ATTACHMENTS

Vision, Planning, Growth & Environment Committee meeting
Separate Attachments 1

Monday, 11 November 2024

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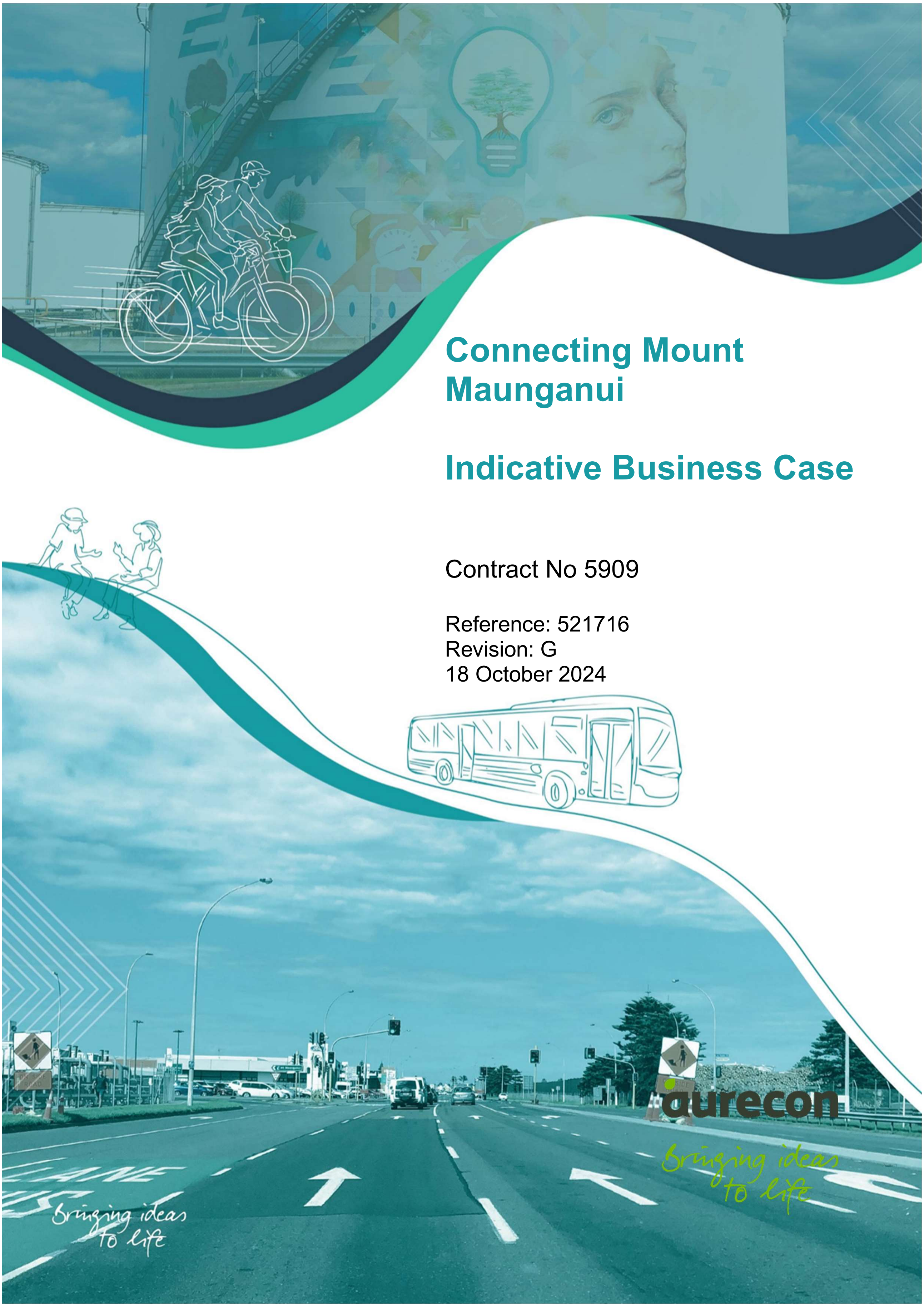

Connecting Mount Maunganui

Indicative Business Case

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Executive Summary

This Indicative Business Case (IBC) - Connecting Mount Maunganui (CMM) - sets out a recommended programme of staged investment to improve the State Highway 2 / Hewletts Road corridor and adjacent transport system. This programme will improve throughput, support freight accessibility and encourage more space efficient modes of transport.

The project is part of the SmartGrowth & NZ Transport Agency endorsed Urban Form + Transport Initiative (UFTI) Connected Centres Programme, a high level, future focused land use and transport programme which will over time:

- Intensify existing urban areas and enabling new growth areas,
- Develop a transport system that is safe and enables frequent and reliable multimodal access for people and goods.

This business case sets out the recommended option to improve long term transport outcomes on the SH2 / Hewletts Road and adjacent local transport system, aligning with the Connected Centres Programme. A key activity identified by the Connected Centres programme for the short term is the design and implementation of a Hewletts Road optimisation package.

A range of problems have stemmed from competing journeys, limited route choice, competition for road space and a lack of viable alternative modes along a single corridor to access the Mount Industrial Area, an area of economic and national significance. The recommended programme features a co-ordinated, wide-ranging suite of measures across SH2 / Hewletts Rd and local roads for all modes, to maximise the efficient movement of people and goods whilst improving safety and environmental outcomes for everyone.

Key features of the recommended programme include:

- Improvements along Hewletts Road for all road users, including grade separation of the right turn movement from Tōtara Street to increase capacity and reduce turning conflicts
- More and improved local road connections to reduce traffic on Hewletts Road and improve freight access
- Better customer facilities for public transport users, such as new bus shelters and signage
- Improvements for cycling with new cycle facilities on Maunganui Road and a new East-West cycle facility from Tōtara Street to Maunganui Road
- Improvements for freight efficiency through the installation of Managed Lanes on Hewletts Road

Reflecting the significance of the area and ensuring involvement in this project, NZ Transport Agency has developed a strong relationship with Ngāi Tukairangi and Ngāti Kuku hapū, and their involvement has influenced the recommended option.

Project Area

Western Bay of Plenty is one of New Zealand's fastest growing regions, with a rapidly growing population and economy. As one of three current routes available between the two sides of Tauranga Harbour, State Highway 2/Hewletts Road is a well-known bottleneck that lacks resilience, with high traffic volumes, congestion and limited transport alternatives.

Figure A: Map of the Project Area in the Context of Tauranga City

Given the expected population growth and economic importance across the Western Bay of Plenty sub-region, and its strategic importance as a key node of the Golden Triangle, effective operation of Hewletts Road and the surrounding transport system is critical.

The area includes places of cultural significance to Mana Whenua, including the Whareroa Marae. The primary hapū for this marae are Ngāi Tukairangi and Ngāti Kuku of Ngāi Te Rangi. Reflecting the significance of this area to hapū, the CMM project is based on a strong partnership between the NZ Transport Agency Waka Kotahi, Tauranga City Council (TCC), Bay of Plenty Regional Council (BoPRC), Ngāi Tukairangi and Ngāti Kuku.

The CMM project area includes the wider Mount Maunganui local road network to the north and south of SH2 / Hewletts Road and the corresponding transport system (including Maunganui Road, Hull Road and Tōtara Street). A network of local access roads provides direct access to industrial and commercial properties; however the local network has minimal internal connections. Local roads make up around 20km of public roads within the project area.

State Highway 2 (SH2) / Hewletts Road is a nationally strategic corridor, with multiple and competing functions. The State Highway makes up 2.5km of public roads within the project area.

Collectively, the transport system in the project area provides:

- Access to Mount Maunganui, Pāpāmoa, and eastern communities within Western Bay of Plenty (WBOP);
- Access to community facilities such as Mauao, beaches and sport and recreational facilities;
- Freight access to the Mount Maunganui side of the Port of Tauranga and the Mount Maunganui industrial area;
- Access to the Whareroa Marae; and
- Access to the Tauranga airport.

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The Hewletts Road sub area has been identified as the second highest transport priority in the region[1]. Anticipated growth in the area means that without intervention, the problems identified in this IBC will be exacerbated, negatively impacting people travelling in and through the area.

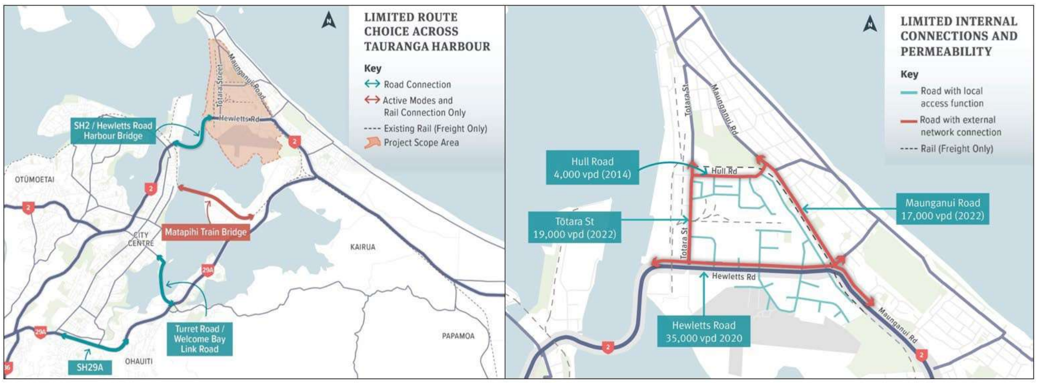

Figure B: Limited Route Choice and Limited Internal Connections: Unreliable journeys for people and goods

It is vital that interventions be identified to support reliable transport choices and to protect the mauri (life essence), hauora (health) and wairua (spirit) of the environment (te taiao). These interventions will be critical to help maintain the effective operation of SH2 / Hewletts Road and the wider WBOP transport system, now and into the future (2048). Three problems have been identified as the main drivers of the business case:

1. Competing journey purposes, limited route choice and internal connections to access Mount Maunganui (residential, recreational, commercial and industrial) and the eastern corridor results in unreliable journeys for people and goods (see Figure B);
2. Competition for limited road space is causing high levels of exposure for vulnerable users and conflict between vehicles resulting in harm to people and the community; and
3. High volumes of vehicles travelling and a lack of viable alternative options results in transport related effects impacting on the environment (Whareroa marae, the harbour and public health) and New Zealand's transport emissions.

There is strong and specific evidence to show that these problems exist now, and with forecast growth in the wider Tauranga and Mount Maunganui area, they will continue to worsen if not addressed.

Benefits of investing to solve the problems

This business case has identified the following benefits of investing to resolve these problems:

- Improved transport system reliability, access, and throughput of people and goods;
- A multi-modal transport system that supports safer and healthier journeys;
- Improved transport choice for access to social and economic opportunities;
- Reduced impact on the environment and climate change impacts from transport related carbon emissions; and
- Improved public health outcomes.

All benefits identified support sustainable urban growth and give effect to the direction established by SmartGrowth via the UFTI Connected Centres Programme. While population and freight growth will exacerbate the problems identified above, addressing the problems will also help support the opportunity for additional growth.

[1] The Transport System Plan (TSP)

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Option Identification and Assessment Process

The project team has assessed a wide range of potential options, testing each on their ability to meet the Project Objectives. These included options (Kowhiri) developed by Ngāi Tukairangi and Ngāti Kuku.

The process to identify a Recommended Programme is illustrated below.

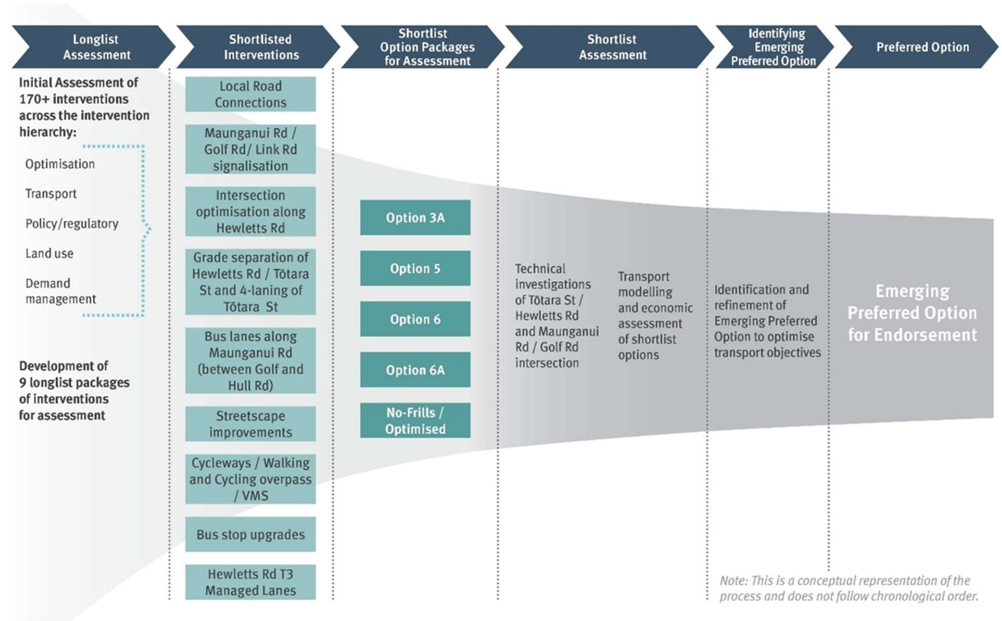

Figure C: Options Assessment Overview

An options and alternatives assessment was undertaken to determine a preferred way forward for investment. The options were initially screened through an Early Assessment Sifting Tool, then a longlist multi-criteria analysis and further refined through a shortlist multi-criteria analysis. The emerging preferred option was chosen following rigorous assessment and further investigations during and following the shortlist analysis.

Recommended Programme

The intent of the recommended programme is to maximise the efficient movement of people and goods whilst improving safety and environmental outcomes for all customers in a cost-effective manner.

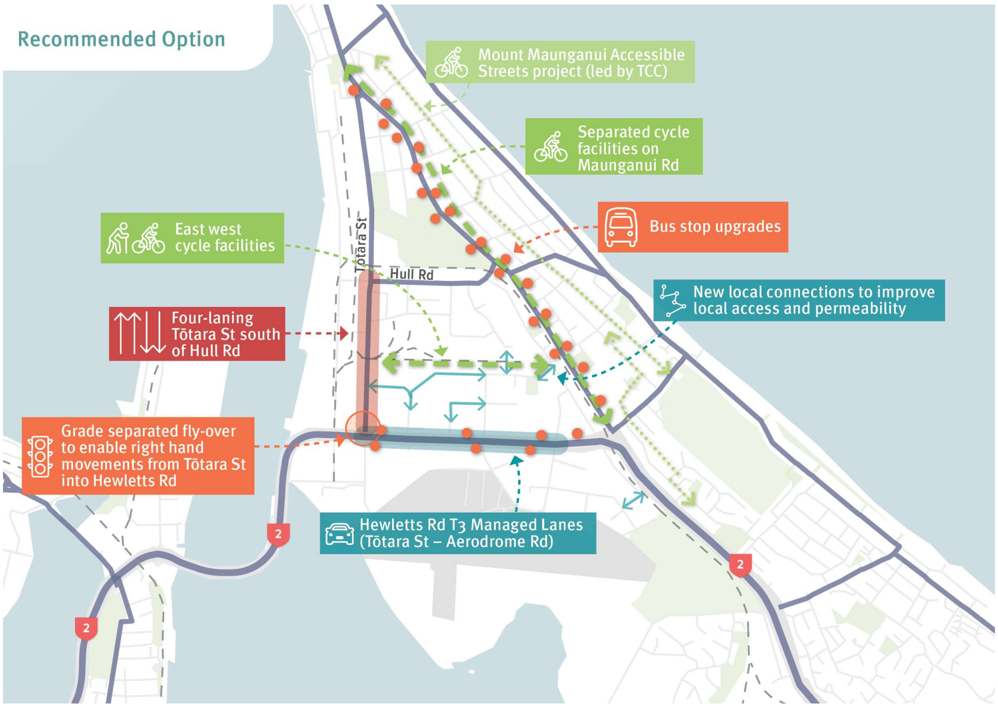

Figure D: Recommended Programme

Key features of the recommended programme include:

Major improvements along Hewletts Road

- A partial grade separated intersection upgrade to increase capacity of the right turn movements from Tōtara Street onto Hewletts Road.
- T3 Managed Lanes to provide travel time savings for all vehicles

Improved local road connections

- Four-laning of Tōtara Street between Hewletts Road and Hull Road (from the current two lanes).
- Improved local connections, enabling more efficient local trips and reducing congestion on Hewletts Road / SH2, including completing the Te Marie link.

Improvements for public transport users and services

- Bus stop upgrades to provide greater transport choice.
- Improved journey times and reliability due to the more efficient operation of the Hewletts Road / Tōtara Street intersection as well as wider system optimisation

Improvements for cycling

- Cycle facilities on Maunganui Road.
- East-west cycle facilities.

Benefits of the Recommended Programme

As well as setting foundations consistent with the UFTI Connected Centres Programme, the recommended programme will enable the transport system to function more efficiently, supporting economic growth and productivity. This is particularly important given the role of the Port of Tauranga in

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the national supply chain – improving travel times and travel reliability for Heavy Commercial Vehicles (HCVs) will increase the efficiency, competitiveness and productive potential of importers and exporters. Elements of the recommended programme also align with preferences expressed by hapū during the IBC process.

Many interventions are local road improvements which will allow local trips to be made on the local network, enabling greater capacity for throughput on Hewletts Road which will have network-wide capacity and efficiency benefits.

The recommended programme will mean travel through the project area will be more consistent and predictable to support the city and sub-region as it grows. It will enable safe and reliable access to economic, educational and social opportunities within Tauranga and the western Bay of Plenty, including for both hapū.

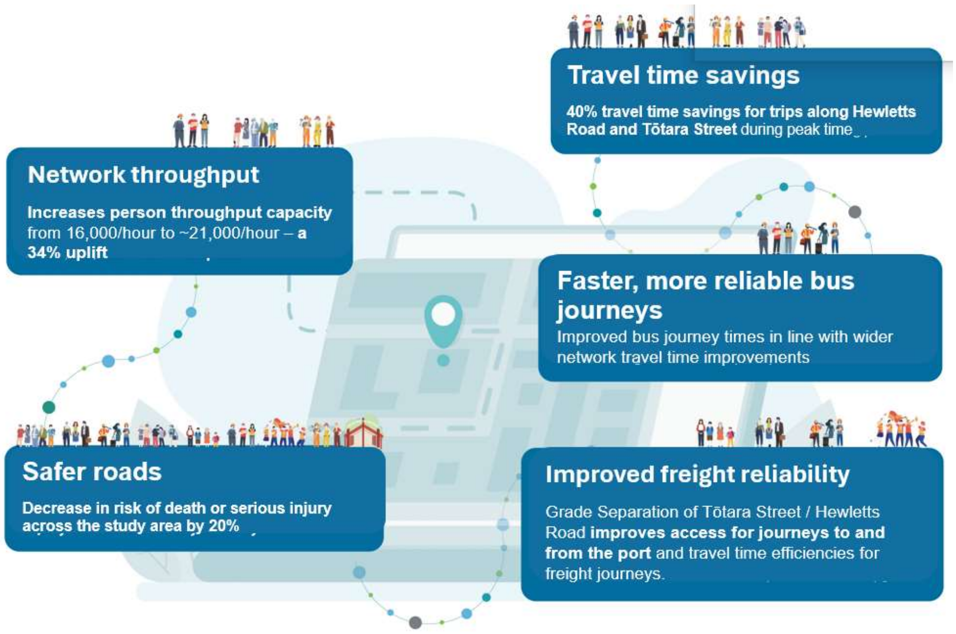


Figure E: Better Outcomes for all Customer Groups

The recommended programme is expected to deliver the following benefits:

Network throughput: Increases person throughput from 16,000/hour to ~21,000/hour – a 34% uplift (noting this is theoretical capacity only).

Freight reliability: Grade Separation of Tōtara Street / Hewletts Road improves access for journeys to and from the port and travel time efficiencies for freight.

Travel time savings: 40% travel time savings for trips along Hewletts Road and Tōtara Street for freight and general traffic in both the AM and the PM peak

Network optimisation: With a focus on Hewletts Road, changes will enable the transport system to deliver optimal performance, by improving reliability and throughput, including for freight journeys.

Safer roads: Moderate reduction in exposure to risk of death or serious injury across the study area by ~20%, including interventions to improve road safety (i.e. improved cycle facilities)

Increased transport choice: Interventions will support an increase in walking and cycling trips, including 4.9km of new or substantially upgraded cycle paths

Faster, more reliable bus journeys: Improved bus journey times in line with wider network travel time improvements

Access to social and economic opportunities: Greater population within 30 min catchment, especially for access to Mauao, supporting outcomes sought through the Mount Maunganui Spatial Plan changes.

Economic Summary

Project Costs

The total expected cost to deliver the Recommended Option is between $276m (P50) and $373m (P95) (excluding T3 Managed Lanes). Cost estimates have been undertaken in line with NZTA's Cost Estimating Manual SM014, and do not include escalation[2].

Component Estimate	Cost (undiscounted)
Base Estimate	$184m
Contingency	$92m
50th Percentile Project Estimate (P50)	**$276m**
Funding Risk Contingency	$97m
95th Percentile Project Estimate (P95)	**$373m**

The funding split between project partners will be confirmed during each subsequent stage once more detailed cost estimates have been undertaken and there is more certainty of design.

Given the relative lack of design detail (appropriate for an IBC), exact land requirements are not yet fully understood, making it difficult to determine property costs explicitly for each option. Based on indicative property cost estimates, an estimated $48 million (P50) has been allocated towards property costs. A contingency of 50% (P50) and a funding risk contingency of 52% (P95) have been applied to the overall pre-imp and implementation phase costs, as recommended by the NZTA Cost Estimation Manual (SM014).

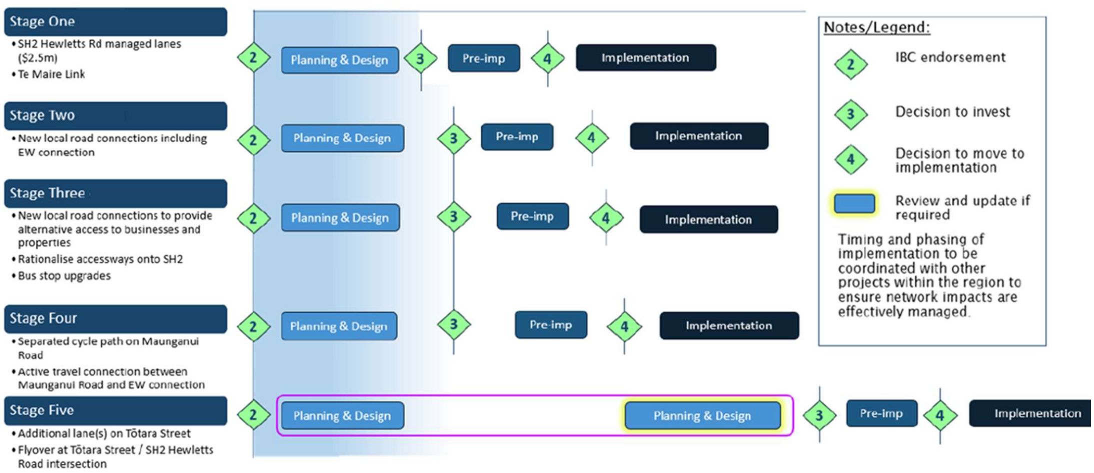
The T3 Managed Lanes intervention has been costed separately and has an indicative cost of $2.0-2.5m. This high-level estimate includes costs for safety improvements, public consultation, design and implementation, and contingency.

Cost Effectiveness

The Benefit Cost Ratio (BCR) for the recommended option ranges between 0.98 (P95 cost)-1.30(P50 cost). The T3 Managed Lanes intervention has been assessed separately and has an indicative BCR of 7.7.

Staging

Post IBC, the programme has been separated into 5 stages to manage risk and exposure (Figure F).



[2] Cost index: Q1-2023

Figure F: Indicative Staging Approach

The proposed pathway provides flexibility to approach the next project phase(s). The planning and design phases can be right sized to support investment decision-making and efficient progression to pre-implementation. There are opportunities to bring different stages forward, within reason, and dependent on funding availability and priority. Construction disruption and timing with other Tauranga projects will need to be considered and planned for.

Risks

The risks for the next stages of the project are well understood and a comprehensive Risk Register (including treatment) is contained in Appendix F. Extensive risk management controls are in place and a risk management framework is proposed for each subsequent stage. Briefly, risks identified include:

Risk	Description	Proposed treatment
Future land use	High level of uncertainty regarding future land use in the area, including rate of growth in the Eastern Corridor. Changes to long term / wider sub- regional growth patterns could impact demands and outcomes.	Project team to review latest land use plans (e.g. Mount Spatial Plan) and continue close liaison with key stakeholders e.g. Port of Tauranga
Cost escalation	Increasing construction / material costs, property acquisition, costs, and costs associated with complex ground conditions	Cost information to be further refined in during planning and design of each stage once further detail is known.
Funding availability	Funding for next phases of delivery of the project is a risk, noting funding constraints both for Tauranga City Council and the National Land Transport Fund. There is also risk that the Recommended Programme is not aligned with funding availability	Project team to focus on funding and financing options for each stage, noting current split between NZ Transport Agency and Tauranga City Council.
Benefits and Funding	Risk that the BCR will not justify expenditure resulting in re-scoping, project delay	The next stages to focus on identifying additional benefits, in particular wider regional benefits of this nationally significant freight and industrial area and other WEBs. Note that cost information is more complete than the benefit information in the current IBC phase
Project support	Risk of opposition for project from Mana Whenua. Ngāti Kuku have concerns that the recommended option does not support their land use aspirations, has te ao Māori impacts, and is unlikely to improve air quality and associated health impacts.	Continue regular engagement with both Ngāi Tukairangi and Ngāti Kuku. Where possible, integrate te ao Māori world view and hapū aspirations into project decision-making. Project team to continue supporting Waka Kotahi in engagement with hapū. Continue to respond to hapū concerns and suggestions.
Recommended programme endorsement by the project partners	Risk that project team, project partners and/or PSG cannot reach agreement on the recommended option.	Project team to continue regular engagement and integrate feedback as part of the next stages.
Relitigation of previous decisions	Undoing previous decisions made or requesting additional investigations or modelling, causing delay and additional costs	Project team to record and share all decisions made including reasons for decisions. Documentation to be made available to all Project partners to review regularly

Implementation and Next Steps

The next stages of the project are well understood with appropriate governance plans and processes already in place to help ensure the successful delivery of the programme, as outlined in the Management Case.

There are four project partners – mana whenua, NZ Transport Agency, TCC and BOPRC. The two Investment Partners and road controlling authorities (RCA) are TCC and NZ Transport Agency. They will fund a large part of the CMM project. BOPRC will fund the public transport services.

Ongoing partnership and engagement with the hapū of Whareroa marae will continue to ensure the project team understands te ao Māori values and hapū aspirations for whanau[3]. This will help shape and inform option development and preferred designs to align with hapū aspirations where possible.

On behalf of the project partners, NZ Transport Agency will continue to manage the Connecting Mount Maunganui business case, and subsequent pre-implementation and implementation according to its standard procedures.

During the next project phases, opportunities may be identified to implement discrete packages of works, delivering optimisation and improvement in the short term. This could include safety upgrades, intersection signal optimisation, and local network connections.

Noting that the timescale for the project will span a significant number of years, opportunities to implement improvements in the shorter term will be sought, to realise benefits sooner. Project management of short-term optimisation and improvement works could be implemented under a common framework with the primary project works.

[3] Note: Ngāti Kuku have been involved in the development of the IBC and the options identification and assessment process. The hapū have chosen to withdraw as a project partner due to concerns about the potential visual impact of the SH2/Tōtara St grade-separated intersection. The hapū hold an ambition that the Mount Maunganui industrial area will no longer be used for industrial use and be changed to mixed commercial/residential use. If this change occurred the intersection structure would then have a visual impact to the view of Mauao.

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Glossary of Terms, Abbreviations and Acronyms

Abbreviation	Definition
AADT	Annual Average Daily Traffic
BOPRC	Bay of Plenty Regional Council
DBC	Detailed Business Case
ERP	Emissions Reduction Plan
EVs	Electric Vehicles
GPS	Government Policy Statement on Land Transport 2024
IBC	Indicative Business Case
JSP	Joint Spatial Plan
KPI	Key Performance Indicator
MCA	Multi-Criteria Analysis
MSP	Mode Shift Plan
NPS-UD	National Policy Statement on Urban Development
PT	Public Transport
RLTP	Regional Land Transport Plan
SH2	State Highway 2
SOE	State Owned Enterprise
TCC	Tauranga City Council
TOF	Transport Outcomes Framework
TSP	Transport System Plan (the Western Bay of Plenty)
UFTI	Urban Form and Transport Initiative
VKT	Vehicle Kilometres Travelled
WBOP	Western Bay of Plenty

Term	Definition
Urban Form and Transport Initiative	The SmartGrowth[4] endorsed Urban Form + Transport Initiative (UFTI)[5] Connected Centres Programme is a high level and future focussed land use and transport programme to be implemented over time. The UFTI Connected Centres Programme is based on intensifying existing and enable new growth areas, and having a transport system that supports safe, frequent and reliable multimodal access for people and goods.
Transport System Plan	Western Bay of Plenty Transport System Plan identifies transport investments to support the UFTI Connected Centres Programme. It prioritises the transport projects based on levels of service to be included in Regional Land Transport Plans and includes major public transport and mode shift initiatives to change the way people move around the Western Bay of Plenty over the next 30 years

[4] See https://www.smartgrowthbop.org.nz for information about SmartGrowth and its partners
[5] SmartGrowth and Waka Kotahi endorsed the UFTI Connected Centres Programme in June and August 2020. See https://ufti.org.nz for more information about the UFTI Connected Centres Programme and analysis supporting the programme

PART A – STRATEGIC CASE

1 Introduction

The Connecting Mount Maunganui project is one piece of a much bigger picture when it comes to the future of transport and movement of people and goods throughout Tauranga and the western Bay of Plenty.

SH2/Hewletts Road and the surrounding area is the crucial ‘last mile’ connection between the Upper North Island freight network and the Port of Tauranga. The demand across this part of the Tauranga network is significant resulting in unreliable journey times and delays for freight, general traffic and public transport. Demand is forecast to increase with significant growth anticipated across the Bay of Plenty and at key connections including the Port or Tauranga.

The NZ Transport Agency and project partners are working together on the best options to connect the growing communities on the eastern side of the city, to contribute to a safe transport network and to protect the natural environment.

1.1 Purpose

The purpose of this Indicative Business Case (IBC) is to identify an optimal and recommended way forward to improve the SH2 / Hewletts Road and adjacent local transport system, which will:

- Improve the reliability, access, and throughput of people and goods to enable safe access to economic, education, and social opportunities within Tauranga and the western Bay of Plenty.
- Support the implementation of the Urban Form + Transport Initiative (UFTI) Connected Centres Programme Business Case (PBC); and
- Be consistent with the Western Bay of Plenty Transport System Plan

This IBC is one of a number of business cases being prepared for the region, including the 15th Avenue to Welcome Bay Road SSBC, Cameron Road Business Cases (Stage 2[6]), the Public Transport Services and Infrastructure Business Case and Tauriko West Connections (SH29/SH29A) Business Case.

1.2 Building on Work Completed to Date

Considerable work has been completed via the UFTI PBC, the Transport System Plan (TSP) and subsequent business cases. This provides the framework for the problems, outcomes and desired targets to support the Connected Centres Programme, a 50 year plus integrated land use and transport programme.

This IBC builds on extensive investigations previously undertaken which have identified potential options to improve transport outcomes along the Hewletts Road corridor and adjacent network. These provide a starting point for considering options to improve multimodal throughput, encourage mode shift from private vehicles, and support freight accessibility, particularly in terms of corridor optimisation options.

1.2.1 UFTI Connected Centres Programme

SmartGrowth[7] endorsed UFTI[8] Connected Centres Programme, a high level, future focused land use and transport programme. It focuses on intensifying existing urban areas and enabling new growth areas, with a transport system that supports safe, frequent and reliable multimodal access for people and goods. The programme is designed to cater for the approximately 200,000 additional people, 95,000 new homes, and two million additional transport movements per day expected within the next 30 to 70 years. The Connected Centres programme looks to:

- Increase the number of dwellings by intensifying existing urban and new growth areas, maximising land available for development and helping support a well-functioning multimodal transport system;

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[6] The Cameron Road Stage 2 Business Case (from 17th Avenue to Pyes Pa, excluding Barkes Corner) is currently underway
[7] See https://www.smartgrowthbop.org.nz for information about SmartGrowth and its partners.
[8] SmartGrowth and Waka Kotahi endorsed the UFTI Connected Centres Programme in June and August 2020. See UFTI (smartgrowthbop.org.nz) for more information about the UFTI Connected Centres Programme and analysis supporting the programme.

- Ensure local social and economic opportunities can be accessed within a 15-minute journey time, and sub-regional social and economic opportunities within 30–45 minutes; and
- Identify the critical sub-regional journeys and their strategic functions and movement/modes priorities based on previous completed transport planning work.

This business case sets out the recommended option to improve long term transport outcomes on the SH2 / Hewletts Road and adjacent local transport system, aligning with the Connected Centres Programme. The UFTI challenges and benefits identified (see Table 1-1) provide a basis for the area-specific problems and benefits identified in this project. The recommended improvements investigated in this business case are a critical step in achieving the UFTI Connected Centres Programme.

Table 1-1: UFTI Challenges and Benefits

UFTI Challenges[9]	UFTI Benefits
The lack of housing supply, transport choice, and a high dependency on private vehicles in WBOP restricts access to social and economic opportunities and is leading to poor social and environmental outcomes	We have the housing we need and can afford We can move and enjoy our live, learn, work, and play lifestyle The quality of our environment is improving Our economic productivity and prosperity are improving for all
The ability to access community facilities and infrastructure levels of service are not aligned with community needs and expectations and are impeding the ability of people to fully enjoy the Bay of Plenty lifestyle.	
WBOP's harbour geography and dispersed land use pattern and increasing traffic volumes negatively impact on the safe and efficient movement of people and goods	

A key activity identified by the Connected Centres programme for the long term is the design and implementation of a Hewletts Road Indicative Business Case.

Figure 1-1: UFTI Movement Priorities Summary Map

This includes investigation interventions such as intersection improvements, lane usage, public transport priority lanes and other interventions to support the strategic function and mode/movement priorities.

These improvements will help support a thriving sub-region, supporting growth, increased safety (transport and personal), better travel choices, improved modal shift, inter-regional freight efficiency[10].

[9] https://secureftp.tauranga.govt.nz/public/file/qm4061UPRUCXTrFdbWrjow/22527-TCC-UFTI-Final-Report-FINAL.pdf p. 29
[10] https://secureftp.tauranga.govt.nz/public/file/qm4061UPRUCXTrFdbWrjow/22527-TCC-UFTI-Final-Report-FINAL.pdf p .97

2 Project Scope

The Connecting Mount Maunganui project involves the development of an IBC that identifies and recommends preferred interventions for the SH2 / Hewletts Road corridor and surrounding local transport system to address identified problems, deliver on desired transport outcomes and help deliver elements of the UFTI Connected Centres Programme.

2.1 Study Area

The study area for this IBC is shown in Figure 2-1. It includes the SH2 / Hewletts Road corridor and the adjacent Mount Maunganui local road network. This includes:

- SH2 from the SH2 / Tauranga Bridge Marine intersection to SH2 / Northern boundary of the Link Avenue Reserve;
- SH2 / Maunganui Road to Maunganui Road / Rata Street; and
- Rata Street / Tōtara Street to the end of Tōtara Street

SH2 / Hewletts Road is a nationally strategic corridor and one of three current routes available between the two sides of the Tauranga Harbour (the other two being 15th Avenue / Turret Road and SH29A). The corridor has multiple and often competing functions, including:

- Providing safe access to Mount Maunganui, Pāpāmoa, and eastern communities within WBOP;
- Providing access to several community facilities such as sport and recreational facilities; and
- Providing freight access to the Mount Maunganui side of the Port of Tauranga and the Mount Maunganui industrial area which also includes the airport and other key commercial activities such as building supply sites.

Figure 2-1: Study Area of Connecting Mount Maunganui IBC

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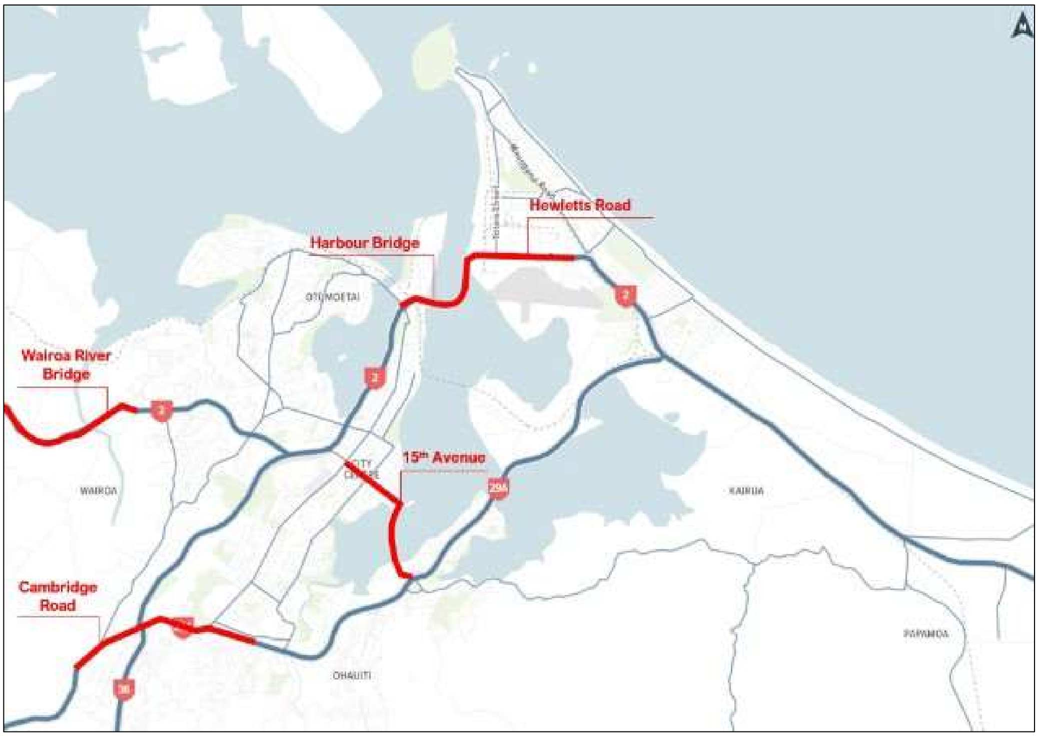

Figure 2-2: Pinch Points in Tauranga City Traffic Network[11]

Hewletts Road is well known as a bottleneck in the local traffic network, identified as a location where people driving across the city or through the region are likely to experience congestion, with limited alternatives (Figure 2-2).

Transport modelling analysis undertaken for the TSP indicates that adding capacity within the Hewletts Road corridor would require additional capacity to the SH2 harbour crossing and other parts of the SH2 corridor[12]. Additional capacity on the SH2 harbour crossing is not in scope for the Connecting Mount Maunganui IBC.

With significant traffic volumes[13] using Hewletts Road and further growth expected in the Eastern Corridor[14], identifying interventions to support a reliable and multi-modal journey experience is critical to maintaining the effective operation of Hewletts Road and the WBOP transport system. This includes the need to increase the efficient movement of both people and goods through the Eastern Corridor to cater for the planned growth.

If Hewletts Road is unable to appropriately support the functions planned for in the Connected Centres programme and confirmed via the TSP, it is likely additional demand will be applied to Turret Road/15th Ave and SH29A which also provide access between the two sides of the harbour.

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[11] https://www.tauranga.govt.nz/Portals/0/data/future/growth/files/transport-system-plan-executive-summary.pdf p.12

[12] The Executive Summary of the Transport Modelling Report for UFTI (https://assets-global.website-files.com/639c0b75c31ac6442f8d9994/640f92151b317e718cc4fef3_FINAL-UFTI-REPORT-Modelling-Report.pdf) notes that the 2048 scenarios have peak-period congestion on most commuter routes, but with only a limited number of locations with more extreme congestion (LoS F). It states that "*Additional interventions were tested that had the potential to address those locations. However, the increased road capacity in some corridors (such as Hewletts Road), in turn induced more traffic to the corridor, which generated new congestion spots.*

[13] ~24k (2020) annual average daily traffic (AADT) before Tōtara Street, and ~17k AADT near Jean Batten Dr in each direction, with approximately 9-12% heavy commercial vehicle share: https://maphub.nzta.govt.nz/public/?appid=31305d4c1c794c1188a87da0d3e85d04

[14] The Eastern Corridor stretches from SH2 to the coast and from Girven Road and Te Maunga intersections to Paengaroa junction (SH2 and 33). It includes Pāpāmoa up to Maketu, including Tauranga Eastern Link, Te Puke, Paengaroa, Maketu and Pukehina Beach

4

2.1.1 Key Features and Areas of Cultural Significance

Figure 2-3: Key Features of Study Area and Surrounding Environment, and Sites of Cultural Significance

The study area and surrounding environment have many competing industrial, commercial, recreational and cultural functions and uses. Coupled with limited routes and increasing traffic volumes, this creates challenges for people moving through and around the area. Its key features / destinations include Tauranga Airport, Mount Maunganui Industrial Zone and Whareroa Marae, as well as others identified in Figure 2-3.

3 Key Partners and Stakeholders

A range of project partners and key stakeholders have been involved in the Connecting Mount Maunganui IBC, all project partners and stakeholders are aligned with the purpose, objectives and benefits of investing in the project. Project partners and key stakeholders include:

3.1 IBC Project Partners

The project partners for the CMM project are:

- NZ Transport Agency Waka Kotahi
- Tauranga City Council
- Bay of Plenty Regional Council,
- Ngāi Tukairangi and
- Ngāti Kuku

3.1.1 Organisational Overview

The following partners are responsible for delivering the investment:

- **NZ Transport Agency Waka Kotahi**: State highway asset owner, transport system advisor and investor in New Zealand's transport system. Its responsibilities include planning and funding activities, building and maintaining networks that connect communities, and ensuring the people and vehicles that use the system are safe to do so. A principal responsibility is effective operation of the State Highway network.
  - Hewletts Road is a state highway asset. NZ Transport Agency Waka Kotahi holds accountability and responsibility for its operation, management, and improvements. It is also the investor for the state highway network.
  - NZ Transport Agency has several roles on this IBC, including implementation of the GPS investment priorities.
- **Tauranga City Council**: Territorial authority responsible for all local government decisions and responsibilities in Tauranga city. Responsibility includes being the asset owner and managing the local road network and public transport infrastructure in Tauranga city. Of relevance to this project,
  - Is currently working with key stakeholders, partners and the community to develop industrial and residential spatial plans for the area. The spatial plans will outline issues and a vision, and then set policy direction to achieve this.
  - The surrounding SH2 / Hewletts Road Mount Maunganui transport system comprises local roads under the ownership and management of TCC. TCC also have statutory functions under the LGA and other legislative framework.
- **Bay of Plenty Regional Council**: Overarching regional responsibility for planning and regional land transport for the Bay of Plenty region. Includes the management and operation of the region's public transport services. Is also responsible for managing effects on freshwater, land, air and coastal waters.

3.1.2 Mana Whenua

Mana whenua partners in the study area include the mana whenua hapū from Ngāiterangi of Ngāti Kuku and Ngāi Tukairangi. The Ngāiterangi rohe extends from Mayor Island and Bowentown in the north, to the Kaimai Range in the west, south to Te Puke and to Maketu in the east. Whareroa marae is formally recognised in the TCC City Plan as supporting the cultural activities of the affected hapū.

The project team continues to engage with mana whenua about the project. Regular hui have been held with the hapū of Whareroa marae and a working group was established to undertake various engagement and information sharing, as well as cultural impact assessments.

A summary of key issues / concerns raised by hapū of Whareroa marae include:

- Changing the land use to mixed commercial and residential
- Whareroa marae community and whenua is a culturally significant and sensitive area. CMM project should not compound current issues/deteriorate the existing situation
- Protection of the mauri (life force), haoura (health) and wairua (spirit) of the project area
- Progress occurs to the detriment of Whareroa/tangata whenua wellbeing
- Whareroa Marae objective is to relocate polluting and heavy industry away from Whareroa marae area
- Support use of rail/heavy road user tariffs to reduce truck road usage
- Flyover at Tōtara Street/Hewletts Road intersection is opposed as the structure will block views to Mauao
- How will the project benefit Whareroa marae/whānau?
- Hapū voice must be prioritised – CMM could amplify intergenerational inequities for Whareroa marae community
- Strong direction spatial planning should integrate with CMM project

The values and concerns of Mana Whenua require careful consideration. Cultural Impact Assessments or other engagement and information sharing processes (as agreed with Mana Whenua) will assist with understanding their values in relation to any site or place potentially affected by the activities proposed by this business case.

3.1.3 Ngāi Tukairangi

Ngāi Tukairangi hapū is based at Hungahungatoroa/Whakahinga marae and Tāpuiti wharenui at Matapihi, and Whareroa marae and Rauru ki Tahi wharenui at Mount Maunganui.

Based in Matapihi, the Ngai Tukairangi Trust was formed through the amalgamation of several Māori owned land blocks. Ngai Tukairangi Trust owns two large kiwifruit operations in Hawkes Bay and the Bay of Plenty and has significant investments in commercial property and other businesses.

3.1.4 Ngāti Kuku

Ngāti Kuku hapū is a sub-tribe of Ngāiterangi, based at Whareroa marae and Rauru ki Tahi wharenui at Mount Maunganui. Ngāti Kuku originally had significant land holdings which have been acquired under the Public Works Act between 1940 (for aerodrome purposes) and 1952 (land for ‘better utilisation’). Much of the land taken in 1952 is now being used for industrial, port and harbour facilities. Whareroa Marae is home to around 80 people from the Ngāti Kuku sub-tribe (hapū).

Note: Ngāti Kuku have been involved in the development of the IBC and the options identification and assessment process. The hapū have chosen to withdraw as a project partner due to concerns about the visual impact of the SH2/Tōtara St grade-separated intersection. The hapū hold an ambition that the Mount Maunganui industrial area will no longer be used for industrial use and be changed to mixed commercial/residential use. If this change occurred the intersection structure would then have a significant visual impact to the view of Mauao.

3.2 Stakeholders

As well as multiple project partners, the CMM project has a wide range of stakeholders (Figure 3-1) that have an interest in or could inform the outcome of this project. The interests and priorities of these stakeholders are complex and often competing. These stakeholders include:

- **Tauranga Airport** –Owned by TCC, Tauranga Airport is the eighth busiest airport in the country and the third busiest for general aviation. The airport is centrally located in Tauranga, with a land holding of 225 hectares. Much of the land surrounding the airport is leased for commercial use e.g. Bunnings and warehousing.

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- **Port of Tauranga** – New Zealand's largest port, operating New Zealand's international container freight hub, bulk cargo wharves, bunkering facilities and extensive cargo storage areas. The Port of Tauranga handles approximately a third of all New Zealand cargo, 40% of New Zealand exports and nearly half of all shipping containers. Port of Tauranga is listed on the NZX.
- **Quayside** – Quayside Investment Holdings (Quayside) is the investment arm of Bay of Plenty Regional Council. Via a subsidiary, it is the majority shareholder in the Port of Tauranga. Quayside will advise on opportunities arising from the relocation of industrial activities to (for example) Rangiuru Business Park;
- **KiwiRail** - Rail freight movements to and from the Port of Tauranga reduce the number of heavy vehicles travelling through the Tauranga urban area, improving safety outcomes. KiwiRail continues to advise on its current and future rail freight demand and potential interventions to support freight and potential metro rail access.

A summary of the Engagement Strategy is included in Appendix A.

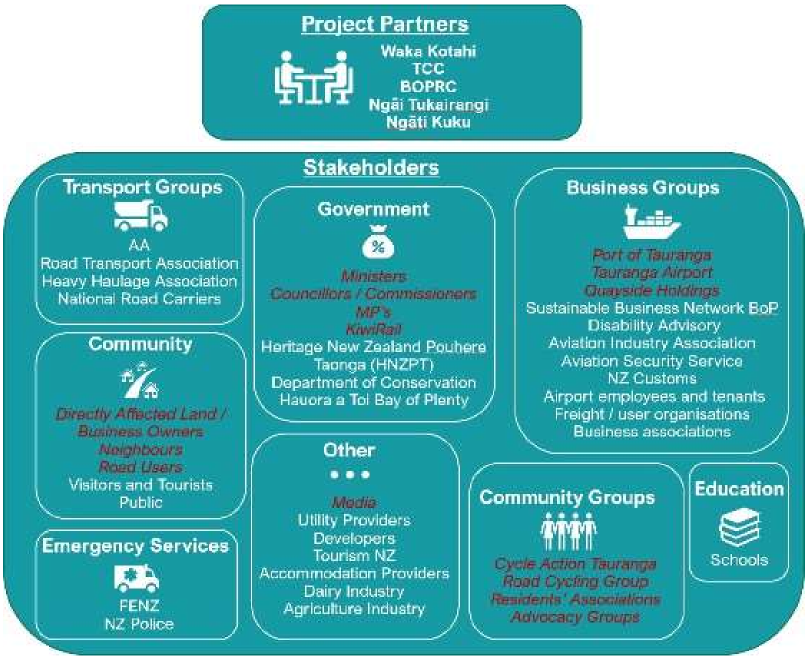

Figure 2-4: Multiple Project Partners and Stakeholders have an interest in the Project

3.3 Engagement to date

Throughout the IBC, the project team has engaged with businesses and organisations in the area including the Port of Tauranga, KiwiRail, Tauranga Airport, Priority One, Sustainability BOP, the Heavy Haulage Association and local residents' associations.

People have shared their views on transport in the Mount Maunganui area through surveys and customer insights research. The project team has analysed this and existing research to understand peoples' views.

Further engagement was undertaken in March 2022, alongside the Mount Maunganui Spatial Plan activities. Several key themes emerged, including:

Improving safety

People are concerned about safety on the roads, including the volume of heavy vehicles moving through the area, and safety for cyclists. People also have poor perceptions of safety on the bus network, which can affect usage. While the majority of Tauranga respondents consider public transport to be safe, this is the lowest of all other major New Zealand cities surveyed.

Improving reliability

Reliable travel times are a key concern. People are frustrated with heavy traffic, delays and unreliable journeys. While the sub-region's traffic delays are modest compared with other New Zealand cities, continued growth has resulted in increased demand for travel. People would like more reliable journeys, particularly during peak periods.

More travel options

More than half of people feel the car is their only option for travel in the morning. However, people are open to changing to bus or bike if the alternatives are improved, which in turn will improve air quality. If congestion worsened, 35% indicated they would very likely or likely use an alternative mode: the bus, travel less or cycle.

With Tauranga having one of the highest private vehicle use rates in the country, there is an opportunity to make improve the attractiveness of public transport and active modes.

Many local businesses would like to see delays reduced for freight and commercial journeys, particularly along Hewletts Road and Tōtara Street.

Both people cycling and people not cycling perceive safety as a key barrier, due to how other people drive, not feeling safe cycling in the dark and the speed of other users. Barriers to walking include not feeling safe walking in the dark, it being too slow, living too far away, it taking too long.

3.3.1 Customer Views of the Problems

A customer-focused lens to drive outcomes

Nine key customer groups were identified for the SH2 / Hewletts Road and adjacent local transport system. These originated from the Customer Insights Report Technical Note (refer to Supporting Information) developed from the evidence base and following a customer insights workshop held 1 July 2022. These customers' problems are further described in the evidence for each problem statement.

Figure 2-5 summarises the different priorities across each of the customer groups. These were identified through the customer insights workshop. Safety is the most prominent issue for all customer groups with other priorities being reliability/speed of journey, directness of access and quality of service/infrastructure.

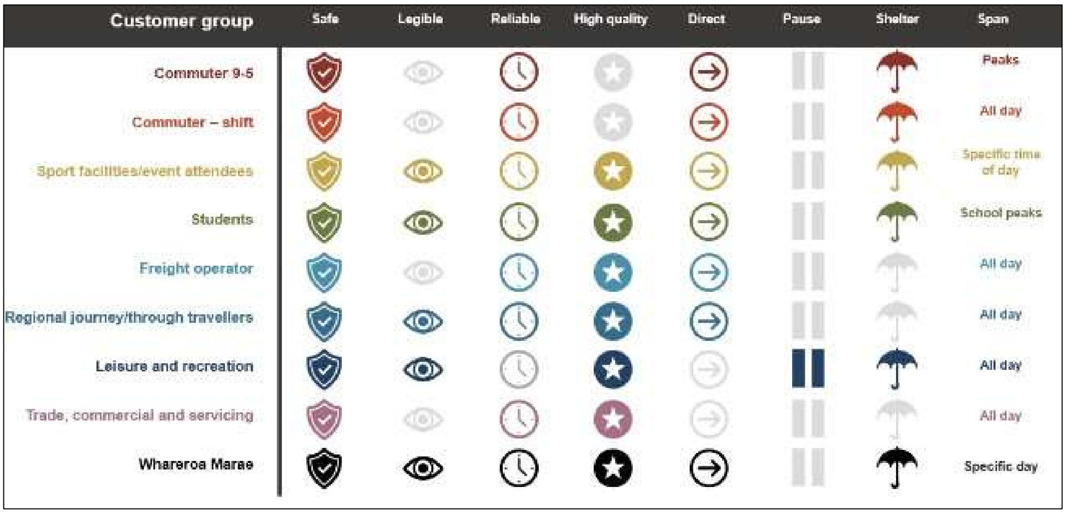

Figure 2-5: Customer Needs Summary for Each Customer Group

Customer issues by mode (within the study area) were also identified, are summarised in Figure 2-6.

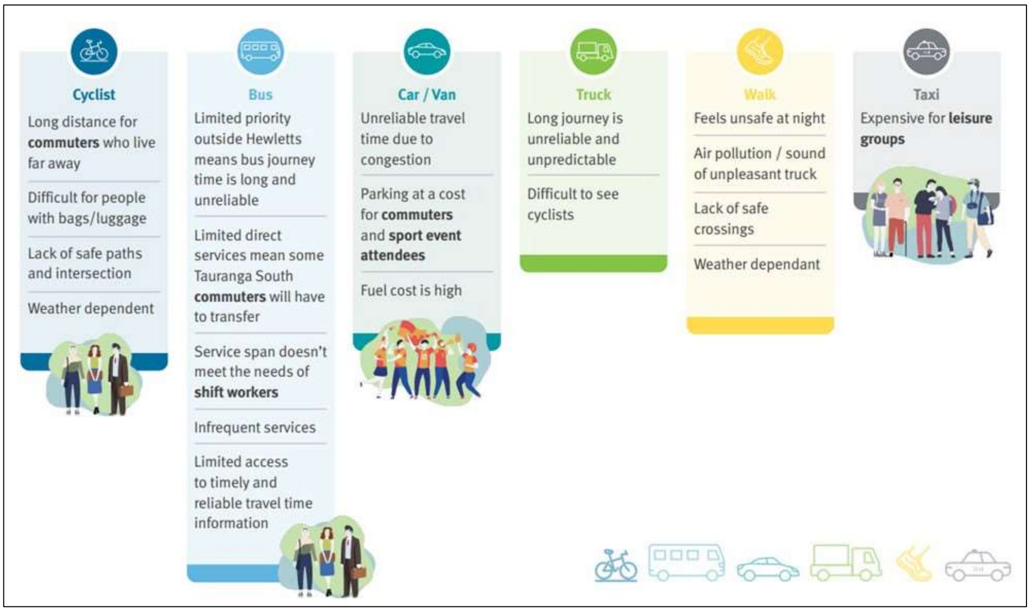

Figure 2-6: Customer Issues Identified for Each Mode within the Study Area

3.3.2 Engagement through the Mount to Arataki Spatial Plan activities

Customers were asked for their views on the Mount to Arataki Spatial Plan which sets the direction for how the area will develop over the next 30 years. Common themes from feedback relevant to the CMM project included:

- Maintaining access to the beach while preserving the coastal environment.
- The need for more road maintenance and safer roads, including cycle and pedestrian infrastructure, and the deliberate slowing of traffic in residential areas using measures like roundabouts and speed bumps.
- Enhancing parking and accessibility at key centres.
- Managing traffic congestion.
- The need to manage the risk of natural hazards and climate change related impacts including flooding, sea level rise, and tsunami.
- Concerns were raised regarding air, noise, and water pollution associated with the industrial area.

