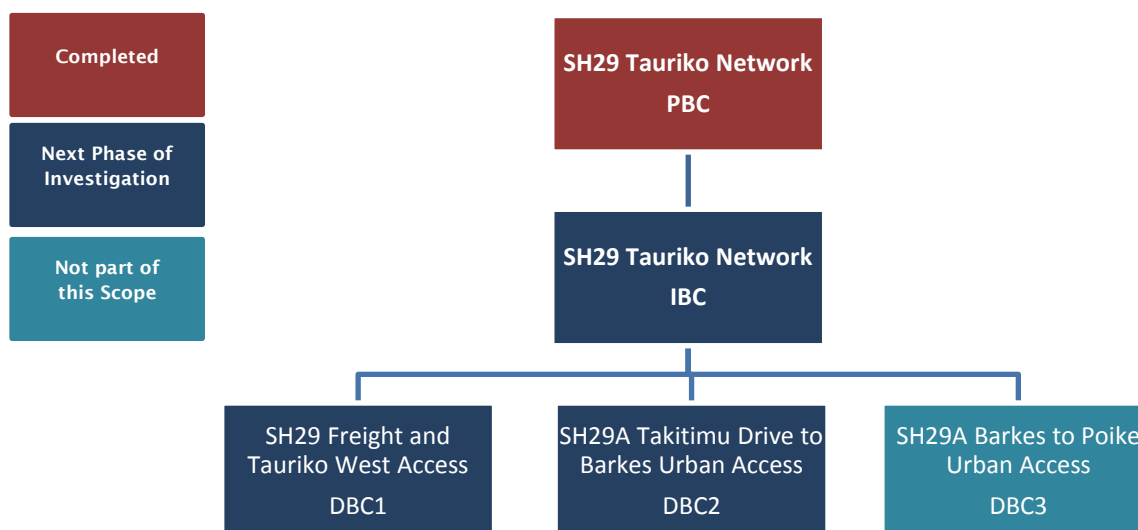
Process for Programme Delivery

Section C provides a plan for successfully delivering the programme by identifying how the next phases of the project will deliver on the investment objectives. It is recommended that Tauriko network progress as one IBC and three dependent DBCs. The Tauriko Network Programme Business Case (PBC) recommends the following programme of works:

- Tauriko Network IBC
 - DBC1: SH29 Freight and Tauriko West Access
 - DBC2: SH29A Takitimu Drive to Barks Urban Access
 - DBC3: SH29A Barks to Poike Urban Access

Figure 29 below indicates the logic flow from the Strategic Case down to the individual DBCs

Figure 29, IBC and DBC structuring



Five key measures of success are identified for the next phase:

1. IBC and DBCs structured by dependencies, programme timings and defined deliverables;
2. Integrated planning with clear roles and responsibilities across the implementation parties;
3. Timing triggers and cost breakdown;
4. Performance and review;
5. Transparent IBC and DBC deliverables.

9.2 IBC AND DBC STRUCTURING

A workshop was held with the key stakeholders on 15 June 2016 to determine the proposed phasing for programme delivery. This and subsequent workshops resulted in a phasing proposal shown in Appendix XXII, Appendix XXIII, Appendix XXIV, and summarised in Part C. The following steps were followed:

- During the recommended programme assessment stakeholders determined in broad terms (0-10yr, 10-30yr) when each alternative option would likely to be implemented in the three short-listed programmes. This helped identify what would need to happen early, which went into the high-level BCR, and also highlighted the risks of large investments having to happen now (for example, the northern capacity improvement in Programme 4)
- After a recommended programme was determined, a phasing workshop was held to break each alternative option of the recommended programme into its next steps:
 - » IBC and DBC
 - » Pre-Implementation
 - » Implementation.

The IBC recommendation is for a single network IBC followed by multiple DBCs. DBC structuring workshops and analysis identified three focus areas discussed below. These are represented in **Error! Reference source not found.** and aligned to structure planning dependencies and the road hierarchy.

IBC Structure – Tauriko Network IBC

There is a strong timing and network design dependency to develop a single IBC as a collaborative initiative across delivery parties rather than multiple IBCs. A single IBC that is led by the Agency with inputs from regional and city council will successfully deliver the next phase as:

- Structure planning and transport options will be considered together for the western corridor as a whole
- Shortlisting and timing of treatment options can be undertaken as a whole of life exercise within the specified study area. This reduces the risk of partners working in isolation or not actively being involved in a timely manner (i.e. an intervention is no longer considered a priority by a partner compared to other organisational goals)
- Multiple IBCs are less likely to achieve a co-ordinated one network approach for the growth area
- IBC dependencies between treatments are more difficult to align across multiple IBCs

The IBC will filter out a significant number of treatment options and provide an improved level of certainty of how the network will function over time. It is proposed that separate DBCs can be developed without compromising the network form after the IBC is completed.

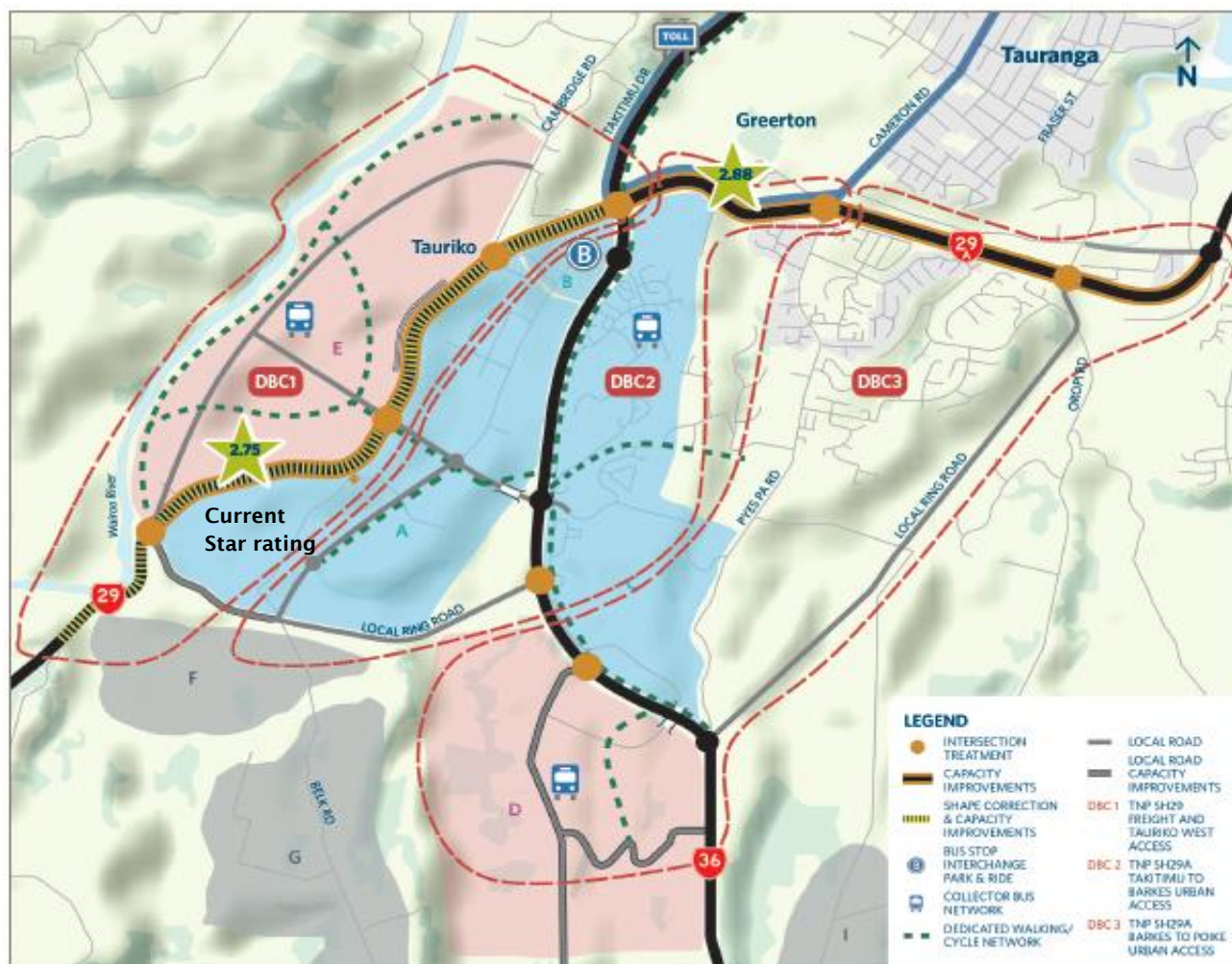
DBC 1: Tauriko network plan – Freight and Tauriko West access