4 Strategic Context

The strategic context describes the population, transport, economic, land use, and cultural context within which the Connecting Mount Maunganui project sits.

4.1 Population Context

Over the last 30 years, Tauranga City has doubled in size to be New Zealand's fifth largest city. This trend of sustained high population growth is anticipated to continue. The 2021 TCC population and dwelling study projects that population and dwelling increases for Tauranga City will be significant[15]. Specifically, the population is projected to increase by 47% from approximately 142,000 residents in 2018 to 209,000 residents in 2048 (Figure 4-1). Within the Mount Maunganui area this is projected to increase by 15.6% from 22,662 residents in 2018, to 26,193 residents by 2048[16].

As the population increases, so will demand for travel. This will require the transport system to support more efficient and effective movement of people and goods. Across the wider WBOP region, the population is forecast to increase by an extra 200,000 people in the next 30-50 years, requiring an additional 95,000 dwellings[17]. This could create two million additional transport movements per day, adding pressure to an already stressed transport system.

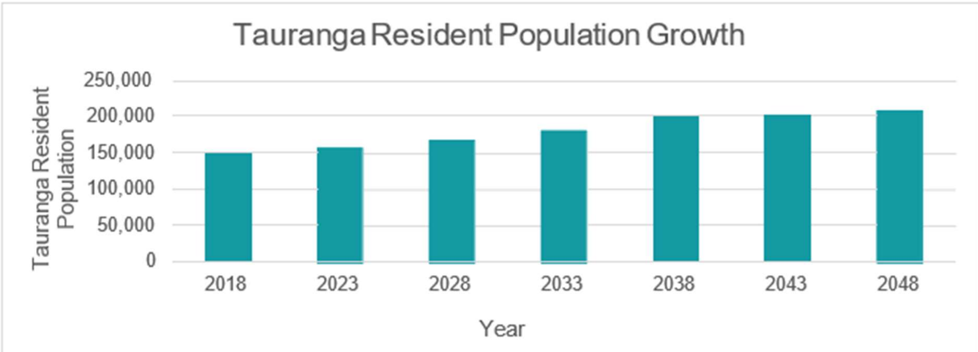

Figure 4-1: Tauranga City Projected Resident Population Growth 2018-2048

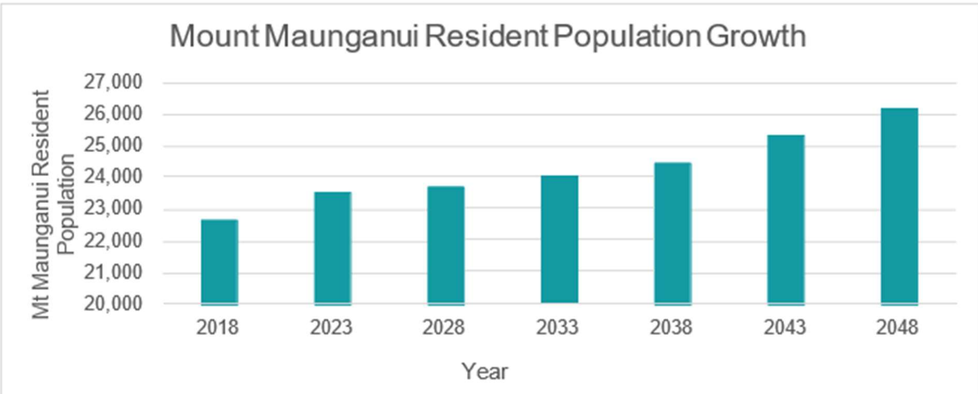

Figure 4-2: Mount Maunganui Projected Resident Population Growth 2018-2048

[15] https://www.tauranga.govt.nz/Portals/0/data/council/reports/population-household-review-2021.pdf p. 13
[16] https://www.tauranga.govt.nz/Portals/0/data/council/reports/population-household-review-2021-app1.pdf
[17] See the UFTI Final Report available at https://ufti.org.nz/reports, accessed in June 2022

4.1.1 Economic Growth

Since 2000, Tauranga has generally experienced an economic growth rate higher than the New Zealand average (Figure 4-3). This is projected to continue given the natural attractiveness of the region, expected high levels of population growth, continuing importance of the Port of Tauranga, and expected growth of primary industries in the surrounding region.

While this is positive for the local economy and creates diverse social and cultural benefits, it creates challenges for urban development and transport infrastructure to meet the needs of growing communities.

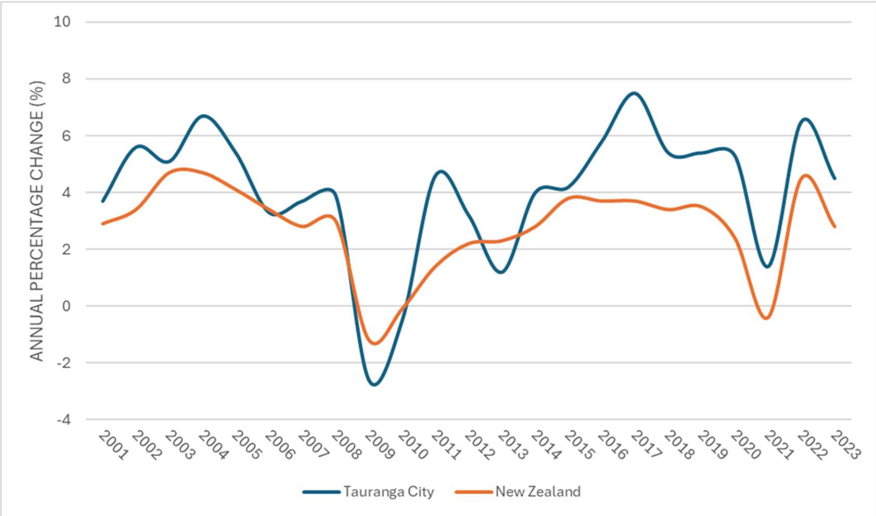

Figure 4-3: Percentage Change in GDP Tauranga and New Zealand 2001-2023[18]

4.2 Transport Context

When compared to other cities within New Zealand, Tauranga has a high proportion of trips taken by private vehicles, and moderate walking and cycling use. Public transport use is very low (see Figure 4-4)[19] and there are significant opportunities to increase the use of more space efficient transport modes.

Figure 4-4: Mode Share of Total Trip Legs in New Zealand (2014-18)

[18] https://ecoprofile.infometrics.co.nz/Tauranga%2BCity/Gdp/Growth

[19] See the Benchmarking Sustainable Urban Mobility 2022 report prepared for Waka Kotahi, accessed in June 2022 and available at https://nzta.govt.nz/assets/resources/sustainable-urban-mobility-benchmarking/sustainable-urban-mobility-benchmarking-report.pdf

Like many other cities across New Zealand, there is neither the space nor investment available to increase roading capacity. Numerous transport studies show that increasing urban roading capacity induces demand and does not resolve congestion issues[20].

4.3 Land Use Context

The predominant land use in the study area is Industrial and Port Industrial, as shown in Figure 4-5. This includes the Port of Tauranga's Mt Maunganui facilities and the port industrial area focused on the western side of Tōtara Street, while Hewletts Road provides access to the Sulphur Point container terminal, to the west of the study area. Other land uses within the study area include rail, commercial, residential, sporting and recreational destinations, schools, an urban marae community, a retail/nightlife area, and active open spaces. The range of land use and number of destinations generates demand for transportation.

Figure 4-5: Land Use within/adjacent to the Hewletts Road Study Area

4.4 Freight growth

As New Zealand's largest port, the Port of Tauranga plays a critically important role in the national economy. In 2019, it was responsible for the highest volume of both exports (15.6 million tonnes) and imports (6 million tonnes) of all NZ ports[21]. The industrial area surrounding the Port supports and enables this economic activity and connectivity within this area is crucial.

[20] Transport researchers have been observing induced demand since at least the 1960's when the economist Anthony Downs coined his *Law of Peak Hour Traffic Congestion*, which states that "on urban commuter expressways, peak-hour traffic congestion rises to meet maximum capacity.

[21] Statistics New Zealand, "Imports and Exports: New Zealand Port by Country of Origin, Commodity (HS2) and Period, http://nzdotstat.stats.govt.nz/WBOS/Index.aspx?DataSetCode=TABLECODE7302.

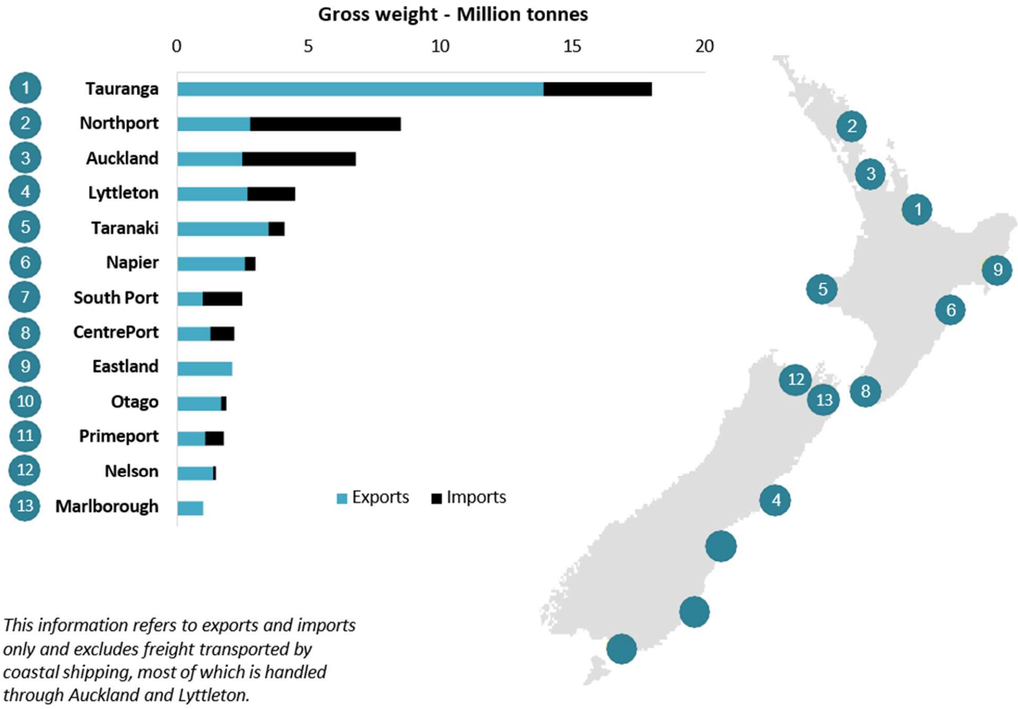

Figure 4-6: Exports and Imports by Port and Volume (2019)

The Port of Tauranga was responsible for handling the highest value of exports at $25.9 billion ahead of Auckland Airport in second place ($7.6 billion)[22].

The Port of Tauranga is a key destination for both national and regional freight and commercial vehicle movements. The Port is served by both rail and road networks; currently handling 32% of New Zealand cargo, 37% of New Zealand exports and 41% of all shipping containers[23].

In future, freight volumes in the Bay of Plenty are expected to grow significantly based on forecast export growth and interregional demand. Between 2020-2030, freight volumes at the Port of Tauranga are anticipated to increase by 49-61%, with freight volumes on the SH2 Waihi to Tauranga Corridor anticipated to increase by 24-49%[24]. Given the port location, this will increase pressure on the local transport network.

Enabling and maintaining the efficient operation of New Zealand's largest important port, including access /egress for freight movements and the surrounding industrial area, is of national economic significance.

4.4.1 Mount to Arataki Spatial Plan

The Mount to Arataki Spatial Plan sets a 30-year vision for the spatial development of the area south of Mauao to Papamoa, including Omanu, Arataki, the Mount Industrial Area and Whareroa marae. State Highway 2 and 29A facilitate the majority of transport to and from the area. The spatial plan area directly overlaps with the CMM project. The plan contains a 10-year focus on projects, to create an overall vision for the Mount to Arataki area. Helping people and goods to move efficiently and safely in and around this area through the CMM project is well aligned with the Mount to Arataki Spatial Plan.

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[22] Statistics New Zealand, "Imports and Exports: New Zealand Port by Country of Origin, Commodity (HS2) and Period, .http://nzdotstat.stats.govt.nz/WBOS/Index.aspx?DataSetCode=TABLECODE7302.

[23] Port of Tauranga Annual Report 2020 - https://www.port-tauranga.co.nz/investors/financial-information/download-annual-report/

[24] https://tewakapublicwebsite.blob.core.windows.net/sitefinity-storage-production/docs/default-source/resources/freight-action-plan-launch-digital-final.pdf?sfvrsn=5bd2a0ba_6 p. 10

4.4.2 Mount Industrial Plan

Tauranga City Council is working on a 30-year plan to ensure that industrial land in the Mount Maunganui area meets the future economic, environmental and social needs of the city. This is happening in conjunction with the Mount to Arataki Spatial Plan.

The plan was submitted to Council for consideration in December 2023. Several recommendations have been agreed with Tauranga City Council to better regulate the use of land in the Mount Maunganui Industrial Area and to improve environmental and cultural well-being outcomes.

This includes no new emitting industries within the Whareroa and Newton Road/MacDonald Street areas and looking to transition to lighter industry over the longer term in these areas. It intends to restrict housing and accommodation within current commercial zoned areas of the Mount Maunganui Airshed.

4.5 Cultural Context

The iwi and hapū identified as having mana whenua over the CMM study area are Ngai Tukairangi and Ngati Kuku of Ngai Te Rangi Iwi. The range of cultural, spiritual and historical values which may be held require further consideration in partnership with Mana Whenua.

Whareroa marae is a culturally sensitive place and the only heritage area in the Connecting Mount Maunganui project area. Whareroa marae is located across the harbour from Tauranga in Mount Maunganui. Whareroa marae is a traditional pa site and one of the oldest marae in the Bay of Plenty (Figure 4-8).

Whareroa marae was the central hub of Ngai Tukairangi prior to development of the area and its subsequent industrialisation. The original Whareroa block originally consisted of 1262 acres (Figure 4-7). It was known for its size and prominence as one of the biggest communities in the late 1800s[25].

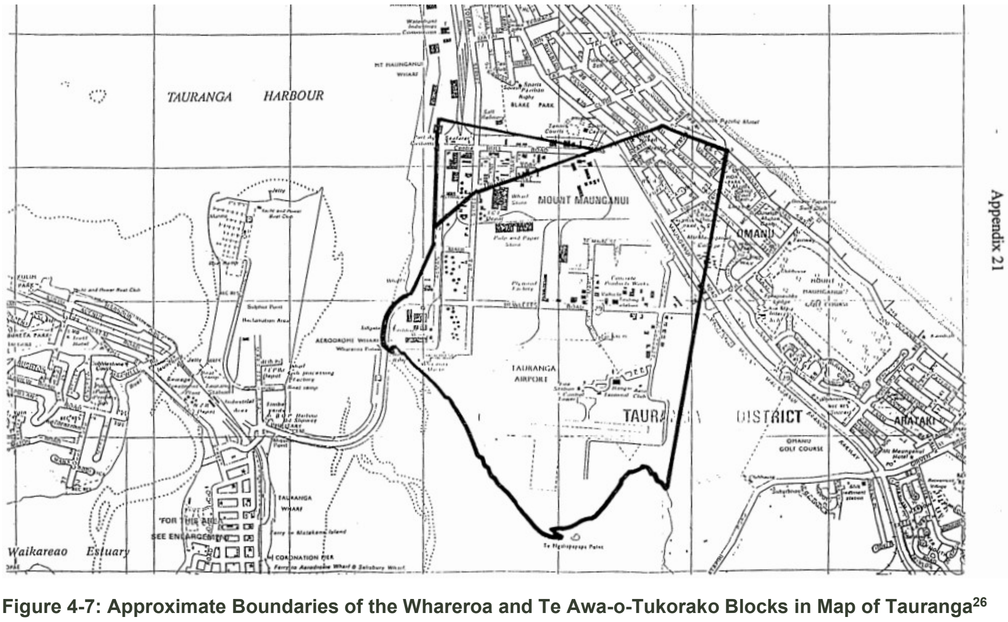

Figure 4-7: Approximate Boundaries of the Whareroa and Te Awa-o-Tukorako Blocks in Map of Tauranga[26]

In 1864, following the Māori Land Wars, the government moved quickly to take ownership of much of the Te Papa Peninsula and surrounding lands, leaving mana whenua essentially homeless. Understandably, these confiscations and the subsequent displacement of mana whenua remain a significant grievance.

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25 Ngai Tukairangi, Ngati Tapu: Hapu Management Plan 2014. Available at https://www.boprc.govt.nz/media/464651/ngai-tapu-ngai- tukairangi-hapu-management-plan-final.pdf

26 Te Awa-o-Tukorako & Whareroa Blocks, Kere T. Cookson-Ua, June 1996. Report commissioned by the Waitangi Tribunal for Wai 211)

Development of the Port of Tauranga has diminished the connection, relationship and customary fishing practices of hapū within Te Awanui (Tauranga Harbour)[27]. Ngāi Tukairangi have suffered loss of land and demise of traditional food gathering areas within Te Awanui, with the deepening of the shipping channel to allow larger ships to enter and dock at the port, enabling economic development to proceed.

Ngāti Kuku has also suffered loss of land, much of which was acquired under the Public Works Act since 1952. This includes land taken for the aerodrome in 1940 which is being used for Tauranga airport today.

Whareroa is closely situated to the Tauranga Harbour bridge and is often impacted by airport traffic, coastal erosion, and seaward traffic. There is no buffer zone between the MMIZ28 and the community who live at Whareroa marae, who are exposed to the air and visual pollution that comes with these activities.

About 80 people reside at Whareroa permanently and many are concerned about the growth and expansion of this industrial area, environmental impacts, and public health effects on their people, the wider community and their cultural practices. A recent study by Toi Te Ora Public Health into air quality found that, compared with Ōtūmoetai, in Mount Maunganui there were around five additional premature deaths in adults (>30 years) each year associated with exposure to long-term concentrations of PM2.5 and NO2. Social costs due to additional mortality and morbidity has been estimated to be $22 million[29].

Figure 4-8: Location of Whareroa Marae, Prior to Industrialisation of Mount Maunganui

A tāngata whenua Spatial Plan has been developed through SmartGrowth[30], which identifies and consolidates iwi/hapū perspectives and aspirations regarding land use and growth within the Mount Maunganui area and across the Western Bay of Plenty (WBOP).

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[27] Ngai Tukairangi, Ngati Tapu: Hapu Management Plan 2014. Available at https://www.boprc.govt.nz/media/464651/ngai-tapu-ngai- tukairangi-hapu-management-plan-final.pdf
[28] Mount Maunganui Industrial Zone
[29] https://esr2.cwp.govt.nz/assets/Environmental-reports/Mount-Maunganui_Air-Quality_Health-Risk-Assessment_2023.pdf
[30] SMARTGROWTH STRATEGY 2024-2074

5 Alignment with Existing Strategies and Policies

A range of national and regional level strategies and organisational goals, including those of the three investment partners, have been reviewed to confirm this IBC's alignment with their objectives.

5.1 National Policy Context

Table 5-1: Summary of Relevant National Policy

National Policy	Description	Relevance
The Transport Outcomes Framework	The Ministry of Transport has identified five transport outcomes which aim to improve NZ's wellbeing and liveability by ensuring transport provides a positive contribution to society across five core outcomes: • Inclusive access, • Health and safe people, • Economic prosperity, • Environmental sustainability, and • Resilience and security. The framework ensures that decisions about investment in the transport system reflect the need for transport to be integrated with land-use planning, and urban and regional development.	Requirement to align overall outcomes and benefits framework for the CMM project.
Government Policy Statement on Land Transport 2024	An updated Government Policy Statement on Land Transport 2024 sets out the Government's land transport strategy and priorities for 2024-2027. The GPS 2024 is built around four strategic priorities: • Economic Growth and Productivity • Increased maintenance and resilience • Safety • Value for money	The benefits of this project include a reduction journey times, improving travel time savings on key freight routes, contributing to efficient access to the Mount Industrial Area and the Port. These benefits are directly aligned to Economic Growth and Productivity and Value for Money Strategic Priorities.
Road Safety Strategy	Released in late 2019, Road to Zero was a previous Government's road safety strategy. The strategy included a vision for a New Zealand where no one is killed or seriously injured in road crashes, and a targeted a 40% reduction in death and serious injuries (from 2018 levels) by 2030. **Road to Zero will be replaced with an objectives document that sets out the National/ACT/NZ First Coalition government's road safety priorities.**	CMM will focus on improving safety outcomes for all road users within the study area, with a focus on vulnerable / active mode users
Arataki 2023	30-year plan to support transport planning and land use decisions. Specific focus for Te Moana a Toi-te-Huatahi / Bay of Plenty on: • Small-scale projects and getting more from existing infrastructure • Encouraging use of active modes and public transport by reallocating existing road space • Influencing travel behaviour and growth patterns.	CMM supports shift to 'decide and provide' approach to deliver multiple outcomes, specifically • Moving freight more efficiently and safely • Influencing travel behaviour • Encouraging the use of active modes • A fit for purposed design to support active modes and inclusive accessibility

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National Policy	Description	Relevance
National Policy Statement on Urban Development 2020	The National Policy Statement for Urban Development sets out the objectives and policies for planning for well-functioning urban environments under the RMA 1991. All Tier 1 urban environments, which includes Tauranga, must implement intensification policies. This is expected to increase transport demand over time.	CMM will respond to transport demand for current and future land use changes as per the recently released Mount to Arataki Spatial Plan.

5.2 Regional and Local Policy Context

5.2.1 UFTI

The UFTI Connected Centres Programme is the over-arching strategic programme that identified Hewletts Road as having freight, public transport and active mode strategic movement priorities (Figure 5-1). It also identifies the different modes that need to be provided for along the corridor.

The UFTI Movement Priorities map identifies Tōtara Street as having freight and active mode movement priorities and Maunganui Road as having public transport and active mode movement priorities. No other movement priorities are identified within the study area.

Figure 5-1: UFTI Movement Priorities Summary Map

As well as UFTI, there are a number of other regional and local policies relevant to the Connecting Mount Maunganui IBC.

Table 5-2: Summary of Relevant Regional and Local Policy

Regional and Local Policy	Description	Relevance
Western Bay of Plenty Transport System Plan	Helps Councils develop the Regional Land Transport Programme (RLTP) by prioritising transport projects across the western Bay of Plenty sub-region.	Project is identified as high priority in the TSP.
Draft Joint Spatial Plan	Formalises Connected Centres Programme to enable Councils to include in their District Plans.	With intensification and growth expected in the eastern corridor, the CMM options will need to consider future transport demands.
Bay of Plenty Regional Land Transport Programme 2024-2034	Sets out Bay of Plenty's transport priorities and projects for consideration in the National Land Transport Programme.	The CMM project is included in the RLTP
Western Bay of Plenty Public Transport Services & Infrastructure	SSBC sets out future investment in public transport (PT) and supporting infrastructure over 10 to 30 years across Tauranga and Western Bay of Plenty sub-region.	CMM investment objectives align the outcomes sought through the Business Case, and will facilitate the uplift in frequencies along the key corridors
Bay of Plenty Regional Council's Long-Term Plan	Sets out Council outcomes to be achieved across its organisation.	The CMM is consistent with relevant LTP outcomes.
Tauranga City Council Long Term Plan	Outlines planned investments and activities over the next decade.	Project is consistent with relevant LTP outcomes
Upper North Island Supply Chain Strategy	Sets out the desired freight corridors to support the flow of good throughout the upper North Island. The	Project is consistent with the Strategy with a focus on journey reliability.
Mount Maunganui Airshed	Emissions and air pollutants are being monitored as they exceed national standards.	The Airshed mean that any CMM improvements will need to consider how emissions and air pollutants are reduced and monitored.

5.3 Relevant Projects and Initiatives

Table 5-3 provides a high-level summary of other transport projects that are relevant to this business case and may impact the transport network within the study area.

Table 5-3: High Level Summary of Relevant Projects

Project	Relevance to the Connecting Mount Maunganui IBC
UFTI Connected Centres Programme	The UFTI Connected Centres Programme is the over-arching strategic programme that identified Hewletts Road as having freight, public transport and active mode strategic movement priorities. It also identifies the different modes that need to be provided for along the corridor. UFTI strategic journey movement priorities identify Tōtara Street as having freight and active mode movement priorities and Maunganui Road as having public transport and active mode movement priorities. No other movement priorities are identified within the study area
15th Avenue and Turret Road to Welcome Bay Business Case[31]	There is close alignment between the 15th Ave-Welcome Bay and CMM projects to ensure the solutions are integrated and support desired outcomes to provide safe reliable and multimodal access for people and goods across the city via these journeys. The study area for this business case is the corridor including Fifteenth Avenue and Turret Road through to Welcome Bay Road. The business case has recommended tidal lanes across the harbour, supporting multimodal access, giving effect to UFTI and the Te Papa Peninsula business cases.
BayLink – Baypark to Bayfair	The Bay Link project improves safety with a new SH2/SH29A interchange and a new SH2 flyover over the Bayfair roundabout, separating local traffic from the state highway and rail corridor, providing safer walking and cycling connections, and complete the State Highway 2 Eastern Corridor for the Bay of Plenty. This project was recently completed.
Cameron Road Upgrades	Improved public transport and active mode facilities along Cameron Road. The Cameron Road Stage 2 and TCC cycleway projects are funded but not construction committed.
Tōtara Street SSBC	The Tōtara Street SSBC recommended a shared path to improve safety and support the development of the city's cycle network. The SSBC focused on active mode safety rather than other transport outcomes relevant to the Tōtara Street corridor, such as freight/commercial access to the industrial area, and connections across the transport system. The shared path was recently constructed, and the project completed.
Maunganui Road SSBC	The Maunganui Road SSBC recommends a staged sequence of upgrades to improve active mode access. The first of four stages is nearing completion with the remaining stages programme for completion by 2024. The corridor programme allows for, but does not include any, improvements to support public transport priority access to/from the Mount Maunganui area.
TCC Accessible Streets	The TCC Accessible Streets Programme looks to improve walking, cycling, and micro-mobility, safety on key corridors in Tauranga.
SmartTrip Proof of Concept	An investigation was recently completed to assess the feasibility of a variable charging scheme in Tauranga. SmartTrip would replace the current toll road charges with variable charges across Tauranga's highways, based on demand. SH2 / Hewletts Road is included in the scope of a potential network. Work has completed, with the community not supporting SmartTrip. Further investigations are required to understand legislative processes and additional impacts on the community.
SmartGrowth industrial land study[32]	SmartGrowth partners have identified the future industrial land needs and areas. Depending on findings and development, the distribution of businesses around the sub-region could change along with potential transport demand within the project scope.

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[31] See https://www.tauranga.govt.nz/exploring/transportation-and-roads/transportation-projects/connecting-the-people-fifteenth-avenue- to-welcome-bay for more details about the 15th Ave to Welcome Bay project. Weblink accessed June 2022.

[32] See http://www.smartgrowthbop.org.nz/media/1433/f-industrial_land_brief__final_.pdf for more details about the industrial land study. Weblink accessed June 2022

Project	Relevance to the Connecting Mount Maunganui IBC
Western Bay Public Transport Services and Infrastructure SSBC	The SSBC has been developed to identify the public transport service model (and associated infrastructure) required to support a growing sub-region and a thriving, sustainable Tauranga. It identifies a 30-year vision for public transport services which is supported by a 10- and 30- year infrastructure programme of projects. This business case is critical to increase mode shift outcomes in WBOP and has identified the optimal public transport service routes for WBOP. Hewletts Road and Maunganui Road are both noted as significant PT corridor which will need to be factored into the Hewletts Road business case/ investigation. The PT Services and Infrastructure SSBC is currently not funded under the NLTF. BOPRC are exploring opportunities to deliver this project via other funding pathways.
PT Ferry Service Investigation[33]	Priority One completed an initial feasibility study looking at passenger ferry services between Ōmokoroa – Mount Maunganui – Tauranga waterfront. The initial feasibility study suggests a service is feasible. In June 2022, BOPRC published a separate piece of work investigating PT ferry options further. This work concluded that there is a case for ferry services however there is no “risk-free, low cost” option that could be delivered in the short- term that would likely be attractive for customers. All options have several issues and associated risks. Following the release of the NLTF programme for 2024, with no funding prioritised for public transport services, BOPRC have agreed to not fund the project, there are no immediate plans to look for funding from elsewhere.
Arataki bus facility[34]	TCC are investigating potential bus facility sites at Arataki (Bayfair area) to connect Arataki with the wider City and Western Bay of Plenty sub-region. They are undertaking a DBC to finalise the site selection and develop the necessary bus facility designs for the optimal site. This is essential to the success of the bus system on this side of the Harbour. Construction of a new facility could start as early as 2024.
Whareroa Marae and managed retreat of heavy industry[35]	BOPRC and TCC are working with Whareroa Marae and heavy industry to consider managed retreat options to better address environmental and public health concerns as part of the management of the Mount Maunganui airshed. TCC has agreed to seek an initial scoping and issues report to consider options for a potential future managed retreat. BoPRC is responsible for air quality management and last week agreed to commission a health study, in conjunction with the Bay of Plenty District Health Board and Western Bay Primary Health Organisation, to assess the impact of air pollution on Whareroa residents. Depending on the outcomes of these reports and studies, freight demand could change over time within the project scope.
TCC City Plan Review[36]	TCC are reviewing their city plan to consider how to best make sure the city continues to thrive and that we understand and protect what people value about living in Tauranga. While TCC has placed the review on hold until the new legislation intended to replace the RMA is better defined, this, alongside the NPS-UD and the RMA amendments, has potential implications for future land use and subsequent travel demand in the wider area.
The Mount Maunganui Spatial Plan	TCC have prepared a spatial plan for the Mount Maunganui area to support future intensification. This will have implications in terms of future demand for movement across and around the harbour, and in terms of the form and function of the streets within the project area, particularly if there is a move to create more mixed use or residential developments in the area.
The Mount Industrial Plan	Tauranga City Council is working on a 30-year plan to ensure that industrial land in the Mount Maunganui area meets the future economic, environmental and social needs of our city. This is happening in conjunction with the Mount to Arataki Spatial Plan (also being led by Tauranga City Council) and this Connecting Mount Maunganui project.

[33] See: https://infocouncil.boprc.govt.nz/Open/2022/06/PTC_20220623_AGN_3508_AT.PDF
[34] See https://www.tauranga.govt.nz/exploring/transportation-and-roads/transportation-projects/arataki-bus-facility. Weblink accessed June 2022
[35] See https://www.tauranga.govt.nz/council/council-news-and-updates/latest-news/artmid/456/articleid/5766. Weblink accessed June 2022
[36] See https://www.tauranga.govt.nz/council/council-documents/tauranga-city-plan/city-plan-review. Weblink accessed June 2022.

Project	Relevance to the Connecting Mount Maunganui IBC
Rangiuru Business Park Development[37]	The Rangiuru Business Park has 148 hectares of business land, adjacent to the Tauranga Eastern Link expressway, creating a large format industrial zone to service the strong growth projected for the Bay of Plenty region. It is majority owned by Quayside Properties Limited (40%), which is a wholly owned subsidiary of Quayside, with other key partners being WBPRC, TCC, SmartGrowth. With the excellent rail and road connections, and central Bay of Plenty location, Rangiuru has the potential to support logistic related industry and businesses amongst others.
Wairakei town centre and Te Tumu rezoning[38]	TCC is working closely with landowners, iwi and hapū to create a new coastal community in Pāpāmoa East (Te Tumu) that can help support Tauranga's city growth. It is envisaged that Te Tumu will provide new housing for approximately 15,500 people. This future development area is being progressed through the required planning process (future plan change) and if approved will increase the population residing in the eastern corridor.
Eastern township	WBOPDC and Kāinga Ora are investigating a new development at Paengaroa. This is in the early investigation phase. Depending on the size of the development, this may increase future demands on the eastern corridor including SH2/Hewletts Road.
SH29 Tauriko West (RONs)	The Tauriko Network Plan is part of Tauriko for Tomorrow – a collaborative project driven by four key partners, Western Bay of Plenty District Council, Bay of Plenty Regional Council, Tauranga City Council, and NZ Transport Agency Waka Kotahi – focussing on development in the Tauriko West area. SH29 is the key route connecting our region with Auckland, Waikato, and the Upper North Island. This route supports the economic success of the western Bay of Plenty. It is vital that growth and liveability, and safety and productivity go hand in hand. The Omanawa Bridge Replacement project is the first deliverable from SH29 Tauriko West project. The scope includes the replacement of the Omanawa Bridge on the future alignment of SH29, with a short section of road linking back into the existing SH29.
Takitimu North Link Stage 1 (RONs)	Takitimu North Link is a vital transport link providing a safer, more efficient and reliable route between Tauranga and Ōmokoroa. The Takitimu North Link Stage 1 project is a Crown funded new 6.8km 4-lane expressway between Tauranga and Te Puna. The Bay of Plenty state highway network has national economic significance and plays a crucial role connecting people and freight to the golden triangle cities of Tauranga, Auckland and Hamilton, and beyond.
Takitimu North Link Stage 2 (RONs)	Stage 2 is an extension of Stage 1 between Tauranga and Te Puna. It will include a new 7km four lane highway between Te Puna and Omokoroa with the existing SH2 highway retained as a local road.

The partners will work across these interfacing projects to integrate them within this IBC to improve the transport outcomes sought for the Connecting Mount Maunganui project area.

37 See https://rangiuru.co.nz/. Weblink accessed June 2022.
38 See https://www.tauranga.govt.nz/our-future/enabling-growth/new-community-te-tumu/wairakei-te-tumu-town-centre. Weblink accessed June 2022.

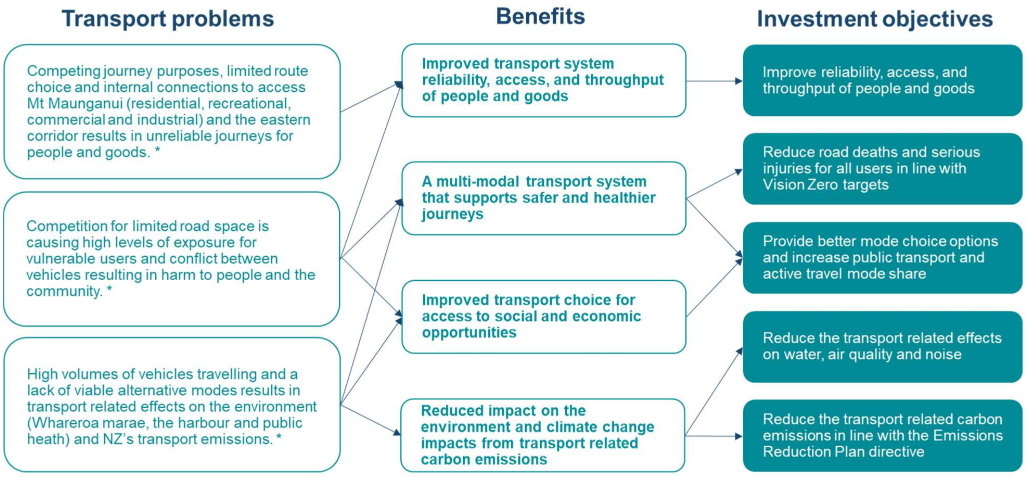
6 The Case for Change

6.1 Investment Logic Map

The key element of developing the strategic case is to outline the Problem Statements and evidence, Benefits, and Investment Objectives.

A problem definition workshop was held 1 July 2022 with representatives from NZ Transport Agency Waka Kotahi, TCC and BOPRC along with the consultant team (Aurecon and Flow) to confirm the problems and benefits associated with Connecting Mount Maunganui IBC that build on the work previously undertaken. Following this, the Investment Logic Map (ILM) was developed. For SMART investment objectives, please refer to the benefits realisation plan in Appendix G.

For the purposes of the multi-criteria option assessment, the objectives are weighted equally; however, to understand the effects of weighting the objectives on the assessment of options, some sensitivity testing will be undertaken.



**Urban and economic growth expected to occur in the SmartGrowth eastern corridor and across the western Bay of Plenty sub-region will exacerbate these problems.*

Figure 6-1: Problems, Investment Objectives and Benefits of Investing

6.2 Defining the Problems

Three problem statements were identified within the Investment Logic Map. These are:

- **Problem Statement 1:** Competing journey purposes, limited route choice and internal connections to access Mount Maunganui (residential, recreational, commercial and industrial) and the eastern corridor results in unreliable journeys for people and goods;
- **Problem Statement 2:** Competition for limited road space is causing high levels of exposure for vulnerable users and conflict between vehicles resulting in harm to people and the community; and
- **Problem Statement 3:** High volumes of vehicles travelling and a lack of viable alternative options results in transport related effects impacting on the environment (Whareroa marae, the harbour and public health) and NZ's transport emissions.

While not explicitly stated for each problem statement, anticipated future urban and economic growth across the Western Bay of Plenty sub-region will exacerbate these problems.

6.3 Problem Statement One

Competing journey purposes, limited route choice and internal connections to access Mount Maunganui (residential, recreational, commercial and industrial) and the eastern corridor results in unreliable journeys for people and goods.

This problem is broken down into cause and effect and addressed in two parts:

- Mount Maunganui and the eastern corridor have residential, recreational, commercial, and industrial destinations, which result in competing journey purposes. This is an issue due to limited routes, particularly to the industrial areas;
- This creates unreliable journeys through the corridor.

March 2019 travel times for general vehicles have been used to indicate pre-Covid travel (as opposed to March 2022). This was when New Zealand was at red alert level, and travel demand was reduced. Bus travel times are only available from July 2021 via the Bee Card system; hence March 2022 bus travel time has been used.

6.3.1 Cause - competing journey purposes and limited route choice

The Mount Maunganui area has a range of destinations and land uses which generate demands for transportation along the SH2/Hewletts Road corridor and within the wider project area. This includes journeys to and from the Port of Tauranga (including freight), Tauranga Airport, surrounding industrial/commercial land use, residential properties, sporting and recreational destinations, schools, a marae, and a retail/nightlife area.

The road layout within the area features several no exit streets, which results in a concentration of traffic onto a limited number of routes impacting network performance. Traffic modelling completed through the TSP indicated that any increase in capacity along Hewletts Road would create a ‘choke’ point at the Harbour Bridge, which sits outside the study area. Within the study area, traffic optimisation and efficient use of space are the primary focus.

There is a high volume of activity generated by a range of destinations occurring in the project area. Key drivers for this include movements associated with people who live in Mount Maunganui travelling to town, tourism (including cruise ship traffic) and event-based traffic, in addition to freight traffic from the Port of Tauranga, commercial traffic from the industrial area, traffic from Whareroa Marae, Bayfair, Mauao, beaches, sport and recreational facilities, and Tauranga Airport.

Travel to destinations, particularly within the Mount Maunganui industrial area, is constrained by the existing roading network which lacks internal connectivity and access in the vicinity of Hewletts Road corridor. A network of local access roads provides direct access to industrial and commercial properties, however the local roading network has minimal connections to the external roading network (Figure 6-2).

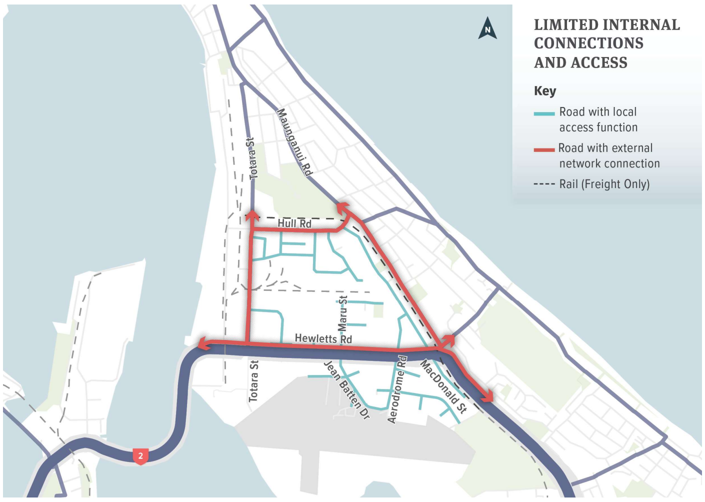


Figure 6-2: Limited Internal Connections and Access within the Study Area

Internal access and connectivity within the northern portion of the study area is limited, with Hull Road being the only east west connection available between Tōtara Street and Maunganui Road (and the only place to cross the rail line (at grade crossing) in addition to the crossing provided on Hewletts Road).

South of Hewletts Road (adjacent to Tauranga Airport), there is limited internal access and connectivity. Traffic movements to and from properties south of the corridor (including access to the Airport) generally need to use Jean Batten Drive/Aerodrome Road. There is no connectivity with other north-south roads that connect to Hewletts Road from the south (i.e., Tōtara Street or MacDonald Street). There is no alternate east west connection, with all vehicles required to use Hewletts Road to access this area, even if they are arriving or departing to or from the southeast. This means high volumes of local traffic are funnelled through Hewletts Road requiring additional turning movements at the signalised intersections. This reduces the available green time for through movements along Hewletts Road.

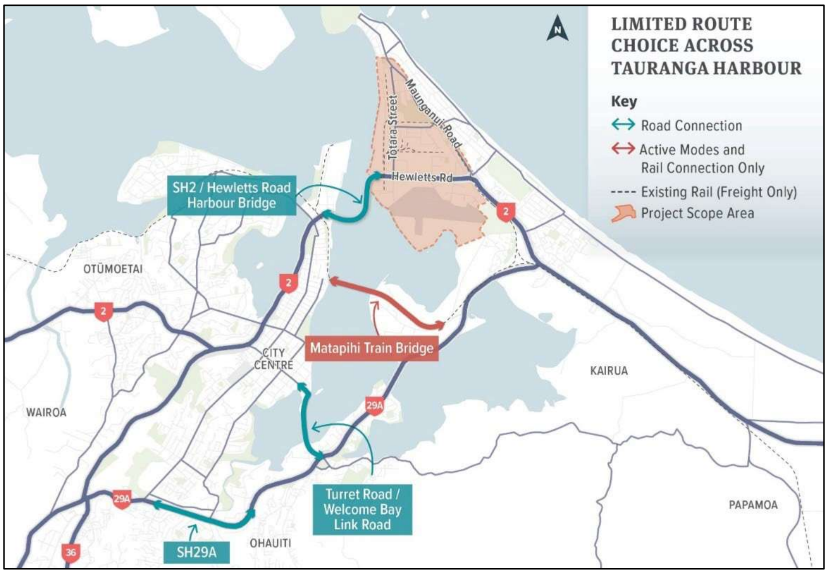


Figure 6-3: Limited Route Choice Across Tauranga Harbour

In addition to internal connectivity constraints, there are limited options for accessing the Mount Maunganui area and travelling in an east-west direction (the harbour is a natural barrier). Three existing roading connections cross the harbour: SH2/Hewletts Road Harbour Bridge; Turret Road/Welcome Bay Link Road; and SH29A (Figure 6-3). The Matapihi rail bridge provides for active modes but not passenger rail service).

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The corridor also provides access to Pāpāmoa and eastern communities within western Bay of Plenty (WBOP). This is important as Pāpāmoa has been a key growth hub for Tauranga in recent years and TCC is working with landowners to create a new coastal community in Pāpāmoa East to support future growth in the city. This population growth will continue to place pressure on the Hewletts Road corridor, which will require immediate intervention to enable continued economic prosperity and productivity.

Heavy Commercial Vehicle Flows

Much of the freight movement across the Bay of Plenty State Highway is focused on the Port of Tauranga, reflecting the significant role of the Port on the economic productivity of the wider region[39]. Freight movements to the Port occur within a limited number of routes. The heat map below shows Tauranga's key freight corridors by volume with thick black lines representing the highest freight volume corridors, which includes Hewletts Road[40]. This reflects the lack of a connected local network, funnelling movements onto these roads.

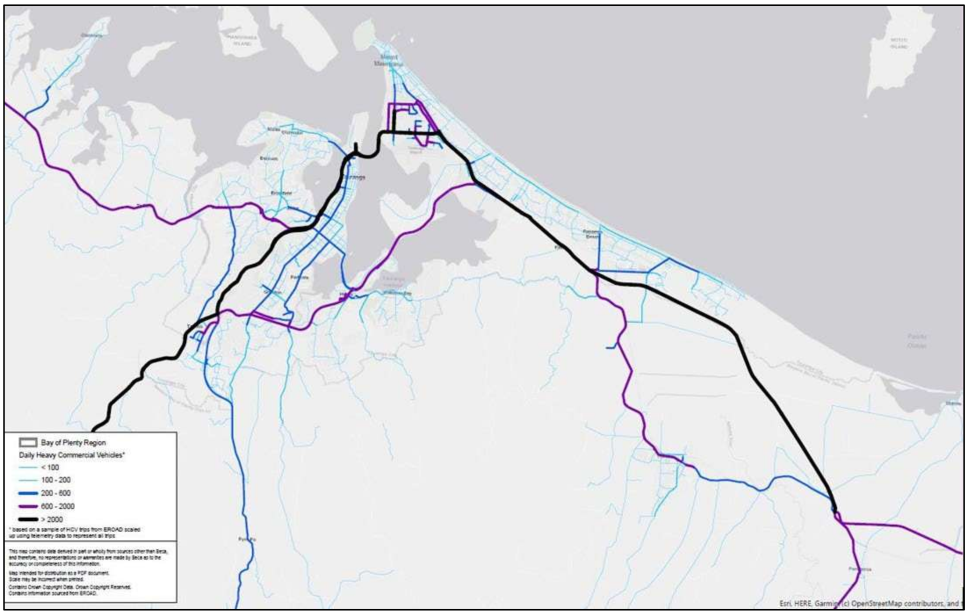

Figure 6-4: Tauranga Area Freight Heat Map

The key road routes into the port are SH2 and 33 from the east and SH2, 29 & 36 from the west. A more detailed picture of localised freight movements on these routes is shown in Figure 6-5.

[39] Beca, Paling and King, 2020, Ibid. p11
[40] Beca, Paling and King, 2020, Ibid. p11

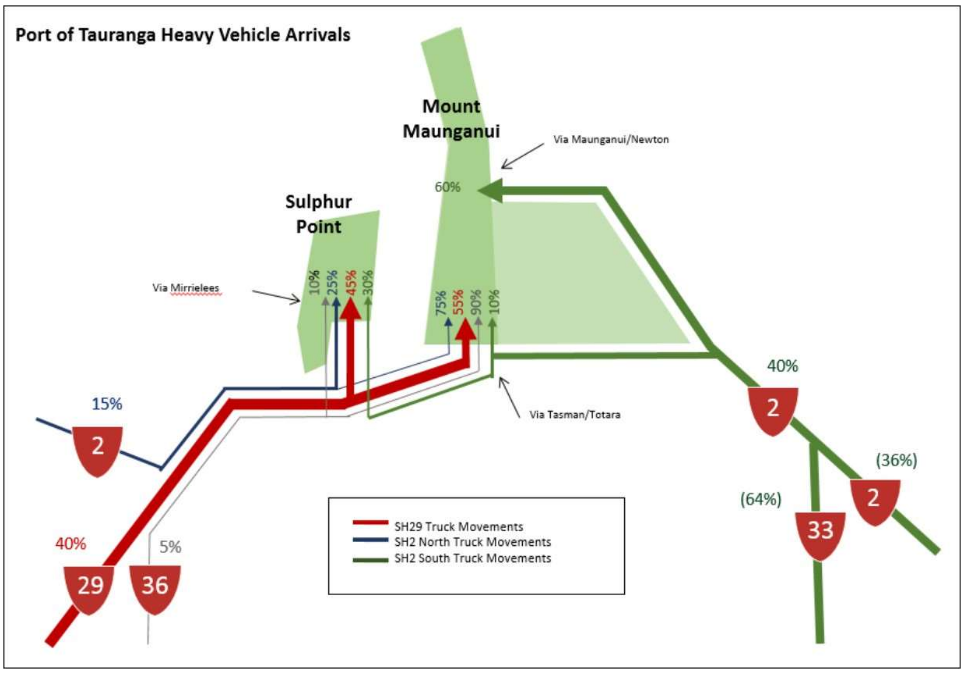

Figure 6-5: HCV movements to PoT 2017 (checked against 2018 data)[41]

From this information it is possible to categorise heavy vehicle traffic movements to and from the two main Port of Tauranga facilities (Sulphur Point Container and Mt Maunganui Bulk) by route. The data demonstrates the following:

- Around 60% of HCV trips related to the Port of Tauranga are to/from the west and 40% to/from the east.
- Overall, around 66% of Port of Tauranga's HCV movements are linked to the Mount Manganui bulk facility and 34% linked to Sulphur Point.
- Around 63% of HCV trips to/from the west and 70% to/from the east are generated by the Mount Manganui facility.
- This reflects the types of commodities on these routes including bulk products such as logs and kiwifruit which are predominantly exported via Mount Maunganui but also the importance of rail in serving the containerised traffic via Sulphur Point[42]
- Most trips from the east to the Mt Maunganui facility access the port via Mt Maunganui rather than Hewletts Road.
- Hewletts Road serves three key HCV movements accounting for 53.8% of total HCV movements to/from the Port: from the west to Mt Maunganui (37.8% of all trips), from the east to Mt Maunganui (4% of all trips) and from the East to Sulphur Point (12% of all trips).
- Overall, approximately 50% of freight enters and exits the Port of Tauranga via road, and 53.8% of these HCV movements travel via Hewletts Road.
- Around 25% of the freight passing through the Port of Tauranga travels along Hewletts Road.

Further, the Mount to Arataki Spatial Plan has proposed to implement a new bylaw to restrict freight movement along Maunganui Road. Consideration also needs to be given to the appropriateness of Maunganui Road as a route for High Productivity Motor Vehicles (HPMV), as removing this as an HMPV route or general freight route will further exacerbate pressure on Hewletts Road, Tōtara Street and Newton Road.

[41] Beca, Paling and King, 2020, Ibid. p11
[42] Beca, Paling and King, 2020, Ibid. p20.

6.3.2 Effect - Unreliable journeys

The consequence of competing journeys with limited route choice and internal connections are high traffic volumes on a small number of arterials/corridors. This results in delays on the SH2/Hewletts Road corridor, Tōtara Street, Maunganui Road, (especially during the AM and PM peaks) and unreliable journey times.

General traffic travel times, particularly on the SH2/Hewletts Road and Tōtara Street, are unreliable during peak periods (Figure 6-7, Figure 6-8 and Figure 6-9). In the AM peak, the 85th percentile travel time for general traffic is over twice that of median travel time for journeys from the east of Hewletts Road to the CBD. This is replicated for journeys from Mount Maunganui North to the CBD, and from Pāpāmoa to the CBD. Journey time is also increased in the PM peak, but the effect is less pronounced and more dispersed than the AM peak.

Journey time unreliability is exacerbated along the SH2/Hewletts Road corridor by the presence of signalised intersections (and conflicting major movements (e.g. Tōtara Street and Hewletts Road). While in isolation this would not cause unreliable journey times, traffic volumes (which are forecast to increase alongside economic and population growth) are such that significant delays can occur, and journey times are often unreliable.

Limited internal connections place pressure on the Hewletts Road corridor for the through movement that occurs as part of the wider State Highway function of Hewletts Road, people accessing the central city and general west to east movement. This through movement travel is significant with approximately 40-70% of eastbound traffic on Hewletts Road in 2031 anticipated to continue travel southeast past Arataki and 20-40% to continue travel beyond Pāpāmoa in AM and PM peaks respectively. In 2031, approximately 20-30% of Westbound traffic on Hewletts Road will travel beyond the city centre.

Variability in journey times and periods of delay negatively impact customers' experience, increasing the likelihood of needing to incorporate extra time to avoid late arrivals. Sitting in traffic may lead to drivers' frustration and consequently aggressive driving behaviours, as well as a potential loss in productivity.

By comparison, public transport journey times are more reliable. This is likely due to the dedicated bus lanes along the SH2/Hewletts Road corridor. Public transport is a very space efficient mode; however, outside of SH2/Hewletts Road, buses suffer from the same congestion, are unreliable and are poorly utilised, with low ridership levels.

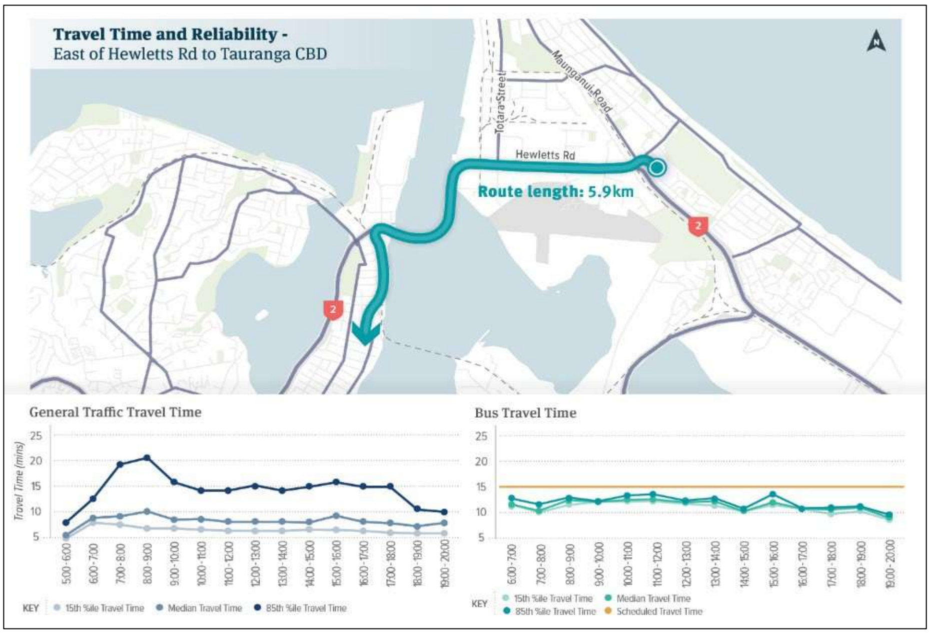

Figure 6-6: Vehicle and Bus Travel Time Reliability for Weekdays (East Hewletts Road to Tauranga CBD)

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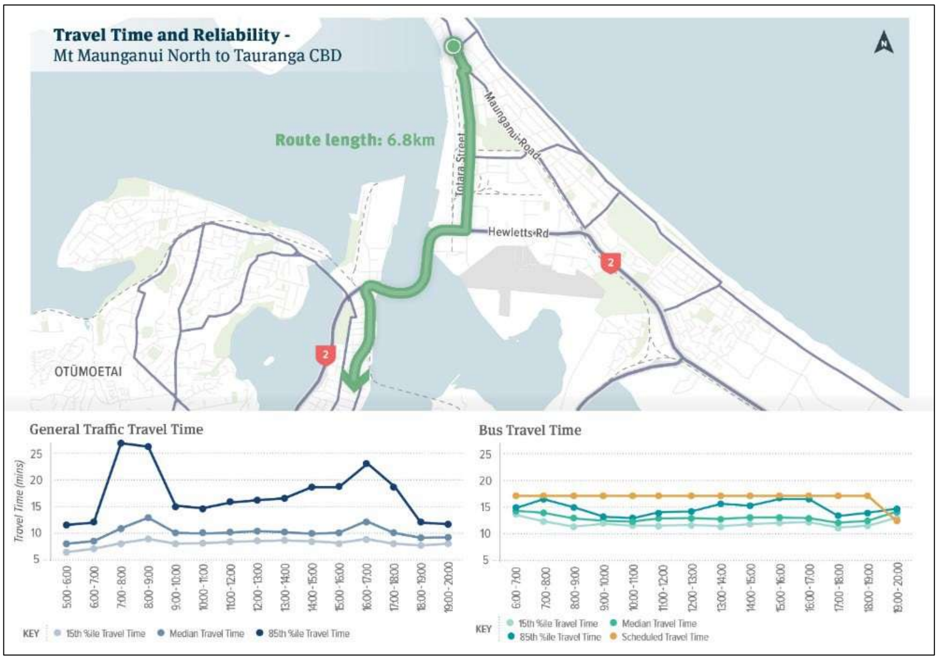

Figure 6-7: Vehicle and Bus Travel Time Reliability for Weekdays (Mount Maunganui North to Tauranga CBD)

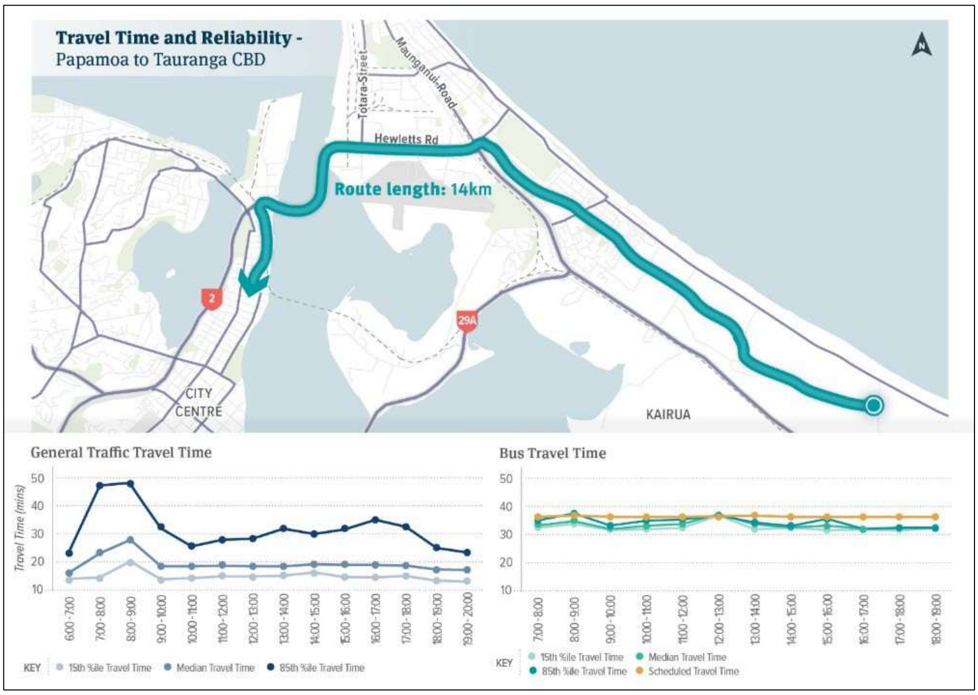

Figure 6-8: Vehicle and Bus Travel Time Reliability for Weekdays (Pāpāmoa to Tauranga CBD)

Across Tauranga, delays added an extra seven minutes per 30-minute trip in the morning and evening peak periods[43]. Data shows that, on average, 52 hours a year are lost to traffic delays in Tauranga. To put the sub-region's delays into perspective, Aucklanders lose on average 71 hours a year due to delays;

[43] Based on the 2021 Tomtom congestion index and data available for Tauranga (see https://www.tomtom.com/en_gb/traffic- index/tauranga-traffic#statistics). The information presented is based on average data across the city.

Wellingtonians 66 hours a year; and people driving in Hamilton 59 hours a year. Tauranga is ranked 171 out of 402 cities internationally in the TOMTOM Congestion Index.

Reduced speeds caused by congestion and stopping at controlled intersections along the Hewletts Road corridor also disrupt traffic flow, adding to the variability in journey times.

Figure 6-9 highlights the oversaturation at the Hewletts Road/Tōtara Street intersection, especially for the eastbound/westbound movement on Hewletts Road and right turn from Tōtara Street north. This confirms the delays customers are experiencing, which is expected to increase with population growth.

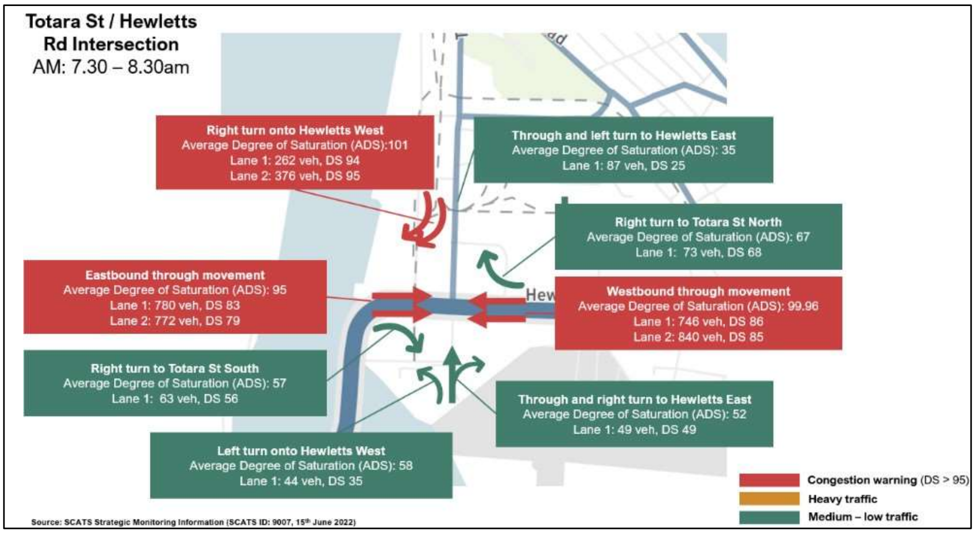

Figure 6-9: Intersection Performance at Hewletts Road / Tōtara Street Intersection (SCATS June 2022)

Traffic congestion significantly impacts people's perceptions of their quality of life. In the 2020 Quality of Life survey, 53% of Tauranga respondents said their city had become a worse place to live over the previous 12 months, with the main reason being increased traffic congestion. In addition, 98% of respondents from Tauranga scored traffic congestion as being either a big problem or a bit of a problem (significantly higher than any other New Zealand city surveyed) (Figure 6-10).

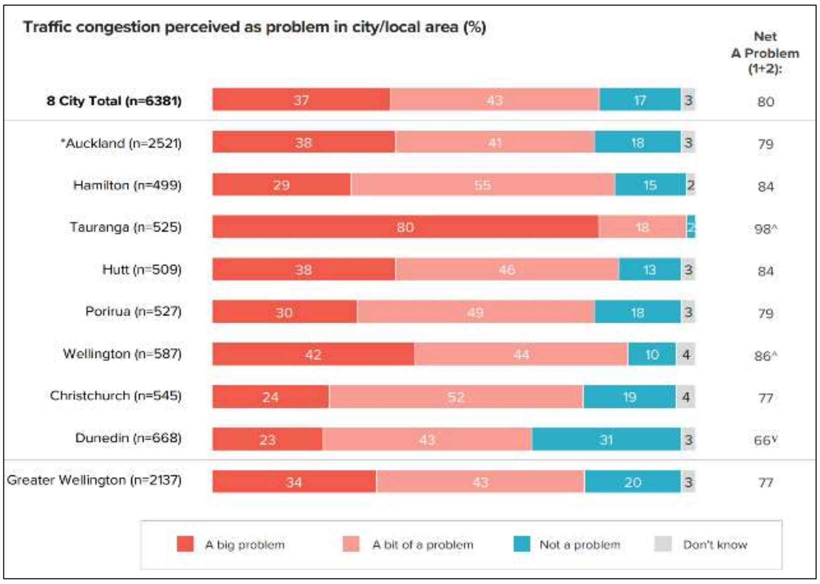

Figure 6-10: Traffic Congestion Perceptions by City, Quality of Life Survey 2020

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While congestion issues are more acute in several other New Zealand cities, perceptions can influence travel behaviour, making this a relevant consideration for this project.

6.3.3 Summary – why address this problem now?

The population and economic growth expected in the eastern corridor will increase the freight demands and the number of people wanting to travel within this corridor. The number of destinations with competing journey purposes and limited route choice (both internally within the study area for access to Mount Maunganui and externally for through movements) will increase with growth, increasing transport demand.

Limited internal connections mean the local road system is very inefficient with most trips needing to be funnelled onto a small number of roads. Without intervention, trips will continue to be concentrated on a few routes. Coupled with the numerous signalised intersections on SH2/Hewletts Road and conflicting major movements, the increasing population and economic growth will exacerbate poor journey time reliability.

This impacts economic performance (associated with increased travel times for goods and lost productive time). Unreliable journey time (or perceptions of) is one of several factors that can act as a deterrent for people wishing to access the area for employment, education, shopping, travel or recreation. Without intervention (i.e. Do Minimum), anticipated growth across the Eastern Corridor and freight demands across Auckland, Waikato and the Bay of Plenty will exacerbate these issues.

The evidence suggests that bus journey times are highly predictable along Hewletts Rd and are less than the scheduled journey time. There are some variances to journey times from Pāpāmoa to Tauranga CBD where congestion does look to impact bus journey times and are greater than the schedule journey times. At present, public transport is poorly utilised, this means there is significant capacity and opportunities to increase public transport usage.

6.4 Problem Statement Two

Competition for limited road space is causing high levels of exposure for vulnerable users and conflict between vehicles resulting in harm to people and the community.

This cause and effect of this problem is broken down and addressed in two parts:

- Competition for limited road space; and
- Vulnerable user exposure and vehicle conflict, resulting in harm to people and the community.

6.4.1 Cause – Competition for limited road space

The combination of existing concentrated vehicle movements and multiple journey purposes along the SH2 / Hewletts Road corridor, as evidenced in Problem Statement One, and within the surrounding project area, results in competition for the limited road space.

Existing two-way people movement on Hewletts Road is dominated by general vehicles as shown in Figure 6-11 below.

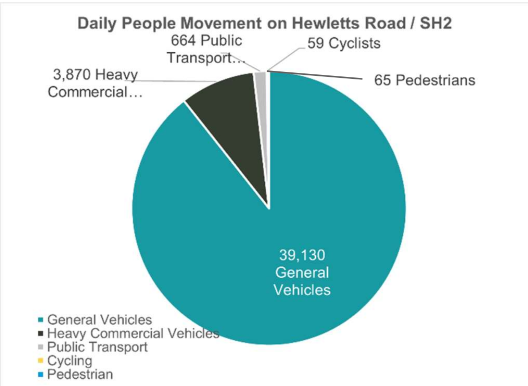

Figure 6-11: Daily People Movements on Hewletts Road / SH2[44]

The Hewletts Road corridor currently provides for approximately 44,000 people-movements per day as an annual average (approximately 98% vehicle movements, 1.5% bus movements, < 0.2% cycling and <0.2% walking movements). This volume is anticipated to grow with urban and economic growth expected in the Smart Growth eastern corridor and across the western Bay of Plenty sub-region.

This existing people throughout per day is represented spatially across the existing Hewletts Road corridor, as seen in Figure 6-12.

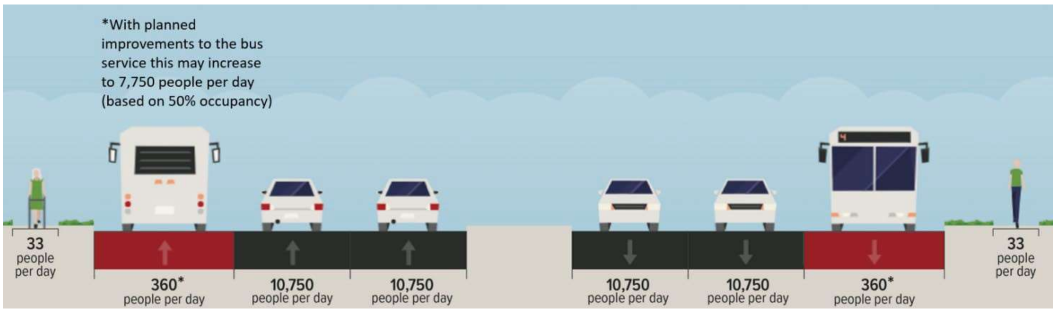

Figure 6-12: Use of Space Represented Spatially as People Throughput per Day

[44] Vehicle movements from NZTA State Highway Traffic Counts 2020, using average occupancy of 1.23 taken from UFTI (smartgrowthbop.org.nz), Public Transport Patronage from Beecard bus patronage data March 2022 and Pedestrian and cyclist counts from Tauranga City Council 2022

This existing transport environment does not give effect to the strategic movement priorities, as identified in UFTI, for the corridor (being freight, public transport, and active modes). Further, the existing road cross- section for Hewletts Road does not provide sufficient facilities for each of the modes identified as having strategic movement priorities within the limited road space of the corridor (Existing Corridors within the Study Area). The high vehicle mode share reflects the existing road space allocation.

Average trip time to drive through the Hewletts Road corridor is generally 2.5 - 4.5 minutes throughout the day. The busiest time in the westbound direction is between 8 – 9am, when average travel time is approximately five minutes with an 85th percentile travel time of approximately 11.5 minutes. Eastbound, the busiest time is between 4 – 5pm, with an average travel time of approximately four minutes and an 85th percentile travel time of approximately 8.5 minutes[45].

The high volume of vehicle movements and competition for limited road space results in queuing during peak hours. Observations during the AM peak in May 2022 demonstrates queuing of the Hewletts Road corridor westbound, due to traffic stopping at a red light to enable right turning traffic into Jean Batten Drive.

Table 6-1 provides a breakdown of the existing movements within the key corridors of the study area.

[45] Taken from Tomtom traffic data, May 2022 (weekdays)

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Table 6-1: Summary of Existing Movements within Key Corridors of the Study Area

Movement Type	Hewletts Road	Tōtara Street	Hull Road	Maunganui Road
Vehicles	In 2020, there were ~35,000 vehicles per day (vpd) on Hewletts Road, comprising ~17,000 vehicles per direction.[46] Compared with other routes across the harbour (SH29A (~20,000 vpd in 2020) and Turret Road (~26,000 from 2010 which is most recent available)), there is a high volume of vehicle movements reflecting the provision of four lanes within the Hewletts Road for vehicle movement. Based on an assumed vehicle occupancy of 1.23[47] the traffic volumes on Hewletts Road equate to approximately 43,000 person-trips per day. **Freight movements** Of the ~35,000 vehicles per day, approximately 3,150 (9%) are Heavy Commercial Vehicles (HCVs).	In 2022 there were ~19,000 vehicles per day using Tōtara Street[48]. Based on assumed vehicle occupancy of 1.23,traffic volumes on Tōtara Street equate to approx. 23,000 person-trips per day. **Freight movements** Of ~19,000 vehicles per day, approximately 1,200 (6%) are Heavy Commercial Vehicles (HCVs).	Recent count data for Hull Road is not available. In 2014, ~4,000 vehicles per day used Hull Road. This is likely to have increased significantly. Based on an assumed vehicle occupancy of 1.23, traffic volumes on Hull Road equate to approximately 5,000 person-trips per day. **Freight movements** Of ~4,000 vehicles per day, approx. 800 (20%) are Heavy Commercial Vehicles (HCVs).	In 2022 there were ~17,000 vehicles per day using Maunganui Road. Based on assumed vehicle occupancy of 1.23, traffic volumes on Maunganui Road equate to approx 21,000 person-trips per day. **Freight movements** Of ~17,000 vehicles per day, approx 100 (1%) are Heavy Commercial Vehicles (HCVs).
Public Transport	There are 664 bus passengers travelling along Hewletts Road per day[49] within 52 bus movements per day. These were on the 2W & 2B bus services which operate a combined two services per hour in each direction, for 13 hours per day[50]	Along Tōtara Street there are 337 passengers per day[51] travelling on five bus services (operating twice per hour per direction for 13 hours per day (52 bus movements per day)[52].	No bus services currently using Hull Road.	The No.5 Bus service currently runs along Maunganui Rd with a frequency of up to 4 buses per hour during peak periods.

46 Waka Kotahi state highway traffic counts 2020
47 UFTI (smartgrowthbop.org.nz)
48 Counts for Tōtara St, Hull Road, Jean Batten Dr and Maunganui Road are on automatic tube counts obtained from Tauranga City Council. Heavy Commercial Vehicles are counted as Vehicle Class 5 and above.
49 Beecard Bus Patronage data for March 2022
50 BayBus scheduled frequencies https://www.baybus.co.nz/tauranga-western-bay/tauranga-and-western-bay/
51 Beecard Bus Patronage data for March 2022
52 BayBus scheduled frequencies https://www.baybus.co.nz/tauranga-western-bay/tauranga-and-western-bay/

Movement Type	Hewletts Road	Tōtara Street	Hull Road	Maunganui Road
Cycling	Cycling count data obtained from TCC for 2022 shows average daily cycle volumes of 242 on Tōtara Street cycle lanes, and 301 on Harbour Bridge shared path. To establish an approximate figure for cyclist counts on Hewletts Road, it was assumed that all cyclists that cross the harbour bridge use either Tōtara Street or Hewletts Road (See Supporting Information). This results in 59 cyclists a day travelling along Hewletts Road. Total daily cycling numbers along Hewletts Road may be higher than reported as cycle counts have not been taken specifically from Hewletts Road and Harbour Bridge cycle counts have been taken from shared path (excluding any cyclists travelling on-road).	In 2022 there was an average of 242 cyclists per day using Tōtara Street.	In 2022, there was an average of 73 cyclists per day travelling eastbound on Hull Road.	No counts available
Pedestrians	Pedestrian count data obtained from TCC for 2022 shows average daily pedestrian volumes on Tōtara Street of 23, with 88 pedestrians on the Harbour Bridge. Using the same method as above for cyclist volumes, the number of pedestrians travelling along Hewletts Road is estimated at 65 pedestrians a day. There are numerous people employed within the industrial businesses located alongside or within a short walking distance from Hewletts Road who will cross the street and/or walk along the corridor to purchase lunch/coffee.	In 2022 an average of 23 pedestrians per day used Tōtara Street.	No counts available	No counts available
Rail crossings	There is one at grade rail crossing on Hewletts Road, on the eastern extent, less than 5m away from the roundabout with Maunganui Road and Golf Road. This crossing has barrier arms and signals for vehicles. Electronic swing gates have been recently installed to improve pedestrian safety. The SH2 flyover does not have any at grade rail crossings.	Two at grade rail crossings on Tōtara Street, one north of roundabout with Hull Road and one south of roundabout with Hull Road. The southern one is used for shunting only. Both crossings have barrier arms and signals for vehicle and pedestrians.	One at grade rail crossing on Hull Road, on the eastern extent, approximately 55m away from the intersection with Maunganui Road. This crossing has barrier arms and signals for vehicles only (not pedestrians).	There are no rail crossings on Maunganui Road.

Significant movements around Hull Road, Sulphur Point and Tasman Quay indicate high utilisation of the proximate road corridors for both cars and trucks accessing the port.

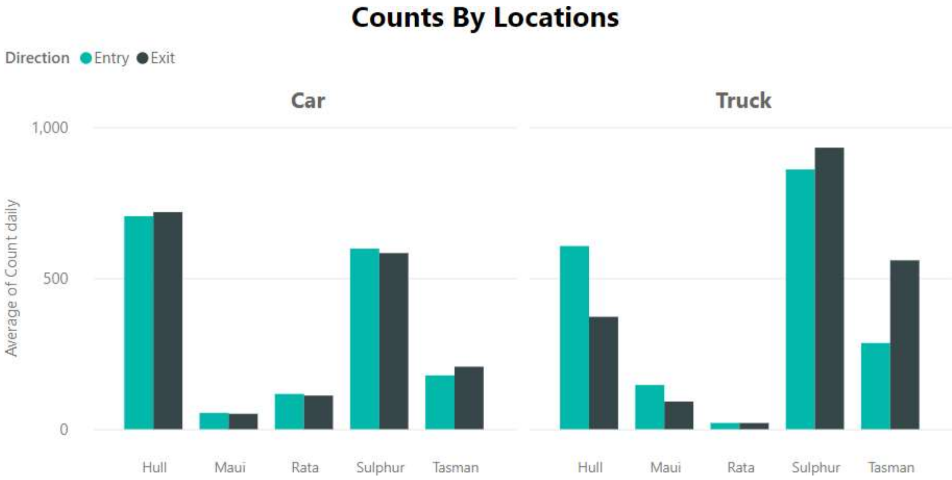

Figure 6-13: Car and Truck Counts by Location (Weekdays 2023 February 1 to July 31)

6.4.2 Effect - Vulnerable user exposure and vehicle conflict harming people and community

The Crash Analysis System (CAS) database records crash details nationwide. CAS data obtained for the study area for the five years (2017-2022) identified a total of 422 crashes on Hewletts Road, Tōtara Street and Maunganui Road (noting Covid-19 will have impacted travel patterns over the past two years).

These statistics do not consider the two fatalities that occurred within the study area in 2023 - a cyclist was killed at the intersection of Hewlett's Road and Tasman Quay in April 2023, and a young girl died at the pedestrian rail level crossing on Hewletts Road near Maunganui and Golf Roads in July 2023.

Of the crashes, 13 resulted in fatal or serious injuries. Eight (53%) of the fatal and serious injuries involved pedestrians, cyclists and motorcyclists who are significantly more vulnerable to crash forces (Figure 6-17). Given the low mode split (see Figure 4-4) along these corridors (vulnerable users comprise less than 2% of all trips) this is a significant over-representation in the level of harm experienced by these users.

Table 6-2: Crash Data for Hewletts Road, Tōtara Street, and Maunganui Road between 2017 and 2022 (CAS)

	Fatal	Serious	Minor	Non-injury	TOTAL
Hewletts Road	0	5	47	160	212
Tōtara Street	2	1	24	82	109
Maunganui Road	1	4	21	75	101
TOTAL	3	10	92	317	**422**

The location of the serious and fatal crashes in the study area are illustrated in Figure 6-14 below. Note this does not include the two fatalities within the study area that occurred in 2023.

Figure 6-14: All Recorded Serious and Fatal Crashes in the Study Area 2017 – 2022[53]

Crash data for the study area only includes those crashes reported to the police. The number of near misses and non-injury crashes involving vulnerable users is likely to be higher than reported.

A factor contributing to crashes on Hewletts Road is the speed differential between the general traffic lanes and the bus lane. As shown in Figure 6-12, general traffic lanes have a high throughput which results in queued traffic, while the bus lanes have low throughput and generally operate with free-flowing conditions, resulting in a speed differential between the lanes. This was a specific factor in the serious injury pedestrian crash on Hewletts Road (shown in Figure 6-14), where a pedestrian was crossing through queued lanes and was struck by a moving vehicle in the bus lane. This is a known crossing point for people accessing the bakery and anecdotal reports suggest there have been several near misses at this location.

The Kiwi Road Assessment Programme (KiwiRAP) is a crash-risk mapping tool which quantifies and compares historical road deaths and serious injuries (DSI) as recorded by Waka Kotahi Crash Analysis System crash data sets. It is a tool used to identify significant existing crash-risk areas on the transport network. Roads within the study area have been classified through the KiwiRAP collective and personal risk analysis and a heat map has been produced showing vulnerable road user crashes for the study area. Maps are included in Supporting Information. In summary, the KiwiRAP analysis shows:

- Hewletts Road and Maunganui Road are medium to medium-high from a collective risk perspective
- Several roads in the study area are classified as low-medium to medium personal risk with a number classified as high personal risk between Tōtara Street and Maunganui Road, north of Hull Road.
- Hewletts Road and Maunganui Road feature prominently in the VRUs heat map for the period 2012-2016.

[53] Source: NZTA Crash Analysis System

6.4.3 Level Crossing Safety

The study area contains four at-grade level crossings, all presenting significant safety risks, with the Hewletts Road level crossing near Golf Road and Maunganui Road being of particular concern.

The Hewletts Road crossing faces several critical issues, such as short stacking, queuing from nearby intersections, the high proportion of heavy vehicles, and the limited distance between the advanced warning and the crossing. These factors, particularly short stacking and queuing, increase the risk of fatal and serious-injury accidents.

Tragically, a recent fatality involving a young pedestrian at this crossing has highlighted these safety concerns. In response to this incident, pedestrian safety improvements have been implemented at the Hewletts Road level crossing. While these upgrades have addressed some of the immediate concerns for vulnerable road users, this location continues to pose significant risks.

Over the past decade, KiwiRail has recorded seven incidents at the Hewletts Road crossing, including one collision with a light vehicle. Additionally, NZ Transport Agency's Crash Analysis System (CAS) has recorded 43 crashes in the surrounding area, with 13 related directly to the crossing. One incident involved a driver striking the crossing's flashing lights before being hit by a train.

It is worth noting that, following the recent fatality, safety interventions for pedestrians have now been completed at all four at-grade rail crossings within the study area. However, despite these improvements, continued monitoring and further risk mitigation measures may be necessary to ensure long-term safety, particularly given the unique risks at Hewletts Road.

6.4.4 Perceptions of Safety

Research has shown that barriers to cycling tend to focus on issues regarding perceptions of safety - particularly from motor vehicle drivers and cycling in the dark[54]. This is a key consideration in achieving mode shift and improvements to cycling infrastructure play a key role in encouraging more cycling.

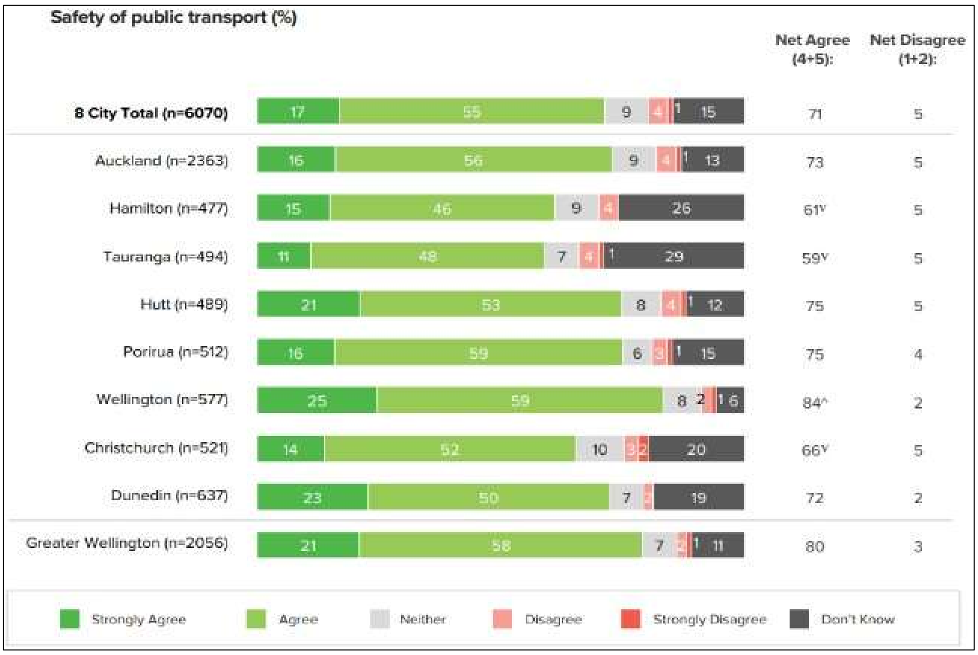

Figure 6-15: Public Perception of Public Transport by City, Quality of Life Survey 2020

54 https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/Waka-Kotahi-Attitudes-to-cycling-and-walking-final-report-2021.pdf

Currently there is a low perception of safety for vulnerable users. TCC's Resident Survey[55] identified low levels of satisfaction with cycling on existing roads or cycleways in Tauranga City (35%). Similar low safety perceptions exist for public transport in the city. The 2020 Quality of Life Survey found only 59% of Tauranga respondents consider public transport safe, the lowest of all major New Zealand cities perception surveyed). This is amplified by media articles such as the one published in May 2022 stating that bus drivers are boycotting certain bus stops amid safety fears.

6.4.5 Summary

In summary, competition for limited road space through high vehicle volumes, competing journey purposes (freight, community, recreational and through route travel), and inefficient use of the current road corridor (including the under-utilised bus lanes on Hewletts Road) results in high levels of exposure for vulnerable users and conflict between vehicles. This is resulting in harm to people and the community with an overrepresentation of vulnerable users in the crash data from the study area in the last five years.

6.5 Problem Statement Three

High volumes of vehicles travelling and a lack of viable alternative options results in transport related effects on the environment (Whareroa marae, the harbour and public heath) and NZ's transport emissions.

The causes and effects of this problem are addressed in three parts:

- Cause: High volumes of vehicles, mode share and;
- A lack of viable alternatives;
- Effect: transport related effects on the environment - emissions, environmental effects and public health impacts.

6.5.1 High Volumes of Vehicles and Private Vehicle Mode Share

As outlined in Section 6.4, the Hewletts Road corridor currently provides for approximately 44,000 people-movements per day as an annual average (approximately 98% of which are vehicle movements, 1.5% bus movements, < 0.2% cycling and <0.2% walking movements). New Zealand cities typically have a high level of car dependency[56] and this number reflects a city-wide high vehicle mode share (in Tauranga, trips by car comprised 86% of total trip legs between 2014-2018 (Figure 4-4).

This is the second highest of five major cities, just behind Hamilton. By contrast, in Wellington during the same period, 70% of total trip legs were made by car. Many trips within Tauranga are less than 10km (Mount Maunganui to the CBD is 7km), and the terrain is relatively flat. Both factors support active mode trips.

[55] https://www.tauranga.govt.nz/Portals/0/data/council/reports/residents-survey-2021.pdf, p.48
[56] https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/Keeping-cities-moving.pdf , p. 6

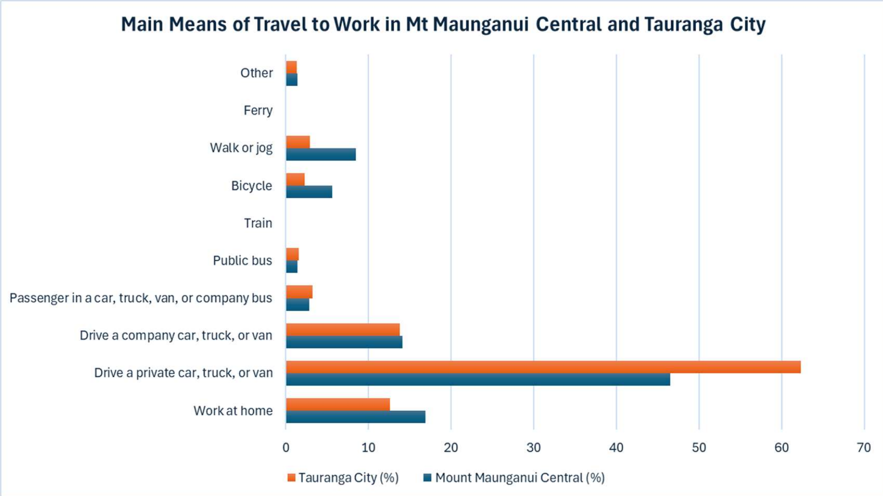

Figure 6-16: 2018 Journey to Work for Mount Maunganui Central and Tauranga[57]

In both Tauranga City and Mount Maunganui Central, most people commute to work via a private or company vehicle, with over 80% of Tauranga City workers and around 63% of Mount Maunganui Central workers using this mode. Active modes such as walking and cycling combined account for 5% and 14% for Tauranga City and Mt Maunganui Central respectively. Public transport use remains notably low accounting for less than 2% in both locations.

This data is based on the 2018 Census, collected before the Covid-19 pandemic. As a result, the proportion of respondents working from home has likely increased across all areas since then.

6.5.2 Lack of Viable Alternatives

Public Transport

Although those travelling by private vehicle often experience issues with journey time reliability, public transport is perceived to be an unattractive alternative. A combination of service provision (number of services, frequencies, span, directness) and infrastructure (priority provision, stops and shelters) as well as perceived safety issues are indicators of its perceived value and popularity.

This reinforces car dependency and ongoing low mode share for public transport and contributes to worsening environmental outcomes and emissions.

Journey Time Competitiveness

While Section 6.3.2 demonstrates that along the Hewletts Road corridor itself, public transport journey times are more reliable than private vehicle journey times (likely because of the current dedicated bus lane), the overall journey time competitiveness of public transport is not comparable over a greater distance.

Figure 6-15 shows the distance that can be travelled by public transport and private vehicle within 15 and 30 minutes from Hewletts Road during the AM peak. It shows a significant increase in people's ability to access opportunities such as jobs, education and social activities by car when compared to public transport, reducing the attractiveness of public transport. Generally, within 30 minutes using public transport from Hewletts Road, a person would be able to travel less than half the distance possible within 15 minutes by car.

[57] Census 2018 Journey to Work

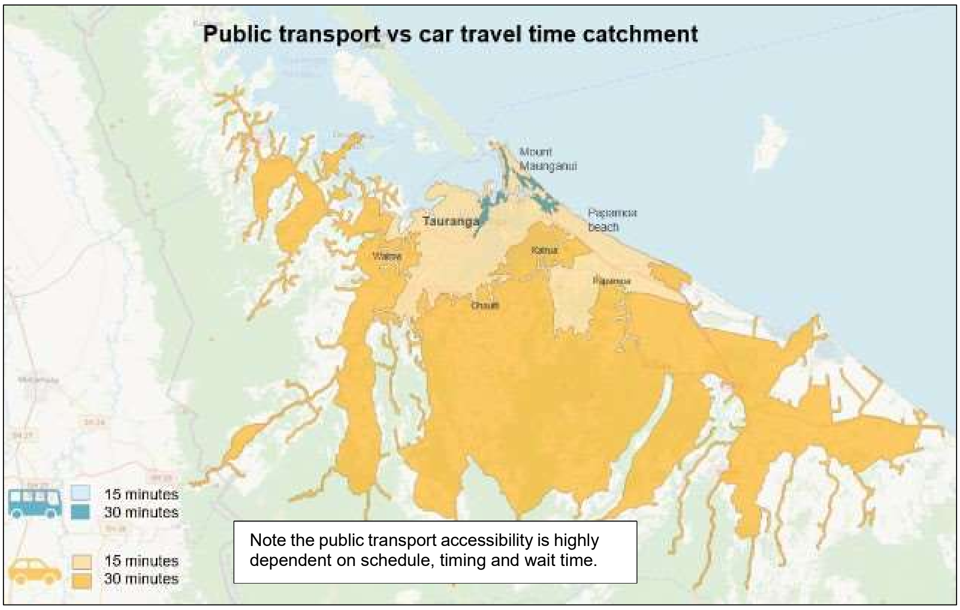

Figure 6-17: 2022 Bus and Car Accessibility within 15 and 30 Minutes to Hewletts Road during AM Peak

Service Provision

Within the study area, there are two urban bus routes, with limited services operating throughout the day, and three regional bus services using SH2 Hewletts Road. Figure 6-18.

Route 2 (2W/2B - the red route in Figure 6-22) operates between Pāpāmoa Beach and Tauranga city and Route 5 (the purple route in Figure 6-22) operates between Bayfair, Mount Maunganui and Tauranga city. Both routes operate at a 30-minute interval, between 6am and 8pm, 7 days a week. Both are Connector services (moderate frequency routes) according to BOPRC RPTP[58].

Route 101 operates between Whakatāne and Tauranga, Route 143A and Route 143B operates between Whakatāne and Tauranga via Paengaroa / Pukehina and Te Puke. These routes are Local/Regional services according to BOPRC RPTP.

Moderate frequency services such as these are known to create 'journey stress' and low confidence in the service. Customers add a substantial buffer time into their journey planning to avoid missing the scheduled service so they can reach their destination on time[59]. In contrast, primary routes are higher frequency services (every 15 minutes or less[60]) and provide confidence for customers and improve the attractiveness of public transport.

Directness to destination and transfer requirements also have a significant impact on customers' experience of public transport. Both bus services travelling through the study area terminate at Tauranga CBD meaning a transfer is required to access areas further south of Tauranga CBD. This negatively impacts customers' experience of public transport.

Limited public transport within the study area requires potential users to carefully plan their journeys around timetabled services, restricting trip flexibility. Compared with the flexibility of private vehicles, these bus services often appear significantly less attractive.

[58] Bay of Plenty Regional Public Transport Plan, 2019
[59] Waka Kotahi New Zealand Transport Agency, *Assessing the value of public transport as a network*, May 2017
[60] Fast and frequent service is defined by in the Bay of Plenty Regional Public Transport Plan, 2019

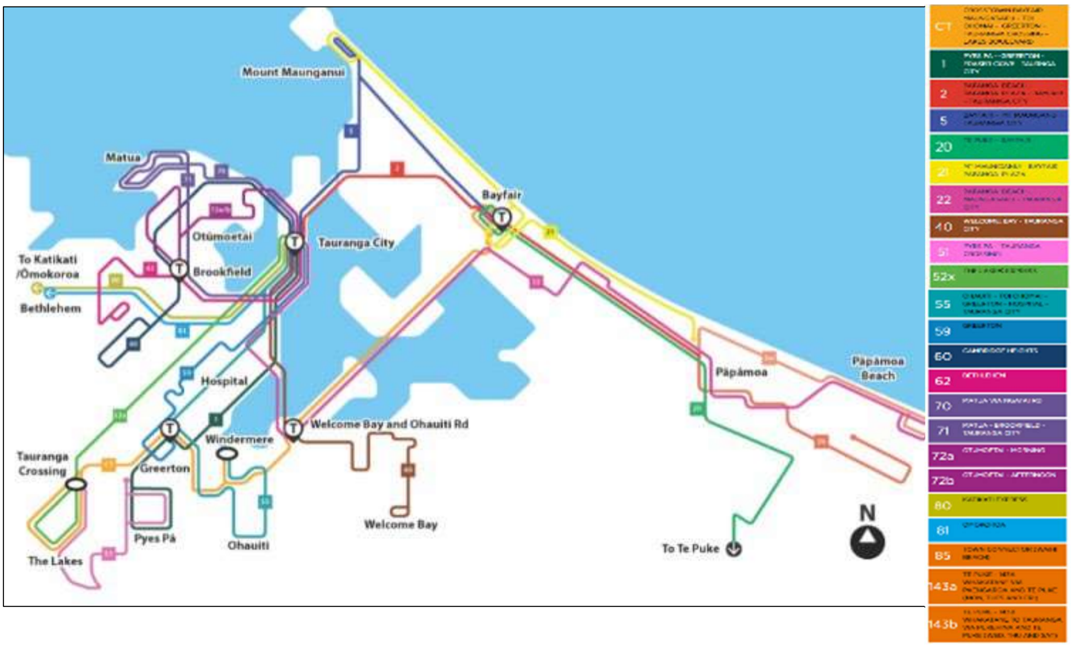

Figure 6-18: Existing Tauranga Bus Network (2022)[61]

As noted in Section 5.3, a business case is underway to explore improvements to PT services and infrastructure to support the delivery of the Connected Centres Programme.

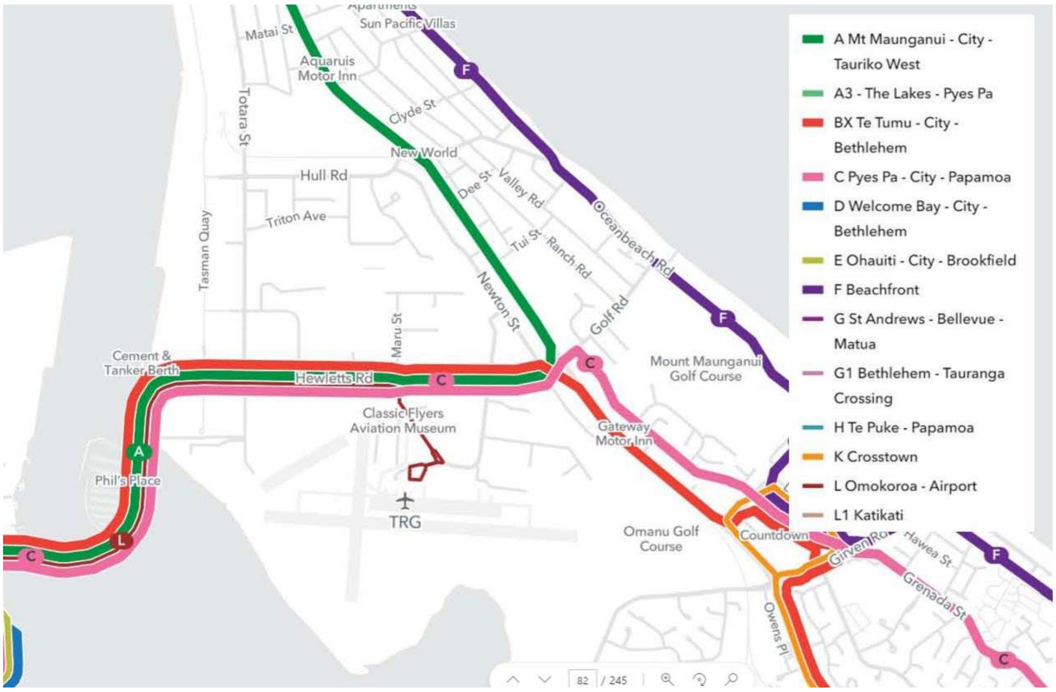

Figure 6-19: Proposed Future PT Services within the Project Area

This will see a step change in frequency within the study area and would significantly improve the throughput of people, freeing up capacity for those trips that cannot shift to other, more efficient modes. However, the

[61] Western Bay and Tauranga Bus Network, 2022, https://www.baybus.co.nz/tauranga-western-bay/tauranga-and-western-bay/

benefits can only be realised with associated Public Transport priority measures to support this planned growth, with particular pinch points noted at the intersection of Hewletts Road, Maunganui Road and Golf Road as well as the intersection of Hewletts Road and Tōtara Street.

Quality of Supporting Infrastructure
In addition to limited-public transport services, there is limited supporting infrastructure within the study area. Where bus stops are present, these are low-quality, with more than 80% having no shelter and seating and no real time displays. This is of particular concern on Maunganui Road, a key corridor for bus movements and for people boarding and alighting. Within the study area, the only existing bus priority measure is the 1.6km length of bus lanes provided on SH2/Hewletts Road.

Poor Public Perception

In a 2020 TCC resident survey, approximately half of respondents said the car was their only option for morning travel[62]. Further multiple resident surveys indicated a poor perception of public transport[63], which is seen as inconvenient, infrequent, and unreliable. For example, in the Quality-of-Life Survey 2020:

- Only 34% of respondents said public transport in Tauranga is reliable, significantly lower than all other major New Zealand cities surveyed; and
- Only 46% of respondents said public transport is frequent in Tauranga, significantly lower than all other major New Zealand cities surveyed.

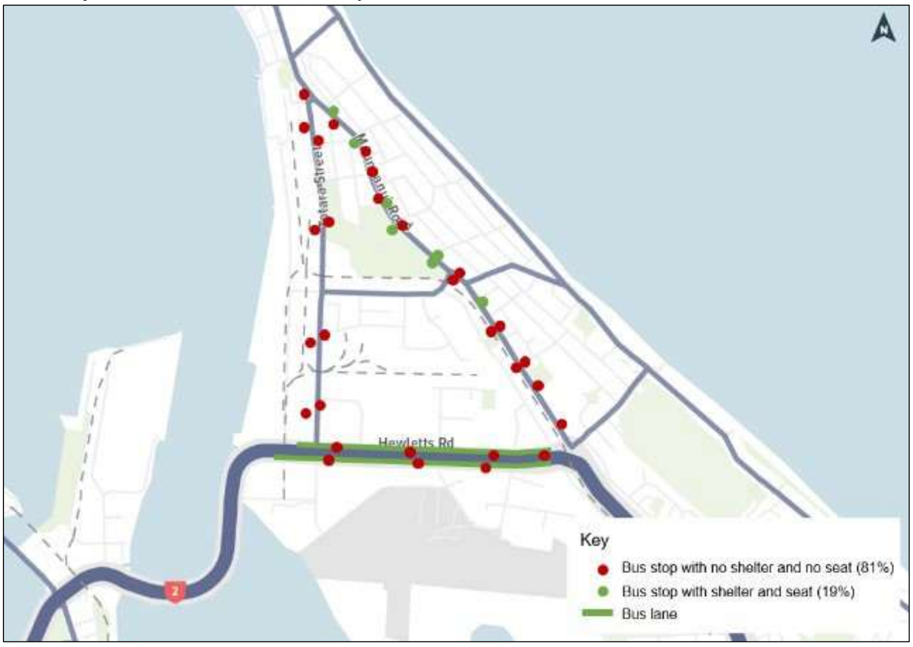

Figure 6-20: Existing Public Transport Infrastructure within the Study Area

Public Transport Patronage
Public transport is currently significantly less attractive as a transport option compared to private vehicles, limiting travel choice and access to opportunities for people. This reflects the wider public transport trend for Tauranga. As shown by Figure 6-21, Tauranga has significantly low public transport patronage per capita in comparison with similar urban areas, and this trend is continued within the study area as shown by the Mount Maunganui 2018 Journey to Work data.

[62] Waka Kotahi, Travel Demand Management in Tauranga, Presentation 16 May 2019, p.35
[63] Quality of Life Survey 2020, TCC Resident Survey, p.61

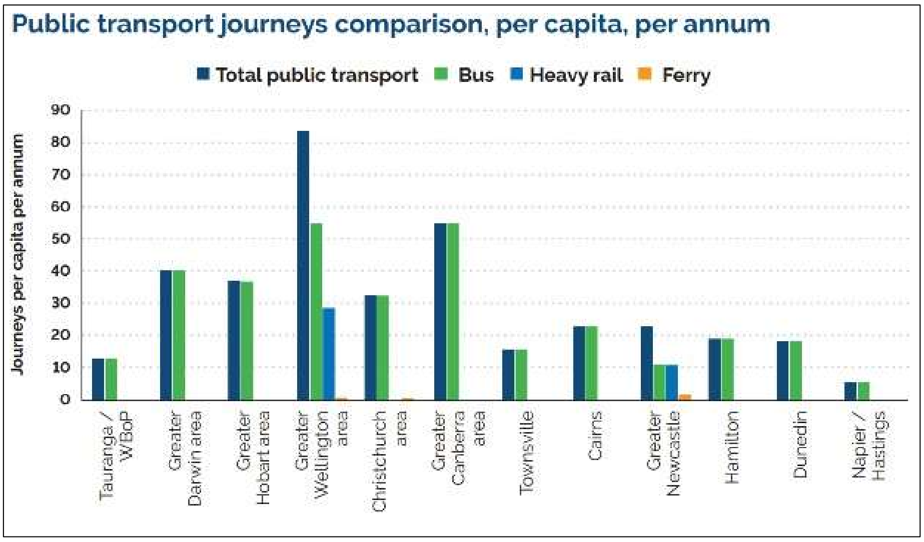

Figure 6-21: Low Public Transport Ridership Compared to Other Similar Urban Areas (2018, UFTI)

Active Modes

Active modes such as walking and cycling are also not a popular viable alternative to private vehicle and there are currently no protected cycle facilities within the study area (Figure 6-16 in Section 6.4.1). Whilst an off-road shared path on Maunganui Road is being constructed and a shared path is planned for Tōtara Street, the active mode network within the study area is and will remain generally disconnected, a barrier for people who might otherwise cycle longer distances. This further embeds private vehicle dependency.

While footpaths are provided on either side of the SH2/ Hewletts Road corridor, these provide a low-quality pedestrian experience. They are narrow (approximately 1.3m in width) and interspersed with large vehicle crossings. There is no street vegetation providing any urban amenity or shade. Footpaths and pedestrian facilities in the wider study area are also generally of a poor standard (being narrow and of low amenity) or in many places non-existent. For example, there are no footpaths along Waimarie Street, Maru Street or Aerodrome Roads, all of which connect to Hewletts Road (Figure 6-22).

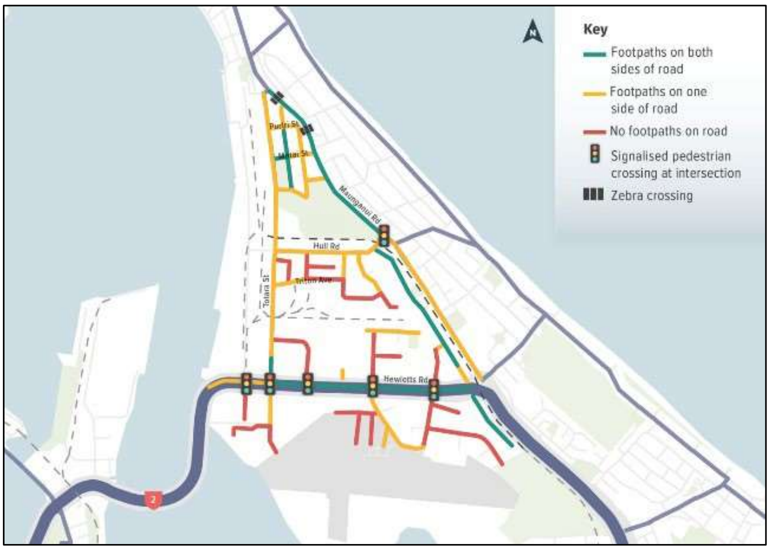

Figure 6-22: Existing Pedestrian Facilities in the Study Area

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6.5.3 Transport Emissions, Environmental Effects and Public Health Impacts

Forty seven percent of carbon dioxide emissions in New Zealand in 2018 originated from transport (90.7% from road vehicle emissions and 6.7% from domestic aviation)[64] and Tauranga's per capita emissions for transport are higher than other cities in New Zealand including Wellington and Dunedin[65].

Transportation sources contributed 463,960 tonnes of carbon dioxide equivalents (CO2e) in 2015/16, representing over 60% of Tauranga City's overall gross emissions[66], and indicating that transport sources are a significant contributor to poor local air quality. 97% of transport emissions are from road transport, and come from the use of petrol, diesel and LPG for vehicle transport. As overall national transport emissions have increased substantially since 2015, these statistics for Tauranga are likely to have increased.

In 2022, Toi Te Ora commissioned two reports from Emission Impossible on behalf of the Institute of Environmental Science and Research Ltd (ESR) to investigate the air quality in the Mount Maunganui area. The report compares the air quality in Mount Maunganui with the nearby suburb of Ōtūmoetai identified that potential adverse outcomes include premature deaths, a higher frequency of cardiovascular and respiratory hospitalisation, and more restricted activity days[67].

Figure 6-23 illustrates the emissions profile for road, rail, water transport and transport services for Bay of Plenty Region over a 13-year period from 2007 to 2019, indicating emissions from transport have increased from 137 to 181 kilo tonnes of CO2e. This trend will only continue with the perpetuation of high car dependency, lack of attractive transport choices and anticipated future urban growth.

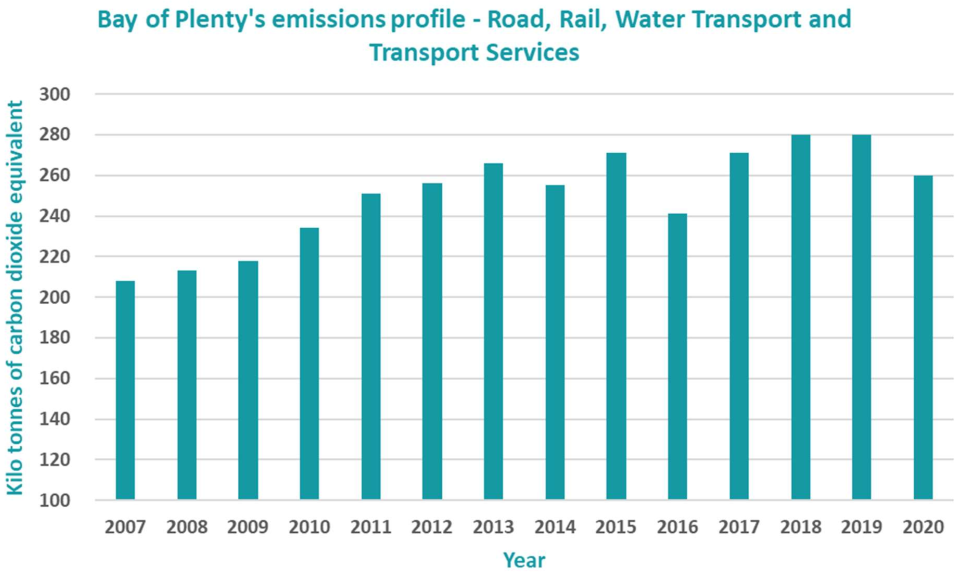

Figure 6-23: Emissions from Road, Rail, Water Transport and Transport Services in BoP from 2007 – 2020[68]

In addition to emissions, high volumes of vehicles and a lack of alternative options also negatively impact the environment and air quality in the surrounding area. Air pollution caused by high levels of particulate matter (PM), sulphur oxides (SOx) carbon monoxide (CO), nitrogen oxides (NOx) leads to health conditions such as respiratory diseases, heart attack, lung cancer and mortality. In Tauranga, the main sources of air pollution include domestic heating, shipping, industry, port activities, motor vehicles[69]. Whareroa Marae and residents have especially expressed concerns about the air quality in the Mount.

[64] https://www.stats.govt.nz/indicators/new-zealands-greenhouse-gas-emissions
[65] https://www.tauranga.govt.nz/living/climate-change/community-climate-action
[66] Community Carbon Footprint, TCC, 2015/2016
[67] https://esr2.cwp.govt.nz/assets/Environmental-reports/Mount-Maunganui_Air-Quality_Health-Risk-Assessment_2023.pdf
[68] Stats NZ, Greenhouse gas emissions by region (industry and household): Year ended 2019
[69] https://atlas.boprc.govt.nz/api/v1/edms/document/A3251656/content

Vehicle emissions include particulates, carbon monoxide, carbon dioxide, nitrogen dioxide, sulphur dioxide and benzene. These emissions are damaging to both people's health and wellbeing, and the environment, with the adverse effects greater in areas with high traffic and congestion rates.

Motor vehicles contribute to approximately 37% of CO emissions, 30% of NOx emissions and 6% of PM emissions in Tauranga[70]. Emissions from motor vehicle to air comprise of tailpipe emissions of a range of contaminants and particulate emissions from the wear of brakes and tyres.

High car dependency also contributes to negative environmental outcomes through the construction and operation impacts of roading infrastructure. A reduction in car usage and consequently road infrastructure construction and operation will result in fewer harmful effects on water, biodiversity, and resource consumption from expansion of roads[71]. The extent of urban area dedicated to moving and storing vehicles is also a poor environmental, social and urban amenity outcome.

Stormwater

TCC currently owns and manages the public stormwater network. The city is split into six stormwater catchments and the Hewletts Road sub-area falls within CSC1 - Mount Industrial and Sulphur Point.

Stormwater discharges entirely into Tauranga Harbour at Pilot Bay, Tauranga wharves, Waipu Bay and Sulphur Point. A very large proportion of this stormwater is discharged into the harbour with little or no treatment. The harbour is recognised by BOPRC in the Regional Coastal Environment Plan as an outstanding natural feature and is classed as an Area of Significant Cultural Value. This project presents an opportunity to improve the quality of discharge of roading related stormwater into the harbour.