The focus is on the national freight route on SH29 whilst enabling an integrated approach to network planning and urban growth. A structure plan is being developed on the northern side of the SH29 for a new large residential development (Tauriko West) which will require connections to the transportation network. On the southern side of the SH the roll out of Tauriko Industrial Estate is threatening the opportunity to protect a future realignment options at Belk Road to improve safety.

A clear scope of investigation for DBC 1 delivers the SH29 freight and safety investment objectives whilst developing appropriate access to Tauriko West and the industrial estate. Appropriate access means it does not compromise the freight objective, and provides direct connectivity (without using the SH) between different parts of the local community. This DBC allows the inter-dependencies between Tauriko West structure planning and network planning to be progressed and aims to jointly notify changes to designations, District Plan and RPS.

In addition to transport and growth objectives, DBC 1 aims to improve amenity of the existing and new community through addressing reverse sensitivity issues such as noise and aesthetic quality. This includes reducing side friction issues by providing alternative access to Tauriko primary school and improving noise and aesthetic qualities of the SH29 corridor. Rationalisation of access to the SH will also improve safety and adheres to the form and function of a national freight route.

Figure 30, Focus areas for DBC 1, 2 and 3



DBC 2: Tauriko network plan – SH29A Takitimu to Barkes urban access

DBC 2 is focused on providing urban access from Tauriko to both Tauranga peninsula and the east (via the ‘around the harbour’ journey using SH29A). This stretch of SH29A is already congested during the peaks and will disrupt the freight route if it extends down to Takitimu Drive.

Public transport is an integral part of this package. Investigation into a bus interchange, park and ride, rapid bus services and bus priority form part of DBC 2. In addition, the connectivity of local amenity destinations to passive and active transport modes are a key feature of the structure planning for Pyes Pa West residential development and future connectivity to the DBC 1 study area.

DBC 2 recognises that reduced pressure on SH29A by providing good urban access also helps to protect the freight route. The PBC outlines the key option for this stretch of SH29A as capacity improvements on SH29A (with a clear prioritisation for efficient people movement) to move congestion away from SH29. This will also improve the urban access to Tauranga City via SH29A and Cameron Road.

DBC 3: Tauriko network plan – Barkes to Poike urban access

DBC 3 is focused on that area which will come under more pressure further into the future once Tauriko West is completed and development occurs at Kennedy Road. This is likely to be 10 or more years away. Development expansion at Kennedy Road will load additional traffic onto SH36, SH29 and SH29A. A principal intersection that will also be under increasing pressure will be Takitimu Drive. The principal purpose of this DBC is to develop thinking beyond the ten year window and opportunities to better connect different parts of the community and to reduce pressure on the SH network (Investment objectives 1-3).

Table 22 below outlines the proposed phasing and expenditure for the programme including other IBC and DBC structuring that were considered.

Table 22, IBC/DBC grouping options

Criteria	Option 1	Option 2	Option 3
	Progress a single IBC for the entire programme with DBC 1 & 2 starting immediately after IBC completion	Split the programme into three Single Stage Business Cases (SSBC) for Tauriko along SH29, and two IBCs local ring road and SH29	Split the programme into two separate IBCs: One for Tauriko, one for the remaining works. Then six DBCs
Ability to deliver programme objectives	Delivery of critical path, get collective buy-in before incorporating into PBC	Risk of the programme deliverable elements being lost or items being done in isolation.	Risk of the programme deliverable elements being lost or items being done in isolation.
A network approach to the PBC where partners collaborate	Progress a single IBC with all network elements	Split the programme into three deliverables fragments the network approach.	Split the programme into three IBCs fragments the network approach.
SmartGrowth partners aligned	Priorities are aligned in a single IBC	Prioritised in isolation.	Prioritised in isolation.
Confidence of co-investment request to board	Strong dependency between the network treatments is a good rationale for the approach.	The request for co-investment will have to include the risk that the maximum interventions.	Can give confidence in co-investment request to complete optioneering phase.
Delivery of critical the path	Priority for SH29, alternative modes and growth enabler for Tauriko West. Even so, it may be difficult to get designation (By Jan 2018)	Priority for SH29, and growth enabler for Tauriko West. Even so, it may be difficult to get designation (By Jan 2018)	Is likely to fail to deliver the critical path.

9.3 INTEGRATED PLANNING WITH CLEAR ROLES AND RESPONSIBILITIES

The flow diagram below in Figure 31 summarises the high level deliverables expected from each organisation, to complete and deliver a final Indicative Business Case. The IBC will be structured so that the NZTA Principal Consultant will deliver the IBC on behalf of all the partners.

Transport Agency – Accountable for IBC delivery. This includes assessment of the IBC intervention preferred options against investment objectives. The Transport Agency will be responsible for managing option workshops and co-ordinating the multi-party project team.

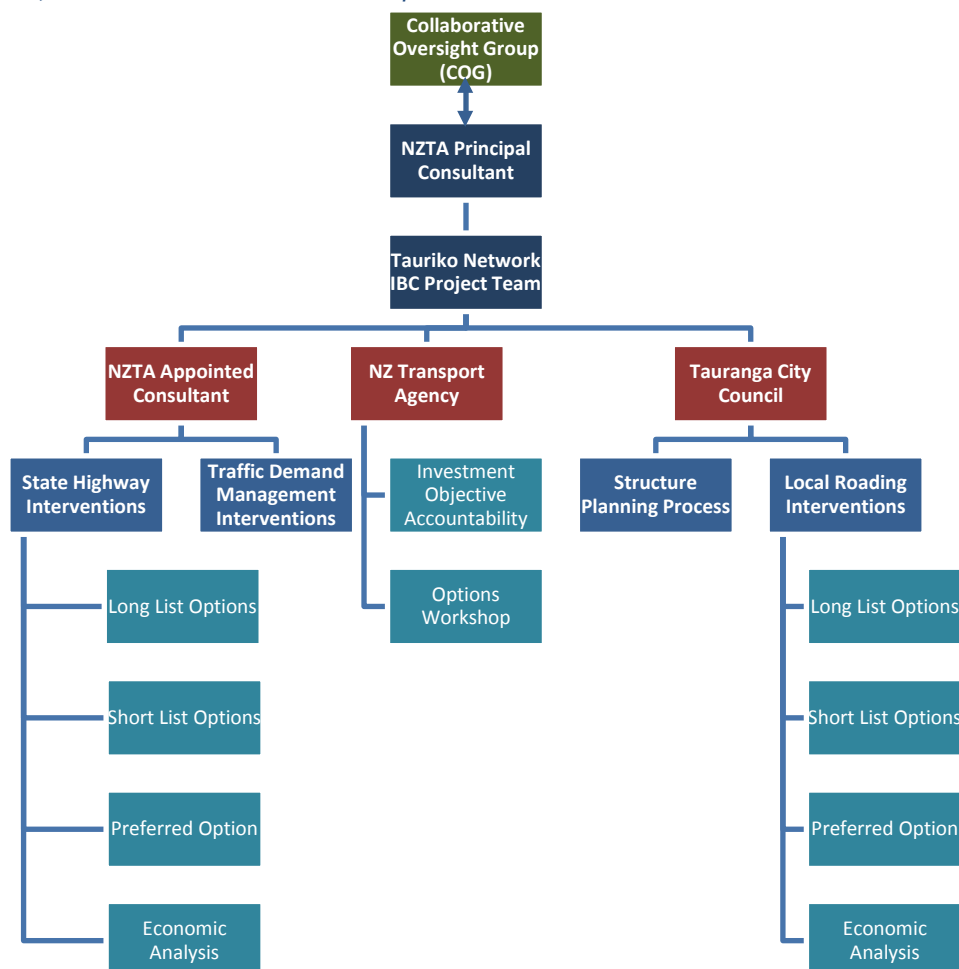
Transport Agency Principal Consultant – Responsible for the IBC delivery. The programme level economic analysis, amalgamation of the PBC intervention options for SH, local road and PT interventions into a single Tauriko Network IBC will be the responsibility of the principal consultant. This consultant will have reporting accountability to the Collective Oversight Group (multi-agency group including Transport Agency, TCC, WBoPDC, BoPRC, SmartGrowth).