Inactivity and Public Health Impacts

Low physical activity levels in New Zealand mean that only half of adults meet New Zealand's physical activity guidelines[72]. International studies show that taking up cycling and walking for transport leads to increased levels of PA, reductions in BMI and diabetes, and lower levels of sick leave. People who cycle for transport have lower mortality than those who do not.

Research carried out into transport and public health impacts in New Zealand found that if local and national governments had put in place policies and infrastructure around transport and land use in Tauranga that resulted in a similar mode share as Wellington, there would be around 50 fewer premature deaths per year (which is about four times larger than the effect of preventing all road injury deaths in Tauranga)[73]. Given that Hewletts Road and Maunganui Road will be two of the key future public transport spines, there are significant public health impacts of investing in bus priority within the study area to enable mode shift away from private cars.

6.5.4 Summary

A reduction in car mode share in Tauranga, and specifically within the study area will contribute positively towards improved emissions, provide benefits in terms of public health, and potentially free up valuable road space that could be reallocated to support greater throughput of people and goods. In terms of stormwater quality, changes to the roading network as part of this project present an opportunity to upgrade the stormwater treatment mechanisms to reduce the quantity of transport related contaminants being discharged into the Tauranga Harbour.

[70] BOPRC Tauranga Air Emissions Inventory 2018, https://atlas.boprc.govt.nz/api/v1/edms/document/A3251656/content
[71] https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/Keeping-cities-moving.pdf p.9
[72] https://www.health.govt.nz/publication/annual-update-key-results-2020-21-new-zealand-health-survey
[73] Health consequences of transport patterns in New Zealand s largest cities 2018 https://journal.nzma.org.nz/journal-articles/health-consequences-of-transport-patterns-in-new-zealand-s-largest-cities

6.6 The Benefits of Investment

The benefits of successfully addressing the problems through investment in the CMM project were identified as follows:

- Improved transport system reliability, access, and throughput of people and goods;
- A multi-modal transport system that supports safer and healthier journeys;
- Improved transport choice for access to social and economic opportunities;
- Reduced impact on the environment and climate change impacts from transport related carbon emissions; and
- Improved public health incomes.

All the benefits identified support sustainable urban growth and give effect to the direction established by SmartGrowth via the UFTI Connected Centres Programme. While population and freight growth will exacerbate the problems identified above, the benefits of addressing the problems will also help support the opportunity for additional growth.

It should be noted that while the project scope is for a relatively short length of road, the improvements proposed via the CMM project will provide benefits to the wider transport network.

6.7 Investment Objectives

Addressing the problems identified will contribute to achieving the following investment objectives:

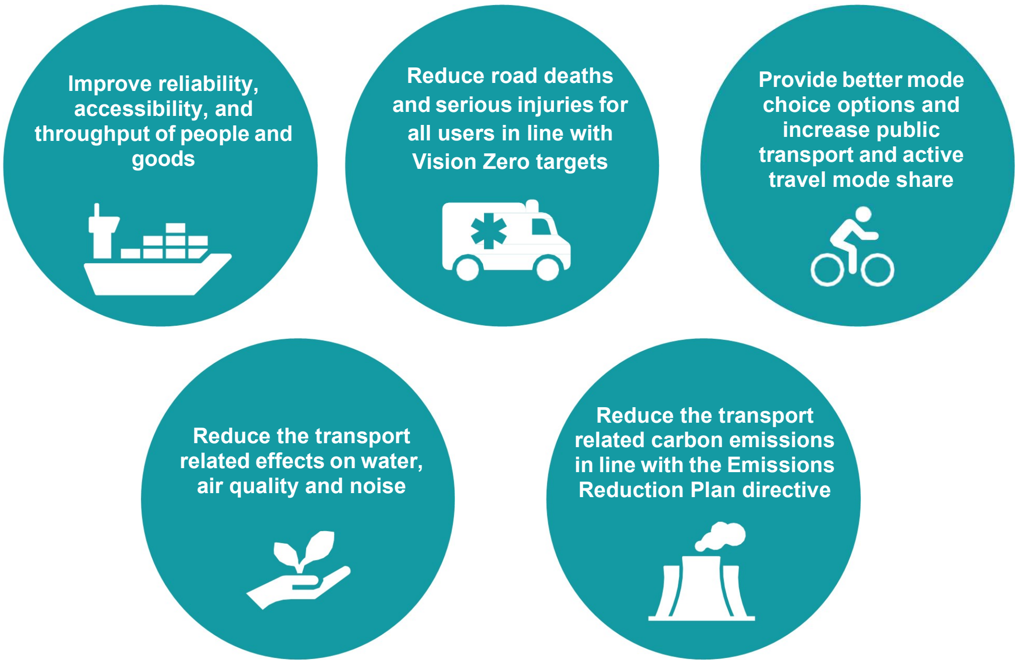

Figure 6-24: Investment Objectives

6.8 Key Performance Indicators

To assess options against the identified Investment Objectives and determine the level of "benefit" that could be derived, a set of Key Performance Indicators (KPIs) was developed. The adopted KPIs are set out in Table 6-3. The KPIs have been developed in accordance with the Waka Kotahi Land Transport Benefits Framework and Management Approach guidelines and align with the Ministry of Transport's Transport Outcomes Framework.

Table 6-3: Key Performance Indicators

Benefits	Investment Objectives	Key Performance Indicators
Improved transport system reliability, access, and throughput of people and goods	Improve reliability, access, and throughput of people and goods	KPI 1: People throughput KPI 2: Travel time reliability for freight movements
A multi-modal transport system that supports safer and healthier journeys	Reduce road deaths and serious injuries for all users by at least 40%	KPI 3: Risk of death and serious injuries (collective risk)
Improved transport choice for access to social and economic opportunities	Provide better mode choice options and increase public transport and active travel mode share	KPI 4: Public transport travel time compared to general vehicle travel time KPI 5: Access to social and economic destinations by PT, walking and cycling
Reduced impact on the environment and climate change impacts from transport related carbon emissions	Reduce the transport related effects on water, air quality and noise	KPI 6: Ambient air quality - NO2 and PM10 and noise level
	Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	KPI 7: CO2 emissions (mode shift from single occupancy vehicles)

6.8.1 Key Performance Targets and Rationale

Table 6-4 outlines the key performance targets for each Key Performance Indicator (KPI), with targets set using the SMART criteria (Specific, Measurable, Achievable, Relevant, Time-bound). Each KPI is associated with a measurable target, a baseline for comparison, and a rationale that justifies the target.

Table 6-4: SMART Key Performance Targets and Rationale

KPI	Investment Objective	KPI / Measure	Baseline	Target	Rationale
1	Improve reliability, access, and throughput of people and goods	10.1.6 Increase people throughput	Existing State	Increase people throughput capacity for all modes in the morning peak by 40% by 2048	In line with projected WBOP population growth to 2050
2		5.1.2 Improve travel time reliability for freight *Or* 5.1.3 Travel time delay	Hewletts Rd from Aerodrome Rd to Tōtara St travel time: 6 mins Tōtara St to Hewletts Rd travel time: 5 mins	Hewletts Rd from Aerodrome Rd to Tōtara St travel time: 4 mins Tōtara St to Hewletts Rd travel time: 3 mins	Routes assessed include Tōtara Street between Hull Road and SH2 Harbour Bridge & Hewletts Road westbound between Aerodrome Road and SH2 Harbour Bridge

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KPI	Investment Objective	KPI / Measure	Baseline	Target	Rationale
3	Reduce road deaths and serious injuries for all users	1.1.3 Reduce the risk of death and serious injuries	13 DSIs (2017-22)	Reduction in deaths and serious injuries	Aligned with Road Safety strategy
4	Provide better mode choice options and increase public transport and active travel mode share	10.1.9 Reduce public transport travel time *Or* 8.1.2 Mode shift from single occupancy private vehicle	For the route East of Hewletts Rd to Tauranga CBD General Traffic Travel Time (Median): 10minutes Bus Travel Time (Median): 12minutes	Reduce public transport travel time in the morning peak to private vehicle travel times by 2048 between Mt Maunganui and CBD.	Used to measure the potential for mode shift on to PT as a more attractive means of travel than driving by private vehicle.
5		5.2.6 Increase access to social and economic destinations	2031 30 min catchment: CBD: 88,000 Port & Marae: 59,000 Hospital: 53,000 Mauao: 35,000	Increase access for people living within 30 mins of key economic and social destinations by PT in the morning peak by 50% by 2048.	Support UFTI aspiration of 15min local and 45min subregional accessibility.
6	Reduce the transport related effects on water, air quality and noise	3.2.1 / 3.2.2 Improve ambient air quality by reducing concentrations of transport related NO2 and PM10 emissions	584kg/day (VEPM6.3)	Reduce transport related NO2 concentrations by 20% by 2035	In line with the Emissions Reduction Plan
			118kg/day (VEPM6.3)	Reduce transport related PM10 concentrations by 20%	In line with the Emissions Reduction Plan
7	Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	8.1.1 Reduce transport related CO2 emissions	7.1kg of CO2 per person per day. (UFTI)	Reduce transport related harmful emissions to 2.1kg of CO2 per person per day (UFTI)	In line with the TSP and UFTI

7 Constraints, Uncertainties and Assumptions

This section describes the issues, constraints, uncertainties and assumptions surrounding the CMM project. These include the multiple factors that may influence long-term travel demand forecasts, some of which may significantly change transport supply within the study area and factors that could impact on the cost of the programme.

7.1 Constraints

Potential constraints that will impact the options for this IBC include:

- The uncertain nature and timing of development influences by regulatory/policy change and funding (early deliverables will progress on the basis of the Government funding);
- Any 'interim' measures, that are unable to be adapted to the final solution will become sunk costs;
- Property ownership and any acquisition process will need to be limited to allow rapid implementation; and
- Options will be constrained to those which have appropriate consenting timescale given any consenting process can become time consuming and costly.

During the development of the investment objectives, the investment partners also considered the uncertainty of key assumptions used to develop this IBC, as summarised in Table 7-1.

7.2 Uncertainties and assumptions

Supporting the optioneering approach and development of the recommended option are a set of base assumptions. These have been incorporated to manage several uncertainties that could impact the project:

Table 7-1: Uncertainties and Assumptions Log

Factor	Assumption	Impact on the Project
Growth	Project assumes future growth will occur in line with the UFTI Connected Centres sub- regional and Eastern Corridor growth. This will see more homes built in existing and new growth areas (e.g. 52,000 additional homes by 2048 in the Western Bay of Plenty). It also includes predicted growth in freight as a result of projects in the Auckland, Bay of Plenty Waikato triangle.	Assume growth in line with UFTI Eastern Corridor Housing targets. Assume freight growth in line with associated projects within the Auckland, Bay of Plenty, Waikato triangle These growth assumptions are built into Tauranga's Strategic Transport Model (TTSM). The implications of this are that the project is a taker of these assumptions.
Changes in land use in project area	For this project, the planning assumption is that key strategic assets such as the Port of Tauranga and Tauranga Airport will not move within the planning horizon. Over time, the land use in the industrial area could change particularly as Rangiuru Business Park comes online. TCC has recently signalled through the Mount Industrial Plan that any new 'heavy industrial activity' will be required to obtain land use consent.	The changes will not permit any new emitting industries within the Whareroa and Newton Road/MacDonald Street areas and look to transition to lighter industry over the longer term. It is also intended to restrict housing and accommodation within current commercial zoned areas of the Mount Maunganui Airshed. As land use changes (industrial to commercial/ residential etc) over time, the impact is likely to be neutral and have minimal impact on throughput of people and goods.

Factor	Assumption	Impact on the Project
Additional harbour crossing	It is assumed that there is no additional harbour crossing for public transport or general traffic (including bus and walking and cycling,) and potentially future passenger rail connections.	The SH2/Hewletts Road corridor as one of three ways to cross or go around the harbour will need to cater for the expected growth.
Plan Change 33	Mount to Arataki Spatial Plan work is ongoing which could result in land use changes that impact the project area. However as this is not adopted, PC33 is not included in the Do Minimum programme.	This will be updated as and when TCC confirm Plan Change and impact for the Mount to Arataki Spatial Plan area
Future PT services	The Western Bay of Plenty Public Transport Blueprint (services and infrastructure) is implemented to support the multimodal transport system. It assumes that future PT frequencies on Hewletts Road and Maunganui Road, and no services on Tōtara Street as illustrated in 'Reference Case'. It also assumes the hybrid PT operation model.	Assumption that Reference Case frequencies are in place and CMM project needs to facilitate the uplift in frequency to enable mode shift. PT facilities / priority are therefore considered within the study area will focus on future planned corridors of Hewletts Road and Maunganui Road. No provision will be made for Tōtara Street, where no future PT services are anticipated. The PT Services and Infrastructure SSBC is currently not funded under the NLTF. BOPRC are exploring opportunities to deliver this project via other funding pathways.
Bus Rapid Transit	Based on advice from BoPRC, our understanding is there are no current plans for a future BRT-type system within in the WBOP. If plans change, it is assumed that Hewletts Road would potentially be a primary corridor for a BRT system, so the recommended option should not preclude this happening at a future date.	No further plans will be progressed unless BOPRC indicate a networkwide plan for BRT, which includes the CMM project area
Cameron Road Stage 2	The preferred option for Cameron Road Stage 2 includes multimodal provision and space for dedicated bus lanes.	The assumption is that this project is not included in the Do Minimum, as the business case is underway and not yet confirmed. This is likely to happen within the timeframe of the subsequent project stages so the assumption will be updated as necessary.
Tauriko Long Term Network plan	The recently endorsed Tauriko Long-Term Connections Detailed Business Case features multi-modal improvements (local roading, public transport, walking and cycling, and state highway). This will support the current agreed Tauriko industrial and residential development as per the existing SmartGrowth agreed settlement pattern.	Freight will have a more reliable journey from Tauriko to the Port. The improvements will support expected freight growth from Waikato.
Future ferry service	We are aware that there was a ferry trial run as part of the Wednesday Challenge. Services ran between Omokoroa, the Mount and the CBD. There is currently no indication that this service will be made permanent.	This project assumes that PT ferry services are not included in the Do Min. Following the release of the NLTF programme for 2024, with no funding prioritised for public transport services, BOPRC have agreed to not fund the project. There are no immediate plans to look for funding from elsewhere.

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PART B – ECONOMIC CASE

8 Assessment Methodology

8.1 General Methodology

The assessment methodology involved a two-stage long list assessment process, followed by a short list assessment to confirm the recommended option. This approach is illustrated in Figure 8-1.

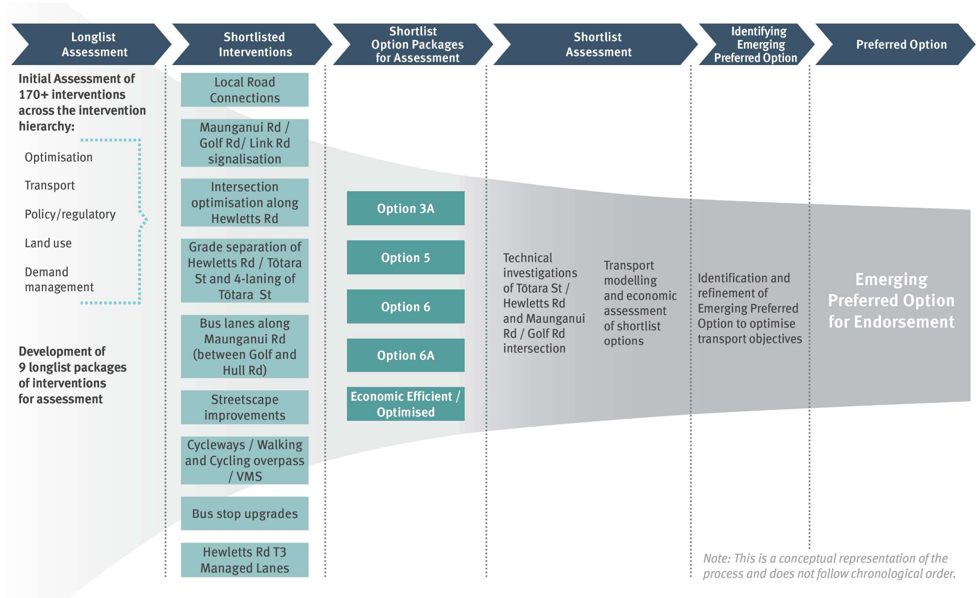

Figure 8-1: Overall Assessment Approach

The project team identified a range of alternatives and options in accordance with the Waka Kotahi intervention hierarchy which were confirmed with project partners.

Based on the NZ Transport Agency Business Case Approach Guidance[74],

- Interventions are defined as "any action or change that is designed to impact positively on the transport system" (e.g., add a left turn slip lane at a specific intersection).
- Options are defined as "different ways to achieve an outcome or objective" (e.g., a demand management led option).

Each option included a number of interventions, and the list of interventions generated for assessment was longer than the number of options.

The assessment methodology is detailed further in Appendix B1 and B3.

[74] https://www.nzta.govt.nz/planning-and-investment/learning-and-resources/business-case-approach-guidance/supporting-material/glossary/

8.2 Te ao Māori Assessment Process

Ngāi Tukairangi and Ngāti Kuku are partners of the project. Both hapū are mana whenua representatives and whakapapa to Ngāi Te Rangi Iwi. Whareroa Marae is the traditional pa site and key marae for Ngāi Tukairangi and Ngāti Kuku hapū. Whareroa is one of the oldest kainga and is of great significance to hapū and the community that live there. Of note, Whareroa is surrounded by industry and the Tauranga airport.

To support hapū representatives identify and assess te ao Māori impacts, Nassah Rolleston-Steed was commissioned by both hapū to provide advice and support. In this role, Nassah has been part of the project team and involved in the IBC technical investigations.

To identify and consider the potential impacts of each option from te ao Māori worldview and alignment to the Whareroa marae strategy, the following approach was taken:

- Each hapū decided on representatives to work with Nassah Rolleston-Steed and the project team to identify and assess te ao Māori impacts.
- Several hui were held with Ngāi Tukairangi and Ngāti Kuku hapū representatives and Nassah Rolleston-Steed to kōrero and go through the options to better understand their likely benefits and impacts. The kōrero helped ensure hapū representatives were familiar with and understood each option and had an opportunity to provide feedback and input.
- Ngāti Kuku prepared a cultural insights paper outlining the cultural views of Ngāti Kuku and Whareroa regarding the Connecting Mount Maunganui project. The purpose of this paper was to clearly document the views and priorities of Ngāti Kuku and Whareroa so they could be embedded in the project in a meaningful way. During this time, Ngāti Kuku reiterated their reluctance to engage with any and all government entities because their people have been let down by successive governments.
- NZ Transport Agency Waka Kotahi project representatives were invited to two hui with Ngāti Kuku hapū at Whareroa Marae to discuss the eight project options. These hui took place in December 2022 and March 2023.
- Ngāi Tukairangi hapū representatives worked with Nassah Rolleston-Steed to consider all eight options and develop a Ngāi Tukairangi option. On behalf of the hapū, Nassah Rolleston-Steed documented the consideration and impacts of the eight options (refer Appendix B2).
- The Ngāi Tukairangi option outlines the aspirations of the hapū in terms of transportation and land use within the Mount Maunganui area. This option includes many aspects relevant to the Connecting Mount Maunganui project, as well as possible future projects such as passenger rail in the Bay of Plenty. See Section 10.2.2 for further detail.
- Waka Kotahi project representatives were invited to a hui with Ngāi Tukairangi hapū to discuss the Connecting Mount Maunganui project options and the Ngāi Tukairangi option. From the kōrero, hapū representatives worked with Nassah to further refine the Ngāi Tukairangi option.
- Further hui both at Hungahungatoroa Marae and online have taken place with NZ Transport Agency project representatives. These hui have helped inform the hapū about the options and the hapū trustees finalise the Ngāi Tukairangi option and confirm the te ao Māori impacts.
- Ngāti Kuku met with Nassah Rolleston-Steed to discuss the options, outlining te ao Māori views, considerations and impacts. Ngāti Kuku hapū representatives worked with Nassah Rolleston-Steed to document this, producing a Position Paper (Kowhiri) (refer Appendix B2).

Through the process described above, Nassah Rolleston-Steed, Ngāi Tukairangi, and Ngāti Kuku hapū representatives have provided the Connecting Mount Maunganui project with their consideration of te ao Māori impacts to include in the overall multi-criteria assessment (MCA).

Using the documentation provided, the project team included a qualitative description of te ao Māori impacts for each of the eight options, with more detail for the four short-listed options. The project team also undertook a technical assessment of the option developed by Ngāi Tukairangi and considered detailed feedback from Ngāti Kuku on the options developed.

9 Assessment Framework and Approach

To align with the NZ Transport Agency Land Transport Benefit Management Framework and Management Approach guidelines, the project team identified Key Performance Indicators (KPIs) linked to the relevant benefit clusters and Investment Objectives.

The criteria used in assessing the options at all stages have been developed to give specific effect to achieving the benefits of investment. The MCA helps understand the pros and cons of each option against a consistent criteria and aids understanding trade-offs between options.

9.1 Assessment Framework

The assessment framework was tailored between the long list and short list optioneering stages, with the long list stage using largely qualitative-based measures, the short list stage being quantitative.

The additional assessments undertaken to re-confirm the Recommended Programme used the assessment framework outlined in 6.8, tailored to meet the requirements of the nature of the assessment, as well as the EAST tool where appropriate. This approach has ensured consistency across the technical investigations undertaken to help determine the optimal mix of solutions to achieve the investment objectives.

The technical / feasibility criteria is outlined in Table 9-1.

Table 9-1 Technical / Feasibility Criteria

Technical / Feasibility Criteria		
Engineering Feasibility	Constructability / Implementability	Assessment of Constructability / complexity of facility including stormwater infrastructure
Consenting	Planning and consenting	Likelihood of obtaining approval and Qualitative assessment of impacts on property
Cost (not scored)	CAPEX	High level $ estimate of capital costs of physical works
	Operating Cost / Efficiency	Assessment of operational costs including infrastructure maintenance
Value for Money / Affordability	Economic analysis (high-level BCR)	
Meeting customer needs	Qualitative assessment of options against specific customer needs and pain points	
Climate Change Mitigation	Assessment of mode shift and traffic reduction, VKT, land use	
Alignment with Whareroa Marae's Strategy	Extent to which option complements Whareroa Marae strategy for future land use	
Impacts on te ao Māori	Assessment of impact on te ao Māori including areas of significance for Māori, Māori land and Kaitiakitanga.	

Importantly, stakeholders agreed that environmental assessment criteria were not required to be assessed, given the nature and scale of environmental impacts are expected to be the same across all options, and therefore not a significant differentiator for options. Some options include grade separation interventions, which may require extensive removal of contaminated land, and likely impact cost and time, rather than having any significant impacts on the environment.

9.2 Assessment Scale

The seven-point assessment scale is shown below Table 9-3. The rating for each measure is based on a tailored assessment specific to each measure. See Appendix C1 and C3 for further detail on how ratings are defined for each measure.

All assessments were made in relation to the do minimum.

Table 9-3: Assessment Scale

Rating	Description
3	Large positive (+ve)
2	Moderate positive (+ve)
1	Slight positive (+ve)
0	Neutral
-1	Slight negative (-ve)
-2	Moderate negative (-ve)
-3	Large negative (-ve)
NA	Not Assessed (Do-minimum)

9.3 Do Minimum

A do-minimum baseline was developed to include ‘committed’ projects in the vicinity of the project area. These interventions are included in all options.,

The do-minimum is shown in Figure 9-1 and includes the following:

- Maunganui Road Safety Improvements: Off-road shared path, on road cycle facilities and crossing improvements (fully funded – phase 1 under construction, phase 2 due 2024)
- Cameron Road Upgrades (Stage 1): Improved public transport and active mode facilities along Cameron Road (funding committed - Stage 1 under construction, nearing completion)
- Baypark to Bayfair Link: A new SH2/SH29A interchange, a new flyover taking SH2 traffic over the Bayfair roundabout, and improved walking and cycling connections This project was near completion at the time of assessment
- Hewletts Road level crossing safety improvements: installation of a paved and fenced pedestrian maze and additional fencing to prevent crossing at other areas along the track (near completion at time of assessment)
- Public transport network changes: Increased bus frequency along Hewletts Road and Maunganui Road with no bus services on Tōtara St, in line with the Public Transport Reference Case[75]

[75] This project was included in the modelling do-minimum as it was considered for inclusion in the 2024-27 NLTP and prioritised as a regionally significant activity in the 2024-30 RLTP. However, the project was ultimately not included in the final 2024-27 NLTP. Changing the do-minimum would require remodelling all of the shortlist options.

Figure 9-1: Do-Minimum for the SH2 / Connecting Mount Maunganui IBC

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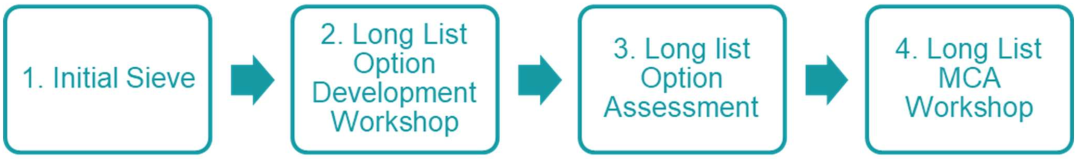
10 Long List Options Assessment

The approach for developing and assessing the long list options is described in the following sections. A detailed report on the development and assessment of the long list options can be found in the Long List Options Development and Assessment Report attached in Appendix B1.



10.1 Longlist Sieving

The outcomes of the long list sieving process were discussed with project partners and agreed at the Initial Sieving and Long List Development Working Session on 24 August 2022. The process is outlined below.

10.1.1 Intervention and Option Collation

An extensive list of options and interventions was collected from all project partners.

The approach for this process was discussed and agreed in the Long List Collation Working Session (the meeting record is included in Supporting Information**)**. Ten Strategic Options and 165 Interventions were put forward for assessment.

10.1.2 Strategic Options Sieve

The strategic options sieve was carried out to remove any strategic options which did not align with the outcomes and direction established by the Urban Form and Transport Initiative (UFTI), the Transport System Plan (TSP) and other strategic policy documents such as the Government Policy Statement on land transport (GPS) and Emissions Reduction Plan (ERP) documents.

It was identified and agreed that a Vision Zero approach to safety, as well as good walking, cycling, and public transport elements would be included in all options as a baseline. On this basis, the Safety Improvements, Walking and Cycling and Public Transport Strategic Options did not necessarily need to be the focus of any specific Long List Options.

10.1.3 Intervention Feasibility Sieve

The Intervention Feasibility Sieve was carried out to exclude options that had fatal flaws.

In total, 165 interventions were put forward by project partners during the Long List Collation process. Similar interventions were aggregated into 44 intervention groupings (for example, the left in left out (LILO) at each intersection interventions were grouped into “intersection optimisation / restriction”).

The 44 intervention groupings were then sieved through a simplified version of the NZ Transport Agency Early Assessment Sifting Tool (EAST). Twelve intervention groups were identified as infeasible and discontinued, while 32 were progressed.

10.2 Option Assessment

The Longlist Option Development Workshop was held with project partners on 24th August 2022 to present and discuss initial sieve results. This process led to the establishment of eight long list options. These were then further developed and refined by the project team, taking onboard feedback received from project partners.

The Longlist MCA workshop was held with project partners on 23rd September 2022. Initial assessments were completed by the consultant team prior to the workshop and the findings summarised.

Following feedback from project partners at the Longlist MCA workshop an additional longlist option (Option 3a) was introduced and developed. This tested the combined effects of pricing schemes from Option 2, and elements of limited access from Option 3, along with other supporting interventions. Option 3a was taken through the assessment process to determine whether it warranted proceeding to the shortlist.

Hapū also reviewed the options and developed their own kowhiri (options), which are also summarised in the following table and detailed further in this section.

Table 10-1: Summary of Longlist Options

Option	Name	Description	Option Type
Option 1	Land Use and local network change led	Led by land use and local network changes, supported by freight priority, walking, cycling and public transport interventions to improve transport options and route choice. With the intent to reduce reliance on Hewletts Road for local trips and enable a reduced need to travel out of the area through mixed land uses.	Demand Management
Option 2	Pricing and Road Space Reallocation to support movement of people & goods	Pricing signals for all modes to influence choices, supported by a range of physical and operational measures to enable changes in time and mode choice for people and goods. The intent is to use the existing road space more effectively, enabling greater user of higher productivity modes	Demand Management
Option 3	Hewletts Road limited access to improve SH2 throughput	Recognising the role of SH2/Hewletts Road as a major connector, reinforcing the road hierarchy by prioritising through movements by reducing side friction and conflicting movements.	Optimisation
Option 4	Dynamic road allocation	Creating physical space and capacity for different modes at different times of the day. To improve the throughput of people and goods, support more reliable freight access in the off peak, increase public transport uptake by making journeys more attractive and reliable.	Optimisation
Option 5	Freight, public transport, W&C improvements	Led by freight, walking and cycling, and public transport improvements, at-grade. This is supported by pricing, streetscape and behaviour change programmes to drive mode change for commuters to open up road capacity for essential users like trucks. To improve and reinforce transport choice, support multimodal and safe journeys for people and improve reliability, throughput of people and goods by shifting as many people as possible to alternative modes.	Supply
Option 6	Grade separation of Tōtara Street and supporting network changes	Grade separation of the right turn from Tōtara Street into Hewletts Road and widening of Tōtara Street to enable more throughput and a lane-gain for the left turn from Hewletts into Tōtara. Also includes potential port circulation improvements and rail upgrades to improve efficiency for rail and reduce impacts on level crossings.	Supply

Option 7	Grade separation of Tōtara Street and Jean Batten Drive	Grade separate the through movement on Hewletts Road at Tōtara Street/Hewletts Road and Jean Batten Dr/ Hewletts Road intersections along with consequential local network changes. To improve throughput and route productivity through the two grade separations and significant investment in public transport, walking and cycling facilities. Also includes potential port circulation improvements and rail upgrades to improve efficiency for rail and grade separation of Hull Road and Tōtara Street level crossings.	Supply
Option 8	Bus Rapid Transit (BRT) and ferry	Maximising the public transport potential of the corridor. This includes a ferry from Mount Maunganui and a separated BRT-style bus corridor on Hewletts Road as means of maximising throughput of people and freeing road space for increasing reliability and throughput for freight	Supply
Option 3a	Hewletts Road limited access and pricing led	Combined effects of limited access elements from Option 3 and pricing signals of Option 2. Aims to prioritise throughput by rationalising access points to and from Hewletts Road, improving reliability and throughput of people and goods, while improving safety by reducing movement conflicts.	Optimisation and Demand Management
Ngāi Tukairangi Option (Option 9)	Land use change, freight, public transport, walking and cycling improvements	Combines elements from the above long list options, aligning with the preferences of the Ngāi Tukairangi hapū. This approach aims to strike balance between transportation goals, advancements in environmental well-being, and substantial shifts in land utilization, all geared towards enhancing outcomes for tāngata whenua. See Section 10.2.2 for further details on the development of this option.	Demand Management & Supply
Ngāti Kuku Kowhiri	Land use change, walking and cycling improvements, rail safety improvements, public transport including rail and new local connections	Combines elements from the above long list options with additional elements that align with the preferences of Ngāti Kuku. This includes land use change, walking, cycling and Public Transport improvements. There is a strong focus on protecting the mauri, haoura and wairua of the area through options that enable enhancement or protection of te taiao. Acceptance of any option is predicated on the removal of noxious industry away from Zone 1 and Zone 2.	Demand Management

10.2.1 Options Assessment Workshop

The Long List Options Assessment Workshop was held with TCC, BOPRC and NZ Transport Agency on 23rd September 2022.

The workshop included the longlist assessments undertaken by the project team, with additional project partner comments and updated scoring incorporated after the workshop.

10.2.2 Mana Whenua Option Development and Assessment

The NZ Transport Agency engaged with both hapū, Ngāi Tukairangi and Ngāti Kuku, to understand which proposed options/interventions aligned with a te ao Māori perspective (see Section 8.2 for detailed methodology) and the Whareroa Marae vision for future land use. Both hapū provided the team with a list of cultural considerations, and expressed that protecting the wairua (spirit), haoura (health) and mauri (life force) of the rohe (area) is a high priority and should be a consideration in all options.

Ngāi Tukairangi

Ngāi Tukairangi hapū reviewed the eight different long list options and from this, developed a ninth option – Kowhiri Iwa. This included elements of the various eight options along with additional cultural considerations. This option was required to address the investment criteria and was assessed through the optioneering process.

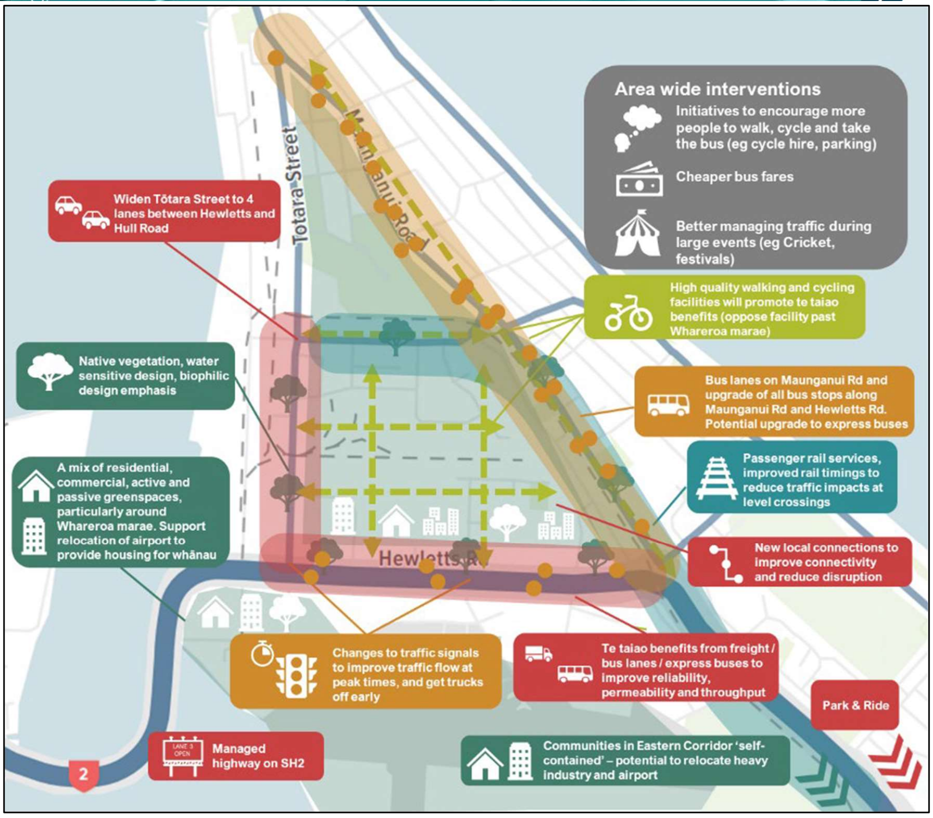


Figure 10-1: Option 9 - Ngai Tukairangi Hapū Kowhiri Iwa

This kōwhiri Iwa (ninth option) focused on the following:

- Supporting interventions aligned with hapū kaitiakitanga vision and address hapū concerns
- Balancing transport outcomes
- Improving environmental outcomes that reflect hapū tikanga and
- Focusing on significant land use changes to support outcomes for tāngata whenua

The proposed interventions include:

- Support for land use change, particularly surrounding Whareroa Marae
- Streetscape improvements with more tāngata whenua reflected and water sensitive design, including
- Biophilic initiatives
- Spaces and places to facilitate community interaction
- Completion of the rail loop with an at grade crossing on Newton Street to reduce the impact of level crossings
- Freight lanes on Hewletts Road, with freight allowed to use bus lanes in off peak and priority at intersections
- Service lanes and local road network optimisation along with new local connections
- Enabling mode shift to cycling through cycle way facilities but not past Whareroa marae or along the northern side of the airport
- A new bus lane on Maunganui Road and upgrades of all bus stops on Maunganui Road
- Upgrading Tōtara Street to four lanes between Hull and Hewletts Roads
- Signal optimisation to prioritise through movements and freight priority
- A Park and Ride in new Eastern Communities

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Details of the Ngāi Tukairangi Kowhiri Iwa option can be found in Appendix B2 Ngāi Tukairangi Hapū Kowhiri Iwa for Connecting Mount Maunganui Project (Position Paper).

The project team assessed this option against the MCA Criteria. While the option scored well against outcomes, significant issues were identified with deliverability. It was assessed as being up to TCC to progress as planning led.

10.2.3 Ngāti Kuku

Ngāti Kuku hapū reviewed the eight different long list options and developed a position paper comprising interventions whenua were comfortable supporting and provided comments on the elements of the various eight options and additional cultural considerations.

This Ngāti Kuku Hapū Kowhiri importantly notes that the ability to live on ancestral lands without fear of ongoing poisons to air, waterways and land is a critical priority for Whareroa and its people. It states that any intervention that compromises this priority is a *'breach of tangata whenua rights under Te Tiriti o Waitangi and as indigenous peoples under the United Nations Rights of Indigenous Peoples'*.

Ngāti Kuku also stated that their support for any option was predicated on 'removing noxious industries away from Zone 1 and Zone 2'. The Ngāti Kuku Hapū Kowhiri provided the project team with insight into which options/interventions were better or worse from a te ao Māori perspective. A summary of this is provided in Table 10-2.

Table 10-2: Summary of Ngāti Kuku Hapū Kowhiri

Intervention	Note
City plan changes to enable mixed use with master planned blocks and local networks	Aligns with Ngāti Kuku hapū future vision for Whareroa block. Hapū preference to enable remediation of surrounding contaminated industrial sites to enable long term expansion of the existing Urban marae community zone and provide additional whanau housing / papakainga development. The paper states that *'if removing noxious industries away from Zone 1 and Zone 2 is not supported, then Ngāti Kuku support for other interventions is deemed null and void'*
Tuku Ihotanga / Ahurea	Ngāti Kuku requests naming rights for streets / wayfinding, significant infrastrucure and buildings, as well as the ability to activate cultural narratives across the CMM area. Opportunities for the return of ancestral lands in the CMM area.
Enhancement of Whareroa Marae access options	Access interventions to prioritise 'tangata whenua only access to/from Whareroa from the main street'. Note: *Ngāti Kuku opposes 'grade separation (i.e. a new flyover) at the Hewletts Road / Tōtara Street intersection.'*
Iho Pumanawa – meaningful opportunities for hapū / whānau employment and business through CMM works / project	Derived from 'Cultural Insights Paper'. Includes involvement in co-designing progressive procurement targets and involvement in procurement policies
High quality walking and cycling connections	Support for active mode connections except past Whareroa Marae. Includes bike parking / e-bike charging infrastructure. Pedestrian and cyclist overbridge over Tōtara Street (Derived from Options 1,2,3,3a, 4,5,6)
Immediate pedestrian / cyclist improvements to rail crossing at Hewletts / Maunganui / Golf Road	The death of a young rangatahi from Whareroa Marae highlighted the need to prioritise immediate safety improvements. Ngāti Kuku does not support an overpass or underpass *Note short term safety improvements are currently underway.
Public Transport improvements / incentives – Electric Passenger rail and ferry services	Support for investment in bus, rail and ferry public transport. Notes alignment with Emissions Reduction Plan. Options derived from those presented except Electric rail
District Plan Change for communities in Eastern Corridor	District Plan Change to help enable development of a new self-contained community.

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Intervention	Note
Water Sensitive Design (WSD) stormwater treatment and attenuation	Integration of WSD measures in physical project works (including reducing stormwater pollution impacts, planting of native flora, green space creation).
Streetscape improvements across CMM project area	To improve surrounds for active mode and PT users
Completion of rail loop at Newton Street	Derived from Options 6,7
Management of rail timing	Sought to mitigate road network impact of rail movements
New local connections	New local connections in conjunction with desired City Plan changes to enable mixed use with master planned blocks and local networks
Widening of Tōtara Street	Contributes to addressing Whareroa community safety concerns related to traffic along Hewletts Road and Tōtara Street.
Behaviour change / workplace travel choice programme	Support for Behaviour change interventions
Managed motorway on SH2 and harbour bridge including variable speed limits and metering	Derived from Option 3, noting Ngāti Kuku opposes grade separation at the Hewletts Road / Tōtara Street intersection.

Details of the Ngāti Kuku Kowhiri position paper can be found in Appendix B2 Final Ngāti Kuku Hapū Kowhiri for Connecting Mount Maunganui Project 10 September 2023.

This option was ultimately not included in the long-list MCA as many of the physical interventions are part of the other scored options. Intangible elements such as, Tuku Ihotanga / Ahurea and Iho Pumanawa will be assessed and implemented through the Cultural and Urban Design Framework developed during subsequent phases of the project. Other interventions included in this option are outside the scope of the project so were not able to be assessed against project objectives.

10.3 Multi-Criteria Assessment Summary

A summary of the MCA for the longlist is included in Figure 10-3. This includes Option 3a and Ngai Tukairangi Option, which were developed and scored following feedback from project partners during the workshop. In line with NZ Transport Agency guidance, while the scores provide a useful tool to assess the combined outcomes of qualitative and quantitative criteria, it is not intended that they are added up. The visual representation of different colours of scoring are provided to help readers see where different options are better or worse in terms of the Investment Objectives and Technical / feasibility criteria.

		Do Minimum	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 3a	Ngāi Tukairangi Option
BENEFIT	INVESTMENT OBJECTIVE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE
Improved transport system reliability, permeability, and throughput of people and goods	To improve reliability, permeability, and throughput of people and goods	0	0	-1	1	1	2	2	2	3	1	2
		0	0	2	1	2	2	3	3	0	2	2
		0	1	0	0	-2	2	2	2	3	1	2
		0	0	0	1	2	2	3	3	0	0	2
A multi-modal transport system that supports safer and healthier journeys	To reduce road deaths and serious injuries for all users by at least 40%	0	0	1	1	-1	3	0	0	2	1	0
Improved transport choice for access to social and economic opportunities	To provide better mode choice options and increase public transport and active travel mode share	0	1	1	0	-1	2	1	0	3	1	1
		0	2	1	0	-1	3	-1	-1	2	1	2
		0	1	0	-1	0	2	0	1	2	0	1
		0	2	0	0	1	2	2	2	3	0	2
Reduced impact on the environment and climate change impacts from transport related carbon emissions	To reduce the transport related effects on water, air quality and noise	0	-1	0	-1	-1	1	-1	-1	1	0	0
		No differential between options. Will become a principle to be developed through the design process.										
	To reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	0	1	1	-1	0	2	0	-1	2	0	1
		0	0	0	0	0	0	1	1	0	0	1
Technical / Feasibility Criteria												
BENEFIT	INVESTMENT OBJECTIVE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE
Feasibility	Constructability/Implementability	0	-3	-1	-1	-2	-1	-2	-2	-2	-1	-3
Consenting & property impacts	Planning and Consenting	0	-3	-1	-2	-1	-1	-3	-3	-3	-1	-3
Cost	CAPEX	0	-1	-1	-1	-1	-1	-2	-3	-3	-1	-2
	Operating Cost/ Efficiency	0	-1	-1	-1	-1	-1	-2	-3	-2	-1	-1
Value for Money	High-level assessment of value for money	0	1	1	0	1	1	1	0	0	1	1
Meeting customer needs	Qualitative assessment of the options against the specific customer needs and pain points	0	2	1	1	2	3	3	3	2	1	3
Climate Change Mitigation (Mandatory)	Assessment of mode shift and traffic reduction, VKT, land use	*Assessed as per Investment Objective above*										
Alignment with Whareroa Marae's Strategy	The extent to which the option complements Whareroa Marae's strategy for future land use	0	2	-1	-1	-1	-1	-1	-1	-1	-1	2
Impacts on Te Ao Māori (Mandatory)	Assessment of impact on Te Ao Māori including areas of significance for Māori, Māori land and Kaitiakitanga	0	2	1	1	2	1	-1	-2	2	1	3

Figure 10-3: Longlist MCA Assessment Summary

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10.4 Long List Assessment Outcome Summary

Based on the MCA assessment and the Longlist Option Assessment Workshop, the following options are recommended to proceed to the shortlist stage, for more detailed development and assessment:

Option 3a – Throughput focus: Performs reasonably well against KPIs, though not against the Investment Objectives. Includes elements from Options 2 and 3, including additional focus on limiting access on SH2 and enhancing role of Newton Road (or parallel corridor). Recommended to be taken forward to short list.

Option 5 – At grade improvements and mode shift: Scores well against the outcomes. Recommended to be taken forward to short list.

Option 6 – Improving goods throughput: Scores well against most outcomes. Appears to provide a good balance of mode shift, and throughput. Recommended to be taken forward to short list.

The following options were not progressed to the short list stage:

Option 1 – Land use change: Can apply to any option and could be implemented over time. Significant issues in terms of deliverability. Would be up to TCC to progress as planning led.

Option 2 – Reallocation of space and pricing: Doesn't achieve the outcomes on its own. Elements will be incorporated into other options e.g., Option 3a.

Option 3 – Throughput focus: Performs reasonably well against the outcomes. Recommended to be taken forward to shortlist with some amends (including elements taken from Option 2), developed as Option 3a.

Option 4 – Dynamic lanes: Improves throughput but has complex safety issues to overcome. Issues could be resolved if concept applied more widely across transport network.

Option 7 – Increase throughput and capacity: Scores the highest in terms of throughput of people and goods, but worst for air quality and emissions. Cost and constructability challenges are significant, with extensive land acquisition required. On balance, the risks outweigh the benefits[76].

Option 8 – Increase people throughput (BRT & Ferry): Scores well against outcomes, but unviable without a wider BRT system and network to tie into across Tauranga and Bay of Plenty. There is no current expectation that a wider BRT network will be planned. It is acknowledged that BRT is best run as a wider network. Any future system would potentially include a public transport and/or passenger rail service over the Matapihi Bridge.

Option 9 - Ngāi Tukairangi Option: Scores well against outcomes, however there are significant issues in terms of deliverability. It would be up to TCC to progress as planning led.

76. Option 7 was initially included in the shortlist assessment; however, it was removed following peer reviewer feedback noting significant cost and feasibility challenges.

11 Short List Option Development and Assessment

Following the long list options assessment, the three short listed options were further developed and refined. This included developing the technical detail and rationale for each option, taking on board feedback from project partners.

Following an initial high-level economic assessment that produced low benefit-cost ratios (BCR) for the shortlisted options, a more comprehensive economic analysis was conducted based on advice from NZTA. The primary focus of this analysis was to ensure value for money by better understanding the estimated costs and benefits of each intervention.

A detailed modelling and economic methodology was developed, allowing for the individual analysis of each intervention within the shortlisted option programmes. This enabled an incremental approach, highlighting the trade-offs associated with reduced investment. Refer to Appendix C – Transport Modelling and Economic Evaluation for further detail.

Table 11-1: Summary of Short List Options

Option	Name	Description
Option 3A	Rationalising Access	Option 3a tests the combined effects of limited access with other interventions such as improved active mode facilities. Limiting access on Hewletts Road aims to prioritise throughput to improve reliability and throughput of people and goods, while reducing conflicts.
Option 5	At-grade improvements	Option 5 features at-grade freight, walking and cycling and public transport improvements supported by streetscape and PT improvements to encourage commuter mode change and free up road capacity for essential users like trucks and commercial users. This option aims to increase throughput with more space efficient modes of transport and more space for freight and commercial users who have fewer options to re-mode.
Option 6	Grade-separation of Hewletts Rd / Tōtara St	Option 6 tests grade separation of the right turn from Tōtara St into Hewletts Road and widening of Tōtara St to enable more throughput and a lane-gain for the left turn from Hewletts into Tōtara. This is intended to resolve the queues and delays to freight and traffic at Tōtara St. Supporting measures to improve route throughput including local network changes and significant public transport and walk/cycle provision.

Two additional short-list options were developed in response to stakeholder and project partner feedback.

Option 6A was developed as a hybrid option that best meets the investment objectives. It includes all shortlisted interventions.

An Economic Efficient option was developed during the short list stage in response to the latest GPS 2024. This was done by identifying the most cost-effective elements within each intervention and combining these to form a ‘optimised’ option.

Option	Name	Description
Option 6A	A hybrid option of Options 5 and 6	Combines at-grade improvements from Option 5 with grade-separation of the Hewletts Rd/Tōtara St intersection from Option 6. This option best meets the project objectives, and project partner aspirations.
Economic Efficient	Optimised	A cost-effective programme of interventions in line with the latest GPS 2024 (see table 11-2 below)

Extensive work was undertaken to ensure te ao Māori considerations were central to the development and assessment process, including support for hapū representatives in identifying and assessing te ao Māori impacts (Section 8.2).

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11.1 Short List Options

The following provides an overview of the various interventions that make up each shortlist option.

Table 11-2: Summary of Interventions by Shortlist Options

Interventions	Options					
	Do-min	Option 3A	Option 5	Option 6	Option 6a	Economic Efficient/ Optimised
Local Road Connections	✗	✓	✓	✓	✓	✓
Maunganui Road/Golf Rd & Link Rd signalisation	✗	✓	✓	✓	✓	✗
Intersection optimisation along Hewletts	✗	✓	✗	✓	✓	✗
Grade Separation of Hewletts/Tōtara + 4-laning Tōtara	✗	✗	✗	✓	✓	✓
Bus lanes along Maunganui Rd (between Golf and Hull Rd)	✗	✗	✓	✓	✓	✗
Streetscape Improvements	✗	✗	✓	✗	✓	✗
Cycleways/ Walking and Cycling Overpass / VMS	✗	✓	✓	✓	✓	✓
Bus Stop Upgrades	✗	✓	✓	✓	✓	✓

11.2 Multi-Criteria Assessment Summary

The Short List MCA workshop was held with representatives of TCC, BOPRC, NZ Transport Agency, Ngāti Kuku and Ngāi Tukairangi on 29 November 2022. Assessments were completed by the consultant team prior to the workshop and the findings were summarised.

The Short List Options Assessment Report Appendix B3 includes details of the full MCA assessment. The outcome of this is summarised in Table 11-3 below.

In line with NZTA's MCA guidance, scores are not added up but used instead to help decision-makers understand the relative performance of options against each other, and across the Investment Objectives and Technical / Feasibility criteria.

Table 11-3: Shortlist MCA Assessment summary

Investment Objectives		Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
BENEFIT	INVESTMENT OBJECTIVE	SCORE	SCORE	SCORE	SCORE	SCORE
Improved transport system reliability, permeability, and throughput of people and goods	To improve reliability, permeability, and throughput of people and goods	1	2	2	2	2
		2	1	2	3	2
A multi-modal transport system that supports safer and healthier journeys	To reduce road deaths and serious injuries for all users by at least 40%	1	3	2	3	1
Improved transport choice for access to social and economic opportunities	To provide better mode choice options and increase public transport and active travel mode share	0	2	1	2	0
		0	1	0	1	0
Reduced impact on the environment and climate change impacts from transport related carbon emissions	To reduce the transport related effects on water, air quality and noise	-1	1	-2	1	-2
	To reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	-1	1	-1	0	-1
Feasibility	Constructability/Implementability	-1	-1	-2	-2	-2
Consenting & property impacts	Planning and Consenting	-1	-1	-2	-3	-2
Cost	CAPEX	-1	-2	-2	-2	-2
	Operating Cost/ Efficiency	-1	-2	-2	-2	-2
Value for Money	High-level assessment of value for money	0	0	1	1	2
Meeting customer needs	Qualitative assessment of the options against the specific customer needs and pain points	1	3	3	3	2
Climate Change Mitigation (Mandatory)	Assessment of mode shift and traffic reduction, VKT, land use	*Assessed as per Investment Objective above*				
Alignment with Whareroa Marae's Strategy	The extent to which the option complements Whareroa Marae's strategy for future land use	-1	-1	-1	0	-1
Impacts on Te Ao Māori (Mandatory)	Assessment of impact on Te Ao Māori including areas of significance for Māori, Māori land and Kaitiakitanga	1	1	-1	-1	-1

The outcomes of the MCA can be summarised as:

- Option 6a performs the best in achieving the the investment objectives aside from air quality and emissions. Substantial benefits come from addressing the right turning movement from Tōtara Street into Hewletts Road, however both options 6/6a carry constructability and feasibility risk associated with the proposed grade-separation.
- Option 5 is effective in achieving the investment objectives, in particular safety – where it has the greatest reduction in crash risk (along with Option 6a).
- Option 3a, whilst resulting in improvements in people throughput and travel time reliability, does not achieve the wider project objectives, in large part to being a traffic throughput focused option. It contributes very little for pedestrians, cyclists and public transport so scores poorly for mode shift and safety.
- The Economic Efficient option performs similarly to Option 6 in achieving most of the investment objectives, with similar constructability and consenting risks associated with the grade-separation of Hewletts Rd/ Tōtara St.

11.3 Economic Evaluation

This section describes the economic assessment of the short-listed options and provides an indicative comparison of the costs and benefits of each short-listed option against the do minimum.

The Short List Economics Assessment Report is included in Appendix C. A summary of the findings is below.

11.3.1 Economic Assessment Methodology

Transport modelling, economics, and other technical analysis was undertaken to enable assessment of the five shortlist options. Table 11-4 describes the assessment approach to calculating the benefits of shortlisted interventions.

Table 11-4: Economic Impacts and their Assessments

Impact	Assessment approach
Travel time costs	Based on modelling outputs. Separately evaluated for different trip purposes included in TTSM.
Congestion Relief	Based on modelling outputs. Considers both user costs and resource costs.
Vehicle operating costs	Based on modelling outputs. This is a direct output from the TTSM.
Crash costs	Using Crash Analysis System data and reduction in crash estimates to estimate the value to society of reduced crashes in the affected areas.
PT Travel Times	Based on modelling outputs, measure of reduction in PT travel times between do-min and options.
Health impacts of increased cycling	Using estimates of current cyclists, share of conventional and e-bikes, and a range of plausible outcomes for the volume of future cyclists, health benefits are estimated using MBCM methods.
Improved PT facilities	PT users value infrastructure features. The size of this value (in minutes) is provided by the MBCM, which can then be used to produce monetary estimates.
Improved urban realm	Using the NZTA interim guidance on valuing urban realm benefits using procedures consistent with MBCM.
Change in emissions	Based on modelling outputs. NZTA Waka Kotahi's Vehicle Emission Prediction Model (VEPM) has been used to calculate the predicted emissions associated with each option.

The Tauranga Transport Strategic Model (TTSM22.2) outputs have been used to inform the economic analysis. The TTSM models include two forecast scenarios (2031 and 2048), and cover the morning peak, midday peak, and evening peak periods.

The following inputs informed the economic assessment:

- Construction start: July 2024
- Construction period: the project has been assumed to be constructed in 5 years
- Benefit period: 35 years
- Annual discount rate: 4%
- Construction payment: the payment has been assumed at the mid-point of the construction period
- Pre-implementation costs are assumed to be paid at the beginning of the construction period

11.3.2 Assessment of Individual Interventions

Modelling was undertaken to enable a like-for-like comparison between the shortlist options. The revised modelling methodology allowed the individual assessment of each intervention (Table 11-5).

In addition to enabling a comparative analysis, assessing each intervention individually allows an incremental analysis which can help determine the components that provide the best value for money.