Transport Agency Appointed Consultant – Responsible for SH29, SH29A and SH36 preferred intervention option. This includes leading on SH intersection treatments in consultation with TCC and stakeholders. Appointed through competitive tender and will provide specialist technical and graphics resourcing for IBC preparation. The consultant will also lead on the bus interchange and park and ride interventions in consultation with stakeholders.

Tauranga City Council - Responsible for local road interventions including arterials, structure planning (including active and passive transport) and provide project support to the principal consultant for TTM modelling (and participate project meetings when relevant).

BoPRC - Responsible for the bus network. BoPRC will be consulted on bus interchange and park and ride interventions.

Figure 31, Governance structure and responsibilities



A key driver of DBC 1 is the development of Tauriko West and the roll out of the Tauriko Industrial estate. The new residential area will require access to both the SH29 and to the industrial estate, retail complex, and amenities. The timing of the structure planning and development is inextricably linked to the timing of the Transport Agency Business Case deliverables. Successful delivery of the Programme will require the a co-ordinated approach over the next five years as mapped out below in Figure 32 and Table 23.

Figure 32, Structure Planning and Business case key Inter-relationships

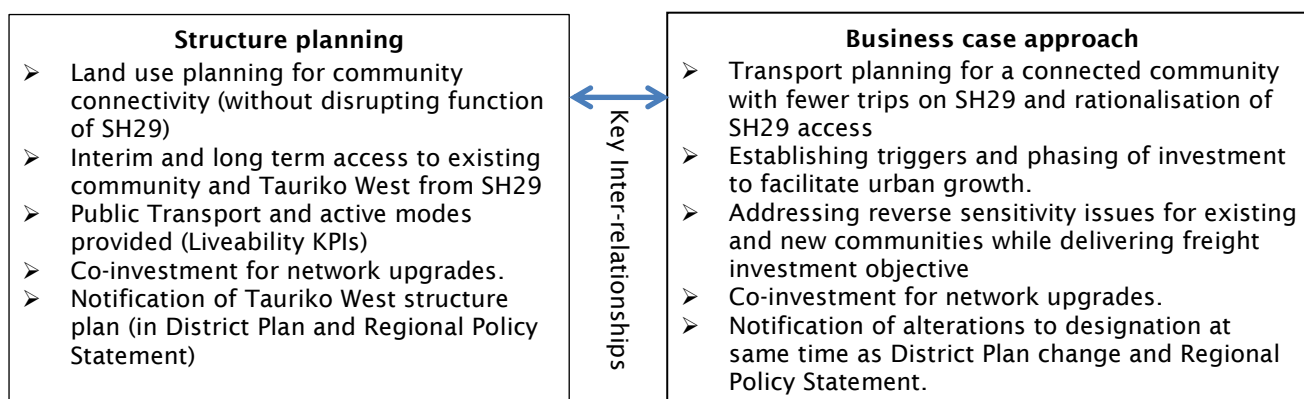


Table 23, Timeline for Joint Structure Plan and Transport Planning Approach (IBC and DBC1&2)

Year	TCC & SmartGrowth Partners structure planning and development	NZ Transport Agency business case process
2016	<ul style="list-style-type: none"> • Tauriko West structure plan project planning 	<ul style="list-style-type: none"> • PBC and recommended programme endorsed • Appoint Consultant for IBC SH deliverables
2017	<ul style="list-style-type: none"> • Joint engagement on settlement pattern • Collaborative working to establish preferred land use options and supporting transport network to enable Tauriko West development. • Structure Planning start 2017 • Co-investment principles developed and agreed. 	<ul style="list-style-type: none"> • Joint engagement on options and recommended programme (supporting settlement pattern). • Complete Tauriko Network IBC – developed collaboratively with structure plan to establish Tauriko West access connections, sequencing, and alignment. • Co-investment principles developed and agreed. Confirm direction Tauriko IBC – and support initiation of DBC1 and DBC2
2018	<ul style="list-style-type: none"> • Structure Planning and development of planning framework in collaboration working transport network needs (continues from 2017 into Q1 and Q2 2018) • Engagement on structure plan and preferred programme. • Public notification of structure plan as a change to District Plan and RPS (mid 2018). • Joint statutory RMA processes: submissions 	<ul style="list-style-type: none"> • Development of DBC1 and DBC2 • Working collaboratively with partners on structure planning process, informing of preferred network options. • Public engagement on preferred programme. • Property purchase plan • Tauriko West Interim access form and function agreed • Prepare RMA documents including Assessment of Effects, Scheme Plan. • Jointly notify changes to State Highway Designation. • Joint statutory RMA processes; submissions
2019	<ul style="list-style-type: none"> • Ongoing statutory RMA process: Hearings (early 2019), appeals and Environment Court mediation (rest of 2019) 	<ul style="list-style-type: none"> • Ongoing statutory RMA process: Hearings (early 2019), appeals and Environment Court mediation • Property purchases (according to sequencing plan)
2020	<ul style="list-style-type: none"> • Bulk infrastructure design and delivery to boundary, and internal developer earthworks/civil works 	<ul style="list-style-type: none"> • Property purchase if necessary (according to sequencing plan)
2021	<ul style="list-style-type: none"> • Completion of first subdivision stages to enable house building 	<ul style="list-style-type: none"> • Access provided to Tauriko West subject to sequencing plan • Property purchase if necessary (according to sequencing plan)

A high level programme of works for the proposed Tauriko Network IBC/DBC can be found in Appendix XXV Tauriko Network Programme Delivery.

9.4 TIMING TRIGGERS AND COST BREAKDOWN

The detailed triggers for the project cost phasing are provided in Appendix XXIII - Alternatives & Options Sequencing and Triggers, and Appendix XXIV - Tauriko Network Proposed DBC Phasing & Cash Flow Breakdown. The high level cost breakdown is provided in Figure 33 and Figure 34, and triggers are provided in Figure 35.

Figure 33, Expenditure breakdown by DBC and activity (\$Ms)

Summary range \$M	DBC1	DBC2	DBC3	Total
SH Roads	81 - 183	14 - 29	34 - 75	129 - 286
SH Intersection	30 - 114	20 - 36	0.0 - 10	50 - 160
Local Roads	43 - 57	34 - 57	60 - 69	137 - 183
PT/ Walking/ Cycling	0.0	20 - 40	0.0	20 - 40
Total	154 - 354	88 - 162	94 - 154	337 - 670

The total cost structure ranges from \$337M to \$670M over the 30 year period across the partner organisations. During the IBC stage, the filtering of options will reduce the range of cost and provide clarity for co-investment opportunities. .