Table 11-5: TTSM Modelled Options

	Modelled Options					
Interventions	**Do-Min**	**Local Road Connections**	**Option 5**	**Option 3a**	**Option 6**	**Option 6a**
Local Road connections (see details for each option)	✗	✓	✓	✓	✓	✓
Golf Road/Maunganui Road & Links Ave signalisation	✗	✗	✓	✓	✓	✓
Intersection optimisation along Hewletts	✗	✗	✗	✓	✓	✓
Grade Separation of Hewletts/Tōtara + 4-laning Tōtara Street	✗	✗	✗	✗	✓	✓
Bus lanes along Maunganui Rd (between Golf and Hull Rd)	✗	✗	✗	✗	✗	✓

Comparing the modelled options enables identification of the relative isolated benefit of each intervention, as shown in Table 11-8. A Local Road Connection only option had to be modelled to allow this intervention's benefits to be calculated by comparing against the do-min.

Table 11-6: Calculation of Incremental Benefits of Interventions

Interventions	Informed by
New local road connections	Local Road Connections compared with Do Minimum
Signalisation of Maunganui Road/Golf Road & Links Ave	Option 5 compared with Local Road Connections
Intersection optimization	Option 3a compared with Option 5
Grade Separation of Hewletts/Tōtara + 4-laning Tōtara Street	Option 6 compared with Option 3a
New bus lanes along Maunganui Road	Option 6a compared with Option 6
Streetscape	Informed by urban realm benefits
Cycleways, walking and cycling overpass	Informed by cycle health benefits
Bus stop upgrades	Informed by Public Transport facility benefits

Active modes facilities, bus stop upgrades, and streetscape improvement interventions have been evaluated using a high-level assessment based on MBCM methodology.

11.3.3 Modelling Outputs and Travel Time Benefits

To inform the economics, the model-predicted travel time benefits/disbenefits are applied with annualisation factors, value of time, and resource cost corrections, as required by MBCM. Based on the model results provided, the following yearly benefits are predicted for each option:

Table 11-7: Predicted Travel Time Savings - morning, midday and evening peak

Benefit	Local Road Connections	Option 5	Option 3a	Option 6	Option 6a
2031 Travel Time Savings ($Million)					
AM Peak - annualised	0.3	0.1	0.4	1.8	1.6
Inter Peak - annualised	1.0	-0.6	-1.4	4.3	3.8
PM Peak - annualised	0.2	0.1	0.1	1.5	1.5
Total 2031	**1.5**	**-0.4**	**-1.0**	**7.7**	**6.9**
2048 Travel Time Savings ($Million)					
AM Peak - annualised	0.9	-0.1	0.2	1.2	2.1
Inter Peak - annualised	1.0	-0.7	0.4	4.9	4.4
PM Peak - annualised	0.4	0.5	1.0	1.9	1.7
Total 2031	**2.2**	**-0.3**	**1.6**	**8.0**	**8.2**

Options 6 and 6a are predicted to provide the highest travel time savings in 2031 and 2048, by a significant amount across all three peak periods. This is expected as both scenarios propose a grade-separated connection between Tōtara Street and Hewletts Road west.

Option 5 predicts reduced travel time benefits compared to the Local Road Connections option. This is considered plausible as the proposed traffic signals at the Maunganui Road/Golf Road and Golf Road/Link Road intersections are likely to increase total travel times through the intersection, particularly during the midday periods. However, it is noted that the signalisation is expected to provide safety benefits, particularly for pedestrians and cyclists.

Option 3a is predicted to provide modest travel time savings. It is noted that these savings are mainly predicted during the AM and PM peak periods, as the proposed optimisations are expected to improve through-traffic delays along Hewletts Road. During the midday peak, travel time disbenefits are predicted as the corridor is less congested, and local road traffic will have to travel longer distances to reach their destination due to the Left-In Left-Out (LILO) treatment proposed.

Overall, a significant portion of travel time benefits are accrued during the interpeak periods, accounting for more than 50% of the total travel time savings. This is due to the annualisation calculations, where the interpeak period spans 10 hours per day, compared to only 2 hours each for the AM and PM peak periods.

11.3.4 Monetised Benefits

Table 11-8 illustrates the total discounted monetised benefits of each shortlist option over and above the do minimum.

Table 11-8: Monetised Benefits of Shortlist Options

Options	3a	5	6	6a	Economic Efficient
Travel Time Costs	$11.6m	($8.2m)	$123.8m	$123.8m	$145.8m
Congestion Relief (CRV)	($5.9m)	($12.8m)	$73.1m	$73.1m	$97.2m
Vehicle Operating Costs	($1.2m)	$14.0m	$25.2m	$25.2m	$32.6m
Crash Costs	$35.6m	$16.5m	$18.1m	$18.1m	($12.6m)
PT TT Benefit	$14.2m	$30.7m	$44.8m	$44.8m	$0.0m
PT Facility Benefit	$11.8m	$19.7m	$15.8m	$15.8m	$19.7m
Emissions	$0.6m	$7.7m	($7.9m)	($7.9m)	($1.6m)
Cycle Health Benefit	$91.1m	$91.1m	$91.1m	$91.1m	$91.1m
Urban Realm Benefit	$17.4m	$43.7m	$21.2m	$43.7m	$0.0m
Total Benefits (Discounted)	**$177.5m**	**$202.5m**	**$405.2m**	**$427.7m**	**$372.3m**

11.3.5 Costs

Indicative cost estimates have been prepared by Quantity Surveyors (True Cost) for the short list option packages. A summary is included in Appendix C2.

Costs are a preliminary planning order of accuracy for the purposes of option comparison. This is considered appropriate for an IBC and is largely due to the lack of detailed survey and development of the option design at this stage of the project. During the relevant planning and design phases of subsequent stages, more robust DBE-level cost estimates will be prepared.

Given the relative lack of design detail (appropriate for an IBC), exact land requirements are not yet fully understood, making it difficult to determine property costs explicitly for each option. Based on indicative property cost estimates, an estimated $48 million (P50) has been allocated towards property costs for each option. A contingency of 50% (P50) and a funding risk contingency of 52% (P95) have been applied, as recommended by the NZTA Cost Estimation Manual (SM014).

Table 11-9 presents the total discounted P50 capital costs (CAPEX) of each option over a 40-year period. Costs have been discounted at 4% based on NZTA guidelines and include maintenance and operational costs (OPEX).

Table 11-9: Discounted Costs of Each Option (P50)

Option	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
Total Cost of Option (Discounted, including OPEX and Property)	$208.6m	$309.9m	$445.2m	$496.6m	$289.7m

11.3.6 Economic Assessment Outcome

The Economic Efficient option is the best performing option with a BCR of 1.3 as illustrated in Table 11-10 below.

Table 11-10: Benefit Cost Ratio of Shortlist Options

Options	3a	5	6	6a	Economic Efficient
Total Benefits (Discounted)	$177.5m	$202.5m	$405.m	$427.7	$372.3m
Total Costs (Discounted)	$208.6m	$309.9m	$445.m	$496.6	$289.7m
Benefit Cost Ratio (BCR)	0.85	0.65	0.91	0.86	1.3

11.3.7 Incremental Analysis

Incremental analysis was undertaken for the shortlist options – summarised in Table 11-11 below. The project does not have a target BCR however for the purposes of incremental analysis a target BCR of 1 has been used. This analysis confirmed the Economic Efficient option as the economically preferred option.

Table 11-11: Incremental Analysis of Shortlist Options

Step	BASE OPTION FOR COMPARISON			NEXT HIGHER COST OPTION			INCREMENTAL ANALYSIS			
	Option (1)	Costs (2)	Benefits (3)	Option (4)	Costs (5)	Benefits (6)	Incremental Cost (7) = (5) - (2)	Incremental Benefits (8) = (6)-(3)	Incremental B/C Ratio (9) = (8)/(7)	Base Option for Next Step (10)
1	Option 3a	$208.7m	$177.5m	Economic Efficient Option	$289.7m	$372.3m	$81.0m	$194.8m	2.4	Economic Efficient Option
2	Economic Efficient Option	$289.7m	$372.3m	Option 5	$309.9m	$202.2m	$20.2m	-$170.1m	-8.4	Economic Efficient Option
3	Economic Efficient Option	$289.7m	$372.3m	Option 6	$445.2m	$405.2m	$155.5m	$32.9m	0.2	Economic Efficient Option
4	Economic Efficient Option	$289.7m	$372.3m	Option 6a	$496.6m	$427.7m	$206.9m	$55.4m	0.3	Economic Efficient Option

11.3.8 Understanding the Potential of Non-Monetised Benefits

A number of benefits were unable to be monetised at this stage due to the level of detail required (e.g. designs developed, more detailed modelling) to enable meaningfully accurate calculations. Further investigation and analysis will be undertaken during the Detailed Business Case to enable these benefits to be monetised where possible.

Based on evidence from other similar projects, we can quantify some of these benefits to provide a view on their potential magnitude once monetised.

Table 11-7: Potential Magnitude of Non-Monetised Benefits

Benefit	Likely increase in total benefits	References/ Supporting Evidence Notes
Pedestrian health	**1%**	Evidence from other projects indicates that pedestrian health benefits could be in the realm of 1%
Travel time reliability	**5%**	Evidence from other projects indicates that trip reliability benefits can vary significantly depending on mode, location etc. This project is expected to make a significant difference to the reliability of freight trips to/from the Port. Travel Time Reliability benefits could be in the realm of 5%.
WEBs	**20%**	WEBs can be significant. The project is located where one would expect access to and between jobs to be improved (close to CBD and Port). WEBs could be in the realm of 20%

These benefits could be expected to account for around 20-25% of total benefits, with WEBs accounting for a significant proportion.

11.4 Short List Outcome: Recommended Programme

Based on the outcomes of the MCA, technical and economic analysis and in collaboration with project partners, the Recommended Option is the Economic Efficient Option.

The analysis shows the Recommended Option will substantially improve throughput of people and goods, increase freight accessibility, improve road safety, increased amenity for PT users and incentivise the use of more space efficient transport modes. The Economic Efficient Option is also the most economically efficient when compared to the other shortlist options and is the only option with a BCR greater than 1.

Additional programmes of investigation have been undertaken separately to the main IBC investigation. Both programmes were evaluated using the MBCM methodology and assessed separately. Both programmes are likely to result in positive BCRs.

11.4.1 East-West Cycle Connection Investigation

An east-west cycle connection between the Harbour Bridge and Maunganui Rd is required to help support the CMM Investment Objectives, to provide better mode choice options, increase active travel mode share, and improve safety outcomes.

TCC's Accessible Streets Programme included an east-west cycle connection providing access between Mount Maunganui, Omanu, Arataki and CBD via the SH2 Harbour Bridge. Part way through the development of this business case, the scope for the Accessible Streets Programme was adjusted to focus on the internal cycle connections within the Mount Maunganui area, which meant that the East West cycle connection was no longer within scope of the Accessible Streets Programme.

This information was received after the CMM IBC shortlisting stage, so project partners agreed provision for an east-west cycle connection would be included in the CMM scope. Optioneering and assessment was subsequently undertaken to identify the optimal route for the east-west cycle connection to include in the CMM Recommended Programme.

In identifying potential active travel routes, the team applied the following constraints:

- The route must connect into either the existing harbour bridge by connecting into the shared path on the north side of SH2/Hewletts Road from Tōtara Street, or the Matapihi rail bridge to cross the Tauranga Harbour.
- The route cannot go past Whareroa community and Marae to connect into the Harbour Bridge. Hapū have repeatedly expressed concern about any route going past the community and marae.
- The route cannot involve addition underpasses on SH2 and needs to maximise the existing Bayfair/Baypark underpass.

- Safety is paramount given the high volume of general traffic and HCVs.

Based on this, 14 potential routes were identified. Two of these (Newton – Portside – Triton and Hull Road on Tasman Quay) were not taken forward as they were either very close to another route or went through the Port of Tauranga's operating area creating both safety and operational concerns.

Based on the MCA, the best active travel route options were identified as:

- Option 6: A new road / active travel connection within the general alignment to Te Marie–Waimarie between Maunganui Road and Tōtara St
- Option 3: A shared path on the Southern side of SH2/Hewletts Road
- Option 5: A shared path on the Northern side of SH2/Hewletts Road

Upon further consideration, the assessment team considered the best option to pursue further is to:

- Include **Option 6** into the CMM Programme as a medium/long term option and integrate with plans to open up accessibility within the Mount Maunganui industrial area via new local roads. The railway overpass required for the connection to Maunganui Rd will be developed during the planning and design phase during the relevant stage.
- Include **Option 5** as short/medium term option to improve active travel safety within the existing road reserve.

It is not recommended to progress Option 3 due to complications crossing SH2 / Hewletts Road near the Golf Road / Maunganui Road intersection and at the Tōtara Street or Tasman Quay intersection to re-connect into the existing shared path to cross the harbour.

11.4.2 SH2 Hewletts Rd Managed Lanes

Investigations have been undertaken to calculate the benefits and impacts of converting the existing bus lanes on SH2 Hewletts Road to allow vehicles with two or more (T2) or three or more (T3) people. Modelling indicates T2/T3 lanes on Hewletts Road will enable travel time savings for cars and trucks without notable impact to buses, particularly in the T3 scenario.

In the westbound AM peak (towards CBD) along Hewletts Road, there are travel time savings for all vehicles under both T2 and T3 scenarios. The impact to buses is minor (2-5 second increase in travel time).

During the PM peak hour, all modes of eastbound traffic on Hewletts Road (between Tasman Quay and Aerodrome Rd) experience an increase in travel time with T2 lanes (6% or 22 seconds). However, there are travel time savings for the longer SH2 section between Sulphur Point and Bayfair (13% or 68 seconds) which includes Hewletts Road. Buses also experience travel time savings in the SH2 section (6% or 27 seconds).

T3 is recommended over T2 to better support reliable public transport (PT) journeys and maintain PT competitiveness. A trigger, based on future PT frequencies, will be established in the next phase to potentially revert to dedicated bus lanes if necessary. Additionally, further safety improvements will be implemented to ensure a reasonably safe off-road cycle facility is available to encourage active modes of transport.

Implementation costs are estimated between $2 - 2.5m with ongoing costs of $200k. Economic benefits for a 10-year period are significant compared with anticipated cost:

- For T2 the BCR is 11.4
- For T3 the BCR is 7.7

Some risks need to be addressed prior to implementation of T2 or T3 managed lanes and further design and investigation of the T3 option is recommended as part of the next project phase which supports reliable PT journeys and ensure PT competitiveness to not undermined.

See Appendix H – Hewletts Rd Managed Lanes Study for further detail.

12 Confirmed Recommended Programme

The following sections describe the recommended programme, including how it addresses the problems identified and in doing so achieves the agreed benefits and investment objectives. The recommended programme has been developed in close collaboration with project partners and key stakeholders.

12.1 Description and Key Features

The intent of the recommended programme is to maximise the efficient movement of people and goods whilst improving safety and environmental outcomes for all customers in a cost-effective manner.

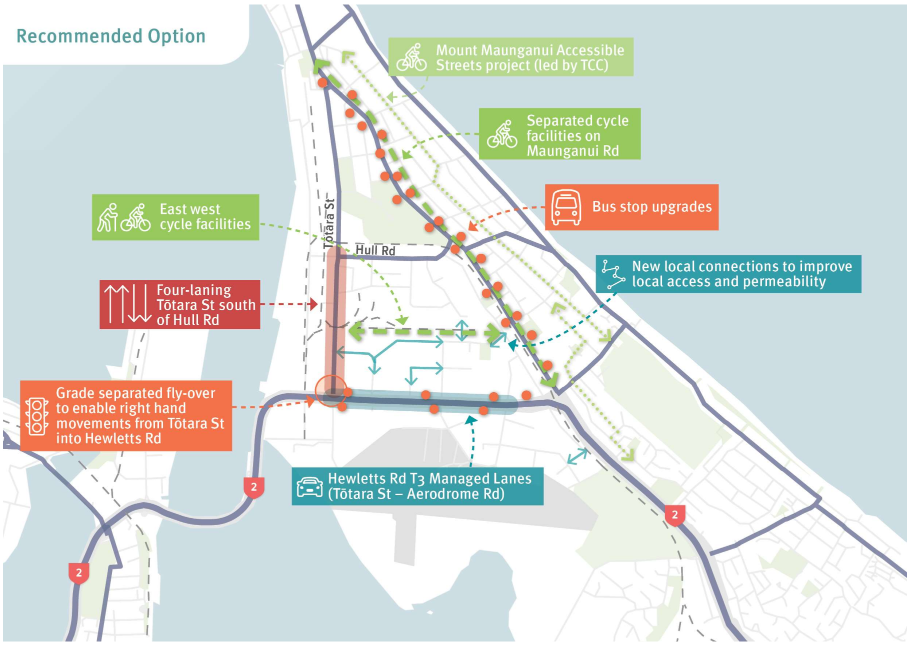

Figure 12-1: Recommended Programme

Key features of the recommended programme include:

Major improvements along Hewletts Road

- A partial grade separated intersection upgrade for the right-turn movement from Tōtara Street onto Hewletts Road to increase capacity and reliability of this congested movement.
- T3 Managed Lanes to provide travel time savings and reliability for all vehicles

Improved local road connections

- Four-laning of Tōtara Street between Hewletts Road and Hull Road (from the current two lanes) to enable the grade-separated right turn movement.
- Improved local connections, including completing the Te Marie link, enabling more efficient local trips and reducing congestion on Hewletts Road / SH2.

Improvements for public transport users and services

- Bus stop upgrades to provide greater transport choice and support the projected population within the Mount Maunganui area.

Improvements for cycling

- Cycle facilities on Maunganui Road, to improve transport choice and safety.
- East-west cycle facilities to improve east west connectivity.

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12.1.1 Customer Benefits of the Recommended Programme

Each element of the programme will target the specific problems of different customer groups and deliver benefits that will effectively address the customer needs. For Stage 1 and 2 (see Section 15.2 for detail on proposed staging), new local connections address the immediate needs of customers, enabling commuters and shift workers to get to work more reliably.

Freight operators and trades, service and commercial customers will be able to make more efficient local and regional deliveries The area wide transport initiatives, including the Mount Spatial and Mount Industrial plans, aim to cater for all customers, but specifically enhance the wellbeing of the Whareroa Marae community. It also maximises multi-modal choices for leisure and recreation users.

For Stage 3 and 4, the new, safe cycle connections will make cycling far more attractive, especially for short to medium trips. This means a healthier option available for customers, especially, 9-5 CBD commuters, sport facilities/event attendees, students, those accessing leisure and recreation opportunities, and the Whareroa Marae community.

The upgraded bus stops and T3 managed lanes on Hewletts Road will improve the attractiveness of public transport for 9-5 CBD commuters, industrial/airport employee and shift workers, students, sport facilities/event attendees, leisure and recreation, especially when it is frequent and has a more competitive and reliable journey time compared to driving and encourage use of higher occupancy private vehicles.

For Stage 5, infrastructure improvements (increasing the number of lanes on Tōtara Street, the flyover from Tōtara Street to Hewletts Road), will enable freight, trades, servicing, and commercial trips to be completed more efficiently and consistently. Regional travellers will experience improved travel time through the Mount Maunganui area.

12.1.2 Alignment with Hapū Kowhiri

Through regular engagement with both hapū and research into the history of the area, the project team identified and included a number of interventions that aligned with the priorities of the Ngāi Tukairangi and Ngāti Kuku Kowhiri (options). These include:

- A focus on providing high quality walking and cycling connections to support the health and wellbeing of hapū community members. This included the hapū expressed preference that cycling connections did not pass directly by Whareroa marae. Hapū noted that increasing cycling and walking will help improve whānau health, fitness and wellbeing by promoting more active forms of transport and activity.
- Prioritising interventions that improve safety, particularly for vulnerable users and at intersections
- Improved public transport facilities and provision
- Widening Tōtara Street to address long wait times and heavy vehicle congestion
- New local road connections to improve local roading connectivity and access
- Water sensitive design, stormwater treatment and attenuation

Ngāti Kuku has voiced concerns that the recommended programme does not support their land use aspirations and are clear that they do not support the upwards grade separation of the Hewletts/Tōtara intersection.

Through the next phase of the project, and as detailed in the governance arrangements in the Management Case, the project team will continue to work closely with both hapū as the technical work is developed to identify areas of alignment. This includes joint working to develop a Cultural and Urban Design Framework that will take into account many of the elements raised in the respective Kowhiri of the two hapū.

12.1.3 Opportunities to Enhance the Recommended Option

There have been a number of opportunities identified to enhance the Recommended Option to better meet investment objectives and further increase value for money during the next stages of the project:

- Simplify and reduce the scope of bus stop upgrades by focusing on providing basic amenity using modular / standard materials, where there is currently no provision (e.g. no shelter).
- Consider whether low-cost, high value for money bus priority measures along Maunganui Road could be provided. This could include bus pockets, clearways, and bus jumps, utilising existing available road space.
- Consider low-cost, high value for money safety improvements at or near the Maunganui Rd/Golf Rd intersection as part of the next project phases.
- The above measures along Maunganui Road could be investigated further and refined in subsequent phases. It is not expected that these elements will add substantial additional costs.

12.2 Economic Evaluation

An economic evaluation of the benefits of the proposed interventions has been completed, in accordance with the MCBM. Given the strategic location of the project area, the wider implications of the transport issues need to be considered when evaluating the economic performance of the recommended option.

12.2.1 Recommended Option BCR

The BCR for the recommended option is shown in Table 13-1 below and described further in Section 11.3 above. The economic assessment has been completed to a level commensurate with an IBC.

Table 13-1: Recommended Option BCR

Recommended Option	
P50 Benefit Cost Ratio (BCR):	**1.3**
P95 Benefit Cost Ratio:	**0.98**

12.2.2 Sensitivity Testing of BCR

To investigate the uncertainties surrounding the project’s costs and 2048 forecasts, we have prepared a number of sensitivity tests, including:

- **Capital costs:** the base BCR assumes P50 costs, while this sensitivity test uses P95 costs, as provided by Aurecon.
- **Operation and maintenance costs:** the base assumption is that annual operation and maintenance costs will be 1% of capital costs. This has been increased to 2.5% for the sensitivity test.
- **Discount rate:** a 6% discount rate is applied in this test, compared to 4% in the base option.
- **2031 and 2048 benefits:** Given the differing trends predicted between 2031 and 2048 in the morning and evening peaks, this test assumes that benefits will be capped beyond 2031.

Results are summarised in Table 12-1 below.

Table 12-1: Sensitivity Test Results

Options	Lower Bound		Upper Bound	
	Value	BCR	Value	BCR
Capital costs	P50	1.3	P95	0.98
Operation and maintenance costs	1%	1.3	2.5%	1.1
Discount rate	4%	1.3	6%	1.0
Forecast benefits	2031 and 2048	1.3	Capped at 2031	1.4

We note the following from the sensitivity test results:

- The sensitivity tests indicate that increased costs or a higher discount rate may lead to a reduction in BCR values, which is expected
- The capping of project benefits at 2031 levels are predicted to have only a modest impact on the BCR for the "Economic Efficient" option.

12.3 Assessment Profile

This section evaluates the alignment of the recommended programme with the:

- Investment Objectives
- Investment prioritisation factors as per NZ Transport Agency Investment Prioritisation Method for the NLTP 2024/27.

12.3.1 Performance of Recommended Programme against Objectives

The recommended programme performs well against investment objectives and provides multi-modal benefits for all transport user modes.

An Appraisal Summary Table (AST) for the recommended programme is included in Appendix D. A summary of the headline performance figures is provided in Table 12-2 below.

Table 12-2: Performance against Investment Objectives

Investment Objectives	Summary of Performance (KPIs)
IO1: Improve reliability, access, and throughput of people and goods	**Network throughput:** Increases the theoretical person throughput capacity from 16,000/hour in the Do-Minimum to ~21,000/hour – a 34% uplift. **Freight reliability:** Grade Separation of Tōtara Street / Hewletts Road reduces pressure and improves access for journeys to and from the port, as well as travel time efficiencies for freight. **Travel time savings:** 40% travel time savings for trips along Hewletts Road and Tōtara Street for freight and general traffic in both the AM and the PM peak. **Network optimisation improvements:** With a focus on Hewletts Road, changes to enable the transport system to deliver optimal performance, by improving reliability and throughput, including for freight journeys.
IO2: Reduce road deaths and serious injuries for all users in line with Vision Zero targets	**Safer roads:** Moderate reduction in exposure to risk of death or serious injury across the study area by ~20%, including interventions to improve road safety.

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IO3: Provide better mode choice options and increase public transport and active travel mode share	**Provision for active modes:** Interventions to support an increase in walking and cycling trips, including 4.9km of new or upgraded cycle paths, providing fast, safe and direct routes through the area, safer crossings and streetscape improvements. **Faster, more reliable bus journeys:** similar improvements to bus travel time in line with general vehicle travel time savings. **Access to social and economic opportunities**: Greater population within 30 min catchment, especially for access to Mauao, supporting outcomes sought through the Mount Maunganui Spatial Plan changes.
IO4: Reduce the transport related effects on water, air quality and noise	**Carbon emissions:** Reduced congestion and more efficient traffic movement as well as increased bus and active mode share will contribute to positive emissions outcomes.
IO5: Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	

12.3.2 Investment Prioritisation Method Assessment

The NZ Transport Agency Waka Kotahi (NZTA) Investment Prioritisation Method (IPM) is used to support NZTA to give effect to the Government Policy Statement (GPS) on land transport through the National Land Transport Programme (NLTP).

The draft IPM for 2024-27 has been updated in response to the Government Policy Statement on Land Transport 2024) and will be used to prioritise activities in the 2024-27 NLTP. The draft Investment Prioritisation Method for 2024–27 NLTP has 3 factors, namely:

- GPS alignment
- Scheduling
- Efficiency

This is a quantitative assessment based on the specific requirements of each criterion in the IPM.

Table 12-3: GPS Alignment Profile Stage 2 (quantitative)

GPS Priority	Assessment	Rating
Economic Growth and Productivity	▪ The recommended programme is expected to reduce journey times by 40% on key freight routes, including Hewletts Road and Tōtara Street, and provide more than five minutes travel time benefit for freight. It contributes to efficient access to/from the Mount Industrial area, a nationally important economic growth location. ▪ Improving access and efficiency for freight travelling to nationally significant production and distribution points - Port of Tauranga ▪ Increased population living within 30 min of key destinations: Including the Hospital, CBD, Mauao, Port/Marae) via PT and active modes	Very High >30% improvement in travel time reliability and/or trip time for freight on a nationally significant route.
OVERALL ALIGNMENT WITH GPS		**VERY HIGH**

A rating of 'Very High' has been assigned based on the overall alignment with the GPS 2024-27, which identifies economic growth and productivity as the top priority.

Table 12-4: Scheduling Assessment

Scheduling Priority	Assessment	Rating
Interdependency	Major housing and economic development are planned within the project area and surrounding environment. Non-delivery of the recommended programme will delay residential growth and impact economic productivity. It will exacerbate identified problems as the region continues to grow. Interdependencies include delivery of the Mount Spatial Plan, Mount Industrial Plan, Eastern Corridor growth, Port of Tauranga expansion plans, as well as investments upstream (Bayfair to Baypark; Papamoa East Interchange) and downstream (Tauriko Network Connections).	High
Criticality	**Programming:** The need for the next phase of work to commence within the 2024-27 NLTP is essential, to enable pre-implementation and delivery to within the 24-27 NLTP. Any delay beyond this will see the problems compound, worsening the economic and growth outlook for the region. **Criticality:** There is little to no resilience in the transport system within the CMM project area. Frequent unplanned LOS currently cause major system issues, and this will continue to worsen without intervention.	High
OVERALL ASSESSMENT		**HIGH**

Table 12-5: Efficiency Rating

Efficiency Rating	Assessment	Rating
Efficiency Rating	The Recommended Option has a BCR of 0.98-1.3 based on P95 and P50 estimates respectively.	Low

The recommended programme has been assessed by the project team against the IPM and it is recommended that the programme be given an initial profile of VH/H/L with an overall priority of 2 as outlined below.

Table 12-6: Overall Proposed IPM Profile

Factor	Proposed rating
GPS 2024 Alignment	VERY HIGH
Scheduling	HIGH
Efficiency	LOW

PART C – READINESS AND ASSURANCE

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13 Financial Case

13.1 Purpose

The purpose of the Financial Case at an IBC stage is to outline the costs and funding requirements for the recommended programme. The Financial Case provides assurance that the recommended programme is affordable to project partners, considering all potential funding sources.

The following sections are based on the indicative staging strategy outlined in Figure 13-1

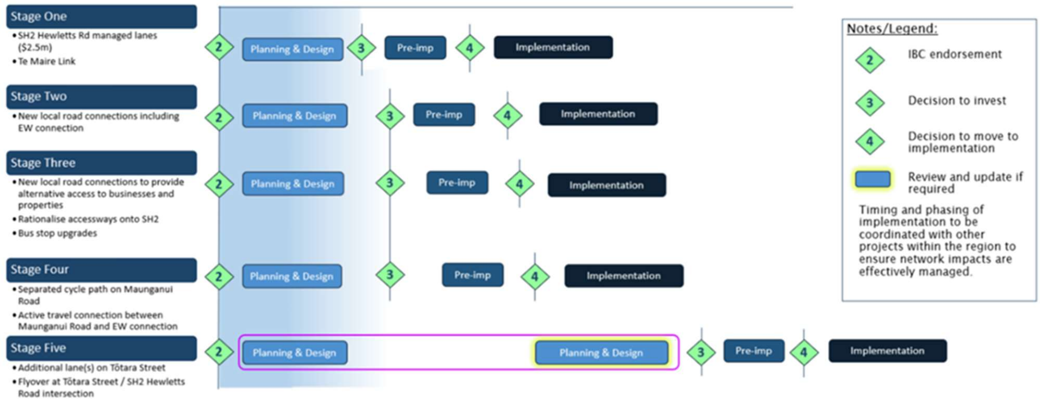

Figure 13-1: Indicative Staging Strategy for Subsequent Project Phases

13.2 Project Costs

13.2.1 Planning and Design Costs

With no funding readily available the programme for undertaking further detailed investigations and implementation of some interventions has been split into five stages to allow for a staggered delivery (see Figure 13-1).

The first stage is based on the making the lane configuration and safety improvements necessary to convert the bus lanes on SH2/Hewletts Rd into managed lanes where buses and vehicles carrying three of more people can travel. The implementation costs for the managed lanes is estimated to be $2-2.5m.

The Te Maire Link has been included in TCC’s Low cost, Low risk programme for 2024-27. However, this project did not receive funding. The expect pre-imp and imp cost is estimated to be $2.5m as TCC already owns the required properties. The detailed planning work for stages 2-5 is estimated to cost $5.0m (P50) based on 2024 costs.

There is flexibility in the timing of completing the Connecting Mount Maunganui project, depending on available funding. Completing the local road stages (Stages 2-4) together is likely to result in efficiency gains. While Stage 5 is independent, having the new local road connections in place is expected to help manage construction-related disruptions and allow for more effective temporary traffic management.

13.2.2 Project Delivery Costs

The total expected construction cost (undiscounted) to deliver the Connecting Mount Maunganui Recommended Option is between $276m (P50) and $373m (P95).

Further work will be undertaken following the endorsement of the IBC to build a more comprehensive understanding of staging and costs of the wider programme of improvements as part of the Recommended Programme.

Delivery capital cost estimates were developed in accordance with the Waka Kotahi 'Cost Estimation Manual' (SM014). Values given are GST exclusive and exclude escalation[77].

Given that the design stage aligns with an IBC, the exact land requirements are not yet fully understood, making it difficult to determine property cost. Based on indicative property cost estimation, an estimated $48 million has been allocated towards property costs for the recommended option. To further mitigate risks around property cost allowance, a contingency of 50% (P50) and a funding risk contingency of 52% (P95) have been applied to the base estimate, as recommended by the NZTA Cost Estimation Manual (SM014).

Table 13-1: Construction Cost Estimate

Component Estimate	Cost
Base Physical Works Estimate	$184m
Contingency	$92m
50th Percentile Project Estimate (P50)	**$276m**
Funding Risk Contingency	$97m
95th Percentile Project Estimate (P95)	**$373m**

13.3 Cash Flow Forecast

The projected cash flow is dependent on several factors including the construction methodology and approval of all elements of the programme developed in the next stages. Detailed cost forecasts will be developed along with the staging methodology.

13.4 Cost Sharing, Funding and Financing Options

NZ Transport Agency Waka Kotahi and TCC agreed that the total project cost will be funded from a range of sources. Due to the significant funding requirements for this project, alternative funding structures/options should be investigated as part of the next stages.

The GPS 2024 requires the NZTA to consider alternative funding and financing arrangements for all new infrastructure projects. Potential funding sources for the project are outlined in Table 13-2 below.

Table 13-2: Potential Funding and Financing Options for Connecting Mount Maunganui Project

Option	Description
National Land Transport Fund	Normal FAR would apply whereby State Highway improvements are eligible for 100% FAR. Other local road improvements would be funded at a normal FAR of 51% for TCC.
Tolling	The GPS 2024 includes consideration for the reforming of tolling legislation that would enable time-of-use charging on the most congested parts of the network.
SmartTrip (Tauranga-based dynamic road user charging scheme)	Potential source of project funding, subject to further feasibility, engagement and legislative change.
Infrastructure Funding & Financing	To date, local government has tended to access this to help fund infrastructure investment
Land value capture	Various mechanisms e.g. through by a targeted rate on substantial uplifts in underlying land value
Regional / City Deal	Form part of a long-term pipeline of infrastructure investment for the region, with agreed funding / financing mechanisms
Port Gate access / developer contributions	Where there are private benefits accrued to private organisation, an appropriation financial contribution could be sought to be reflective the benefit gained.

NZ Transport Agency Waka Kotahi, TCC and BOPRC will explore the options for funding and financing in the next project stages.

[77] Cost index: Q1-2023

13.5 Funding Availability

Tauranga City Council’s draft Long Term Plan 2024-2034 has budgeted $34,273,000 in the 2024-34 period for delivery of the local road improvements component of the Connecting Mount Maunganui programme - with additional funding for implementation also allocated in the TCC 30 Year Infrastructure Strategy.

The NZ Transport Agency has signalled in its State Highway Investment proposal that it expects the Connecting Mount Maunganui Programme to cost in the region of $250m - $999m, within the 24-27 NLTP period and future periods, subject to prioritisation and necessary approvals.

The CMM project is currently unfunded in the 2024-27 NLTP.

13.6 Ongoing Maintenance and Operational Costs

Implementing the project will result in additional assets requiring ongoing maintenance. It is anticipated that TCC will be responsible for infrastructure maintenance costs on local roads and NZ Transport Agency Waka Kotahi on the State Highway Network. BoPRC will be responsible for public transport operational costs.

The maintenance and operational costs associated with the recommended option are assumed as approximately being of 1% of total expected capital expenditure per year. This provides an estimated annual OPEX cost of $3.0m. Ongoing maintenance and operational costs will be confirmed based on further concept design of the recommended option developed through the relevant planning and design phases of each stage.

13.7 Focus of the Financial Case for the Next Stages

Further technical investigations and option refinement in the relevant stages will enable more detailed analysis of affordability, funding arrangements, and accounting issues. This will include:

- Calculating costs based on the detailed design to Waka Kotahi guidance and standards. This will include a comprehensive, costed risk assessment and will be used for the Economic Analysis. The estimated costs will be externally peer reviewed.
- A funding and financing strategy to be developed, to explore options and identify pathways to fund implementation of the recommended programme.
- An implementation Funding Forecast which includes how affordability has been considered
- A refined estimate of annual spend over project phasing and estimated construction.
- Appropriate sensitivity testing of variables to test the BCR analysis. This will consider the discount rate and evaluation period sensitivities.
- Consideration of the benefit cost ratio for alternative revenue opportunities (i.e., tolling and/or pricing, or alternative funding options i.e., non-NLTF funds.)
- An outline and quantification of key financial risks and appropriate risk management actions.
- Project delivery costs and key cost assumptions, including staging of recommended option.
- Any other factors relating to affordability and project cashflow across subsequent phases.

As part of establishing the funding arrangements, a methodology will be developed that shows how the costs of the recommended option should be attributed to the different beneficiaries (e.g. Waka Kotahi / Local Share / Private) that aligns with Waka Kotahi funding principles and policies, which will result from the work of the Funding and Financing Strategy.

14 Commercial Case

14.1 Introduction

This Commercial Case addresses the commercial viability of the CMM project. Delivery staging, consenting and property strategies are relatively high level at the IBC stage, with more detailed work to be undertaken during each subsequent stage as described in the indicative staging strategy (Figure 13-1).

The Commercial Case is closely related to the Management Case. The governance and project management structures set out in the Management Case provide a framework for managing the risks and uncertainties described here.

The approach to delivering the project is affected by its multiparty complexity including:

- Aligning with spatial planning changes.
- Coordination with four project partners and the need for strong governance.
- Interrelated strategic transport network and infrastructure outcomes.
- Multiple infrastructure asset owners - TCC (local roads), NZ Transport Agency Waka Kotahi (state highways), and KiwiRail (railways) - necessitates a focus on coordination among all parties.
- Multi-year (decade) programme spans up to two decades beyond 2040 and requires prioritisation of near-term activities that can be planned now (including optimisation works and completion of the Te Marie link), and deliberate flexibility and option retention for medium- and long-term programme components.
- Multiple funding sources will require agreements on cost sharing between the two investment partners (NZ Transport Agency Waka Kotahi and TCC).
- Several of these aspects relate to and influence the governance arrangements (asset ownership, legal rights, funding), covered in the Management Case. Funding issues also relate to the Financial Case.

The multiparty nature of the programme has underpinned the procurement, consenting and property approaches. These are described below.

14.2 Procurement Strategy

Professional services will be required to complete each stage. Following the completion of the IBC, the NZ Transport Agency and the selected supplier will negotiate completion of the subsequent stages as relevant.

As discussed in more detail in Section 15.2, depending on funding availability, the SH2 Managed Lanes and Te Marie link are in a position to proceed directly to pre-implementation. Services to progress these elements would need to be procured separately.

14.3 Consenting Strategy

The Consenting Strategy provides a set of recommendations for the consenting approvals process and recommends additional work to be undertaken in the planning and design phases of each stage.

An initial planning and environmental screen has been prepared for the IBC phase (see Appendix E). This notes that all roads included within this proposal are located within Tauranga City and are subject to the Tauranga City Plan (TCP). The TCP is currently subject to the following plan changes, which are relevant to the project study area:

- Plan Change 20 (PPC27) – flooding from intense rainfall; and
- Plan Change 30 (PPC30) – earthworks.

The recommended programme will require a wide range of consents. Based on a high-level review of the statutory environment and the project information provided to date, likely planning approvals will include a combination of NoRs for new designation(s) and/or alteration to the existing designation, as well as various resource consents for matters pertaining to land disturbance, stormwater discharge, contaminated land, works

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within identified floodplains, and works within the dripline of notable trees. An Outline Plan of Works will also be required prior to construction.

It is also advised that the consenting approach is tested with TCC and BOPRC as part of a consultation prior to lodgement of the NoR. This will help identify and minimise consenting risks at early stages, as well as confirm minimum information requirements and opportunities to streamline the consenting process.

In addition to this, detailed technical assessments are recommended during the planning and design phases to further refine the consenting risks and strategy such as:

- A preliminary social and community impact assessment to understand potential construction and operational effects on those directly affected by the project and wider the local community.
- A cultural/heritage assessment to understand what heritage sites may be affected. This will include working with nominated hapū representatives to undertake a cultural and heritage screen / survey. The scope of this work will be agreed with mana whenua.
- An environmental and sustainability strategy, including a preliminary Climate Change Risk and Adaptation assessment. This will be undertaken in accordance with AS 5334:2013 – Climate change adaptation for settlements and infrastructure – a risk-based approach and the Ministry for the Environment.

14.4 Property Strategy

With the potential for a significant amount of land to be partially or fully acquired to deliver the recommended programme, the ability to acquire land is a key risk and likely to be an early activity in the successful and/or timely delivery of the project. Acquiring land in association with NZ Transport Agency requirements will reduce transactional costs and impact on landowners.

Recent accelerated projects carried out by the NZ Transport Agency in Auckland have adopted an approach based around early negotiation with landowners concurrently with project planning and ahead of formal lodgement of Notices of Requirement (NoR) or commencement of Boards of Inquiry.

This approach could be considered in this case given the demand and strategic drivers underpinning the project and will require further investigation in the relevant stage as part of the Property Acquisition Strategy.

14.5 Delivery Models for Implementation

Selecting the appropriate delivery model for a project or programme is critical to achieving value for money. This will consider project complexity, scale, timing, innovation potential, risk and supplier market.

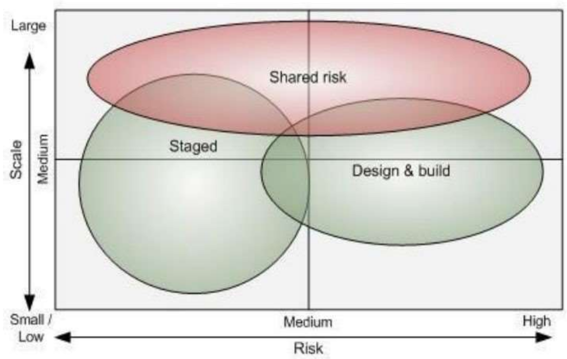

Figure 14-1: Staging Delivery Models

The main delivery models available are staged; design and build; shared risk; and supplier panel. The diagram below (Figure 14-1) illustrates the situations in which the staged, design and build, and shared risk delivery models may be used.

The supplier panel delivery model does not appear in the diagram because it gives purchasers complete flexibility as to the type of contractual arrangement that is established with the supplier.

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Aspects of delivery model selection are covered further in the Waka Kotahi Procurement Manual and will be explored in more detail during the relevant stage.

Note that if funding availability allows, and with Project Partner endorsement, a separate procurement strategy will be developed for the SH2/Hewletts Rd optimisation works and Te Marie link, to pave the way for transition into the pre-implementation phase, which will include the required property, consenting and detailed design deliverables. This element of the programme has lower levels of risk, uncertainty, and complexity as the scope is reasonably well defined.

14.6 Focus of the Commercial Case for each Stage

During the Planning and Design Phase for each stage, the Commercial Case will be a key task to inform the cost allocation, cashflow and workflow planning for pre-implementation and implementation. It will include necessary information to prepare procurement documentation and seek suppliers for pre-implementation.

The Commercial Case will include the following:

- Identification of the key delivery risks and their associated management strategies.
- Outlining the Consenting Strategy, including the recommended pathway to obtain planning consents for the project.
- Outline the process to acquire the necessary property and dispose of any surplus property associated with the project.
- Outline the procurement and delivery model and rationale for as per Waka Kotahi guidelines, the expected contract length, management, and pricing and charging.

15 Management Case

15.1 Introduction

Delivery of the Connecting Mount Maunganui project is a complex undertaking, spanning multiple organisations, time horizons and funding streams. However, the next stages of work are well understood. Appropriate governance, plans and processes are already in place to help ensure the successful transition into the Planning and Design phase for each stage, and the existing governance structures remain fit for purpose as the project progresses.

The detail provided in this section is purposefully high level– with a particular focus on next steps for subsequent stages. The Management Case is made up of the following parts:

- Indicative approach to staging
- Matters for further investigation
- Project management approach
- Roles and governance arrangements
- Risks and issues
- Engagement approach
- Benefits realisation

15.2 Indicative Approach to Staging

This section describes the indicative approach and methodology for staging delivery of the Connected Mount Maunganui recommended programme.

Post IBC, the programme has been separated into 5 stages to manage risk and exposure as shown in Figure 15-1.

Stage One

- SH2 Hewletts Rd managed lanes
- Te Maire Link

Stage Two

- New local road connections including EW connection

Stage Three

- New local road connections to provide alternative access to businesses and properties
- Rationalise accessways onto SH2
- Bus stop upgrades

Stage Four

- Active travel facilities on Maunganui Road
- Active travel facility between Tōtara St and Maunganui Rd including overpass connection between Maunganui Road and EW connection

Stage Five

- Additional lane(s) on Tōtara Street
- Flyover at Tōtara Street / SH2 Hewletts Road intersection

Figure 15-1: Indicative Staging Approach

15.2.1 Project Development Pathway

Standard NZTA dependencies will apply to all stages (i.e. funding priority/affordability, stage gate decisions, co-ordination with other Tauranga projects etc.).

Triggers are not necessary for Stages One & Two, as these comprise lower cost interventions that have already been assessed sufficiently to demonstrate high value for money and will immediately generate benefits following implementation.

Triggers for Stages Three, Four, and Five will be based on:

- Stage Three:
  - Confirmation that new local road connections to support business/property access in the Mount Industrial Area are required.
- Stage Four:
  - Demand for active travel (current and forecast) meets investment criteria
  - New local road in place to provide active travel corridor through Mount Industrial Area
  - Council's Plan Change 33 is enacted to support intensification in surrounding neighbourhoods/ suburbs
- Stage Five:
  - Demand at SH2/Tōtara St intersection exceeds design limits and cause LOS reductions
  - Freight demand accessing Mount Maunganui industrial/ Port area is increasing (actual and forecast)
  - Level of Service for freight journey times leaving Mount Maunganui via Tōtara St is declining below acceptable standard

The proposed implementation pathway illustrated in Figure 15-2 provides flexibility to approach the next project phase(s). No timelines are established as this project is currently unfunded, and there is no indication of when each phase might occur.

The planning and design phases can be right sized to support investment decision-making and efficient progression to pre-implementation. There are opportunities to bring different stages forward, within reason, and dependent on funding availability and priority. Construction disruption and timing with other Tauranga projects will need to be considered and planned for.

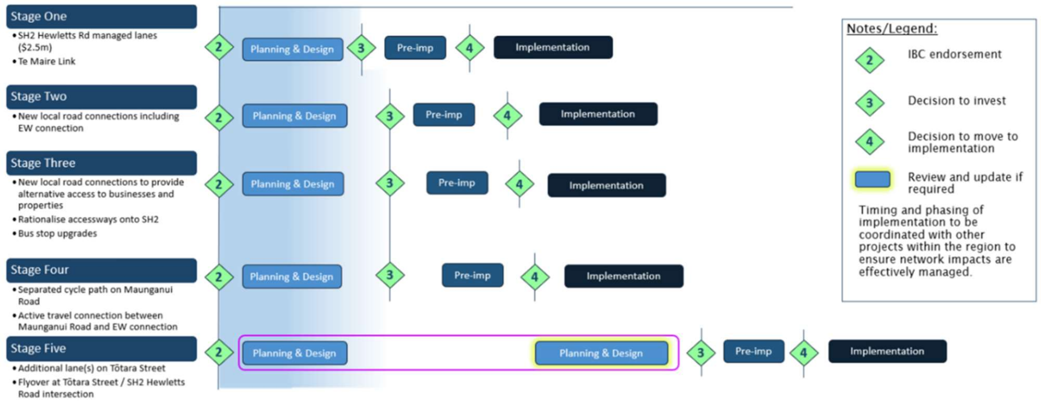

Figure 15-2: Next Project Phase Scope and Staging

15.3 Roles and Governance Arrangements

There are four partners to the Connecting Mount Maunganui project – mana whenua, NZ Transport Agency, TCC and BOPRC. Partner roles and responsibilities is a key consideration in governance arrangements.

The two Investment Partners and road controlling authorities (RCA) are TCC and NZ Transport Agency. They will fund a large part of the CMM project. BOPRC will fund the public transport services.

Ongoing partnership with the hapū of Whareroa marae is imperative to the integrity of this programme, so the project team understands te ao Māori values and hapū aspirations for whanau. This will help shape and inform option development and preferred designs to deliver inherently holistic and integrated outcomes.

15.3.1 Governance Structure

The project governance structure is as set out in Figure 15-3 below.

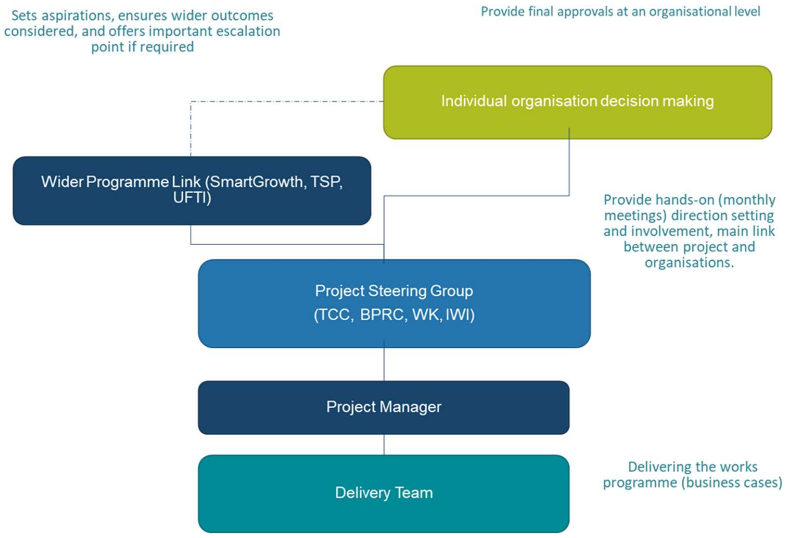

Figure 15-3: Proposed Project Governance Structure

15.3.2 Project Delivery Team

The project team is responsible for day-to-day management and delivery of the Connecting Mount Maunganui project. The core purpose of the project team is to complete the IBC investigation and reports to deliver the project on time and to budget. The secondary role of team members is to co-ordinate inputs from their home organisation.

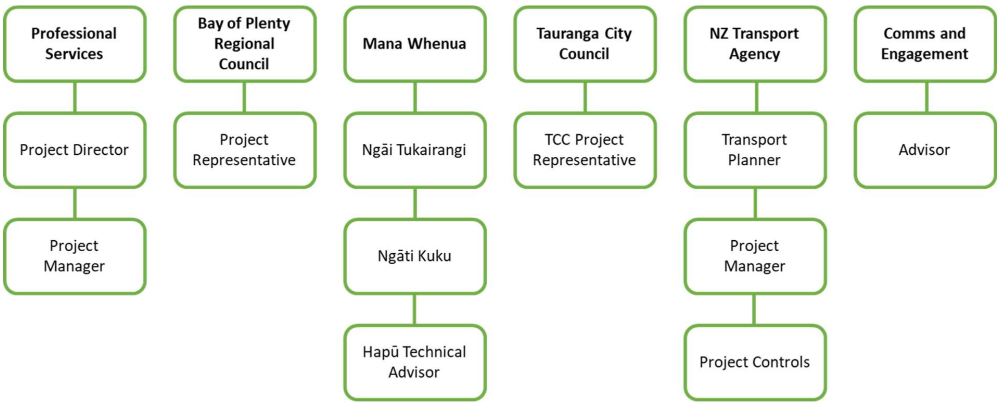

Figure 15-4: Proposed Delivery Team Structure

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15.3.3 Project Meetings

There are several key regular project team meetings including:

- Project Steering Group (PSG) meetings are held monthly. The purpose of these meetings is to provide strategic oversight and guidance for the project. These meetings are used to review project progress, discuss issues and risks, make decisions, and ensure alignment with project objectives.
- Fortnightly project delivery team meetings to discuss project progress, key issues, review outstanding actions, and talking about tasks planned for the coming weeks.
- Fortnightly contract meetings are held with Aurecon as the lead consultant to discuss progress, risks and issues, contractual matters, and other business. This includes project team representatives from the Aurecon team, along with Waka Kotahi team members.

This structured approach allowing regular discussions has worked well with clear lines of communication, as well as tested methods for escalation and decision making.

15.4 Risks and Opportunities

Through a risk workshop involving staff from the NZ Transport Agency, TCC and BOPRC, a risk register has been developed. Monthly risk meetings have been held throughout the duration of the IBC. The register (Appendix F) is a live document and should be maintained and updated throughout the life of the project.

The risk register outlines cause and consequence, notes established controls in place, connections to other risk items, and assesses threat and opportunity level.

A further risk workshop will be held at the commencement of the next stage to check that all relevant key risks are captured, and mitigation measures identified. Future risk analysis work will include cost consequence modelling.

The key risks identified at the IBC Phase include:

- **Recommended programme endorsement by the project partners**: There is a risk that the project team/ PSG cannot reach agreement on a preferred option to endorse. There are two parts to this:
  - Funding
  - Iwi – certain elements of the Recommended Option are not supported by Ngāti Kuku
- **Governance approvals**: There is a risk that decisions made (or consensus reached) at the PSG are overruled.
- **Future land use**: There is a risk due to the high level of uncertainty regarding future land use in the area.
- **Project support**: There is a risk of opposition for the project from Mana Whenua.
- **Funding**: There is a risk that the recommended programme is not aligned with funding
- **Consenting**: There are risks given the brownfield nature of the project area, including a large number of privately owned parcels of land which are fully developed, and particular concerns of Ngāti Kuku with respect to viewshafts and further development within the area.

Mitigations are also detailed in the Risk Register.

15.4.1 Key Technical Risks and Uncertainties

The Connecting Mount Maunganui project area is complex with significant challenges relating to construction and implementation such as land contamination and a high-water table. Utilities can be a notable source of risk, unless early and thorough investigations are undertaken. Planning and property requirements will also impact the project, requiring as much information as possible to inform decisions.

A significant amount of work has already been undertaken through technical investigations undertaken as part of the project. The information captured through that work puts the project in a good place to have a more

robust understanding of the key technical risks and uncertainties and will form part of the next stage of investigations.

The following table outlines some of the key technical risks and uncertainties that will be areas of focus in subsequent phases, summarising the key considerations that will carry forward to the next stage of work and beyond.

These technical risks and mitigations are well understood based on other projects and work to date in this area. For the Additional Options Assessment (focused on the two intersections being SH2 Hewletts Road / Tōtara Street and Golf Road / SH2 Hewletts Road / Maunganui Road), the project identified key technical risks and uncertainties as well as mitigations.

Table 15-1: Recommended Option technical risks, uncertainties and proposed mitigations

Risk area	Description	Mitigation
Utilities	Complex utilities intersect with project area Long lead times required to enable agreement with utility owners – lack of engagement to date	Develop third party utilities engagement strategy. Programme engagement to reach agreement with utility operators
Natural Hazards	Flood hazard areas, overland flow paths, flood prone areas in project area	Further work to develop Consenting Strategy Planning team to work closely with Design team to design out some risk areas, in relation to natural hazards
Contaminated land	Probable PFAS in project area and limited space to treat onsite (required before shifting offsite). Cost and programme implications	Encapsulation, potential treatment, Alternate foundation or ground improvement solutions to limit generation of large surplus soils Additional testing for PFAS.
Planning / Consenting	NoR likely required, on critical path	Further development of comprehensive consenting strategy. (Refer Commercial Case for further information)
Land acquisition	Land acquisition on critical path, early activity	Develop comprehensive Property Acquisition Strategy.

15.4.2 Reputational Risk Management

As all partners share the reputational risk, a comprehensive risk and mitigation strategy was developed in an earlier approved engagement strategy. The project team will refine this during each planning and design phase. We will help resolve issues raised by residents and share information looking ahead to pre-implementation and beyond.

During the IBC, the team undertook external stakeholder analysis to understand issues, aspirations, risks, and opportunities. Further work at the start of each stage will identify opportunities for meaningful ongoing engagement.

For each subsequent stage, we will:

- Update the existing communications and engagement plan and identify key engagement groups.
- Prepare visual aids to support engagement/consultation.
- Hold workshops/engagements with key stakeholders.
- Host public information sessions.

- Prepare engagement results, learning, contacts and follow-up documents.
- Undertake consultation.

The project team will build on established relationships and create new ones with key partners, impacted property and business owners, road users, education/health/emergency services, residents, utility providers and neighbourhood/lobby groups. Monthly reporting on engagement activities and the information shared with partners and stakeholders will ensure no-surprises.

15.5 Opportunities to consider in the subsequent phases

As part of the next stage of investigations, the role of the local road improvements, including local road connections, will be refined and assessed to confirm the best complementary interventions to achieve the outcomes sought through the programme of investment. This will be done by:

- Reassessment of proposed local road connections through further localised modelling; and
- Prioritisation and staging of local road interventions.

There is an opportunity to expand the economic assessment to capture a more compete view of the efficiency gains associated with improved access to the Port for HCVs using Hewletts Road.

This would ideally be based on survey data/evidence provided by local freight and logistics operators which captures:

- Information on the strategies firms have adopted to adapt to the levels of congestion on the road network; and
- The benefits/cost savings of being able to return to more normalised work practices.

These benefits will augment the monetised benefits of both reduced travel time and improved trip reliability.

15.6 Engagement Approach for Subsequent Stages

Building off the IBC, the approach for stakeholder and public engagement will be critical for the success of the project. The next stages will follow NZ Transport Agency communications and engagement guidelines, standards, and practices.

To inform the wider public and help guide conversations with communities and stakeholders, the NZ Transport Agency Project webpage will feature project updates that provide general information about the recommended programme – including the overall process, the project objectives, summary of work, how, and the decision-making process.

Tools such as visualisation, interactive and creative technologies will help shape the story of the recommended programme. The engagement approach to capture the feedback, shape communications and other needs for collateral will be further defined at the start of the planning and design phases.

It will be important to include valuable feedback and insights already gathered during the IBC, to hear from stakeholders, road users and the public on the recommended programme and to close the engagement loops.

The project team will monitor public sentiment and ensure proactive and responsive information and will seek out opportunities for coverage on the recommended option and the solution in general. Proactive management of any possible issues with or for our stakeholders and community will be timely identified and responded to.

15.7 Benefits Realisation

A high-level Benefits Realisation Plan (BRP), appropriate to the IBC stage, has been developed and is included in Appendix G. The BRP includes the proposed methodology for performance measure capture, baseline data (where available) and expected results.

The BRP is a living document that will be reviewed and refined as required through the relevant planning and design phases. Once the subsequent stages are endorsed, benefits will be monitored in a continuous process as the project progresses through detailed design, construction and operation.

A benefits realisation review is recommended to be conducted within 12 months from implementation of the project. The review will outline any changes or progress against the base KPIs and investment objectives determined during this business case and measured prior to implementation.

16 Next Steps

- The recommended programme is endorsed by project partners
- The IBC is endorsed by the project partners' governance fora (e.g. NZ Transport Agency Board, Regional, TCC and Hapū Boards)
- Confirm scope and funding for subsequent stages

Appendix A – Stakeholder Management Plan

Appendix B – Options Assessment Reports

Appendix C – Transport Modelling and Economic Evaluation

Appendix D – Appraisal Summary Table for Recommended Programme

Appendix E – Planning and Environmental Screening

Appendix F – Risk Register

Appendix G – Benefits Realisation Plan

Appendix H – Hewletts Road Managed Lane Study

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Bringing ideas to life

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Engagement Strategy - Summary

The Engagement Strategy outlines the purpose and objectives of engagement, engagement methods and programme. It defines the roles and responsibilities of key stakeholders. The full Engagement Strategy is available in Supporting Information.

The engagement objectives for the IBC phase are as follows:

- Support the project team with identifying and investigating options for the IBC.
- Ensure key stakeholders are aware of the IBC, what we’re trying to achieve and understand the IBC process and how they can have their say.
- Ensure we engage early and inclusively with key stakeholders, that they feel comfortable sharing their insights on movements and travel purposes and understand the value of their contribution to this IBC.
- Project partners (including mana whenua) and key stakeholders understand the project and its why and are kept informed as the project progresses.
- To communicate with all stakeholders to increase awareness of the problems, support the understanding on the options identified and promote the recommended option to all stakeholders / public.

Key messages were developed for the project to support engagement with stakeholders and the community, according to the following themes:

- Connecting Mount Maunganui will mean everyone can get around safely and easily. People will have more travel choices that will work better for them and the environment, and freight and goods can get to where it’s needed to help keep our economy thriving.
- NZ Transport Agency, mana whenua (Ngāti Kuku and Ngāi Tukairangi), Tauranga City Council and Bay of Plenty Regional Council are working together towards solutions to increase travel choices, improve safety and travel time reliability and improve environmental outcomes for the Mount Maunganui transport system including State Highway 2/Hewletts Road, Tōtara Street and Maunganui Road.
- The Connecting Mount Maunganui project is one piece of a much bigger picture when it comes to the future of transportation and movement of people and goods throughout Tauranga and the western Bay of Plenty. We are working together on the best options to connect our growing communities on the eastern side of the city, and to contribute to a safe transport network.
- This is a multi-year project and follows a two-stage business case process. The first stage focuses on recommending a package of options to be investigated further in the second stage of the business case.
- At the same time, Tauranga City Council (TCC) is working with key stakeholders, partners and the community to develop industrial and residential spatial plans for the area. The spatial plans will outline issues and a vision, and then set policy direction to achieve this. Combined, these plans will help set a future land use and transport direction. Connecting Mount Maunganui is working across these projects to help achieve the desired outcomes.
- People’s feedback gathered through this engagement will assist in shaping the transport plans for the Connecting Mount Maunganui area. We will share the plans later in the year.
- Completion of the first stage of the business is expected in mid-2023. The second stage will commence immediately.
- Once the second stage of the business case is completed, the project team will have a better idea of a recommended programme to design and implement options. We will explore how improvements can be phased to deliver the more smaller scale elements in the shorter term, while progressing with the more complex elements in the longer term.
- In the 2024-27 and 2027-31 National Land Transport Programmes there is no funding allocated for implementation of the recommended improvements. The business case will be used to seek endorsement and funding.

SH2/Hewletts Road IBC
Long List MCA Assessment

          

Option	Description	
Do Minimum	Hewletts Rd, Totara St, Maunganui Rd shared paths, B2B, PC33, PT network improvements, SH2 shared paths.	
Option 1 - Land Use and local network change led	Option 1 is led by **land use and local network changes**, supported by freight priority, walking, cycling and public transport interventions to improve transport options and route choice. This is intended to improve reliability, throughput of people and goods on Hewletts Road and mode share through encouraging a more self-contained trip pattern with less reliance on Hewletts Rd freeing up space for trips than need to use it.	Option image
Option 2 - Pricing and Road Space Reallocation to support movement of people & goods	Option 2 tests the effectiveness of using **pricing signals** for all modes to influence choices, supported by a range of physical and operational measures to enable changes in time and mode choice for people and goods. The intent is to use the existing road space (with some augmentation) more effectively by prioritising users by time of day and enabling greater use of higher productivity modes for people, leaving more space for trips that cannot re-mode like freight.	Option image
Option 3 - Hewletts Rd limited access to improve SH2 throughput	Option 3 is designed to test the potential for **prioritising throughput**, by rationalising access points to and from Hewletts Rd to improve reliability and throughput of people and goods. About 37% of the entire state highway network are limited-access roads. Recognising the role of SH2/Hewletts Rd as a major connector, reinforcing the road hierarchy by prioritising throughput and reducing side friction and conflicting movements.	Option image
Option 4 - Dynamic road allocation	Option 4 aims to achieve the outcomes sought by creating physical space and capacity for different modes at different times of the day. This could address the tidal fluctuation in demand and help get more out of the existing road space through **dynamic prioritisation** and capacity allocation mechanisms.	Option image
Option 5 - Freight, public transport, W&C improvements	Option 5 is led by significant **freight, walking and cycling, and public transport** improvements. This is supported by pricing, streetscape and behaviour change programmes to drive mode change for commuters to open up road capacity for essential users like trucks.	Option image
Option 6 - Grade separation of Totara St and supporting network changes	This option tests the **grade separation of the right turn from Totara St into Hewletts Road** and widening of Totara St to enable more throughput and a lane-gain for the left turn from Hewletts into Totara. This is intended to resolve the significant queues and delays to freight and traffic caused by the Totara St intersection. The option includes a range of supporting measures to improve route throughput including local network changes and significant public transport and walk/cycle provision.	Option image
Option 7 - Grade separation of Totara St and Jean Batten Dr	Option 7 **grade separate the through movement on Hewletts Rd at Totara Rd/Hewletts Rd and Jean Batten Dr/ Hewletts Rd** intersections along with consequential local network changes. Strategically, this option considers that SH2 on either side of Hewletts Rd is largely grade separated and brings Hewletts Road to a similar level. The intent is to improve throughput and route productivity through the two grade separations and significant investment in public transport, walking and cycling facilities.	Option image
Option 8 - BRT and ferry	This option tests the potential for **maximising the public transport** potential of the corridor. This includes a ferry from Mt Maunganui and a separated BRT-style bus corridor (modelling on the Eastern Busway in Auckland) on Hewletts Rd as means of maximising throughput of people and freeing road space for increasing reliability and throughput for freight. Overall, this option creates the highest people throughput capacity of all of the options.	Option image
Option 3a - Hewletts Rd limited access and pricing	Option 3a is designed to test the combined effects of limited access elements from Option 3, and pricing signals from Option 2.	
Option 9 - Ngāi Tukairangi Hapū Kōwhiri Iwa	Ngāi Tukairangi a is a bespoke option via a combination of various interventions included in the 8 CMM IBC Long List Options Ngāi Tukairangi hapū are comfortable supporting. It is about balancing transport outcomes, improving environmental outcomes, and significant land use changes to support tāngata whenua outcomes.	

Benefit	Investment Objective	Measure/ KPI	Assessment Summary	Do Minimum Score	Do Minimum Comments	Option 1 Score	Option 1 Comments
Improved transport system reliability, permeability, and throughput of people and goods	To improve reliability, permeability, and throughput of people and goods	People throughput	Qualitative assessment	0	Baseline Scoring	0	Bus lanes on Maunganui Rd, no notable changes to Hewletts Rd potential throughput - overall no notable improvements.
		Travel time reliability for freight movements	Qualitative assessment	0	Baseline Scoring	0	No benefits expected.
		Travel time reliability for public transport	Qualitative assessment	0	Baseline Scoring	1	Bus lanes on Hewletts and Maunganui Rd - however reduced to positive 1 due to uncertainty of benefits actualising from this option.
		Freight throughput value	Qualitative assessment	0	Baseline Scoring	0	No notable impacts to freight throughput value expected.
A multi-modal transport system that supports safer and healthier journeys	To reduce road deaths and serious injuries for all users by at least 40%	Risk of death and serious injuries (collective risk)	Qualitative assessment of alignment with Safe Systems Approach and Vision Zero	0	Baseline Scoring	0	Streetscape rearrangements likely to involve speed reductions which reduces severity of crashes that occur and involve more separation of peds/cyclists from road. New residents exposed to traffic risk. Overall scored neutrally.
Improved transport choice for access to social and economic opportunities	To provide better mode choice options and increase public transport and active travel mode share	Public transport mode share	Qualitative assessment	0	PT mode share of 2.9% in 2031 AM peak hour (Mount Maunganui)	1	Industrial retreat and mixed use developments is likely to reduce private vehicle use and long distance travel, decreasing share of private vehicle and hence increase PT mode share. However, slightly risk/uncertainty in realising this benefit.
		Walking and cycling mode share	Qualitative assessment	0	Mt Maunganui / Omanu / Arataki: TCP Preferred Option of 12% Trips to Work, 21% Trips to School.	2	Industrial retreat and mixed use developments is likely to reduce private vehicle use and long distance travel need. Combined with high quality W&C facilities with urban realm is likely to significantly increase active mode travel and hence mode share. However, slightly risk/uncertainty in realising this benefit. Likely to perform better than do-min.
		Public transport travel time compared to general vehicle travel time	Qualitative assessment	0	Baseline Scoring	1	Industrial retreat and mixed use developments is likely to reduce private vehicle use and long distance travel need, freeing up space for both PT and general traffic (0). Bus lanes on Maunganui (+1)
		Access to social and economic destinations by PT, walk and cycle	Qualitative assessment of impact on access by public transport, walking and cycling to social and economic destinations	0	Baseline Scoring	2	Land use change will improve alternative mode access to work due to residential within close proximity to various destinations (**supermarket/work/schools**). Easy access to **Mauao** via active modes.
Reduced impact on the environment and climate change impacts from transport related carbon emissions	To reduce the transport related effects on water, air quality and noise	Ambient air quality and noise level	Based on vehicle kilometres travelled	0	Baseline Scoring	-1	Residential developments close to a busy road corridor introduces a sensitive receiver near a high volume road. This is likely to result in worse air quality for local residents
		Water quality	Based on vehicle kilometres travelled	No differential between options. Will become a principal to be developed through the design process .			
	To reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	CO_2 emissions (Mode shift from single occupancy private vehicle)	Based on vehicle kilometres travelled (VKT)	0	Baseline Scoring	1	Change in land use to mixed use development with self-contained communities likely to promote active mode travel, as need for long distance private vehicle travel is reduced, therefore reducing emissions. However, slightly risk/uncertainty in realising this benefit.
		Mode shift of freight from road to rail	Qualitative assessment	0	Baseline Scoring	0	It is uncertain where the existing industrial area will be relocated (if they will have good access to rail) so it would be difficult to assess the likely mode shift from road to rail.

Measure/ KPI	Option 2 Score	Option 2 Comments	Option 3 Score	Option 3 Comments	Option 4 Score	Option 4 Comments
People throughput	-1	Reallocation of general traffic lane to freight only in off peak, slight reduction in people throughput capacity.	1	Increased throughput along Hewletts Rd corridor primarily general traffic (poor yield in comparison to PT lanes). Mitigated by the reallocation of bus lane to bus/freight in off peak. Slight improvement overall.	1	Dynamic lanes give increased throughput in general traffic in peak direction.
Travel time reliability for freight movements	2	Pricing mechanisms and freight lanes will improve reliability in off-peak times.	1	Intersection changes likely to improve reliability for through-SH2 movements likely to access port, but worsen reliability for turning movements. However improved local permeability likely to have benefits for commercial vehicles and provide multiple route options. On balance considered to be a slight positive.	2	The reallocation of bus lanes to be bus/freight lanes in off peak, improved freight priority at intersection and the potential shift of general traffic movements from inter peak to peak likely to have benefits for freight reliability.
Travel time reliability for public transport	0	No change to bus lane arrangement - retain existing. Indirect benefits to bus reliability due to reduced general traffic demand. Not considered sufficient for a +1 score.	0	Freight sharing bus lanes in off peak. However throughput improvements at intersections may improve travel time reliability.	-2	Freight sharing bus lanes in off peak along Hewletts. Slightly mitigated by the HOV lanes along Maunganui Rd which is an improvement along this section. Lower volume of buses along Maunganui Rd than Hewletts Rd so overall negative.
Freight throughput value	0	Freight lanes in off peak times will increase potential total freight throughput. Mitigated by port gate pricing and rail timings management.	1	Off peak freight lanes likely to provide some total throughput benefits.	2	Freight lanes in off peak times on Hewletts Rd and dynamic lanes on Totara St will increase potential total freight throughput. Management of rail timings may mitigate benefits somewhat.
Risk of death and serious injuries (collective risk)	1	Slightly positive impact of reduced general vehicle volumes (reduced exposure).	1	Accesses restriction to LILO and removal of driveways reduces conflict points.	-1	Removal of solid median separation / running of contra flow dynamic traffic lane increases risk of head ons, right turning into driveways etc. However somewhat mitigated by an assumed speed limit reduction.
Public transport mode share	1	Reducing the attractiveness of private travel through cordon/parking pricing is likely to increase PT patronage and mode share. PT incentive to improve PT share.	0	Bus stop upgrades unlikely to have significant impact on mode share.	-1	Bus stop upgrades unlikely to have impact on mode share. Dynamic lane likely to further entice peak private vehicle usage.
Walking and cycling mode share	1	Reducing the attractiveness of private travel through cordon/parking pricing is likely to increase active travel and mode share.	0	Short cycle facility on Hull Rd unlikely to have significant impact on mode share.	-1	Short cycle facilities on Hull Rd unlikely to have impact on mode share. Behaviour change programme to have slight impact on mode share. Dynamic lane likely to further entice peak private vehicle usage.
Public transport travel time compared to general vehicle travel time	0	Pricing reduce private vehicle demand and improve travel time for both PT and private vehicle (0).	-1	Improved throughput on SH2 with local links benefits private vehicle travel time (-1).	0	HOV lanes on Maunganui Rd has some improvements to PT travel time (+1). Local network/links and dynamic lanes benefit private vehicle travel time (-1).
Access to social and economic destinations by PT, walk and cycle	0	Very minor improvement in access local employment areas via bus and W&C. Improved access to port and local employment via local connections/freight priority. Pricing at port restrict some freight access to port.	0	Very minor improvement in access local employment areas via bus and W&C.	1	Slight improvement access **local employment areas, schools, Mauao** via bus and W&C, due to HOV lane on Maunganui. Improve access via private vehicle through dynamic lane arrangement.
Ambient air quality and noise level	0	Pricing unlikely to result in notable changes	-1	Increasing throughput on SH2 is likely to result in improved traffic flow through the corridor and induce greater vehicle volumes. This will increase noise and emissions.	-1	This option will increase general vehicle capacity in the peak directions which is likely to induce greater vehicle volumes. This will increase noise and emissions.
Water quality						
CO_2 emissions (Mode shift from single occupancy private vehicle)	1	Pricing & PT incentives are likely to encourage mode shift and result in reduced vehicle trips therefore reducing emissions.	-1	Increased vehicle trips will result in additional emissions, however the impacts are unlikely to be significant (therefore scored a -1, not -2)	0	HOV lanes on Maunganui, and improved bus stops, along with behaviour change programmes will have some minor effect on mode shift from single occupant vehicle. Dynamic/priority lanes on Hewletts Road may improve vehicle travel times along affected sections but unlikely to solve upstream/downstream bottleneck. It may increase vehicle trips at a local level but unlikely to have significant impacts to vehicle emissions due to limited operation periods.
Mode shift of freight from road to rail	0	Pricing at port gates will increase freight costs on roads therefore may increase the attractiveness of rail for freight traffic. Effect TBC.	0	The proposed freight priority lanes may result in additional vehicle traffic for freight. Effect TBC.	0	Pricing at port gates may encourage more freight to shift from road to rail, but freight lanes will encourage road freight use during off peak hours. Effect TBC.

Measure/ KPI	Option 5 Score	Option 5 Comments	Option 6 Score	Option 6 Comments	Option 7 Score	Option 7 Comments
People throughput	2	Continuous PT lanes on Hewletts and Maunganui Rd. bus priority through Golf Rd roundabouts. Increased cycling throughput on Maunganui and Hull Rd. Slightly reduced general traffic throughput with reallocation of traffic lane to freight.	2	Continuous PT lanes on Hewletts and Maunganui Rd. Four lanes on Totara St will increase general traffic capacity through Totara St.	2	Continuous PT lanes on Hewletts and Maunganui Rd. Four lanes on Totara St will increase general traffic capacity through Totara St. Additional general traffic throughput along Hewletts through flyovers (minor increase).
Travel time reliability for freight movements	2	The dynamic freight lanes on Hewletts Rd (reallocation of general traffic lane in off-peak times) is likely to benefit freight reliability. Further supported by measures to reduce private vehicle use for commuters.	3	Grade separation of right turn from Totara to Hewletts and free left turn with lane gain from Hewletts to Totara, and four laning of Totara St, likely to significantly improve the capacity of an important freight and commercial movement. The internal port bridges will improve reliability of movements within the port site, and reduce impacts on the external network. Rail loop completion likely to improve reliability for rail freight customers.	3	Grade separation of the through movements along Hewletts Rd, and four laning of Totara St, expected to significantly improve travel time reliability for freight and commercial movements. The internal port bridges will improve reliability of movements within the port site, and reduce impacts on the external network. Rail loop completion and grade separation of rail crossings likely to improve reliability for rail freight customers.
Travel time reliability for public transport	2	Continuous PT lanes on Hewletts and Maunganui Rd.	2	Continuous PT lanes on Hewletts and Maunganui Rd.	2	Continuous PT lanes on Hewletts and Maunganui Rd.
Freight throughput value	2	Freight lanes in off peak times on Hewletts Rd and dynamic lanes on Totara St will increase potential total freight throughput.	3	Grade separation increases potential freight throughput by road, plus completion of rail loop enables greater freight throughput by rail.	3	Grade separation increases potential freight throughput by road, plus completion of rail loop enables greater freight throughput by rail.
Risk of death and serious injuries (collective risk)	3	Likely to reduce vehicle volumes & include separated facilities (reduces exposure to risk). Likely to reduce number of conflict points (likelihood of crash). Streetscape improvements likely to result in slower operating speeds which reduces the severity of any crashes.	0	New infrastructure provides opportunity to improve safety by design and grade separation involves the removal of certain conflict points at the Totara St/Hewletts Rd intersection which would have a safety benefit. However this is countered by the expected to increase vehicle volumes and speeds near the Totara St/Hewletts Rd intersection which is an increase of exposure to traffic for all road users. Increased speeds likely to result in worsened severity of any crashes that do occur.	0	New infrastructure provides opportunity to improve safety in design and grade separation involves the removal of certain conflict points throughout the Hewletts Road corridor which would have a safety benefit. However this is countered by the expected to increase vehicle volumes and speeds along the Hewletts Road corridor which is an increase of exposure to traffic for all road users. Increased speeds likely to result in worsened severity of any crashes that do occur.
Public transport mode share	2	Improvements to public transport, combined with parking pricing/PT incentives/behaviour change would lead to increased PT patronage and mode share. Likely to perform better compared to TTSM DS scenario (PT mode share of > 3.7% in 2031)	1	Roading upgrade is likely to entice further private vehicle travel for local trips. However, the PT priority/CBD pricing/ PT incentives/behaviour change programme is expected to have greater impact.	0	Significant roading upgrade is likely to entice further private vehicle travel for both local and regional/through trips, and counter the PT priority/CBD pricing/ PT incentives/behaviour change programme.
Walking and cycling mode share	3	Significant improvement to walking, cycling and streetscape, alongside parking pricing/behaviour change would lead to increase active mode usage and mode share. Cycle over path. Likely to perform significantly better than do-min.	-1	Significant roading upgrade is likely to entice further private vehicle travel. Short cycle facility on Hull Rd unlikely to have impact on mode share.	-1	Significant roading upgrade is likely to entice further private vehicle travel. Short cycle facility on Hull Rd unlikely to have impact on mode share.
Public transport travel time compared to general vehicle travel time	2	P&R reduces private veh demand and improve travel time for both PT and private vehicle (0). Continuous bus lanes, plus bus queue jumps at key intersection to improve PT travel time (+2).	0	Minor grade separation (-1) which improves general vehicle travel time for Totara right turn. Four laning Totara improves general vehicle travel time (-1). Continuous bus lanes on Maunganui Rd/Hewletts Rd to improve PT travel time (+2).	1	Significant grade separation (0) which improves general vehicle travel time and bus travel time (little bit) on Hewletts. Four laning Totara improves general vehicle travel time (-1). Continuous bus lanes on Maunganui Rd/Hewletts Rd to improve PT travel time (+2)
Access to social and economic destinations by PT, walk and cycle	2	High quality continuous PT lanes, bus priority, and bus stop upgrades provide good and reliable PT access to **airport, Mauao, local employment areas, CBD/Hospital.** Good access via bi-directional cycle facilities for **local employment** and **schools**.	2	High quality continuous PT lanes, bus priority, and bus stop upgrades provide good and reliable PT access to **airport, Mauao, local employment areas, CBD/Hospital.** Minimal improvement to access by W&C.	2	High quality continuous PT lanes, bus priority, and bus stop upgrades provide good and reliable PT access to **airport, Mauao, local employment areas, CBD/Hospital.** Minimal improvement to access by W&C.
Ambient air quality and noise level	1	Pricing & improved PT is likely to result in reduced vehicle use therefore reducing noise and emissions	-1	The grade separated turn out of Totara Street will increase capacity at and near this intersection, which is likely to induce greater vehicle volumes. This will increase noise and emissions.	-1	The grade separated flyovers will increase capacity through the Hewletts Road corridor, which is likely to induce greater vehicle volumes. This will increase noise and emissions along the corridor and on other connecting roads.
Water quality						
CO_2 emissions (Mode shift from single occupancy private vehicle)	2	Significant improvement to PT, W&C, combined with behaviour change programme, PT incentives and parking pricing are likely to encourage mode shift, resulting in less private vehicle trips, therefore less emission.	0	Totara St widening/grade separation may improve travel times for local traffic therefore may introduce more private vehicle trips. This is countered by PT priority/CBD pricing/ PT incentives/behaviour change programme.	-1	Significant grade separation is likely to entice further private vehicle travel for both local trips and through trips, therefore increasing emissions. This is countered to some extent by PT priority/CBD pricing/ PT incentives/behaviour change programme.
Mode shift of freight from road to rail	0	The proposed improvements are unlikely to result in changes in traffic patterns for freight.	1	Rail loop may improve rail travel times but unlikely to result in significant changes	1	Rail loop may improve rail travel times but unlikely to result in significant changes.

Measure/ KPI	Option 8 Score	Option 8 Comments	Option 3a Score	Option 3a Comments	Option 9 Score	Option 9 Comments
People throughput	3	High capacity BRT system, with bi-directional cycle facilities on both sides of Hewletts Rd. Effective provided network wide linkage.	1	Increased throughput along Hewletts Rd corridor primarily general traffic, slightly countered by reallocation of general traffic lane to freight/HOV in off peak. Totara widening improves throughput minorly.	2	Continuous PT lanes on Hewletts and Maunganui Rd. Four lanes on Totara St will increase general traffic capacity through Totara St.
Travel time reliability for freight movements	0	Significant prioritisation of bus movements at intersections likely to reduce green time for freight movements at intersections. However this is mitigated by the reduction in general vehicle demand caused by mode shift from private vehicle to bus.	2	Pricing mechanisms and freight lanes will improve reliability in off-peak times. Intersection changes likely to improve reliability for through-SH2 movements likely to access port.	2	The reallocation of bus lanes to be bus/freight lanes in off peak, improved freight priority at intersection.
Travel time reliability for public transport	3	BRT likely to have greatest travel time reliability - can utilise signal pre-emption and green waves.	1	No change to bus lane arrangement - retain existing. Bus priority at key intersections has minor improvements to travel time reliability.	2	Continuous PT lanes on Hewletts and Maunganui Rd. However, freight sharing bus lanes in off peak. However throughput improvements at intersections may improve travel time reliability.
Freight throughput value	0	No impact expected.	0	Freight lanes in off peak times will increase potential total freight throughput. Mitigated by port gate pricing and rail timings management.	2	Freight lanes in off peak times on Hewletts Rd and four lanes on Totara St will increase potential total freight throughput.
Risk of death and serious injuries (collective risk)	2	BRT cross section likely to reduce vehicle speeds and vehicle volumes. Assumed to include safer walking and cycling facilities. Slightly increased exposure due to need for pedestrians to cross lanes to access stations.	1	Accesses restriction to LILO and removal of driveways reduces conflict points.	0	Streetscape rearrangements likely to involve speed reductions which reduces severity of crashes that occur and involve more separation of peds/cyclists from road. New residents exposed to traffic risk. Four laning Totara rd would increase traffic exposure risks. Overall scored neutrally.
Public transport mode share	3	Significant improvement to public transport (BRT and ferry), combined with parking pricing/PT incentives/behaviour change would lead to increased PT patronage and mode share. Likely to perform significantly better than TTSM DS scenario (PT mode share of > 3.7% in 2031).	1	Reducing the attractiveness of private travel through cordon/parking pricing is likely to increase PT patronage and mode share. PT incentive to improve PT share.	1	Mixed use developments is likely to reduce private vehicle use and long distance travel, decreasing share of private vehicle and hence increase PT mode share. Improvements to public transport, combined with parking pricing/PT incentives/behaviour change would lead to increased PT patronage and mode share. Likely to perform better compared to TTSM DS scenario (PT mode share of > 3.7% in 2031). However, four-lanning Totara likely to increase traffic, therefore decrease modeshare.
Walking and cycling mode share	2	Continuous high quality bi-directional cycle facilities is likely to increase W&C mode share. Bi-directional cycle facilities on both sides of Hewletts Rd. Minimal streetscape for pedestrian.	1	Reducing the attractiveness of private travel through cordon/parking pricing is likely to increase active travel and mode share.	2	Industrial retreat and mixed use developments is likely to reduce private vehicle use and long distance travel need. Combined with high quality W&C facilities with urban realm is likely to significantly increase active mode travel and hence mode share. However, slightly risk/uncertainty in realising this benefit. Likely to perform better than do-min.
Public transport travel time compared to general vehicle travel time	2	Fully separate BRT (+2) with bus signal pre-emption to improve bus travel time and reliability.	0	Pricing reduce private vehicle demand and improve travel time for both PT and private vehicle (0). Improved throughput on SH2 benefits both private vehicle and bus travel time.	1	Industrial retreat and mixed use developments is likely to reduce private vehicle use and long distance travel need, freeing up space for both PT and general traffic (0). Bus lanes on Maunganui (+1). Four laning Totara improves general vehicle travel time (-1).
Access to social and economic destinations by PT, walk and cycle	3	BRT provides fast and reliable access to **airport, Mauao, local employment areas, CBD/Hospital.** Ferry service provide access to **CBD and Mauao**. Good access via bi-directional cycle facilities for **local employment areas** and **schools**.	0	Very minor improvement in access local employment areas via bus and W&C.	2	Land use change will improve alternative mode access to work due to residential within close proximity to various destinations (**supermarket/work/schools**). Easy access to **Mauao** via active modes.High quality continuous PT lanes, bus priority, and bus stop upgrades provide good and reliable PT access to airport, Mauao, local employment areas, CBD/Hospital.
Ambient air quality and noise level	1	Pricing & improved PT is likely to result in reduced vehicle use therefore reducing emissions and noise levels	0	Increasing throughput on SH2 is likely to result in improved traffic flow through the corridor and induce greater vehicle volumes. Cordon/parking pricing to counter this effect.	0	Residential developments close to a busy road corridor introduces a sensitive receiver near a high volume road. This is likely to result in worse air quality for local residents. This is counter by pricing & improved PT is likely to result in reduced vehicle use therefore reducing noise and emissions. Therefore, overall neutral effects.
Water quality						
CO_2 emissions (Mode shift from single occupancy private vehicle)	2	Significant improvement to public transport (BRT and ferry), and W&C, combined with combined with behaviour change programme, PT incentives and parking pricing likely to have significant impact on mode shift, resulting in less private vehicle trips therefore less emission.	0	Increased vehicle trips will result in additional emissions. This is counter by pricing & PT incentives are likely to encourage mode shift and result in reduced vehicle trips.	1	Change in land use to mixed use development with self-contained communities likely to promote active mode travel, as need for long distance private vehicle travel is reduced, therefore reducing emissions. However, slightly risk/uncertainty in realising this benefit. Improvement to PT prioirty, with incentives likely to have positive impact on mode shift, resulting in less private vehicle trips therefore less emission. However, this is to come extent also counter by the four laning of Totara St.
Mode shift of freight from road to rail	0	The proposed improvements are unlikely to result in changes in traffic patterns for freight.	0	Pricing at port gates will increase freight costs on roads therefore may increase the attractiveness of rail for freight traffic. The proposed freight priority lanes may result in additional vehicle traffic for freight. Effect TBC.	1	Rail loop may improve rail travel times but unlikely to result in significant changes. Passenger rail may provide further opportunities for frieght rail.

          

Option	Description	
Do Minimum	Hewletts Rd, Totara St, Maunganui Rd shared paths, B2B, PC33, PT network improvements, SH2 shared paths.	
Option 1 - Land Use and local network change led	Option 1 is led by **land use and local network changes**, supported by freight priority, walking, cycling and public transport interventions to improve transport options and route choice. This is intended to improve reliability, throughput of people and goods on Hewletts Road and mode share through encouraging a more self-contained trip pattern with less reliance on Hewletts Rd freeing up space for trips than need to use it.	Option image
Option 2 - Pricing and Road Space Reallocation to support movement of people & goods	Option 2 tests the effectiveness of using **pricing signals** for all modes to influence choices, supported by a range of physical and operational measures to enable changes in time and mode choice for people and goods. The intent is to use the existing road space (with some augmentation) more effectively by prioritising users by time of day and enabling greater use of higher productivity modes for people, leaving more space for trips that cannot re-mode like freight.	Option image
Option 3 - Hewletts Rd limited access to improve SH2 throughput	Option 3 is designed to test the potential for **prioritising throughput**, by rationalising access points to and from Hewletts Rd to improve reliability and throughput of people and goods. About 37% of the entire state highway network are limited-access roads. Recognising the role of SH2/Hewletts Rd as a major connector, reinforcing the road hierarchy by prioritising throughput and reducing side friction and conflicting movements.	Option image
Option 4 - Dynamic road allocation	Option 4 aims to achieve the outcomes sought by creating physical space and capacity for different modes at different times of the day. This could address the tidal fluctuation in demand and help get more out of the existing road space through **dynamic prioritisation** and capacity allocation mechanisms.	Option image
Option 5 - Freight, public transport, W&C improvements	Option 5 is led by significant **freight, walking and cycling, and public transport** improvements. This is supported by pricing, streetscape and behaviour change programmes to drive mode change for commuters to open up road capacity for essential users like trucks.	Option image
Option 6 - Grade separation of Totara St and supporting network changes	This option tests the **grade separation of the right turn from Totara St into Hewletts Road** and widening of Totara St to enable more throughput and a lane-gain for the left turn from Hewletts into Totara. This is intended to resolve the significant queues and delays to freight and traffic caused by the Totara St intersection. The option includes a range of supporting measures to improve route throughput including local network changes and significant public transport and walk/cycle provision.	Option image
Option 7 - Grade separation of Totara St and Jean Batten Dr	Option 7 **grade separate the through movement on Hewletts Rd at Totara Rd/Hewletts Rd and Jean Batten Dr/ Hewletts Rd** intersections along with consequential local network changes. Strategically, this option considers that SH2 on either side of Hewletts Rd is largely grade separated and brings Hewletts Road to a similar level. The intent is to improve throughput and route productivity through the two grade separations and significant investment in public transport, walking and cycling facilities.	Option image
Option 8 - BRT and ferry	This option tests the potential for **maximising the public transport** potential of the corridor. This includes a ferry from Mt Maunganui and a separated BRT-style bus corridor (modelling on the Eastern Busway in Auckland) on Hewletts Rd as means of maximising throughput of people and freeing road space for increasing reliability and throughput for freight. Overall, this option creates the highest people throughput capacity of all of the options.	Option image
Option 3a - Hewletts Rd limited access and pricing	Option 3a is designed to test the combined effects of limited access elements from Option 3, and pricing signals from Option 2.	
Option 9 - Ngāi Tukairangi Hapū Option	Option 9 a is a bespoke option via a combination of various interventions included in the 8 CMM IBC Long List Options Ngāi Tukairangi hapū are comfortable supporting. It is about balancing transport outcomes, improving environmental outcomes, and significant land use changes to support tāngata whenua outcomes.	

Technical/ Feasibility Assessment			Assessment Summary	Do Minimum Score	Do Minimum Comments	Option 1 Score	Option 1 Comments
Feasibility	Constructability/Implementability	Assessment of Constructability / complexity of facility including stormwater infrastructure	Specialist assessment (including consideration of land contamination)	0	Baseline Scoring	-3	TCC can action this on a land use planning level, but implementing the land use change relies on private developers to deliver.
Consenting & property impacts	Planning and Consenting	Likelihood of obtaining approval and Qualitative assessment of impacts on property	Specialist assessment	0	Baseline Scoring	-3	The land use change would require a highly complex consenting process using the assessment methodology. Generally the proposed improvements are located within existing road corridors. Minor consents may be required for matters such as flooding and earthworks.
Cost	CAPEX	High level $ estimate of capital costs of physical works and affordability	High level assessment	0	Baseline Scoring	-1	Below $150m - main cost item is streetscape
	Operating Cost/ Efficiency	Assessment of operational costs including infrastructure maintenance	High level assessment	0	Baseline Scoring	-1	Below $3.75m annually
Value for Money	High-level assessment of value for money		High level assessment	0	Baseline Scoring	1	BCR in Low/Very Low range
Meeting customer needs	Qualitative assessment of the options against the specific customer needs and pain points			0	Baseline Scoring	2	Mixed use land uses means customers (**commuters, shift workers, students, sports facilities attendees, leisure/ recreational**) have alternative modes (W&C) to travel to work/education/events/leisure. Regional travellers less likely to be caught in congestion due to self-contained living. Industrial retreat and streetscape benefit for **Whareroa Marae.** Freight/trade/servicing have alternative Newton Rd and local network increasing reliability.
Climate Change Mitigation (Mandatory)	Assessment of mode shift and traffic reduction, VKT, land use		Qualitative assessment	Assessed as per Investment Objective above			
Alignment with Whareroa Marae's Strategy	The extent to which the option complements Whareroa Marae's strategy for future land use			0	Baseline Scoring	2	Significant alignment to Whareroa Marae's strategy - "Hapu support city plan changes as an opportunity to repurpose/change existing heavy polluting industrial land uses, particularly surrounding Whareroa Marae, to a mix of residential, commercial, active and passive greenspaces. "
Impacts on Te Ao Māori (Mandatory)	Assessment of impact on Te Ao Māori including areas of significance for Māori, Māori land and Kaitiakitanga.		Qualitative assessment	0	Baseline Scoring	2	Ngāi Tukairangi supports change from heavy polluting industrial predominant land use to residential, commercial and greenspace, combined with streetscaping,walking/cycling and PT infrastructure. Oppose rationalisation of access and parking maximums

Technical/ Feasibility Assessment	Option 2 Score	Option 2 Comments	Option 3 Score	Option 3 Comments	Option 4 Score	Option 4 Comments
Feasibility	-1	Major construction works but nothing unusual. Widespread traffic management across multiple roads. Reallocation of existing carriageway to enable demand management. ITS/VMS infrastructure required, along with W&C improvements.	-1	Major construction works but nothing unusual. Traffic management focused on Hewletts Rd & local roads. Infrastructure improvements limited to managed motorway, intersection improvements reallocation of carriageway space for priority lanes and W&C improvements.	-2	This work has been done before but is not common. Widespread traffic management across multiple areas. SH and local roading upgrades, plus rail improvements within the Port (multiple stakeholders). PT & W&C improvements.
Consenting & property impacts	-1	All improvements are within the existing corridors. Minor consents are likely to be required. Cordon pricing may require camera gantries to be constructed	-2	Majority of improvements are within existing corridors, however the extensive new local links may require a higher level of consenting than those proposed within option 2. Local links likely to require land acquisition.	-1	All improvements are within the existing corridors. Minor consents are likely to be required
CAPEX	-1	Below $150m - main cost item is new local road connections	-1	Below $150m - main cost item is new local road grid	-1	Below $150m - main cost item is new local roads and dynamic lane infrastructure
Operating Cost/ Efficiency	-1	Below $3.75m annually	-1	Below $3.75m annually	-1	Below $3.75m annually
Value for Money	1	BCR in Low/Very Low range	0	BCR in Very Low range	1	BCR in Low/Very Low range
Meeting customer needs	1	Freight lanes/intersection priority provides reliability for **freight trips**. Pricing at port may restrict certain freight movements. Parking pricing/CBD pricing reduces/disbenefits private vehicle trips, but encourage alternative choice. Minor improvements to PT and W&C for customers (commuter, shift workers, students, sport events attendees, recreational). Manage rail timings to reduce conflict with vehicles to improve safety. VMS to advise **regional travellers.**	1	Local links and freight priority lanes improves **freight, trade/servicing** reliability. Minor improvements to PT and W&C for customers (commuter, shift workers, students, sport events attendees, recreational). Improve safety for all by removing conflict with turning movements with side roads/driveways. VMS to advise **regional travellers.**	2	Dynamic lanes provide increased capacity for customers (**commuters/student/trade servicing) in peak periods.** Event based management provides for **sport events/recreational customers.** Local links provide for trade/servicing. Pricing at port may restrict certain freight movements. Minor improvements to PT and W&C for customers (commuter, shift workers, students, sport events attendees, recreational).
Climate Change Mitigation (Mandatory)						
Alignment with Whareroa Marae's Strategy	-1	Does not align with Whareroa Marae's strategy of industry retreat.	-1	Does not align with Whareroa Marae's strategy of industry retreat.	-1	Does not align with Whareroa Marae's strategy of industry retreat.
Impacts on Te Ao Māori (Mandatory)	1	Ngāi Tukairangi supports improvements to public transport, new walking/cycling connection, local connections and rail timing. However, hapu does not support various cordon /port gate pricing mechanisms.	1	Ngāi Tukairangi supports signalisation of intersection, freight lane, bus priority upgrades, managed motorway and cycle improvements. However, Hapu opposes significant new local links due to acquisition, and rationalisation of access.	2	Ngāi Tukairangi supports dynamic lane on Hewletts, freight using bus lanes in off peak, bus stop upgrades, service lanes and local road network organisation, cycle improvements. However, Hapu opposes HO lanes and port gate pricing.

Technical/ Feasibility Assessment	Option 5 Score	Option 5 Comments	Option 6 Score	Option 6 Comments	Option 7 Score	Option 7 Comments
Feasibility	-1	Moderate construction works. Less disruptive traffic management across spine roads only. Infrastructure improvements limited to streetscape, reallocation of carriageway space for PT and W&C improvements.	-2	Major construction works but nothing unusual. Traffic management focused on Hewletts Rd & Totara Street. Infrastructure improvements include grade separation of one intersection and widening of Totara St which will be disruptive. PT and W&C improvements.	-2	Major construction works but nothing unusual. Concentrated upgrade of rail, SH, local roads and port. Traffic management and disruption. Multiple grade separation along Hewletts Rd. PT & W&C improvements.
Consenting & property impacts	-1	All improvements are within the existing corridors. Minor consents are likely to be required. PnR may require consenting	-3	Highly complex consenting process likely given grade separated interchange proposed, and four laning of Totara Street. Land acquisition likely around four laning of Totara St, rail connection and crossings, and grade separated infrastructure	-3	Highly complex consenting process likely given grade separated interchanges proposed, and four laning of Totara Street. This option presents more consenting risk compared to Option 6. Land acquisition likely around four laning of Totara St, rail connection and crossings, and grade separated infrastructure
CAPEX	-1	Below $150m - most expensive components likely to be streetscape improvements, bus stop improvements, park and ride and new local roads	-2	Between $150m and $300m - most expensive components are the grade separated flyover approx. $60m and completed rail loop at approx. $50m	-3	Between $300m and $600m - includes 2 grade separated rail crossings and two flyovers
Operating Cost/ Efficiency	-1	Below $3.75m annually	-2	Between $3.75m and $7.5m annually	-3	Between $7.5m and $15m annually
Value for Money	1	BCR in Low/Very Low range	1	BCR in Low/Very Low range	0	BCR in Very Low range
Meeting customer needs	3	Significant alternative choices both PT and W&C provided for customers (**commuter, shift worker, leisure/recreational, students**). Streetscaping provides for **Whareroa Marae**. Freight priority provision off peak. VMS to advise **regional travellers**.	3	Grade separation of Totara right turn , and four laning Totara St benefits **freight, trade/servicing, commuter, shift worker** from Mount via private travel. Significant alternative choices both PT and W&C provided for customers (**commuter, shift worker, leisure/recreational, students**). VMS to advise **regional travellers.**	3	Grade separation of Hewletts, and four laning Totara benefits **freight, trade/servicing, commuter, shift worker** from Eastern BOP, and Mount communities via private travel. Significant alternative choices both PT and W&C provided for customers (**commuter, shift worker, leisure/recreational, students**). VMS to advise **regional travellers.**
Climate Change Mitigation (Mandatory)						
Alignment with Whareroa Marae's Strategy	-1	Does not align with Whareroa Marae's strategy of industry retreat.	-1	Does not align with Whareroa Marae's strategy of industry retreat.	-1	Does not align with Whareroa Marae's strategy of industry retreat.
Impacts on Te Ao Māori (Mandatory)	1	Ngāi Tukairangi supports public transport, walking/cycling improvements, widening Totara St, local road network organsation, streetscpae improvements. However, Hapu opposes removal of parking and parking pricing.	-1	Ngāi Tukairangi supports public transport, walking/cycling improvements, widening Totara St, local road network organisation, behaviour change, PT fare incentive. However, Ngāi Tukairangi opposes parking pricing, grade separation, rationalisation of access, and grade separation. Ngāi Kuku are opposed to grade seperation of any form. Ngāi Tukairangi are supportive of grade separation on the basis that a full CBA has been carried out to demonstrate the value	-2	Ngāi Tukairangi supports public transport, walking/cycling improvements, widening Totara St. However, Ngāi Tukairangi opposes parking pricing, grade separation, rationalise local access. Ngāi Kuku are opposed to grade seperation of any form. Ngāi Tukairangi are supportive of grade separation on the basis that a full CBA has been carried out to demonstrate the value.

Technical/ Feasibility Assessment	Option 8 Score	Option 8 Comments	Option 3a Score	Option 3a Comments	Option 9 Score	Option 9 Comments
Feasibility	-2	Major construction works but nothing unusual. Concentrated major inclusion of a new passenger ferry service, bus layover at airport and BRT. Disruptive traffic management across spine roads. PT and W&C improvements.	-1	Major construction works but nothing unusual. Widespread traffic management across multiple roads. Infrastructure improvements limited to managed motorway, intersection improvements reallocation of carriageway space for priority lanes and W&C improvements. Reallocation of existing carriageway to enable demand management.	-3	TCC can action this on a land use planning level, but implementing the land use change relies on private developers to deliver.
Consenting & property impacts	-3	Significant designation required for localised widening around stations. Requires property acquisition along Maunganui Rd and around stations on Hewletts Rd	-1	All improvements are within the existing corridors. Minor consents are likely to be required. Minimal local links. Cordon pricing may require camera gantries to be constructed	-3	The land use change would require a highly complex consenting process using the assessment methodology. Generally the proposed improvements are located within existing road corridors. Minor consents may be required for matters such as flooding and earthworks.
CAPEX	-3	$300 - $600m includes BRT system and stations, and wharf upgrades	-1	Below $150m - main cost item is new local road connections	-2	Between $150m and $300m - most expensive components are street scaping, park and rides, new local roads, and completed rail loop at approx. $50m
Operating Cost/ Efficiency	-2	Between $7.5m and $15m annually - notable opex item operating ferry service	-1	Below $3.75m annually	-1	Below $3.75m annually
Value for Money	0	BCR in Very Low range	1	BCR in Low/Very Low range	1	BCR in Low/Very Low range
Meeting customer needs	2	Significant alternative choices both PT (bus and ferry) and W&C provided for customers (**commuter, shift worker, leisure/recreational (incl airport), students**). Freight priority off-peak for **freight** reliability.	1	Freight lanes/intersection priority provides reliability for **freight trips**. Pricing at port may restrict certain freight movements. Parking pricing/CBD pricing reduces/disbenefits private vehicle trips, but encourage alternative choice. Minor improvements to PT and W&C for customers (commuter, shift workers, students, sport events attendees, recreational). Manage rail timings to reduce conflict with vehicles to improve safety. VMS to advise **regional travellers.**	3	Significant alternative choices both PT and W&C provided for customers (**commuter, shift worker, leisure/recreational, students**). Streetscaping provides for **Whareroa Marae**. Freight priority provision off peak. VMS to advise **regional travellers**.
Climate Change Mitigation (Mandatory)						
Alignment with Whareroa Marae's Strategy	-1	Does not align with Whareroa Marae's strategy of industry retreat.	-1	Does not align with Whareroa Marae's strategy of industry retreat.	2	Significant alignment with Whareroa Marae's strategy - "Hapu support city plan changes as an opportunity to repurpose/change existing heavy polluting industrial land uses, particularly surrounding Whareroa Marae, to a mix of residential, commercial, active and passive greenspaces. "
Impacts on Te Ao Māori (Mandatory)	2	Ngāi Tukairangi supports BRT, cycling improvements, land use change around BRT, ferry service and P&R. However, Ngāi Tukairangi opposes removal of parking, and cordon/parking pricing.	1	Ngāi Tukairangi supports signal optimisation, upgrade of bus stops, cycle improvements, local network organisation, widening Totara. However, Ngāi Tukairangi opposes intersection signalisation, rationalisation of access, port/parking pricing.	3	Ngāi Tukairangi supports city plan changes as an opportunity to repurpose/change existing heavy polluting industrial land uses, particularly surrounding Whareroa Marae, to a mix of residential, commercial, active and passive greenspaces. Support all other interventions as they promote te taiao benefits particularly to rangi (air quality) and te mana o te wai (water quality).

Connecting Mount Maunganui Indicative Business Case

Long List Options Development and Assessment Report

Contract No 5909

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Table of abbreviations

Abbreviation	Name
BCR	Benefit cost ratio
BOPRC	Bay of Plenty Regional Council
BRT	Bus rapid transit
CAPEX	Capital Expenditure
DBC	Detailed Business Case
ERP	Emissions Reduction Plan
GPS	Government Policy Statement on land transport
HOV	High Occupancy Vehicle
IBC	Indicative Business Case
IER	Indicative Efficiency Rating
ILM	Investment Logic Map
MCA	Multi-Criteria Analysis
NLTP	National Land Transport Programme
OPEX	Operational expenditure
P&R	Park and Ride
PT	Public transport
TCC	Tauranga City Council
TSP	Transport System Plan
UFTI	Urban Form and Transport Initiative
VKT	Vehicle kilometres travelled
VMS	Variable Messaging Signage

1 Introduction

1.1 Background

The project area covers the Mount Maunganui transport system including SH2 / Hewletts Rd and the wider local road network to the north and south of SH2 / Hewletts Rd (including, amongst others, Maunganui Rd, Hull Rd, Totara St, Jean Batten Drive, and Aerodrome Rd). Within the transport system, State Highway 2 (SH2) / Hewletts Rd is a nationally strategic corridor, with multiple and competing functions. Collectively, the transport system in the project area provides access to:

- Mount Maunganui, Pāpāmoa, and eastern communities within Western Bay of Plenty (WBOP).
- Several community facilities such as Mauao, beaches and sport and recreational facilities.
- Provides freight access to the Mount Maunganui side of the Port of Tauranga and the Mount Maunganui industrial area.
- Access to the Whareroa Marae and
- Access to the Tauranga airport.

With significant traffic volumes using SH2 / Hewlett Rd and further growth expected in the eastern corridor, it is now critical that a suite of interventions be identified to support a reliable and improved multi-modal journey experience that maintains the effective operation of SH2 / Hewlett Rd, and the wider WBOP transport system, now and into the future (2048). This IBC considers the future to be a minimum of 30 years (2053).

The project scope is to prepare and deliver an IBC identifying a recommended package of interventions for the Mount Maunganui transport system which addresses the identified problems, delivers on the desired transport outcomes and helps deliver elements of the UFTI Connected Centres Programme.

1.2 Purpose of this Report

The project partners are seeking to confirm the recommended option for a range of interventions in the vicinity of the SH2 / Hewletts Rd sub area, outlined in Figure 1-1.

This report outlines the longlist options development and assessment undertaken to respond to the problems and investment objectives identified for SH2 / Hewletts Rd Indicative Business Case (IBC). A set of longlist options for change were developed and assessed to determine their ability to contribute to achieving the objectives and the outcomes sought.

Figure 1-1: Geographical Scope of the Hewletts Rd IBC

1.3 Optioneering Approach

The assessment methodology for this project entails a four-stage process including a two-stage longlist assessment process, followed by a shortlist assessment to confirm the recommended option.

The approach is illustrated in Figure 1-2 and was presented and agreed with Waka Kotahi, Tauranga City Council (TCC), Bay of Plenty Regional Council (BOPRC) on 26 July 2022.

Further detail is provided below. This report covers the second stage of the assessment process.

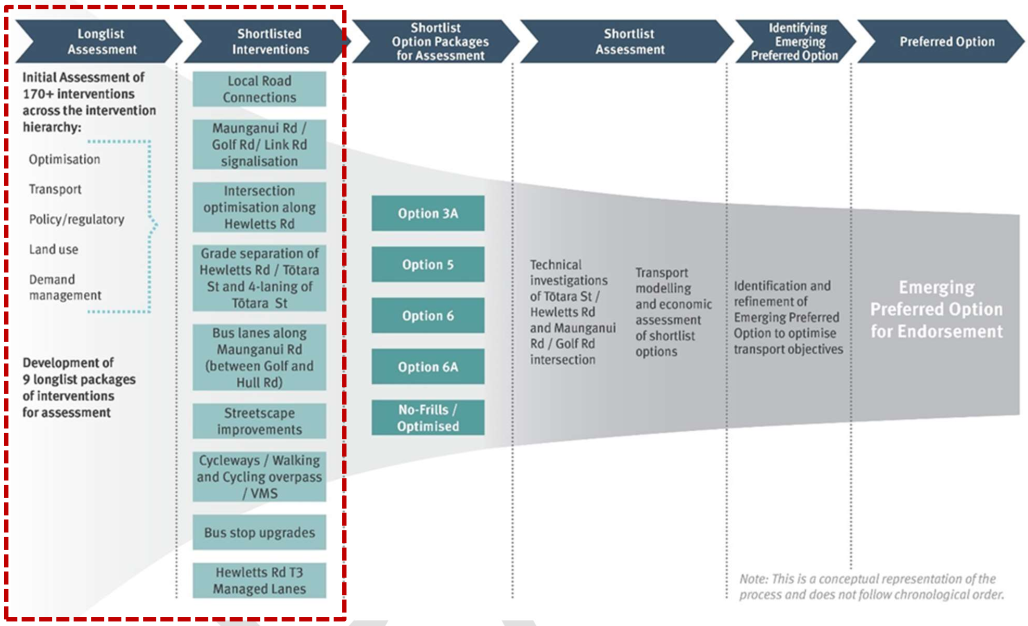

Figure 1-2: Overall Assessment Approach

The assessment methodology has been developed to allow for the following components as shown below.

1. Longlist Sieving

- Define the 'do-minimum' based on funded / committed projects (see Section 2.2 for details).
- Sieving processes in parallel:
  - **Strategic Options Sieve:** High-level sieving of skeleton options, focused on the strategic alignment of each option, to ensure options would not contradict the outcomes and direction established by the Urban Form and Transport Initiative (UFTI), the Transport System Plan (TSP) and other strategic policy documents such as the Government Policy Statement on land transport (GPS) and Emissions Reduction Plan (ERP) documents.
  - **Feasible Interventions Sieve**: High-level sieving of detailed and specific interventions, focused on the feasibility and achievability of each intervention, to ensure options which have fatal flaws can be excluded from the process early. This is designed to ensure we have a focused set of interventions to analyse at the later stages.

2. Longlist Assessment

- Develop up to 8 options based on the options with greatest strategic alignment, incorporating feasible interventions.

A qualitative MCA assessment was undertaken on these options, including a high-level assessment using Waka Kotahi's Indicative Efficiency Rating (IER) tool.

3. Shortlist Assessment

- Develop up to 4 options, based on best performing longlist options. These options will be fully developed with extensive suite of interventions.

A quantitative MCA assessment will be undertaken on these options, using more defined and enhanced measures using modelling, economic, and transport analysis tools to help determine the quantum of benefits possible.

4. Recommended Option

- Develop a recommended option consisting of a package of interventions, based on best performing shortlist options.
- Include specific timing and sequencing for the identified interventions.
- Undertake financial, commercial and delivery analysis to support the IBC.

The recommended option will be investigated further in the Detailed Business Case (DBC). The recommended package is likely to be made up of multiple interventions across the transport system and could include land use, regulatory and policy recommendations.

2 Longlist Option Development

This section provides a description of the process for developing and assessing the longlist options as detailed in Figure 2-1 below.