The Transport Agency's cost for the SH activity is expected to be between \$179M and \$446M.

Figure 34, Expenditure breakdown for the next phases (2016/17, 2017/18)

Next phase of Tauriko network			
GUIDANCE PHASE	WHAT	WHEN	EST. COST
IBC: Tauriko network	Confirmation of issues	Dec 2016	0.7
	Longlist options development and assessment	Mar 2017	
	Shortlist options development and assessment	June 2017	
	Determine recommended option		
DBC: SH29 & Tauriko West	Preferred option development and assessment	Dec 2017	1.3
Pre-Imp: SH29 & Tauriko West	Technical environmental assessment and specimen design sufficient to allow alteration to designation	Mar2018	1.2
DBC: SH29A Takitimu to Barks	Preferred option development and assessment	Dec 2017	0.6
<i>Expected investigation cost for next phase</i>			3.8

Having clearly defined triggers will successfully guide the intervention phasing. Note that authority to start DBC 3 will likely be 2018 or later and will be the subject of a separate funding application.

Figure 35, Key investment triggers and investigation rationale

	WHAT DO WE NEED TO KNOW THE DETAIL ON (DBC)?	WHAT IS THE TRIGGER?	WHY INVESTIGATE NOW?
DBC1	Cambridge Road intersection treatment with SH29 - if there is one	DSI Safety, Tauriko West development from 2020	Informs structure plan. Alteration to designation alignment with district plan and regional policy statement changes 2018
	Kennedy Road intersection treatment with SH29 - if there is one	Tauriko West development from 2020	
	Belk Road intersection treatment with SH29		
	SH29 capacity improvement and shape correction	Capacity threshold exceeding 19,000 vpd	
	Takitimu Road intersection treatment - long term	LOS failure of Takitimu Roundabout	
	Ring Road connecting SH29 to SH36		Informs structure plan and provides route security
DBC2	Barkes Corner intersection treatment	Queue lengths to Takitimu Drive disrupts freight route and PT priority on Cameron Road	PT priority including Cameron road
	SH29A capacity improvement from Takitimu to Barkes		
	Bus stop interchange	Urban growth development	Identifies land and recommends an option for development of bus stop interchange
	Public Transport		

9.5 PROGRAMME PERFORMANCE AND REVIEW

The programme will be led by the Transport Agency with close alignment with the SmartGrowth Settlement Pattern Review and the SmartGrowth partners. Some components of the programme will require investment from other organisations including TCC (local roading and structure planning) and the Regional Council (public transport).

A RACI (Responsible, Accountable, Consulted, Informed) approach will be agreed between stakeholders that identifies the roles and responsibilities of each stakeholder.

A project management team will be responsible for the day-to-day management of the project under the leadership of the principal consultant. Performance will be reported against programme milestones, investment objectives, and deliverables to the COG on a bi-monthly basis.

Within the Transport Agency, responsibilities for the IBC phase are as follows:

Table 24, Responsible role within the Transport Agency

ROLE	ACCOUNTABILITY
Programme Sponsor	Accountable for programme delivery
Transport Planning	Network performance against the investment objectives
Planning and Investment Case Manager	Confirm the need to invest
Road Safety	Treatments are safe and improve Star rating
Journey Manager	Programme supports wider UNI investment story
Project Services	Responsible for programme delivery

9.6 IBC AND DBC DELIVERABLES

The deliverables from the IBC are:

- Generate and assess a long list of options that is consistent with the agreed PBC to a preferred option to progress for further investigation. Where there is a case for bringing forward two options into the DBC phase this will be permitted. This will be accompanied by a MCA methodology that demonstrates the selection process and alignment with other elements of the IBC
- Establish and agree the co-investment principles, allocation and between co-investment partners
- Undertake public consultation on the PBC short listing process and consult seek feedback on IBC option long list
- Agree and finalise the scope of works for DBC 1 and DBC 2
- Reconfirm that the evidence supports the IBC and the strategic case and objectives are still relevant
- Stakeholder workshops of the IBC long list, short list and preferred options
- Governance reporting to SmartGrowth Partners at short list and preferred option stages
- Identify indicative costs, refined timings risks, dis-benefits and dependencies
- Economic analysis and BCR at IBC level
- IBC report including next stages (DBC 1 and 2 scope and deliverables).

Filtering Process

The intervention treatments will have appropriately targeted high or low levels of analysis at the IBC phase.

For example, intersection treatments at Belk Road, Cambridge road, public transport, rationalising access and road straightening on SH29 will receive a high level of analysis due to the potential benefit and dis-benefit they have on the investment objectives. Other interventions such as Keenan Road capacity improvements and PT real time information will have a lower degree of analysis either because they are:

- Beyond the 10 year implementation window;
- Lower significance as a contributor to the investment objectives;
- Largely determined by another interfacing project.

An example of the level of analysis that will be applied to each treatment is provided below in

Table 25. This is not a definitive list, but will be developed as a long list, agreed and then modelled/analysed using a MCA methodology.

Table 25, Example of the level of analysis that will be applied to each treatment

<p>High level of IBC analysis</p> <p>Cambridge Road Intersection Treatment</p>	<p>Intersection treatments considered:</p> <ul style="list-style-type: none"> • Underpass • Roundabout • Grade separation at either Cambridge Road or extension of Kennedy Road (or both). Based on vehicle behaviour and who is using, and who will use, Cambridge Road - use traffic modelling to determine (TTM and blip track). Options - left in and out, right in and out, full access. <p>Consider the consequences of:</p> <ul style="list-style-type: none"> • Current origin and destination travel demand • Traffic volumes and changes once TNL opens • Impact on freight efficiency • Impact on community connectivity • Benefits and dis-benefits of TNL connection to Cambridge Road • Redirecting regional traffic through the new subdivision onto local roads (Kennedy Road)
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Low level of IBC analysis	Consider when land use D will be developed, the expected local traffic growth and demand, to indicate what standard of road will be required. Treatments to consider:
D Upgrade of Keenan Road (Two lane collector)	<ul style="list-style-type: none"> • Two lane local road • Two lane collector road

The deliverables for the DBCs will be clearly defined by the conclusion of the IBC and may likely include some elements of pre-implementation to align with the structure planning timing for Tauriko West.

Deliverables will include:

- Tauriko West access connections, sequencing, and alignment
- Preferred option development and assessment
- Specimen design
- Technical environmental assessment
- Property requirements
- Designation plan

9.7 STAKEHOLDER ENGAGEMENT AND COMMUNICATIONS PLAN

Consultation and statutory processes will be aligned with the SmartGrowth Settlement Pattern Review, Structure Planning processes and the wider Transport Agency consultation for SH29 where possible and will meet RMA Part 2 requirements. A stakeholder plan will be developed to ensure these relationships are appropriately managed and to optimise the development of the IBC.

Stakeholders will be managed through the Programme Manager, with support from the Transport Agency's communications team, who know the stakeholders well and will assist with organisation and preparation for the stakeholder engagement.

A Stakeholder Engagement Plan will be prepared to address the specific details for each stakeholder, including key contact person and approach for engagement. A communications plan will be prepared for the IBC phase including Ministerial briefings and public consultation.

Important stakeholders:

- NZ Transport Agency (Waikato / BoP Region)
- SmartGrowth
- KiwiRail
- Bay of Plenty Regional Council
- Tauranga City Council
- Western Bay of Plenty District Council
- Port of Tauranga
- Freight Logistics Action Group
- Tauriko School
- NZ Police
- Automobile Association
- Road Transport Association.