It details the eight longlist options developed for assessment against the agreed MCA framework.

A do-minimum option scenario was also included as a reference case.

2.1 Longlist Options Development and Assessment Approach

The approach followed for developing and assessing the longlist options is detailed below and summarised in Figure 2-1.

1. Initial Sieve → 2. Long List Option Development Workshop → 3. Long list Option Assessment → 4. Long List MCA Workshop

Figure 2-1: Approach to Longlist Options Assessment

The Initial Sieve comprised the Strategic Options Sieve and the Intervention Feasibility Sieve. The Strategic Options Sieve was carried out to remove any strategic options which poorly aligned with the outcomes and direction established by the UFTI, TSP and other strategic policy documents such as the GPS and the ERP.

The Intervention Feasibility Sieve was carried out to ensure options which have obvious flaws can be excluded from the process early. A total of 165 interventions were considered through this process. The details and the outcomes of this initial sieve can be found in the Initial Sieving Assessment Note (4 October 2022).

The Initial Sieving and Longlist Development Workshop was held with project partners on 24th August 2022 to present and discuss initial sieve results and develop the initial eight longlist options.

The initial eight longlist options were then further developed and refined by the project team, taking onboard feedback received from the project partners.

Ahead of the formal Longlist MCA workshop, one-to-one meetings were held with each of the Project Partners to discuss the eight options assessed, run through the assessment approach and take on board any initial feedback.

The Longlist MCA workshop was held with project partners on 23rd September 2022. Initial assessments were completed by the consultant team prior to the workshop and the findings were summarised. The MCA assessment can be found in Appendix A and minutes of the meeting can be found in Appendix B.

An additional longlist option (Option 3a) was introduced following feedback from Project Partners at the Longlist MCA workshop and was taken through the assessment process to determine whether it warranted proceeding to the shortlist stage.

Waka Kotahi engaged with both hapū, Ngāi Tukairangi and Ngāti Kuku, to understand which proposed options/interventions aligned with a te ao Māori perspective. Both hapū have provided the team with a list of cultural considerations. Ngāi Tukairangi hapū reviewed the eight different long list options and from this, developed a ninth option, made up of elements of the various eight options. This option was required to address the investment criteria and was assessed through the optioneering process.

Although not shown in the longlist options, interventions to the Marina Access intersection are being investigated and may be included into the options going forward.

2.2 Do-Minimum

A do-minimum baseline option was developed to include ‘committed’ projects in the vicinity of the project area. Project partners have each contributed to this list. It is assumed the interventions below are considered to be in all options, outlined in subsequent sections.

The do-minimum is shown in Figure 2-2 and includes the following interventions, with a discussion on why they are considered part of the do minimum option.

Do Minimum Project	Discussion
Totara St Safety Upgrades: Off-road shared path / cycle path with signalised crossings on side roads	To address safety issues arising from the conflicts between on street cyclists and trucks moving through the area, TCC are construction and off-road shared path. The project is under construction and due to be completed in early 2023[1]. This project is expected to provide some safety benefits for pedestrians and cyclists moving through the study area.
Maunganui Rd Safety Improvements: Off-road shared path and crossing improvements	TCC are upgrading Maunganui Rd with intersection upgrades, formalised parking spaces, improved pedestrian crossing points and 3m wide shared paths. The project is under construction and scheduled for completion in 2024[2]. This project is expected to provide some safety benefits for pedestrians and cyclists moving through the study area.
Hewletts Rd Shared Path: Widening of the footpath on the northern side of Hewletts Rd from Totara St to Aerodrome Rd	Waka Kotahi is proceeding to widen the existing footpath on the northern side of Hewletts Rd (between Totara St and Aerodrome Rd) to become a shared path. This involves approximately 0.5m of berm space being paved with concrete. This project is expected to provide some safety benefits for pedestrians and cyclists moving Hewletts Rd.
Cameron Rd Upgrades[3]: Improved public transport and active mode facilities along Cameron Rd	TCC are currently constructing upgrades along Cameron Rd, including improved public transport priority and active mode facilities.
Baypark to Bayfair Link: A new SH2/SH29A interchange, a new flyover taking SH2 traffic over the Bayfair roundabout, and improved walking and cycling connections	Waka Kotahi are grade separating the State Highway 2 corridor through the Bayfair area to separate local traffic from the State Highway. The project is under construction currently with a completion date of December 2023[4]. The completion of this project may increase the flow of vehicles into the Hewletts Rd corridor from the southeast.

[1] https://www.tauranga.govt.nz/exploring/transportation-and-roads/transportation-projects/totara-street-safety-upgrade
[2] https://www.tauranga.govt.nz/exploring/transportation-and-roads/transportation-projects/maunganui-road-safety-improvements
[3] Note that Cameron Rd Stage 2 and TCC cycleway project are funded but not construction committed.
[4] https://www.nzta.govt.nz/projects/baypark-to-bayfair-link/

Do Minimum Project	Discussion
Public transport network changes: Increased bus frequency along Hewletts Rd and Maunganui Rd with no bus services on Totara St. Importantly, this project is not committed but is expected to be delivered by others and considered to be in all options.	BOPRC have proposed an upgraded bus network service, which will include increased bus frequency along Hewletts Rd and Maunganui Rd and the removal of existing bus services on Totara St. The planned frequency on Hewletts Rd is 31 buses per hour. These public transport network changes represent a significant increase in the planned bus volumes through the study area.
The Wednesday Challenge Ferry: Trial ferry service between Mt Maunganui and CBD on Wednesdays	There is a trial ferry service between Mt Maunganui and CBD on Wednesdays as part of the Wednesday Challenge initiative to provide people with different and more sustainable options to travel around.

Figure 2-2: Do-minimum for the SH2 / Hewletts Rd IBC

2.3 Option 1 – Land use and local network change led

Option 1 is led by land use and local network changes, supported by freight priority, walking, cycling and public transport interventions to improve transport options and route choice.

The intent is to reduce reliance on Hewletts Rd for local trips and enable a reduced need to travel out of the area through mixed land use developments. This is intended to improve reliability, throughput of people and goods on Hewletts Rd and mode share through encouraging a more self-contained trip pattern with less reliance on Hewletts Rd freeing up space for trips that need to use it.

The land use change assumes industrial retreat from the Mount industrial area and higher density in Mount Maunganui residential areas.

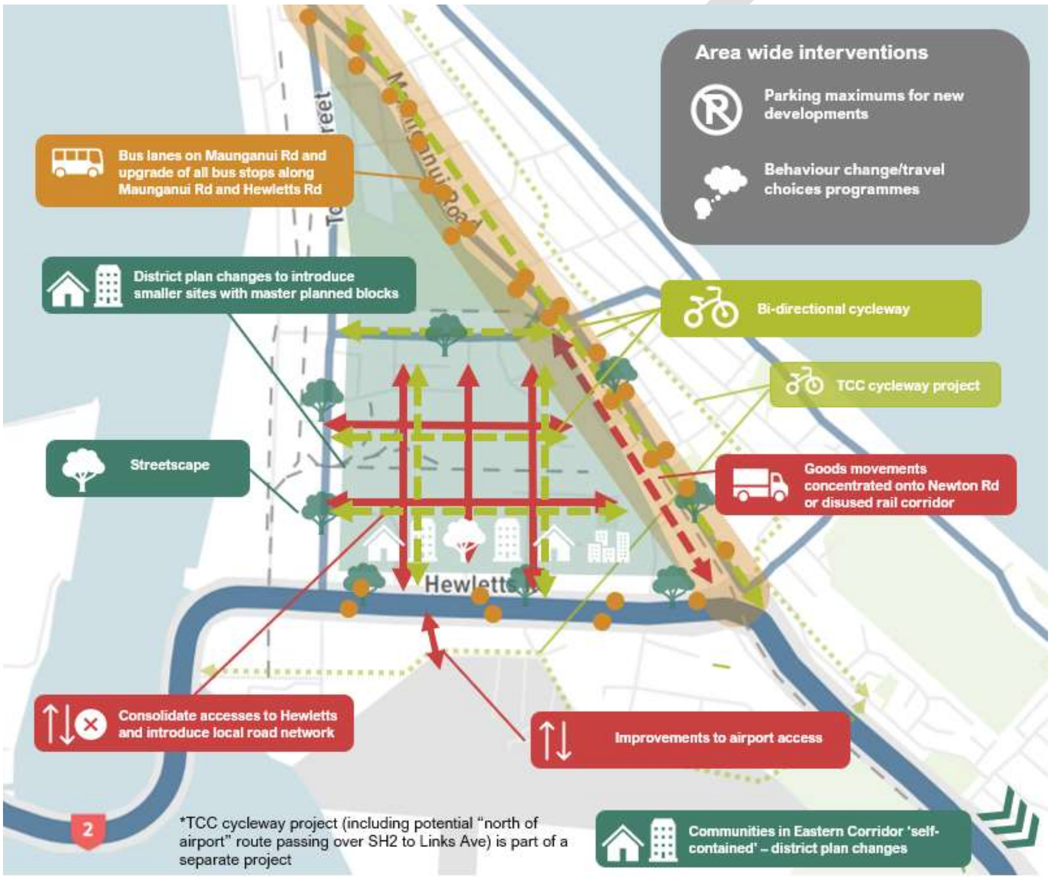

Figure 2-3: Option 1 - Land use and local network change led

Option 1, as shown in Figure 2-3, includes the following interventions:

- District plan changes to enable mixed use with master planned blocks and local networks.
- Streetscape improvements along Hewletts Rd, Totara St, Hull Rd and Maunganui Rd to include high quality paving, benches, bins and landscaping.
- Consolidate access to Hewletts Rd to improve throughput and reliability and introduce a grid of local streets and alleyways throughout the master planned area(s), which is assumed to be privately developed with land use change. It is assumed that there are two connections from the master planned area to each of Hewletts Rd and Totara St.

- Improvements to airport access, via assumed new link from Hewletts to improve permeability to the Airport.
- Signage and industry communication to support Newton Rd (or parallel rail corridor) as a strategic route for the movement of goods to remove local industrial traffic from SH2 and improve journey times for the movement of goods for local trips.
- Parking maximums for new developments in local area to support mode shift and controlled on street parking.
- Behaviour change / travel choices programme to support mode shift.
- Bus lanes on Maunganui Rd and bus stop upgrades along Hewletts Rd and Maunganui Rd (21 to be major stops and 7 to be minor stops).
- High quality walking and cycling connections to city centre and Mauao (cycle paths along Maunganui, Hull Rd and throughout the master planned area(s)) and improve connections to planned cycleways.
- District plans for communities in Eastern Corridor to be 'self-contained' to reduce demand for travel on Hewletts Rd.

Table 2-1 below shows how the option aims to achieve the investment objectives.

Table 2-1: Option 1 alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Improve throughput and reliability on Hewletts Rd and local permeability by removing local circulation traffic to a better-connected local network and encourage route-choice for goods onto a goods-prioritised Newton Rd (or parallel corridor). Option 1 aims to improve access to the airport and by introducing a new link.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Encourage shorter, healthier, more efficient local journeys via mixed-use developments with streetscape and improved public transport / walking and cycling that minimises the need to use private vehicles.
Provide better mode choice options and increase public transport and active travel mode share	Mixed-use developments would allow social and economic opportunities to be in close proximity to residential, and the area is serviced by improved public transport and walking and cycling.
Reduce the transport related effects on water, air quality and noise	Reduce transport effects by reducing the total volumes of vehicle traffic via mixed-use developments. By creating local networks off the highway, this option aims to improve air quality for people on the street.
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Reduce emissions via mixed-use developments with social and economic opportunities in close proximity to residential, reducing trip lengths and the need to travel by car. Behaviour change programmes and parking maximums aim to encourage uptake of low-emission transport options.

2.4 Option 2 – Pricing and road space reallocation

Option 2 tests the effectiveness of using pricing schemes for all modes to influence choices, supported by a range of physical and operational measures to enable changes in time and mode choice for people and goods. The intent is to use the existing road space (with some augmentation) more effectively by prioritising users by time of day and enabling greater use of higher productivity modes for people, leaving more space for trips that cannot re-mode like freight.

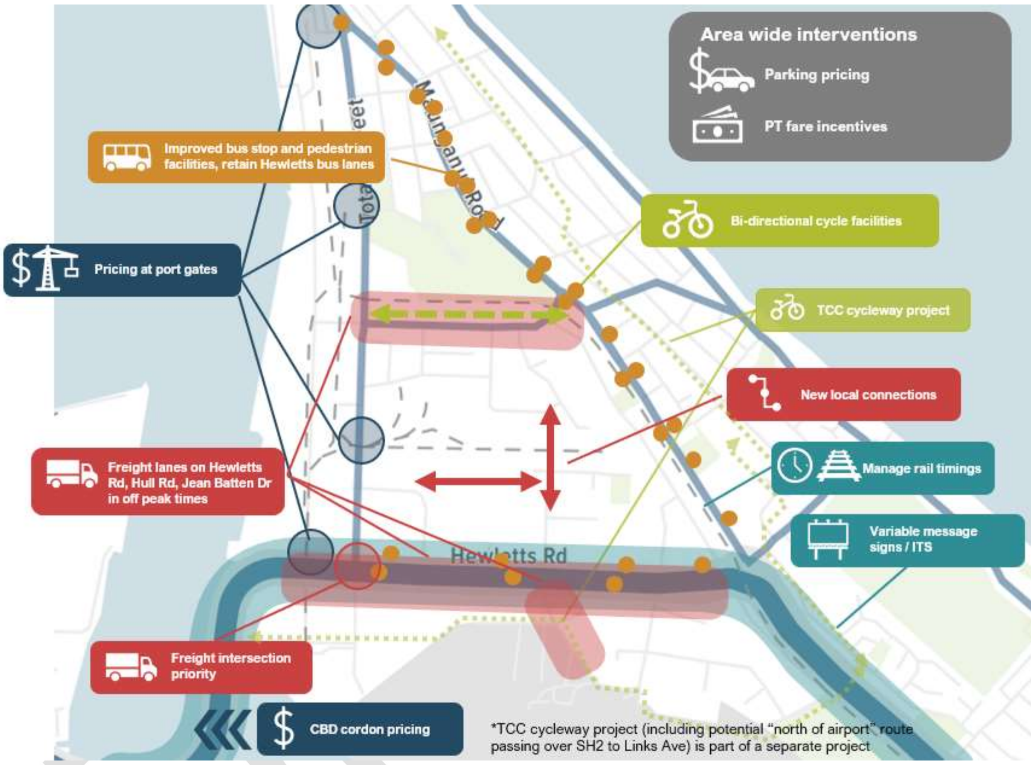

Figure 2-4: Option 2 - Pricing and road space reallocation

Option 2 includes the following interventions:

- Variable CBD cordon pricing to support mode shift. Note, this is to be aligned with the Waka Kotahi/TCC Dynamic Rd Pricing Study[5].
- Variable port gate pricing to provide a greater time of day price differential to encourage off-peak use.
- Freight priority comprises of general traffic lanes reallocated to freight in off-peak times on Jean Batten Dr, Hull Rd and Hewletts Rd and improved freight priority at Totara St/Hewletts Rd intersection. This would involve minor pavement widening and signalised intersection upgrades, signage and markings.
- Public transport fare incentive e.g. reduced fares, transfer discounts, loyalty discounts, capped fees.
- Parking pricing in CBD and the Mount to support mode shift.
- Bus stop upgrades along Hewletts Rd and Maunganui Rd (7 to be major stops and 21 to be minor stops). Retain bus lanes on Hewletts Rd.
- Bi-directional cycle path on Hull Rd to connect to Totara St off-road shared path.

[5] TCC's Dynamic Rd Pricing Study is currently underway.

- New local connections from Portside Dr to Te Maire St and Waimarie St to Maru St to improve local circulation and permeability.
- Variable Messaging Signage (VMS) to inform of alternative routes, congestion levels and influence travel behaviour and improve efficiency. This includes three overhead gantries along SH2.
- Rail timing management to mitigate road network impact of rail movements at level crossings during peak times.

Table 2-2 below shows how the option aims to achieve the investment objectives.

Table 2-2: Option 2 alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Improve all-day throughput or productivity and reliability on Hewletts Rd for all modes via combining pricing and supporting improvements to influence mode choice for commuters and time of day choice for freight. Rail timing management aims to reduce conflict at times of high demand.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Encourage healthy, active and multi-modal journeys by providing improved walking and cycling connections and public transport facilities. Pricing and charges aim to encourage up-take of these options.
Provide better mode choice options and increase public transport and active travel mode share	Provide better mode choice through improved public transport and active mode facilities. The take-up of these modes at times of high demand are encouraged via CBD cordon pricing, parking charges, public transport fare incentives.
Reduce the transport related effects on water, air quality and noise	Protect sensitive users from poor air quality through the provision of separated cycle facilities.
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	The provision of improved active and public transport facilities, combined with encouragement and incentivisation with pricing schemes intends to drive mode shift and reduced vehicle kilometres travelled (VKT) and therefore emissions. Freight priority by time of day intends to reduce truck journey time and reduce emissions.

2.5 Option 3 – Hewletts Rd limited access

Approximately 37% of New Zealand's national state highway network are classified as limited-access roads[6]. Recognising the role of SH2/Hewletts Rd as a major connector, Option 3 reinforces the road hierarchy by prioritising throughput and reducing side friction and conflicting movements.

Option 3 is designed to test the potential for prioritising throughput, by rationalising access points to and from Hewletts Rd to improve reliability and throughput of people and goods. It could also improve safety by reducing movement conflicts, increase the attractiveness of cycling by removing vehicle crossings, and reduce emissions by getting traffic to flow more efficiently and encouraging mode shift.

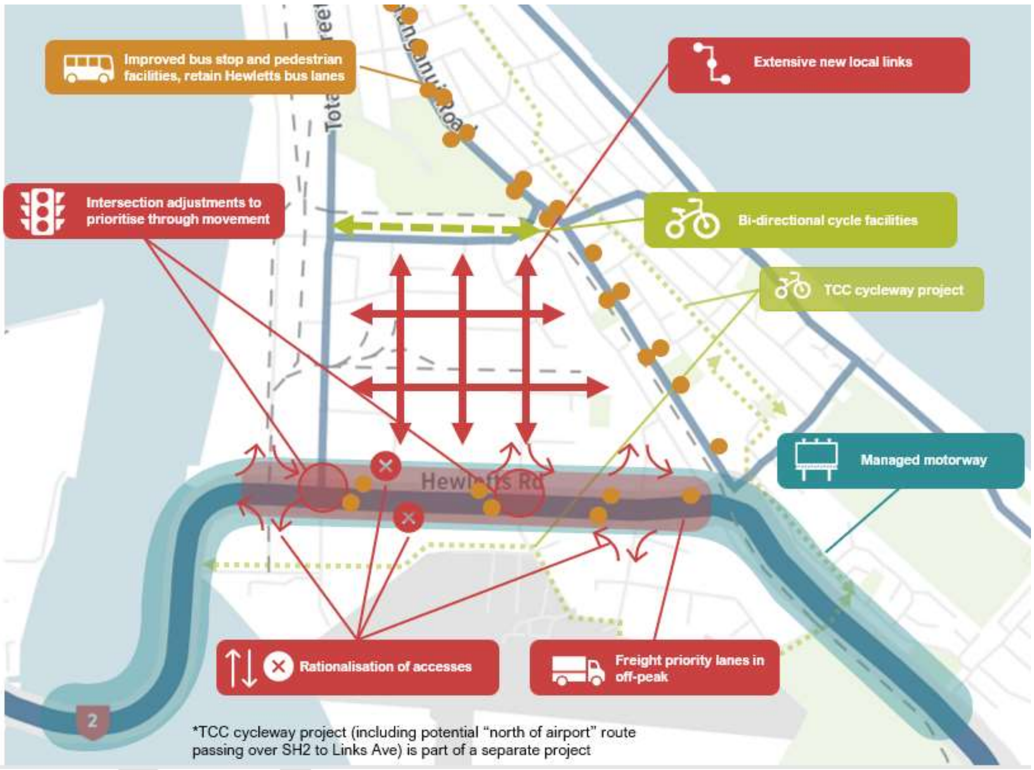

Figure 2-5: Option 3 - Hewletts Rd limited access

Option 3 includes the following interventions:

- New local links to give all sites fronting Hewletts rear access, e.g. a 2 x 3 grid of local roads in the block bounded by Hewletts Rd, Totara St, Hull Rd and Maunganui Rd. This would require land acquisition as these are not currently supported by plan changes.
- Rationalisation of accesses to improve throughput on Hewletts Rd, by removing all vehicle crossings on Hewletts Rd, removing the Waimarie St intersection and converting the Aerodrome Rd, Maru St and Tasman Quay intersections to left in left out only.

[6] Limited-access roads and accessways onto the state highway, Waka Kotahi. https://www.nzta.govt.nz/roads-and-rail/management-and-maintenance/land-use-development-and-the-state-highway-network/limited-access-roads-and-accessways-onto-the-state-highway/#:~:text=Limited%2Daccess%20roads%20are%20sections,network%20are%20limited%2Daccess%20roads.

- Signalised intersection phasing changes to prioritise through-movements over turning-movements at the Totara St and Jean Batten intersections.
- Freight and bus shared lane along Hewletts Rd to give freight priority during off-peak times. This is done by repurposing the existing bus lanes outside of am/pm peak direction to bus and freight shared lane when bus frequencies are lower.
- Bus stop upgrades along Hewletts Rd and Maunganui Rd (7 to be major stops and 21 to be minor stops). Retain bus lanes on Hewletts Rd.
- Managed motorway on SH2 flyover and harbour bridge. This includes the use of variable speed limits and metering of the SH2 flyover into Hewletts on eastern side to optimise traffic flow and improve throughput.
- Bi-directional cycle path on Hull Rd to connect to Totara St off-road shared path.

Table 2-3 below shows how the option aims to achieve the investment objectives.

Table 2-3: Option 3 alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Improve throughput along Hewletts Rd by removing turning movements and giving more green time to through movement at signals. By using bus lanes for freight outside of am/pm peak direction would enable reliable truck movement and improve overall route throughput.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Improve pedestrian, cyclist and motorcyclist safety by removing conflicts with turning movements at side roads / driveways and separated cycleways.
Provide better mode choice options and increase public transport and active travel mode share	Improve mode choice via iincreasing the attractiveness of cycling through reduced conflicts and increasing the attractiveness of public transport through upgraded stops on Maunganui Rd.
Reduce the transport related effects on water, air quality and noise	The provision of separated cycle paths aims to separate sensitive users from poor air quality.
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Reduce transport related carbon emissions via supporting more efficient traffic flow on Hewletts Rd (less stationary traffic) and mode shift to walking, cycling and public transport through improved facilities.

2.6 Option 4 – Dynamic Rd allocation

The purpose of Option 4 is to achieve the outcomes sought by creating physical space and capacity for different modes at different times of the day. This could address the tidal fluctuation in demand and help get more out of the existing road space through dynamic prioritisation and capacity allocation mechanisms.

Option 4 is designed to test the potential for dynamic road allocation to increase the throughput of people and goods, support more reliable freight access in the off peak, increase public transport uptake by making journeys more attractive and reliable, and reduce emissions by getting traffic to flow more efficiently and encouraging mode shift.

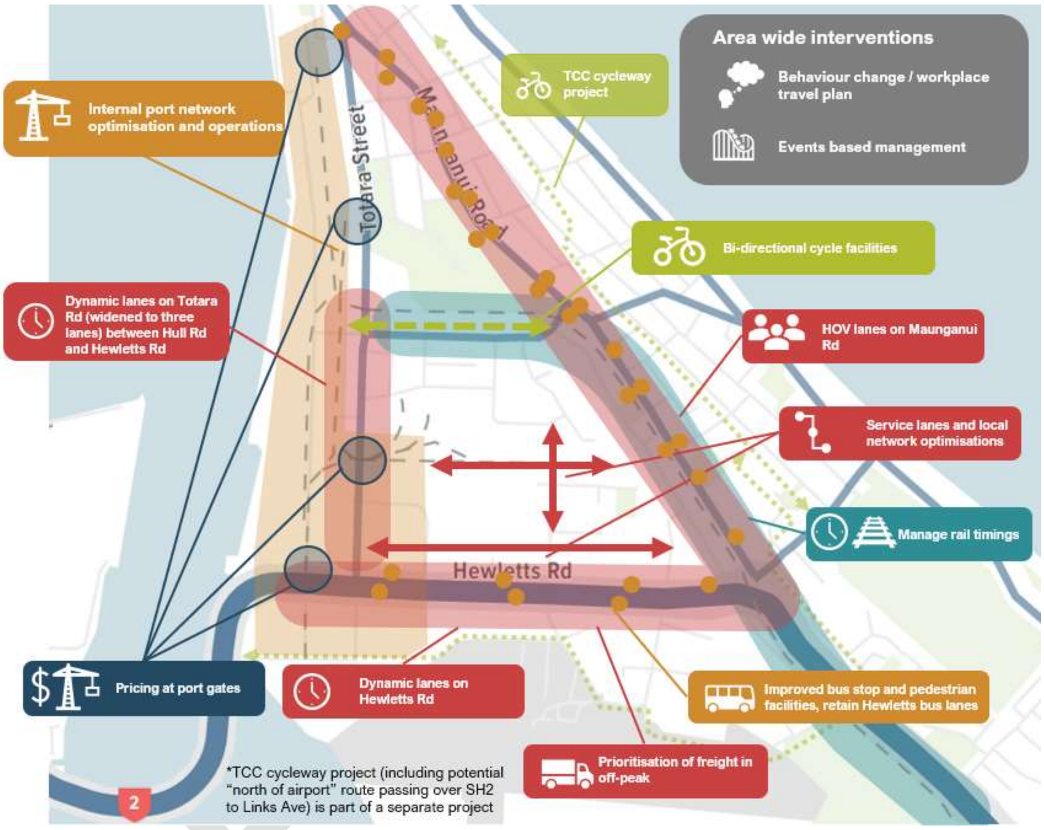

Figure 2-6: Option 4 - Dynamic Rd allocation

Option 4 includes the following interventions:

- Dynamic lanes on Hewletts Rd (including VMS) resulting in greater peak direction capacity while retaining bus lanes.
- Dynamic lanes on Totara St between Hull Rd and Hewletts Rd. This includes widening of Totara St to three lanes.
- Freight and bus shared lane along Hewletts Rd to give freight priority during off-peak times. This is done by repurposing the existing bus lanes outside of am/pm peak direction to bus and freight shared lane when bus frequencies are lower.
- High Occupancy Vehicle (HOV) lanes at peak times on Maunganui Rd to support more reliable commuter trips by encouraging carpooling and mode shift. The additional peak direction lane on Hewletts Rd could potentially be HOV/freight as an opportunity.

- Bus stop upgrades along Hewletts Rd and Maunganui Rd (7 to be major stops and 21 to be minor stops). Retain bus lanes on Hewletts Rd.
- Pricing at port gates.
- Port internal network and operations optimisation, e.g. better use of Tasman Quay, better internal truck movements and circulation.
- Rail timing management to mitigate road network impact of rail movements at level crossings during peak times.
- Service lanes and local road network optimisation. This includes additional connections similar to Te Maire Link to utilise the existing local road network and increase permeability.
- Workplace travel planning and behaviour change programmes.
- Event based management e.g. special lane arrangements, public transport only events, Mount to CBD ferry service coordinated with cruise ship arrival times.
- Bi-directional cycle path on Hull Rd to connect to Totara St off-road shared path.

Table 2-4 below shows how the option aims to achieve the investment objectives.

Table 2-4: Option 4 alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Improve throughput and reliability via allocating the existing road space to provide more capacity in peak times/directions. Variable pricing at port gate aims to provide a greater time of day price differential to encourage off-peak freight use which will be supported by freight lanes for improved reliability. The improved reliability is augmented by managing rail timing to limit conflicts with train crossings.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Reduce conflicts through local road optimisations and reducing nose to tail crashes by reducing congestion.
Provide better mode choice options and increase public transport and active travel mode share	Improve choice via improved cycling facilities to encourage active mode take-up and HOV lanes on Maunganui Rd to support high occupancy use and public transport.
Reduce the transport related effects on water, air quality and noise	Improve localised air quality via improved traffic flow. Separated cycle facility on Hull Rd intents to reduce effects of air quality on people.
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Reduce emissions by helping traffic flow more efficiently and some mode shift through active mode improvements and HOV provision. Behaviour change programme intents to encourage uptake of low-emission transport options.

2.7 Option 5 – Freight, public transport and walking and cycling improvements

Option 5 is led by at-grade freight, walking and cycling, and public transport improvements, which is supported by pricing, streetscape and behaviour change programmes to drive mode change for commuters and open up road capacity for more essential users such as trucks.

This option intends to increase people throughput by enabling people to use more space efficient modes of transport and allocate more space to freight which cannot re-mode. This option also intends to improve transport choice, support multi-modal and safe journeys, and improve reliability/throughput of people and goods by shifting as many people as possible to alternative modes.

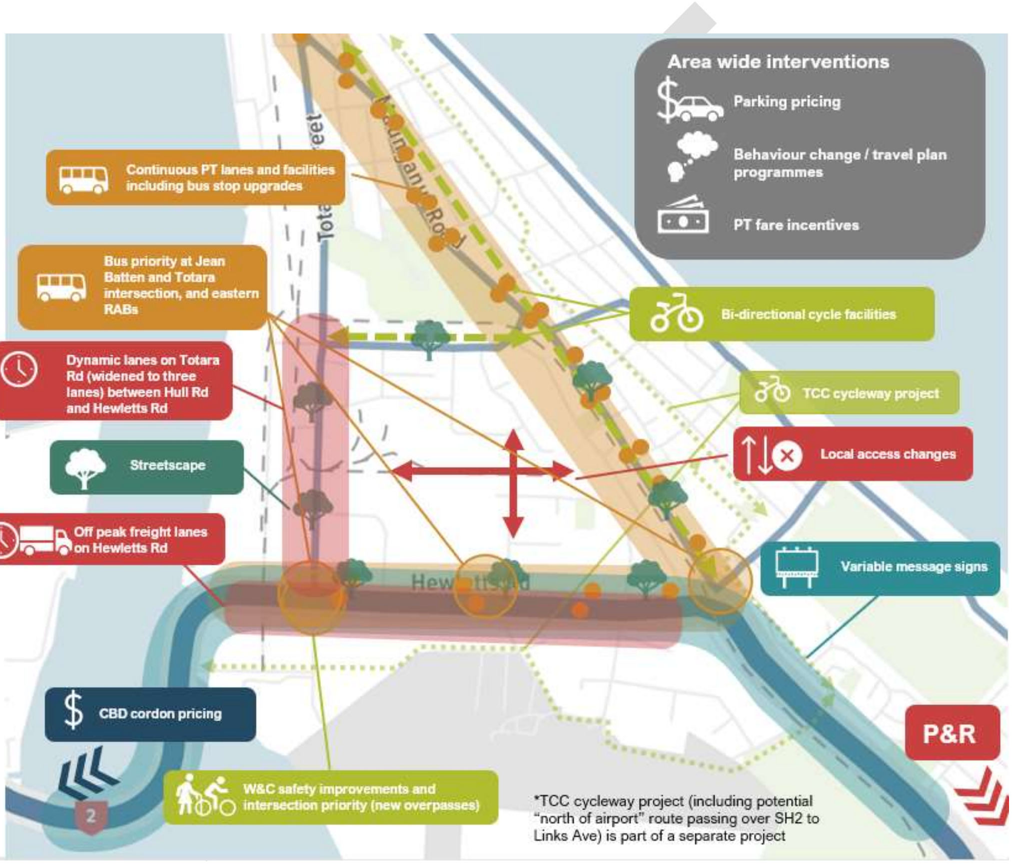

Figure 2-7: Option 5 – Freight, public transport and walking and cycling improvements

Option 5 includes the following interventions:

- Public transport improvements, which includes continuous bus lanes along Maunganui Rd and Hewletts Rd, with bus stop upgrades, bus priority at Golf Rd, Jean Batten Dr and Totara St intersection, and signalisation of the eastern RABs.
- Walking and cycling improvements, which includes bi-directional cycle paths Hull Rd and Maunganui Rd, and a pedestrian and cyclist overbridge over Totara St near Hewletts Rd to provide connectivity between Totara St shared path and harbour bridge shared path.
- Removal of on-street parking along Maunganui Rd to enable width for bus lanes and cycle lanes.
- Dynamic freight lanes as a reallocation of general traffic lanes at off-peak times along Hewletts Rd, as shown in Figure 2-8 below.

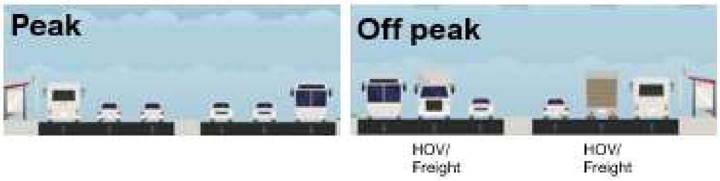

Figure 2-8: Dynamic freight lane configuration on Hewletts Rd

- Dynamic lanes on Totara St between Hull Rd and Hewletts Rd. This includes widening of Totara St to three lanes.
- Local access changes to support goods and freight vehicles moving off Hewletts Rd.
- Variable CBD cordon pricing to support mode shift. Note, this is to be aligned with TCC's Dynamic Rd Pricing Study[7].
- VMS to inform of alternative routes, congestion levels and influence travel behaviour and improve efficiency. This includes three overhead gantries along SH2.
- Park and Ride (P&R) to reduce the demand for travel on Hewletts Rd and surrounds by enabling more people to travel by public transport. This is assumed to be located in new Eastern Communities with 300 spaces[8].
- Streetscape improvements to improve conditions for active modes and public transport users.
- Workplace travel planning and behaviour change programmes.
- Public transport fare incentive, e.g. reduced fares, transfer discounts, loyalty discounts, capped fees.
- Parking pricing in CBD and the Mount to support mode shift.

Table 2-5 below shows how the option aims to achieve the investment objectives.

Table 2-5: Option 5 alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Improving people throughput via uptake of space efficient modes, and similarly freeing up space and improve reliability for essential trips like freight.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Encouraging safe mode choices and healthier journeys through the provision of safe and continuous W&C facilities.
Provide better mode choice options and increase public transport and active travel mode share	Improve public transport and active mode share via P&R, continuous bus lanes, improved bus stops, public transport fare incentives and safe and connected cycling facilities.
Reduce the transport related effects on water, air quality and noise	Improve air quality and noise through encouraging mode shift and reducing private vehicle travel. Separated cycle facilities will reduce effects of air quality on people – particularly using Hull Rd/Maunganui Rd.
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Reduce emissions by limiting long distance trips via P&R, limiting private vehicle trips to CBD via parking and cordon pricing, and providing attractive low-emission alternative travel options. Behaviour change programme intents to further encourage uptake of low-emission transport options.

[7] TCC's Dynamic Rd Pricing Study is currently underway.
[8] Note, this is subjected to the outcomes of the Public Transport Services and Infrastructure Business Case.

2.8 Option 6 – Grade separation of Totara St, supporting network changes and improved rail operations

Option 6 tests the grade separation of the right turn from Totara St into Hewletts Rd and widening of Totara St to enable more throughput and a lane-gain for the left turn from Hewletts Rd into Totara St. This is aimed at resolving the significant queues and delays to freight, and traffic caused by the Totara St intersection. The option includes a range of supporting measures to improve route throughput including local network changes and significant public transport and active mode provision.

Option 6 also includes potential port circulation improvements and rail upgrades to improve efficiency for rail and reduce impacts on level crossings.

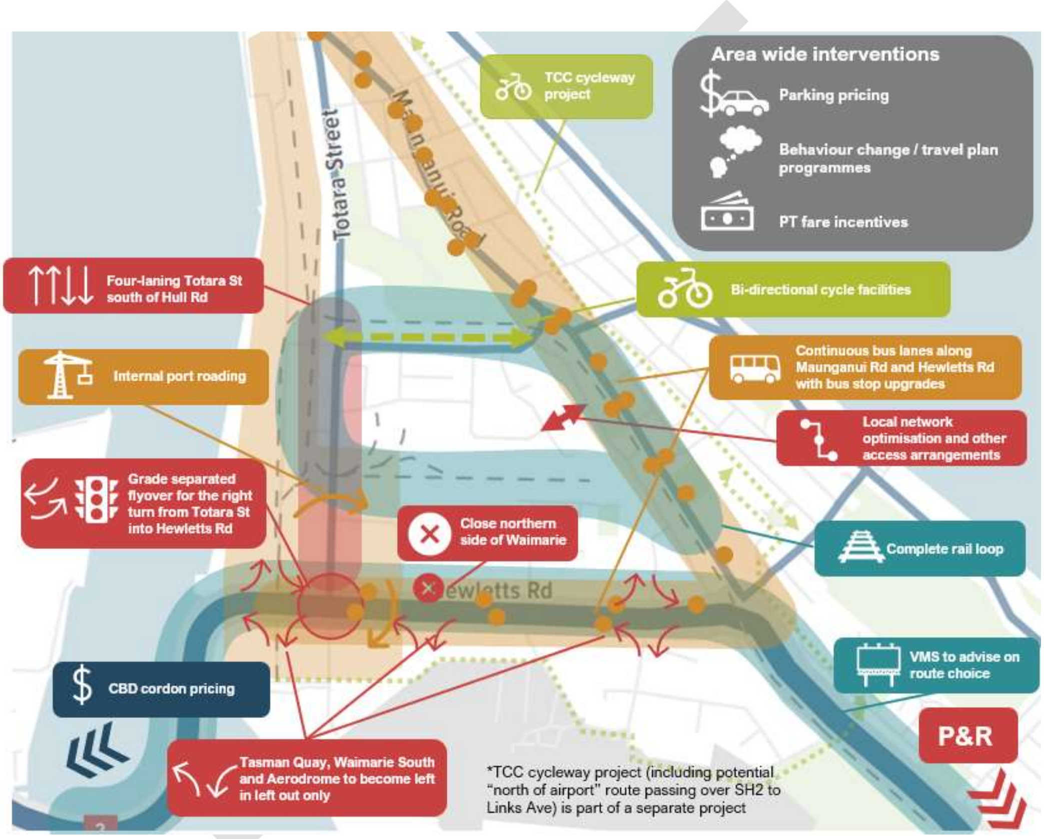

Figure 2-9: Option 6 - Grade separation of Totara St, network changes and improved rail operations

Option 6 includes the following interventions:

- Four-laning of Totara St to improve throughput and reliability for freight, commercial and commuter trips.
- Grade separation of the right turn from Totara St into Hewletts Rd and extended free left turn lane from Hewletts Rd with lane gain on Totara St to support more efficient and reliable trips. Priority for movement of goods through freight-only right turn lane from Hewletts Rd into Totara St at grade. Three exit lanes on Totara St merge into two lanes. See Figure 2-10 below for a high-level sketch.
- Rationalisation of local access roads by limiting Tasman Quay, Waimarie South and both approaches of Aerodrome Rd to left in left out only, and closing the northern approach of Waimarie St.
- Develop port internal roading connections, with two-way bridges over Hewletts Rd and Totara St, to enable more reliable journeys for the movement of goods by removing freight from the public roading network.

- Complete rail loop to reduce the impact of level crossings on the wider network and support the shift of more freight from road to rail.
- VMS to inform of alternative routes, congestion levels and influence travel behaviour and improve efficiency. This includes three overhead gantries along SH2.
- Park and Ride facilities to reduce the demand for travel on Hewletts Rd and surrounds by enabling more people to travel by public transport. This is assumed to be located in new Eastern Communities with 300 spaces[9].
- Continuous bus lanes along Hewletts Rd and Maunganui Rd, with upgraded bus stops to support mode shift.
- Bi-directional cycle path on Hull Rd to connect to Totara St off-road shared path.
- Workplace travel planning and behaviour change programmes.
- Public transport fare incentive, e.g. reduced fares, transfer discounts, loyalty discounts, capped fees.
- Variable CBD cordon pricing to support mode shift. Note, this is to be aligned with TCC's Dynamic Rd Pricing Study[10].
- Parking pricing in CBD and the Mount to support mode shift.

Table 2-6 below shows how the option aims to achieve the investment objectives.

Table 2-6: Option 6 alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Improve reliability and throughput via grade separation of key freight and commercial movements, improved port roading, and completion of rail loop. Continuous bus lanes intent to increase public transport reliability.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Reduce conflicts through grade separation, less turning movements and improved cycling facilities.
Provide better mode choice options and increase public transport and active travel mode share	Improve public transport and active mode share via P&R, continuous bus lanes, improved bus stops, public transport fare incentives and improved cycle facilities.
Reduce the transport related effects on water, air quality and noise	Improve air quality and noise through encouraging mode shift via improvements to public transport and cycling facilities. There is also likely improved stormwater treatment around grade separated infrastructure.
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Reduce emissions via mode shift to public transport and cycling, and improved efficiency of traffic flow. Behaviour change programme, parking pricing, and public fare incentives intent to further encourage the uptake of low-emission transport options.

[9] Note, this is subjected to the outcomes of the Public Transport Services and Infrastructure Business Case.
[10] TCC's Dynamic Rd Pricing Study is currently underway.

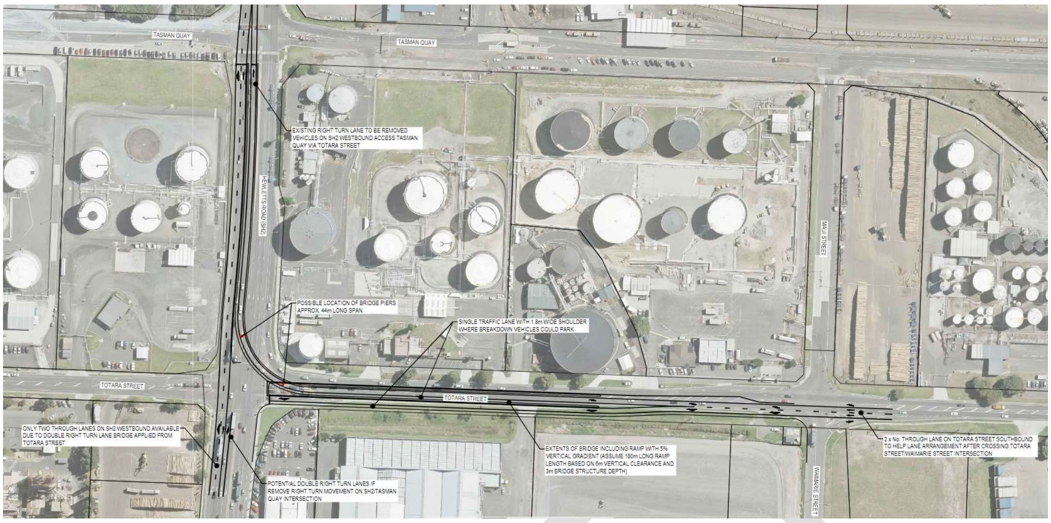

Figure 2-10: Totara St right turn grade separation sketch

2.9 Option 7 – Grade separation of Totara St and Jean Batten Dr

Option 7 is led by grade separation of the through movement on Hewletts Rd at Totara St/Hewletts Rd and Jean Batten Dr/ Hewletts Rd intersections along with consequential local network changes.

Strategically, this option considers that SH2 on either side of Hewletts Rd is largely grade separated and brings Hewletts Rd to a similar level. This option intents to improve throughput and route productivity through the two grade separations and significant investment in public transport, walking and cycling facilities.

Option 7 also includes potential port circulation improvements and rail upgrades to improve efficiency for rail and grade separation of Hull Rd and Totara St level crossings.

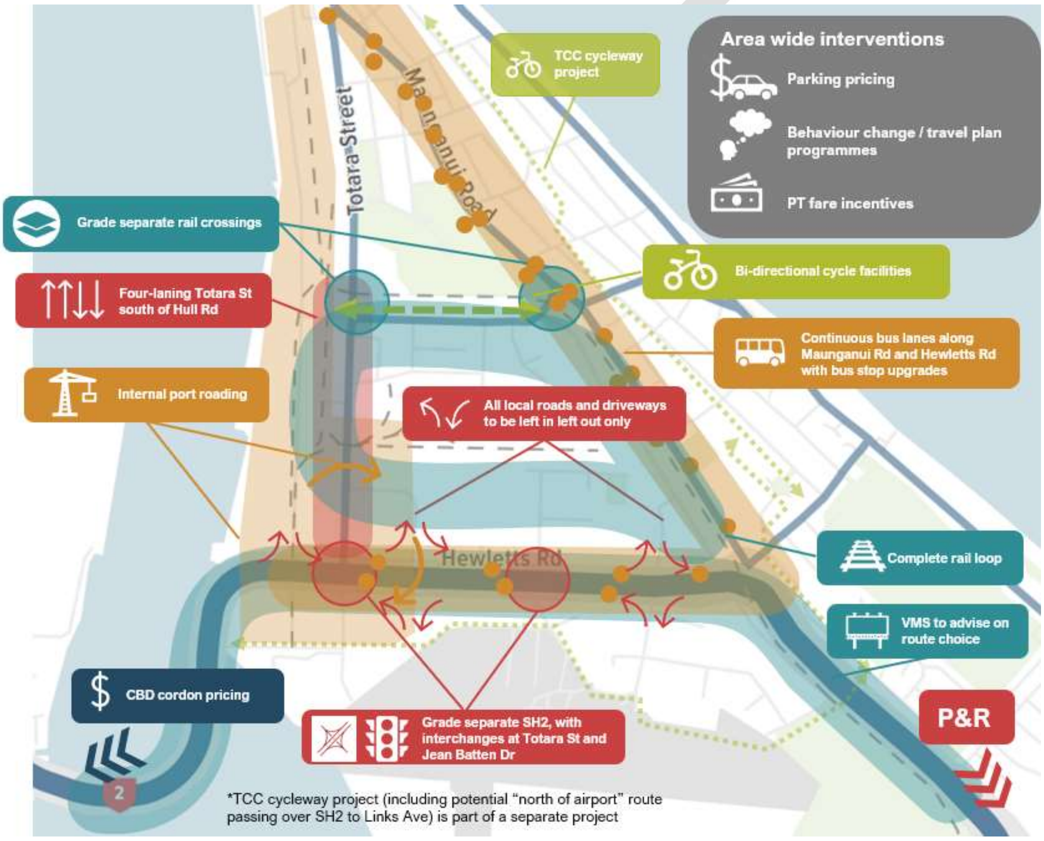

Figure 2-11: Option 7 - Grade separation of Totara St and Jean Batten Dr

Option 7 includes the following interventions:

- Four-laning Totara St including a lane-gain for the left turn from Hewletts Rd. This turning movement would only be impeded when the cycle crossing is being called.
- Grade separate the through movement on Hewletts Rd at Totara St/Hewletts Rd and Jean Batten Dr/ Hewletts Rd intersections along with consequential local network changes. The assumed footprint for the grade separation at Jean Batten Dr is based on the Columbo St/Moorhouse Ave example in Christchurch, however the Hewletts Rd cross section would be wider and would require land acquisition.
- All local roads and property on Hewletts Rd are left in left out with supporting local connections to better utilise the capacity created by the grade separations.

- Grade separation of rail crossings at Totara St and Hull Rd.
- Develop port internal roading connections, with two-way bridges over Hewletts Rd and Totara St, to enable more reliable journeys for the movement of goods by removing freight from the public roading network.
- Complete rail loop to reduce the impact of level crossings on the wider network and support the shift of more freight from road to rail.
- VMS to inform of alternative routes, congestion levels and influence travel behaviour and improve efficiency. This includes three overhead gantries along SH2.
- P&R to reduce the demand for travel on Hewletts Rd and surrounds by enabling more people to travel by public transport. This is assumed to be located in new Eastern Communities with 300 spaces[11].
- Continuous bus lanes along Hewletts Rd and Maunganui Rd, with upgraded bus stops to support mode shift.
- Bi-directional cycle path on Maunganui Rd and Hull Rd. These connections are expected to improve local cycling conditions and provide connectivity to the accessible streets cycleways.
- Variable CBD cordon pricing to support mode shift. Note, this is to be aligned with TCC's Dynamic Rd Pricing Study[12].
- Workplace travel planning and behaviour change programmes.
- Public transport fare incentive, e.g. reduced fares, transfer discounts, loyalty discounts, capped fees
- Parking pricing in CBD and the Mount to support mode shift.

Table 2-7 below shows how the option aims to achieve the investment objectives.

Table 2-7: Option 7 alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Improve throughput and reliability via removal of signalised intersections, which also gives more green time to turning movements and local connections. Continuous bus lanes and cycle facilities aim to increase the overall route throughput potential.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Reduced conflicts between turning movements through grade separation and improved safety of active modes.
Provide better mode choice options and increase public transport and active travel mode share	Improve public transport and active mode share via P&R, continuous bus lanes, improved bus stops, public transport fare incentives and improved cycle facilities.
Reduce the transport related effects on water, air quality and noise	Improve air quality and noise through encouraging mode shift via improvements to public transport and cycling facilities. There is also likely improved stormwater treatment around grade separated infrastructure.
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Reduce emissions via improvements to active modes and public transport facilities to improve attractiveness of alternative, low-emission modes. Behaviour change programme, parking pricing, and public fare incentives intent to further encourage the uptake of low-emission transport options.

[11] Note, this is subjected to the outcomes of the Public Transport Services and Infrastructure Business Case.
[12] TCC's Dynamic Rd Pricing Study is currently underway.

2.10 Option 8 – Bus rapid transit (BRT) and ferry

This option tests the potential for maximising the public transport potential of the corridor. This includes a ferry from Mt Maunganui and a separated BRT-style bus corridor on Hewletts Rd as means of maximising overall people throughput and freeing road space to increase reliability and throughput for freight. Overall, this option creates the highest people throughput capacity of all of the options.

The BRT and ferry would be supported by P&R, intersection changes and pricing to encourage take-up, as well as new cycle and pedestrian provision. Freight priority would be provided for key movements to improve reliability for trucks.

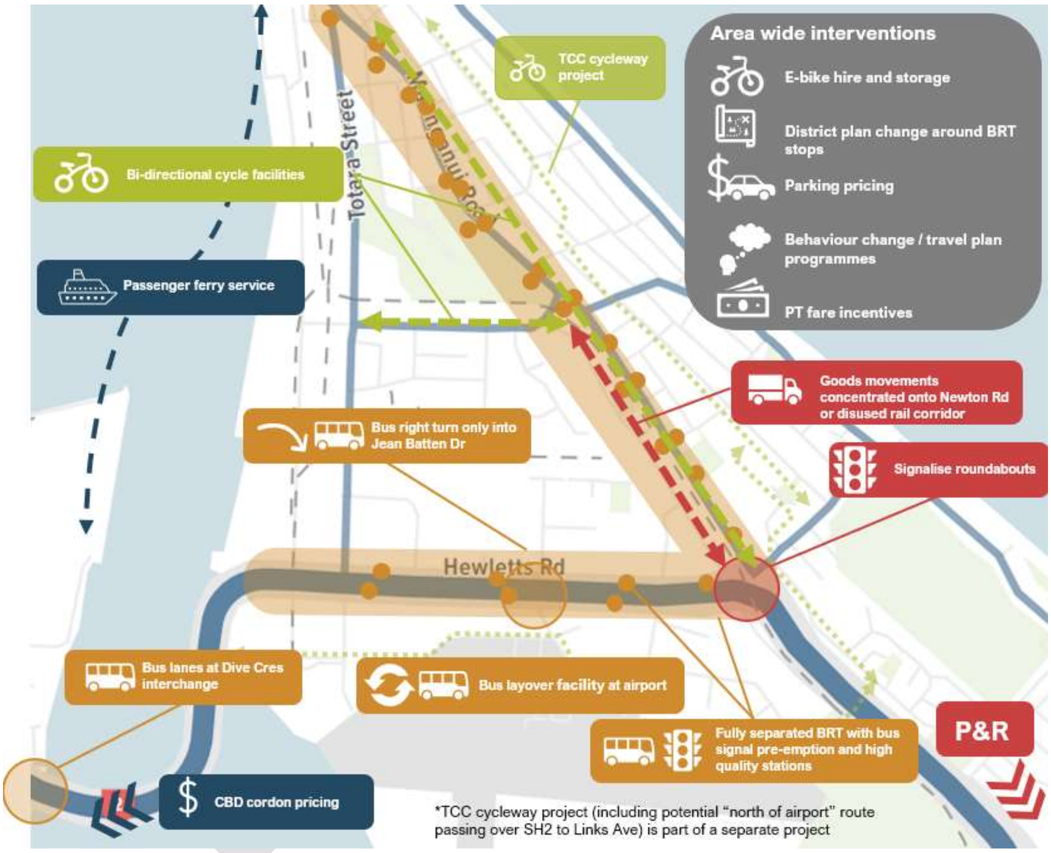

Figure 2-12: Option 8 - BRT and ferry

Option 8 includes the following interventions:

- Fully separated BRT along the length of Hewletts Rd and Maunganui Rd as shown in Figure 2-13 and Figure 2-14 below. This also includes high quality stations, bus signal pre-emption, station access improvements, full length cycleways, and cycle parking/E-bike charging. In addition, there will be a bus only right turn into Jean Batten Dr, and bus lanes at Dive St interchange.
- District plan change (land use) around BRT stops on Hewletts Rd.
- Passenger ferry service between Mount Maunganui and the CBD.

Figure 2-13: Hewletts Rd cross-section

Figure 2-14: Maunganui Rd cross-section

- Bus layover facility at the airport with assumed capacity of 15 buses.
- Parking removal and land take along Maunganui Rd (approx. 5m required). Localised land take along Hewletts Rd (15m of land at stations for a distance of 100m).
- Signage and industry communication to support Newton Rd (or disused rail corridor) as a strategic route for the movement of goods to remove local industrial traffic from SH2 and improve journey times for the movement of goods for local trips. Signalise the eastern roundabouts.
- Potential opportunity to consider time of day management for freight through reallocation of general traffic lanes on Hewletts Rd in off-peak.
- Park Ride Facilities, to reduce the demand for travel on Hewletts Rd and surrounds by enabling more people to travel by public transport. This is assumed to be located in new Eastern Communities with 300 spaces[13].
- Variable CBD cordon pricing to support mode shift. Note, this is to be aligned with TCC's Dynamic Rd Pricing Study[14].
- Workplace travel planning and behaviour change programmes.
- Public transport fare incentive, e.g. reduced fares, transfer discounts, loyalty discounts, capped fees.
- Parking pricing in CBD and the Mount to support mode shift.

Table 2-8 below shows how the option aims to achieve the investment objectives.

Table 2-8: Option 8 alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Enhance the throughput of the route for people and free up space (with some additional measures) for freight throughput through high quality BRT system.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Improve overall safety outcomes by providing safe public transport facilities and walking and cycling facilities. In general, public transport is significantly safer per km travelled compared to cars.
Provide better mode choice options and increase public transport and active travel mode share	Provide better mode choice through improving the attractiveness of taking public transport, walking and cycling through high quality BRT system, P&R, public transport fare incentives and high-quality walking and cycling facilities.
Reduce the transport related effects on water, air quality and noise	Reduce traffic volumes and exposure by improving the design of the corridor and mode share.

[13] Note, this is subjected to the outcomes of the Public Transport Services and Infrastructure Business Case.
[14] TCC's Dynamic Rd Pricing Study is currently underway.

Investment Objective	Option aims to
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Reduce emission via significant mode shift to public transport through high investment in the BRT system.

2.11 Option 3a – Hewletts Rd limited access and pricing led

Although both Options 2 and 3 are low-cost options, they are not effective at addressing the full suite of objectives as individual options. Following feedback and discussion between Project Partners during the Longlist MCA Workshop, a hybrid Option 2/3 was developed to test the combined effects of pricing schemes from Option 2, and elements of limited access from Option 3, along with other supporting interventions.

Limiting access on Hewletts aims to prioritise throughput, by rationalising access points to and from Hewletts Rd to improve reliability and throughput of people and goods, while improve safety by reducing movement conflicts. This is further enhanced by the pricing schemes for all modes to influence choices, supported by a range of physical and operational measures to enable changes in time and mode choice for people and goods.

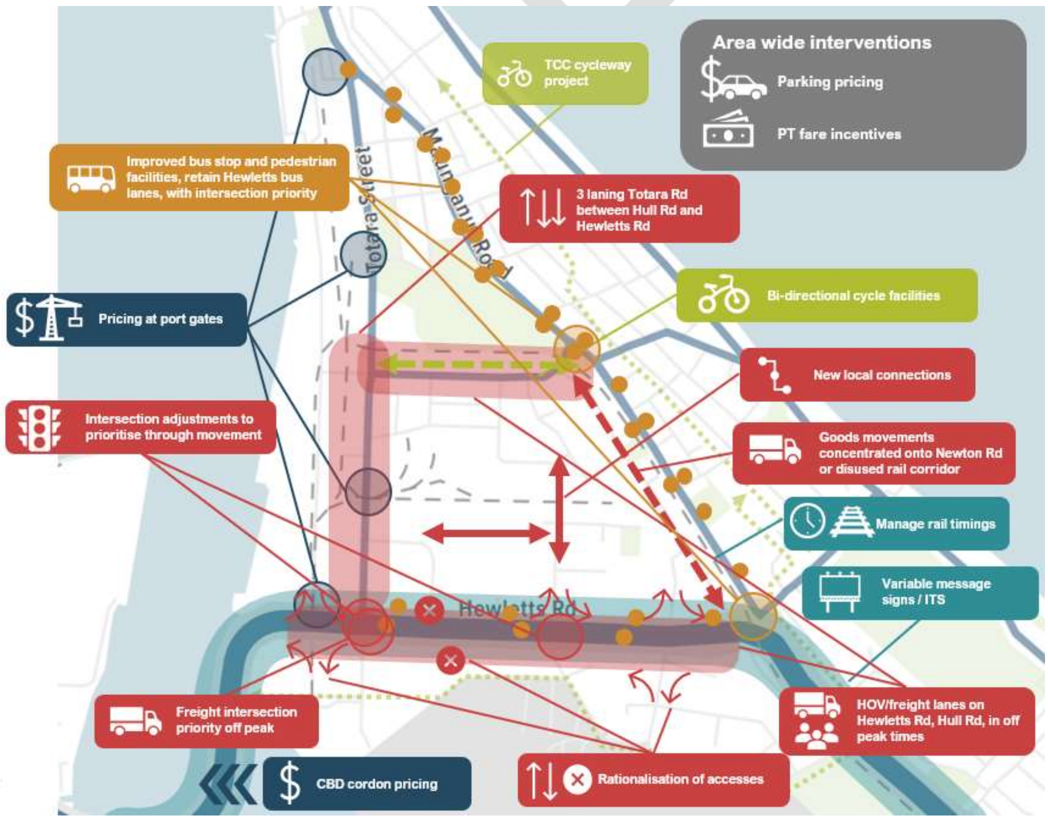

Figure 2-15: Option 3a - Hewletts Rd limited access and pricing led

Option 3a includes the following interventions:

- Rationalisation of accesses to improve throughput on Hewletts Rd, by removing all vehicle crossings on Hewletts Rd, removing the Waimarie St intersection and converting the Aerodrome Rd, Maru St and Tasman Quay intersections to left in left out only.

- Variable port gate pricing to provide a greater time of day price differential to encourage off-peak use.
- Freight priority comprises of general traffic lanes reallocated to freight/HOV in off-peak times on Hewletts Rd and Hull Rd, and improved freight priority at Totara St/Hewletts Rd intersection. This would involve minor pavement widening and signalised intersection upgrades, signage and markings.
- Signage and industry communication to support Newton Rd (or disused rail corridor) as a strategic route for the movement of goods to remove local industrial traffic from SH2 and improve journey times for the movement of goods for local trips.
- Signal optimisation to prioritise through movements over turning-movements during peaks and improve freight priority at Totara St/Hewletts Rd intersection and Jean Batten Dr/Hull Rd/Hewletts Rd off-peak.
- Public transport fare incentive e.g. reduced fares, transfer discounts, loyalty discounts, capped fees.
- Variable CBD cordon pricing to support mode shift. Note, this is to be aligned with TCC's Dynamic Rd Pricing Study[15].
- Bus stop upgrades along Hewletts Rd and Maunganui Rd (7 to be major stops and 21 to be minor stops). Retain bus lanes on Hewletts Rd. Bus priority at key intersections along Hewletts Rd and Maunganui Rd.
- Bi-directional cycle paths along Hull Rd.
- New local connections from Portside Dr to Te Maire St and Waimarie St to Maru St to improve local circulation and permeability.
- Widening Totara St to three lanes between Hull Rd and Hewletts Rd with the additional lane in the southbound direction.
- Managed motorway on SH2 flyover and harbour bridge. This includes the use of variable speed limits and metering of the SH2 flyover into Hewletts on eastern side to optimise traffic flow and improve throughput.
- Rail timing management to mitigate road network impact of rail movements at level crossings during peak times.

Table 2-9 below shows how the option aims to achieve the investment objectives.

Table 2-9: Option 3a alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Improve all-day throughput or productivity and reliability on Hewletts Rd for all modes via reducing turning movement, signal optimisation, pricing and supporting improvements to influence mode choice for commuters and time of day choice for freight. Rail timing management aims to reduce conflict at times of high demand.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Improve pedestrian, cyclist and motorcyclist safety by removing conflicts with turning movements at side roads / driveways and separated cycleways. Encourage healthy, active and multi-modal journeys by providing improved walking and cycling connections and public transport facilities. Pricing and charges aim to encourage up-take of these options.
Provide better mode choice options and increase public transport and active travel mode share	Provide mode choice through improved public transport and active mode facilities. Encourage take-up of these modes at times of high demand via CBD cordon pricing, parking charges, public transport fare incentives.
Reduce the transport related effects on water, air quality and noise	Protect sensitive users from poor air quality through the provision of separated cycle facilities.

15 TCC's Dynamic Rd Pricing Study is currently underway.

Investment Objective	Option aims to
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Reduce transport related carbon emissions via supporting more efficient traffic flow on Hewletts Rd (less stationary traffic) and mode shift to walking, cycling and public transport through improved facilities. Freight priority by time of day intends to reduce truck journey time and reduce emissions.

2.12 Ngāi Tukairangi Option – Land use change, freight, public transport, walking and cycling improvements.

Ngāi Tukairangi hapū Option represents a customized approach that combines elements from the eight long list options, aligning with the preferences of the Ngāi Tukairangi hapū. This approach aims to strike balance between transportation goals, advancements in environmental well-being, and substantial shifts in land utilization, all geared towards enhancing outcomes for tāngata whenua.

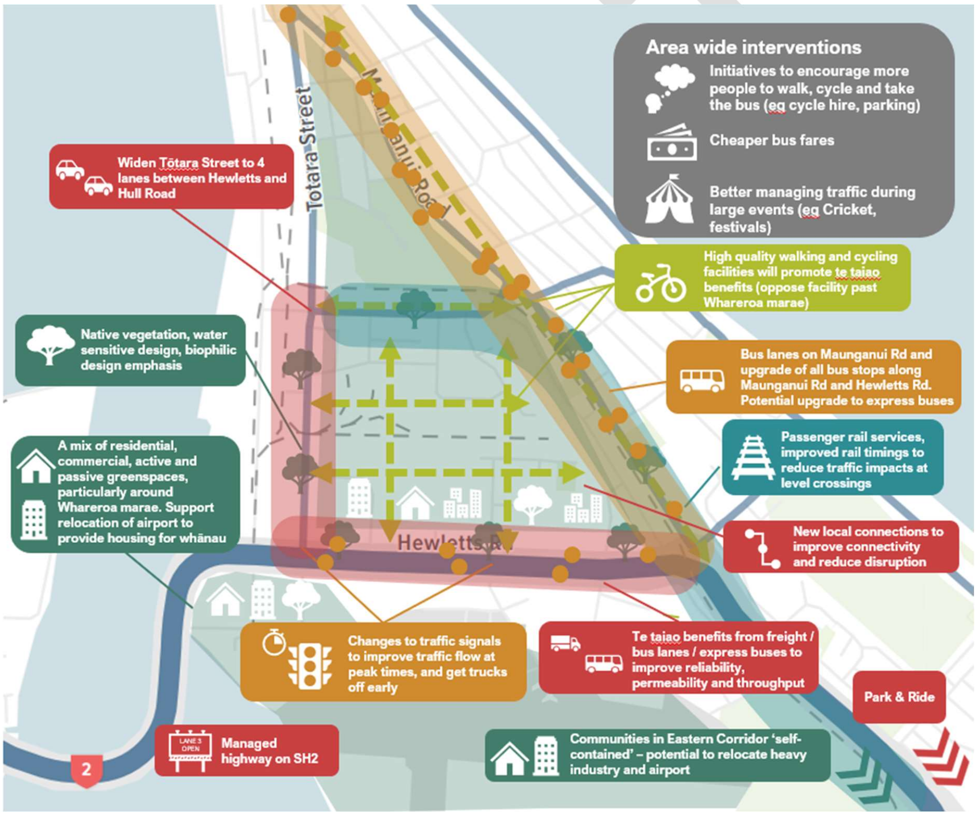

Figure 2-16 Ngāi Tukairangi Option – Land use change, freight, public transport, walking and cycling improvements

Ngāi Tukairangi Option includes the following interventions:

- Changing existing heavy polluting industrial land uses, particularly surrounding Whareroa Marae, to a mix of residential, commercial, active and passive greenspaces.
- Streetscape improvements with more Tāngata Whenua reflected and water sensitive design, including biophilic initiatives. Spaces and places to facilitate community interaction.
- Passenger rail usage to promote te taiao benefits particularly to rangi (air quality) and te mana o te wai (water quality) to remove private vehicle usage. Complete rail loop with at grade crossing on Newton

Street, reducing the impact of level crossings. Also managing rail timings to mitigate the impact on the road network.

- Freight lanes and priority at intersections along Hewletts Road to improve reliability, permeability, and throughput of people and goods through.
- Service lanes and local road network optimisation with new local connections to improve connectivity and permeability and reduce traffic disruption.
- Increased mode shift to cycling, promoting te taiao, health and well-being benefits. Note however, the hapū oppose formalising/providing cycleway past Whareroa Marae/papakāinga and through Tauranga airport.
- A new bus lane on Maunganui Road and the upgrade of all bus stops along Maunganui and Hewletts Road, with potential upgrade to express buses in future. Te taiao benefits particularly rangi (air quality) and te mana o te wai (water quality) are expected from this.
- Self-contained Eastern Communities with the potential to relocate the heavy industry and airport to the eastern corridor. Whānau housing is to be provided at airport site.
- Upgrade Tōtara Street to 4-lanes between Hull and Hewletts Road, assisting traffic throughput and reducing traffic disruptions.
- Signal optimisation to prioritise through movements vs. turning movements during peaks and improve freight priority at the Tōtara Street / Hewletts Road and Jean Batten Drive / Hewletts Road intersections off-peak.
- A new Park and Ride in the new Eastern Communities / Paengaroa, increasing the incentive to commute by bus.

For further detailed description and commentary, please refer to the Ngai Tukairangi Hapū Kowhiri Iwa (position paper).

Table 2-10 Ngāi Tukairangi option alignment to investment objectives

Investment Objective	Option aims to
Improve reliability, permeability, and throughput of people and goods	Improve all-day travel times/throughout along Hewletts Rd for all modes via reducing turning movements, signal optimisation, pricing, and supporting improvements to influence mode choice for commuters and time of day choice for freight. Rail timing management aims to reduce conflict at times of high demand.
Reduce road deaths and serious injuries for all users in line with Vision Zero targets	Reduce speeds by rearrangement of the streetscape. Improve pedestrian and cyclist safety by separation from the road. Encourage healthy, active and multi-modal journeys by providing improved walking and cycling connections and public transport facilities.
Provide better mode choice options and increase public transport and active travel mode share	Provide mode choice through improved public transport and active mode facilities. Encourage uptake of these modes at times of high demand via CBD cordon pricing, parking charges, public transport fare incentives. Improves alternative mode access opportunities to work via providing residential areas within close proximity to destinations.
Reduce the transport related effects on water, air quality and noise	Protect sensitive users from poor air quality through the provision of mixed-use developments with self-contained communities which are likely to promote active mode travel, as the need for long distance travel is reduced.
Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Reduce transport related carbon emissions via mode shift to walking, cycling and public transport through improved facilities. Freight priority will reduce journey time, improving productivity and reducing overall carbon emissions.

3 Longlist Options Assessment

3.1 Multi-Criteria Analysis Framework

The longlist options were evaluated against the criteria of the MCA framework agreed with Project Partners in August 2022. This included:

- Benefit and Investment Objectives
- Technical/feasibility criteria

The project aims to address the following problems identified in the Investment Logic Map (ILM), as shown in Figure 3-1 below.

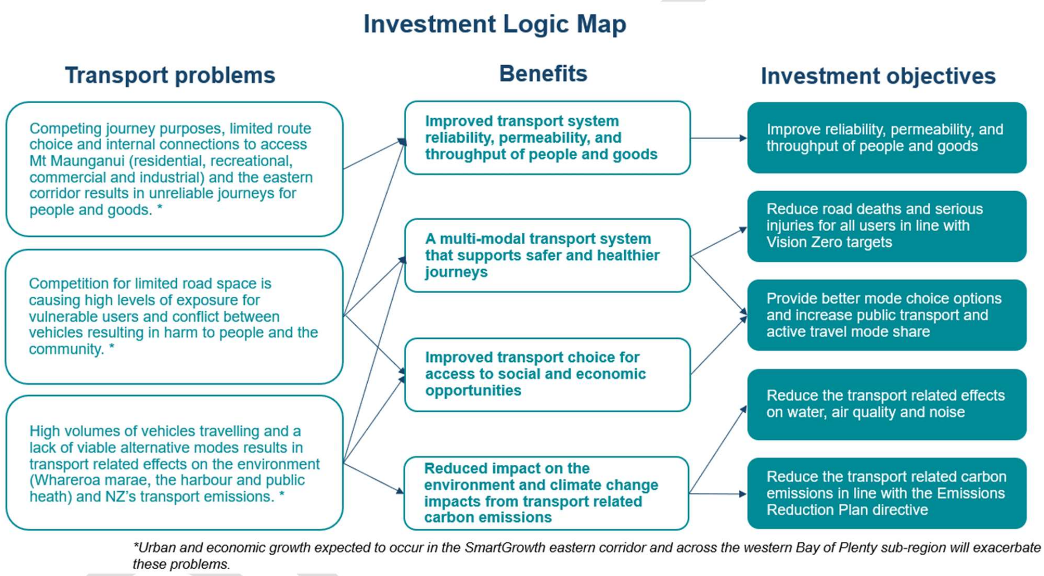

Figure 3-1: Investment Logic Map

3.1.1 Benefits and Investment Objectives

All options developed will be assessed against the benefit and investment objectives shown in Table 3-1 below.

Table 3-1: Investment Objectives and KPIs

Benefit	Investment Objective	KPI
Improved transport system reliability, permeability, and throughput of people and goods	To improve reliability, permeability, and throughput of people and goods	People throughput
		Travel time reliability for freight movements
		Travel time reliability for public transport
		Freight throughput value
A multi-modal transport system that supports safer and healthier journeys	To reduce road deaths and serious injuries for all users by at least 40%	Risk of death and serious injuries (collective risk)
	To provide better mode choice options and increase public	Public transport mode share
		Walking and cycling mode share

Benefit	Investment Objective	KPI
Improved transport choice for access to social and economic opportunities	transport and active travel mode share	Public transport travel time compared to general vehicle travel time
		Access to social and economic destinations by public transport, walk and cycle
Reduced impact on the environment and climate change impacts from transport related carbon emissions	To reduce the transport related effects on water, air quality and noise	Ambient air quality - (NO_2 and PM10) and Noise level
		Water quality
	To reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	CO_2 emissions (Mode shift from single occupancy private vehicle)
		Mode shift of freight from road to rail

3.1.2 Technical and Feasibility Criteria

The agreed technical and/or feasibility criteria are outlined in Table 3-2 below.

Table 3-2: Technical / Feasibility Assessment Criteria

Category	Description
Feasibility	Assessment of Constructability / complexity of facility including stormwater infrastructure
Consenting & property impacts	Likelihood of obtaining approval and Qualitative assessment of impacts on property
Cost	High level $ estimate of capital costs of physical works and affordability
	Assessment of operational costs including infrastructure maintenance
Value for Money	High-level assessment of value for money
Meeting customer needs	Qualitative assessment of the options against the specific customer needs and pain points
Climate Change Mitigation (Mandatory)	Assessment of mode shift and traffic reduction, VKT, land use
Alignment with Whareroa Marae's Strategy	The extent to which the option complements Whareroa Marae's strategy for future land use
Impacts on Te Ao Māori (Mandatory)	Assessment of impact on Te Ao Māori including areas of significance for Māori, Māori land and Kiatiakitanga

Importantly, stakeholders agreed that environmental assessment criteria were not required to be assessed, given the nature and scale of environmental impacts are expected to be the same across all options, and therefore not a significant differentiator for options. Some options include grade separation interventions, which may require extensive removal of contaminated land, and likely impact cost and time, rather than having any significant impacts on the environment.

3.1.3 Assessment scale

Each of the options was assessed based on a 7-point scale as shown in Table 3-3 below. The methodology and detail of assessment is outlined in the sections below.

Table 3-3: Assessment scale

Rating	All assessments will be made in reference to the do-minimum
3	Significantly positive
2	Moderate positive
1	Slight positive
0	Neutral (Do-Minimum)
-1	Slight negative
-2	Moderate negative
-3	Significantly negative

3.2 Multi-Criteria Assessment Summary

The following sections describe the methodology and rationale of assessment for each of the criteria.

3.2.1 Assessment against investment objectives

People throughput

Methodology

This assessment was based on a qualitative estimate of total people throughput along Hewletts Rd, Totara St and Maunganui Rd and considered public transport, walking and cycling and general vehicle throughput.

Table 3-4: Scoring rationale - People throughput

Score	Description
3	Significant increase in people throughput e.g. through major new public transport infrastructure
2	Moderate increase in people throughput, e.g. through improved flow of vehicles or buses by grade separating or giving full priority
1	Slight increase in people throughput through improvements to traffic flow
0	No overall impact on people throughput
-1	Slight reduction in people throughput

Assessment commentary

Option 8 scored best and is the only option which scored 3, due to the significant increases in potential people throughput due to BRT capacity along Hewletts Rd and Maunganui Rd. The BRT system cross section includes protected cycle facilities on Maunganui Rd and bi-directional cycle facilities on both sides of Hewletts Rd.

Options 5, 6, 7 and Ngāi Tukairangi Option scored 2. For Option 5, the potential increase in throughput provided by bus improvements (including continuous bus lanes along Hewletts Rd and Maunganui Rd, and the bus priority through the Golf Rd roundabout) is mitigated by the slight reduction in general traffic capacity due to the off-peak reallocation of one general traffic lane per direction along Hewletts Rd to be a freight only lane, therefore results in a moderate increase in people throughput. For Options 6 and 7, it was considered that the improvements to traffic flow throughout the network caused by the grade separated movements would increase people throughput via general traffic throughput. This is supported by improvements to people throughput on public transport through the continuous bus lanes. For Ngāi Tukairangi Option, the potential increase in throughput provided by bus improvements (including continuous bus lanes along Maunganui Rd) combined with the Totara St widening to 4 lanes are expected to provide moderate increase in people throughput.

Options 3, 4 and 3a scored 1 due to slight improvements to traffic flow.

Option 1 scored 0. While bus lanes are provided on Maunganui Rd, no improvements are made to Hewletts Rd and the uncertainty of delivery of the land use change and its potential impact traffic flow, meant that no notable impacts were expected overall.

Option 2 scored -1 as a slight reduction in people throughput capacity is expected as a result of the reallocation of general traffic lane to freight only in off peak.

Travel time reliability for freight movements

Methodology

This assessment was based on a qualitative estimate of travel time reliability for freight movements along Hewletts Rd, Totara St and Hull Rd with a focus on road freight through trucks and heavy commercial vehicles, and a consideration of rail freight where impacts are expected.

Table 3-5: Scoring rationale - Travel time reliability for freight movement

Score	Description
3	Significant travel time reliability advantages for freight, e.g. grade separation of important freight movements
2	Moderate travel time reliability advantages for freight with some freight priority given
1	Slight travel time reliability advantages for freight, e.g. mixed impacts with a slight positive overall effect
0	No notable impact

Assessment commentary

Options 6 and 7 scored 3 as both options include grade separation of important freight movements. The rail loop completion is also expected to further the potential travel time reliability improvements for rail freight.

Options 2, 4, 5, 3a, and Ngāi Tukairangi Option, scored 2 due to allocation of freight lanes in the off-peak.

Option 3 scored 1 as the intersection changes are likely to improve the reliability for freight through movements along SH2 but worsen the reliability for freight turning movements. Overall, this option was considered to have a slight positive effect.

Option 8 scored 0 due to significant prioritisation of bus movements at intersections which is likely to reduce green time for freight movements. However, this impact could be slightly mitigated by the reduction in general vehicle demand caused by mode shift from private vehicle to bus. Overall, this option was considered to be neutral.

Travel time reliability for public transport

Methodology

This assessment was based on a qualitative estimate of impact on travel time reliability for public transport along Hewletts Rd and Maunganui Rd.

Table 3-6: Scoring rationale - Travel time reliability for public transport

Score	Description
3	Significant travel time reliability advantages for public transport, e.g. new fully separated BRT system
2	Moderate travel time reliability advantages for public transport, e.g. continuous bus lanes on both Hewletts and Maunganui Rd.
1	Slight travel time reliability advantages for public transport through minor interventions
0	No overall impact on travel time reliability public transport, e.g. the existing bus lane arrangement is retained or where interventions balance to a neutral effect.
-2	Moderately negative impact, e.g. bus lanes are shared by freight in off-peak and no other improvements are expected.

Assessment commentary

Option 8 scored best and is the only option to score 3, due to the significant increases in bus travel time reliability through the BRT corridor along Hewletts Rd and Maunganui Rd. It is also noted that the BRT system can utilise signal pre-emption and green waves to maximise this.

Options 5, 6, 7, Ngāi Tukairangi Option scored 2 due to the continuous bus lanes along Maunganui Rd and/or Hewletts Rd.

Options 1 and 3a scored 1 due to slight improvements to bus travel time reliability.

Option 2 and 3 scored 0 as no notable impacts were expected overall.

Option 4 scored -2. The shared freight and bus lane in off peak along Hewletts Rd was considered to have a negative impact, although it could be slightly mitigated by the HOV lanes along Maunganui Rd which is an improvement along this section. However, due to the lower volume of buses along Maunganui Rd compared to Hewletts Rd, the overall impact was considered to be moderately negative.

Freight potential throughput

Methodology

This assessment was based on a qualitative estimate of total value of freight and commercial goods moved through the network, primarily focused on road freight through trucks and heavy commercial vehicles, and a consideration of rail freight where impacts are expected.

Table 3-7: Scoring rationale - Freight potential throughput

Score	Description
3	Significant increase in freight potential throughput through grade separation and potential increase of freight moved by rail enabled by rail loop completion.
2	Moderate increase in freight potential throughput through multiple interventions
1	Slight increase in freight potential throughput. This could include mixed impacts with overall effect being slight positive.

Score	Description
0	No notable impact

Assessment commentary

Options 6 and 7 scored 3 as both options include grade separation of the important freight movements. The rail loop completion is also expected to further improvement with potential increases in rail freight throughput.

Options 4, 5 and Ngāi Tukairangi Option, scored 2 due to allocation of freight lanes on Hewletts Rd in the off-peak and dynamic traffic lanes and/lane widening on Totara St.

Option 3 scores a 1 due to allocation of freight lanes on Hewletts Rd in the off-peak.

Option 1, 2, 8 and 3a scored 0 with a neutral impact expected. The effect of allocation of freight lanes on Hewletts Rd in the off-peak in Option 2 and 3a is countered by the port gate pricing and rail timing management, therefore they scored neutral overall.

Risk of death and serious injuries (collective risk)

Methodology

This assessment was based on a high-level estimate of the impact on the Safe Systems Considerations[16], which includes exposure to risk, likelihood of crash and severity of crash.

The patterns identified in the crash history indicate the greatest historical risk is related to the lack of separated cycle facilities, the lack of safe pedestrian crossing facilities and the conflicts of property accesses with through movements. The assessment also considers the risk associated with other crash types not represented in past 5-year history, such as vehicle conflicts at intersections.

Table 3-8: Scoring rationale - Risk of death and serious injuries (collective risk)

Score	Description
3	Significant improvements, e.g. improvement to multiple elements of the Safe System
2	Some improvements, e.g. improvement to one element of the Safe Systems one element but to a large extent
1	Slightly better than neutral effect on Safe Systems elements
0	Mixed / no overall impact
-1	Risk is worsened

Assessment commentary

Option 5 scored 3 as the mode shift interventions and additional separated cycling facilities are expected reduce exposure to risk and likelihood of crashes for vulnerable users. The streetscape improvements are expected to result in reduced vehicle operating speeds and reduce the severity of any crashes that do occur.

Option 8 scored 2 as the BRT cross section is expected to reduce vehicle speeds and vehicle volumes and provide safer walking and cycling facilities for access to stations and along the corridor. This safety improvement is slight mitigated by the effect of increased exposure due to need for pedestrians to cross traffic lanes to access stations. Overall, this option is considered to have a moderately positive impact on risk of death and serious injury.

16 Austroads Safe System Assessment Framework

Options 2 and 3a scored 1 due to the slightly positive impacts on risk of death and serious injury. For Options 2 and 3a, the improvement relates to a reduction of conflict points due to the removal of driveways or restriction of intersections to left in left out only.

Option 1 and Ngāi Tukairangi Option scored 0 as streetscape rearrangements likely to involve speed reductions which reduces severity of crashes that occur and involve more separation of peds/cyclists from road. However, this is countered new residents being exposed to traffic risks. In addition, for Ngāi Tukairangi Option, four laning of Totara Rd might further increase traffic exposure risks.

Options 6 and 7 scored 0 as it was considered that benefits are mitigated by increases in risk leading to an overall neutral impact. Benefits in these two options include the opportunity to improve safety in design with the new roading infrastructure and that the grade separation involves the removal of certain conflict points at intersections throughout the Hewletts Rd corridor. However, positive effect is countered by the expected increase in vehicle volumes and speeds along the Hewletts Rd corridor which is an increase of exposure to traffic for all road users. Increased speeds are also likely to result in worsened severity of any crashes that do occur.

Option 4 scored -1 as it increases the risk of death and serious injury. The removal of solid median separation and the running of contra flow dynamic traffic lane increases risk of head-on crashes and turning related crashes.

Public transport mode share

Methodology

The assessment was a qualitative assessment based on the extent of provision of high-quality public transport facilities, compared with the extent of provision for private vehicles. Public transport mode share from the Tauranga Transport Strategic Model (TTSM) 2022[17] do min and do something are used for reference.

Table 3-9: Scoring rationale - Public transport mode share

Score	Description
3	Significant public transport improvement, e.g. BRT + ferry
2	Moderate public transport improvements e.g. pricing incentives, bus lanes
1	Minor public transport improvements, e.g. behaviour change/pricing, land use change (with a degree of uncertainty)
0	Similar to do min. This may include roading upgrades which counter public transport improvements, given an overall neutral effect.
-1	Enhancement for private vehicle travel outweighs public transport improvements

Assessment commentary

Option 8 scored best compared to all due to the potential of a high-quality attractive BRT system and ferry service, combining with pricing and behaviour change programme, to improvement public transport mode share. This option is likely to perform significantly better than TTSM do-something scenario, which has a public transport mode share of 3.7% in 2031.

Option 5 scored 2 due to continuous bus lanes on Maunganui Rd, combined with pricing and behaviour change programme to increase public transport mode share.

Option 1, 2, 3a, 6, and Ngāi Tukairangi Option scored 1. Option 1 and Ngāi Tukairangi Option are likely to reduce long distance private vehicle travel due to land use changes, therefore decrease private vehicle

[17] Tauranga Transport Strategic Model (TTSM) – Forecasting Scenarios Modelling, 2021

mode share, and in turn increase public transport mode share. Option 2 is expected to reduce the attractiveness of private travel through cordon charges and parking pricing and increase public transport attractiveness and usage through fare incentives. Option 3a is expected to perform similar to Option 2. Option 6 is likely to entice local private vehicle trips through Totara St grade separation, however, the effects from the provision of Maunganui Rd bus lanes, cordon pricing, and public transport incentives are expected to outweigh that.

Option 7 is likely to entice both local private vehicle trips from Mt Maunganui and through/regional private vehicle trips via significant grade separation on both Totara St and Jean Batten Dr intersections. This negative effect is expected to be countered by the provision of Maunganui Rd bus lanes, cordon pricing, public transport incentives, therefore Option 7 scored neutral overall.

Walking and cycling mode share

Methodology

The assessment was a qualitative assessment based on the extent of provision of active modes facilities and urban realm compared with the extent of provision or attractiveness for private vehicle travel. Cycling mode share from Tauranga Cycle Programme Model (TCP)[18] is used as reference for do-minimum scoring. In the TCP, Mt Maunganui / Omanu / Arataki's cycling mode share is forecasted to be 12% Trips to Work and 21% Trips to School.

Table 3-10: Scoring rationale - Walking and cycling mode share

Score	Description
3	Significant walking and cycling improvements e.g. continuous high-quality paths/streetscape, safety improvements, combined with pricing/behaviour change.
2	Moderate walking and cycling improvements with pricing/behaviour change, e.g. continuous paths
1	Behaviour change/pricing with very minimal active mode facilities
0	Minimal walking and cycling facilities
-1	Significant road investment that increases private vehicle use, e.g. significant grade separation

Assessment commentary

Option 5 scored best due to the high-quality bi-directional cycle facilities long Maunganui Rd, Hewletts Rd, Hull Rd, and a new cycle over path around the Totara St/Hewletts Rd intersection, which improves the walking environment and enhances cycle safety.

Option 1, 8 and Ngāi Tukairangi Option scored moderately positive. Option 1 and Ngāi Tukairangi Option's industrial retreat and mixed-use development are likely to reduce long distance private vehicle travel as there are more people are living closer to supermarkets, workplaces and leisure areas. However, there is a slight uncertainty in realising this benefit due to planning and consenting risks. Option 8's continuous high quality bi-directional cycle facilities on Maunganui Rd, Hewletts Rd (on both sides), and Hull Rd are likely to improve cycling mode share.

Option 2 and Option 3a scored slight positive as it is expected that the attractiveness of private travel is reduced through cordon pricing, parking pricing, public transport pricing and behaviour change programmes.

Option 3 scored neutral as short cycle facility on Hull Rd is unlikely to influence mode share.

Option 4, 6, and 7 scored slight negative. Option 6 and 7's grade separation is likely to entice further private vehicle travel trips due to capacity improvements. Option 4's dynamic lane arrangement is likely to further entice private vehicle usage during the peak periods.

[18] Tauranga Cycle Programme Cycle Demand Assessment and Economic Evaluation, May 2020, Flow

Public transport travel time compared to general vehicle travel time

Methodology

The assessment was a qualitative consideration based on public transport travel time improvements e.g. level of priority, compared with extent of general traffic travel time improvements / restriction. The assessment is based on sum of the scores of each component within each option as outlined in Table 3-11 below to form an overall scoring for each option.

Table 3-11: Scoring rationale - Public transport travel time compared to general vehicle travel time

Score	Description
2	Interventions that significantly improve public transport travel time ▪ BRT ▪ Continuous bus lanes
1	Interventions that moderately improve public transport travel time ▪ Bus lanes ▪ HOV lanes
0	Interventions that improve both public transport and general vehicle travel time ▪ Land use change to mixed use developments ▪ Parking pricing / cordon pricing / behaviour change programme ▪ P&R ▪ Grade separation of Totara St and Jean Batten Dr
-1	Interventions that moderately improve general traffic travel time ▪ Improve throughput on SH2 (only improves travel time for general traffic as there are existing bus lanes on Hewletts Rd) ▪ Grade separation of Totara St right turn ▪ Dynamic lanes ▪ Four laning Totara St

Assessment commentary

Option 8 and 5 scored the best. Option 8's high quality BRT system with bus signal pre-emption, and Option 5's continuous bus lanes with bus queue jumps at key intersection are expected to improve bus travel time significantly.

Option 1 and Ngāi Tukairangi Option scored slightly positive due to bus lanes on Maunganui Rd. Land use change benefits both public transport and general vehicle travel time as it reduces private vehicle demands on road.

Option 7 scored slightly positive due to the public transport travel time improvement via continuous bus lanes on Maunganui Rd and Hewletts Rd outweighing slight improvement to private vehicle travel time via four-laning of Totara St. The grade separation on Totara St and Jean Batten Dr is assumed to improve both general vehicle and bus travel time.

Option 6 scored neutral due to the public transport travel time improvement due to continuous bus lanes on Maunganui Rd and Hewletts Rd is countered by the grade separation at Totara St and four-laning Totara St which benefit private vehicles' travel time only.

Option 2 and 3a scored neutral due to pricing schemes reducing private vehicle demands, which improves both public transport and private vehicle travel time.

Option 3 scored slight negative due to throughput improvements on Hewletts Rd only provides benefit to private vehicles as there are existing bus lanes on Hewletts Rd.

Access to social and economic destinations by public transport, walk and cycle

Methodology

The qualitative assessment was based on people's ability to access to key social (Mauao, Bayfair shopping centre, hospital, supermarket) and economic (port, airport, CBD and work) destinations by public transport, walking and cycling.

Table 3-12: Scoring rationale - Access to social and economic destinations

Score	Description
3	Significantly improved people access via public transport and active modes 5 or more key destinations.
2	Moderate improved people access via public transport and active modes to 3 or more key destinations.
1	Slightly improvement to access via public transport and active modes.
0	None or very minimal improvement to access.

Assessment commentary

Option 8 scored the best due to BRT provides fast and reliable access to **airport, Mauao, local employment areas, CBD/Hospital**. The ferry service provide access to **CBD** and **Mauao**. There is good access via bi-directional cycle facilities along Maunganui Rd and Hull Rd for **local employment areas** and **schools**.

Option 5, 6, 7 scored moderately positive due to high quality continuous public transport lanes, bus priority, and bus stop upgrades providing good and reliable public transport access to **airport, Mauao, local employment areas**, **CBD/Hospital**. Option 5 also has good access via bi-directional cycle facilities along Maunganui Rd and Hull Rd for local employment and schools.

Option 1 and Ngāi Tukairangi Option scored moderately positive due to land use change improving alternative mode access as residential are now within close proximity to various destinations (**supermarket/work/schools/ Mauao**).

Option 4 scored slight positive due to HOV/bus lane on Maunganui Rd slightly improving access to local **employment areas, schools, Mauao** via bus.

Option 2,3 and 3a scored neutral due to minimal improvement for public transport, walking and cycling.

Ambient air quality and noise level

Methodology

This assessment was based on a qualitative estimate of negative impacts on air quality and noise levels present near residential or community areas. This is based on anticipated changes to traffic volumes within proximity of sensitive receivers.

All options were anticipated to result in modest impacts to air quality and noise levels, so scores have been limited to between -1 and +1.

Table 3-13: Scoring rationale - Ambient air quality and noise level

Score	Description
1	Likely to result in reduced traffic demands near residential and community areas.
0	Neutral impacts on traffic demands close to residential and community areas
-1	Likely to result in additional traffic volumes close to residential and community areas.

Assessment commentary

Option 5 and 8 scored 1 as the mode shift improvement were expected to result in reduced vehicle use therefore reducing emissions and noise levels.

Options 1, 3, 4, 6 and 7 scored -1. For Option 1, this was due to the introduction of new sensitive receivers next to the high volume Hewletts Rd corridor through land use change. For Option 3, 4, 6 and 7, this was due to the increases in traffic flows near existing sensitive receivers such as the Whareroa Marae.

Options 3 and 3a scored a 0 as no notable impacts were expected.

Ngāi Tukairangi Option scored 0, as the negative impact through the introduction of new sensitive receivers next to the high volume Hewletts Rd corridor through land use change is countered by pricing and improved public transport which is expected to reduce vehicle use and noise.

Water quality

No differentiation between options at longlist stage as it is assumed that water treatment can be implemented for all options. This will become a principle to be developed through the design process in the shortlist stage.

CO2 emissions

Methodology

The assessment was based on a qualitative estimate of the emissions based on the anticipated changes to overall traffic demands and mode shift from private vehicles, especially from single occupancy vehicle to public transport and active modes. This considers the operational carbon emissions from the transport system. The majority of the carbon emissions from the longlist options are expected to be operational (rather than embodied).

Table 3-14: Scoring rationale - CO2 emissions

Score	Description
2	Significant reduction of through traffic volumes along Hewletts and improvement in mode share
1	Some reduction in traffic volumes and improvement in mode share e.g. pricing/land use change (with uncertainty)
0	Similar to do-min. This may include minor increase in public transport / active mode share counter by minor increase in traffic volumes
-1	Increase in additional traffic volumes

Assessment commentary

Option 5 and 8 scored best due to significant improvement to public transport, walking and cycling, combined with behaviour change programme and pricing schemes are likely to have increase public transport and active mode share and reduce private vehicle trips, therefore reduce overall emission.

Option 1, 2 and Ngāi Tukairangi Option scored 1. Option 1 and Ngāi Tukairangi Option's industrial retreat and mixed-use development are likely to promote active mode travel and reduce long distance private vehicle travel as there are more people living closer to supermarkets, workplaces and leisure areas. However, there is a slight uncertainty in realising this benefit due to planning and consenting risks. Option 2's pricing schemes and public transport incentives are likely to encourage mode shift and reduce vehicle trips, therefore reduce overall emission.

Option 4, 6, 3a scores neutral. Option 4's HOV lanes on Maunganui, and improved bus stops, along with behaviour change programmes will have some minor effect on mode shift from single occupant vehicle. Dynamic/priority lanes on Hewletts Rd may increase vehicle trips at a local level but they are unlikely to have significant impacts to vehicle emissions due to limited operation periods. Option 6's Totara St widening and grade separation may improve travel times for local traffic and introduce more vehicle trips, however, this is countered by public transport priority, pricing and behaviour change programme to support mode shift. Option 3a's prioritising throughput may increase vehicle trips and emissions, however it is countered by pricing and public transport incentives which encourage mode shift.

Option 3, and Option 7 scores -1. Option 3 prioritises throughput and hence increase vehicle trips, which would lead to additional emissions, however, the impact is considered minor. Option 7's Totara St widening and grade separation at both Totara St and Jean Batten intersections are likely to entice both local and through / regional private vehicle trips. This negative effect is countered to some extent by the Maunganui Rd bus lanes, cordon pricing, public transport incentives, giving Option 7 an overall slight negative score.

Mode shift of freight from road to rail

Methodology

The assessment was based on the attractiveness of rail compared with road. It is assumed rail loop will have some improvement to rail travel time, therefore improving mode shift to rail. The scoring is to be further refined in the shortlist stage following discussion with Kiwi Rail.

Table 3-15: Scoring rationale - Mode shift of freight from road to rail

Score	Description
1	Rail loop to improve rail travel time
0	Impact of pricing TBC with Kiwi Rail

Assessment commentary

Option 5, 6 and Ngāi Tukairangi Option scored 1 as the rail loop is expected to improve rail travel time and therefore increase attractiveness of rail compared to road. The remaining options scored a 0, as the effect of pricing of port gates and freight priority lanes on mode shift of freight from road to rail is uncertain and is to be confirmed following further discussions with Port and Kiwi Rail.

3.2.2 Technical and feasibility assessment

Constructability/Implementability

Methodology

This assessment was based on an estimation of the complexity of construction required to deliver the option, based on how common the construction techniques are, the extent of traffic disruption that would be involved with construction, and overall deliverability by partner agencies.

This criterion was scored on a -1 to -3 scale as all options were more complex to construct than the do-minimum.

Table 3-16: Scoring rationale - Constructability/Implementability

Score	Description
-1	Moderate or straightforward works. Localised traffic management and disruption issues.
-2	Major construction works, but nothing uncommon. Wider traffic management and disruption issues
-3	Construction of this kind is not common in New Zealand. Some significant constraints with disruption.

Assessment commentary

Option 1 and Ngāi Tukairangi Option scored -3 due to the uncertainty of delivery. While local council can action this on a land use planning level, implementing the land use change relies on private developers to deliver.

Option 4, 6, 7 and 8 scored -2 due to the large scale, complexity, and traffic disruption of the interventions.

All other options were considered moderate or straightforward works and were scored -1.

Planning and Consenting

Methodology

This assessment was based on a high-level assessment of the likelihood of obtaining planning approval, with consideration of the qualitative impacts on property.

Table 3-17: Scoring rationale - Planning and Consenting

Score	Description
0	Unlikely consents are required/within scope of current consents and planning framework
-1	Minor consenting process expected
-2	Moderately complex consenting process expected
-3	Highly complex consenting processes expected

Assessment commentary

Options 1, 6, 7, 8 and Ngāi Tukairangi Option scored -3 as the land use change would require a highly complex consenting process. Option 6 and 7 also include significant property acquisition require for four laning of Totara St, rail connections and crossings, and grade separated infrastructure.

Option 3 scored -2 due to the property impacts of extensive local connections.

All other options scored -1.

CAPEX

Methodology

This assessment was based on a high-level estimation of capital cost using a basis of assumption that the costs are similar to capital expenditure (CAPEX) of previous projects.

This criterion was scored on a -1 to -3 scale as all options were more expensive to construct than the do-minimum.

Table 3-18: Scoring rationale - CAPEX

Score	Description
-1	Capital cost expected estimate between $0 and $150m
-2	Capital cost expected estimate between $150m and $300m
-3	Capital cost expected estimate between $300m and $600m

Assessment commentary

Options 7 and 8 both scored -3 with capital cost expected estimate between $300m and $600m. The main costs were to deliver the infrastructure upgrades such as the BRT system and ferry in Option 8, and grade separated infrastructure and rail upgrades in Option 7.

Option 6 scored -2 with a capital cost expected estimate between $150m and $300m, the main costs being the grade separated flyover and rail upgrades. The Ngāi Tukairangi Option also scored -2, with the main costs being street scaping, park and rides, new local roads and rail upgrades.

Options 1 to 5 all scored -1 with capital cost estimates below $150m.

Operating Cost/ Efficiency

Methodology

This assessment assumed that annual operational expenditure (OPEX) is approximately 2.5% of CAPEX, with a consideration of OPEX factors.

Table 3-19: Scoring rationale - Operating Cost/ Efficiency

Score	Description
-1	OPEX below $3.75m annually
-2	OPEX between $3.75m and $7.5m annually
-3	OPEX between $7.5m and $15m annually

Assessment commentary

Option 7 scored a -3 as it has the highest OPEX estimate between $7.5m and $15m annually.

Option 6 and 8 scored -2 with an OPEX estimate between $3.75m and $7.5m annually. We note that based on the CAPEX level, Option 8 along would have scored a -3, however it was considered that the BRT system would provide OPEX savings in operations which made Option 8 scored -2.

All other options scored -1 with OPEX estimates below $3.75m annually.

Value for Money

Methodology

This assessment was based on an assessment using the Waka Kotahi Indicative Efficiency Rating (IER) Tool which give an expected benefit to cost ratio (BCR) range as an output indicating expected value for money.

As inputs for the assessment, the following assumptions listed in Table 3-20 were made. These inputs along with the estimates for CAPEX and OPEX were inputted to get a BCR range. The output was sensitivity tested with the high and low ranges of the CAPEX estimates.

Table 3-20: Indicative Efficiency Rating Tool - Input Assumptions

Option	DSI reduction	Percentage improvements in traffic travel time (current travel time 85th percentile assumed to be 12 minutes)	Public transport patronage daily (Do Minimum assumed to be 930 based on TTSM 2018 model results)	New cycling facility length	Percentage improvements to bus travel time (current travel time assumed to be 6 minutes)	Estimated percentage of resilience problems removed	Primary benefit	Secondary benefit
Option 1	40%	3%	3,210	20km	15%	5%	Impact on mode choice & access – PT	Impact on network productivity & user experience – Travel time
Option 2	0%	3%	2,000	4km	15%	5%	Impact on mode choice & access – PT	Impact on network productivity & user experience – Travel time
Option 3	0%	3%	1,000	4km	-15%	5%	Impact on mode choice & access – PT	Impact on network productivity & user experience – Travel time
Option 3a	0%	3%	1,500	4km	0%	5%	Impact on mode choice & access – PT	Impact on network productivity & user experience – Travel time
Option 4	-20%	5%	890	4km	-30%	0%	Impact on network productivity & user experience – Travel time	Impact on reliability & access – Resilience

Option	DSI reduction	Percentage improvements in traffic travel time (current travel time 85th percentile assumed to be 12 minutes)	Public transport patronage daily (Do Minimum assumed to be 930 based on TTSM 2018 model results)	New cycling facility length	Percentage improvements to bus travel time (current travel time assumed to be 6 minutes)	Estimated percentage of resilience problems removed	Primary benefit	Secondary benefit
Option 5	65%	0%	3,210	11km	30%	10%	Impact on mode choice & access – PT	Impact on Safety
Option 6	0%	10%	2,000	4km	30%	15%	Impact on network productivity & user experience – Travel time changes	Impact on mode choice & access – PT
Option 7	15%	20%	1,000	4km	30%	20%	Impact on network productivity & user experience – Travel time changes	Impact on mode choice & access – PT
Option 8	40%	0%	4,000	11km	30%	25%	Impact on mode choice & access – PT	Impact on mode choice & access – Active mode
Ngāi Tukairangi Option (Scored as per Option 1)	40%	3%	3,210	20km	15%	5%	Impact on mode choice & access – PT	Impact on network productivity & user experience – Travel time

The input assumptions above were developed based on the following basis.

- DSI reduction was based on consideration of the expected safety improvements associated with each option and assumed to be in the range of standard safety intervention improvements.
- Walking and cycling facility length was given as the length of new facility provided where there is none currently. Cycle lane lengths were doubled where bidirectional facilities were provided. All options have 2km of new walking facility.
- Percentage improvements in travel time were based on consideration of the traffic travel time impacts and benchmarked against similar projects.
- Target public transport patronage was based upon the TTSM Do min of 930 passengers per day and the TTSM future Do Something estimate of 3,210 passengers per day. The options were scored relative to this level with consideration of the level of public transport improvements included.

- The estimated percentage of resilience problems removed by each option were estimated relative to all options. Interventions such as additional local connections, dynamic lanes and multi-modal corridors were assumed to provide improved resilience.

Table 3-21: Scoring rationale - Value for Money

Score	Description
1	BCR in Low/Very Low range
0	BCR in Very Low Range

Assessment commentary

This tool gave low or very low expected BCR ranges for all options. We note that this may be due to the limited benefit recognition built into the tool, which offers five benefits of which two are considered for each option.

Options 3 and 7 scored 0. For Option 7, a key influence was the high construction cost and OPEX cost. For Option 3, this was largely due to the poor level of benefits as recognised by the IER tool for this option with low impact on public transport mode choice, access, and travel time.

All other options scored a 1.

Meeting customer needs

Methodology

This assessment is a qualitative assessment against the specific customer needs and pain points, which includes safety (for all customers, shift worker at night), trip lengths (commuter), reliability (commuter, freight operator, trade/servicing/commercial, regional travellers), choice (commuter, shift worker, sport facilities attendees, students, leisure), environment/urban realm/air quality (leisure and recreation, Whareroa Marae).

Table 3-22: Scoring rationale - Meeting customer needs

Score	Description
3	Significant improvement to 6 or more customer groups
2	Significant improvement to 4 or more customer groups
1	Significant improvement to 2 or more customer groups

Assessment commentary

Option 5, 6, 7 and Ngāi Tukairangi Option scored the best.

For Option 5 and the Ngāi Tukairangi Option, the significant additional alternative choices for public transport, walking and cycling are provided for customers (**commuter, shift worker, leisure/recreational, students**). Streetscaping improves air quality and urban realm and provides for **Whareroa Marae**. VMS intents to advise **regional travellers** of congestion and route choices.

Option 6 and 7's grade separation, and four laning Totara provides improves travel time and reliability for **freight, trade/servicing, commuter, shift** worker from Mount communities, and Eastern Bay of Plenty (for Option 7) via private travel. Significant additional alternative choices are provided for most customers (**commuter, shift worker, leisure/recreational, students**). Option 6 and 7 also have VMS to advise **regional travellers** of congestion and route choices.

Option 1 and 4 scored 2. Option 1's mixed use land uses mean most customers (**commuters, shift workers, students, sports facilities attendees, leisure/ recreational**) would have alternative modes to travel to **work/education/events/leisure**. Regional travellers are also less likely to be caught in congestion due to self-contained living. Industrial retreat and streetscape improve air quality and provide benefit for **Whareroa Marae**. Option 4's dynamic lanes provide increased capacity for customers (**commuters/student/trade servicing**) in peak periods. Event based management provides for **sport events/recreational customers**.

Option 2, 3, and 3a scored 1, as they provide significant improvement to mainly **freight** trips through freight priority and VMS for **regional travellers**.

Climate Change Mitigation

This climate change mitigation is scored in the Investment Objective CO2 emissions.

Alignment with Whareroa Marae's Strategy

Methodology

This assessment is a qualitative assessment against the alignment of the options with Whareroa Marae's Strategy.

Table 3-23: Scoring rationale - Meeting customer needs

Score	Description
2	Alignment with Whareroa Marae's Strategy
-1	Does not Align with Whareroa Marae's Strategy

Assessment commentary

Options 1 and Ngāi Tukairangi Option scored +2 as both options support the city plan changes as an opportunity to repurpose/change existing heavy polluting industrial land uses, particularly surrounding Whareroa Marae, to a mix of residential, commercial, active and passive greenspace.

The rest of the options scored a -1 and do not align with Whareroa Marae's strategy for industrial retreat.

Impacts on Te Ao Māori

Methodology

This assessment is a qualitative assessment based on a combination of feedback from Ngāi Tukairangi hapū[19] and Ngāti Kuku. Please see the Ngai Tukairangi Hapū Kowhiri Iwa (position paper) for further commentary.

Table 3-24: Scoring rationale - Impacts on Te Ao Māori

Score	Description
3	All interventions supported by Ngāi Tukairangi
2	Net 'support' (number of interventions supported minus the number of interventions opposed) provided by Ngāi Tukairangi >=4, and/or neutral feedback from Ngāti Kuku.
1	Net 'support' (number of interventions supported minus the number of interventions opposed) provided by Ngāi Tukairangi >=2, and/or neutral feedback from Ngāti Kuku.
0	Net 'support' around 0

[19] Ngai Tukairangi Hapū Kowhiri Iwa (position paper)

Score	Description
-1	Minor grade separation not supported by Ngāti Kuku
-2	Major grade separation not supported by Ngāti Kuku

Assessment commentary

Ngāi Tukairangi Option scored the best. The Ngāi Tukairangi Option developed by the Ngāi Tukairangi Hapū is comprised of elements from the other longlist options that Ngāi Tukairangi Hapū supports. The option is primarily driven by the city's plan modifications, which offer a chance to transform current industrial zones with high pollution levels, especially those around Whareroa Marae. The intention is to create a blend of residential, commercial, and vibrant green spaces for both active and leisurely purposes. Additionally, Hapū is in favour of all other interventions that enhance environmental well-being, particularly in terms of improving air and water quality.

Options 1, 4, 8 scored 2. Option 1 scored 2 as the Ngāi Tukairangi Hapū supports changes in the land use from heavy polluting industrial predominant land use to residential, commercial and greenspace, combined with streetscaping (with a preference for indigenous vegetation, water sensitive design and biophilic design emphasis), walking/cycling and public transport infrastructure. Option 4 also score 2 as the Ngāi Tukairangi Hapū supports dynamic lanes on Hewletts, enabling efficient freight trips through allowing freight to use bus lane in the off-peak, along with enhancements to bus stops, upgrades to cycling infrastructure, local network optimisation and managed rail timings. Option 8 scored a 2 as the Ngāi Tukairangi Hapū supports upgrades to a full BRT system along with cycle infrastructure upgrades.

Option 2, 3, 3a and 5 scored a 1. The Ngāi Tukairangi Hapū supports a range of interventions including signalisation of intersection, improvements to bus stops, new walking/cycling connection, minor local connections improvements, off-peak freight lanes, widening of Totara St, however, the Hapū also opposes various interventions within the options including significant local links upgrades leading to acquisitions, rationalisation of access, removal of parking, and parking/port gate and cordon pricing.

Option 6 and Option 7 scored -1 and -2 respectively, mainly due to Ngāti Kuku opposing grade separation in any form and Option 7 scores worse as it includes the full grade separation of Hewletts Rd. Ngāi Tukairangi are supportive on the basis that a full CBA has been carried out to demonstrate the value.

3.3 Options Assessment Workshop

The Options Assessment Workshop was held with TCC, BOPRC and Waka Kotahi on 23rd September 2022. A list of the workshop attendees is included in Table 3-25 below.

Table 3-25: MCA Options Assessment Workshop Attendees

Name	Organisation
Ben Peacey	Waka Kotahi
Will Bamford (WB)	Waka Kotahi
Sangamesh Chouka	Waka Kotahi
Paul Willey	Waka Kotahi
Skip Fourie (SF)	TCC
Tony Bonetti (TB)	TCC
Oliver Haycock (OH)	BOPRC
Erica Walker (EW)	Aurecon
Steve Dudley (SD)	Aurecon
Flynn Roser (FR)	Aurecon
Peter Theiler (PT)	Aurecon
Norma Kloosterman	Aurecon
Ian Clark (IC)	Flow (for Aurecon)

The workshop included the longlist assessments undertaken by the project team, with additional Project Partner comments and updated scoring incorporated after the workshop.

Below is a summary of the key feedback and discussion points covered during the workshop:

- **Approach to scoring MCA:** There was a discussion regarding whether the team would be using weighted MCA totals to determine the shortlist. It was confirmed that the team would not use totals as a way of determining shortlist, noting that this could be a flawed method to rely on totals.
- **Dynamic Rd Allocation:** The group discussed the scoring for Dynamic Rd Allocation, particularly the public transport travel time scoring. It was explained that this is because the bus lanes become shared freight and bus lanes in the off-peak times. No change was made to scoring. For the Safety scoring, it was agreed to improve this from a -2 to a -1, as it would likely involve a speed reduction given risk of head on crashes.
- **BRT Option:** The group discussed the rationale for the freight scoring. It was assumed that the BRT system would get priority at signalised intersections, which may worsen freight reliability. However, this this may be mitigated by the likely mode shift from private vehicle to bus which would reduce general traffic volumes therefore improving freight travel time reliability. It was agreed to amend the score to 0.
- **CBD Cordon Pricing:** The group discussed to what extent we can rely on the cordon pricing interventions to be implementable, as this is a city-wide intervention which has wider considerations and implications beyond this project. A joint Waka Kotahi/TCC 'Dynamic Rd Pricing Study" is currently underway, which will provide a baseline for other projects considering cordon pricing to align to. It was noted that options are not reliant on the cordon pricing for their scoring. Following the meeting, it was decided to remove the cordon pricing element from the shortlist options, pending the outcome of the study and lack of available legislative powers to implement such a scheme. Importantly, other general pricing interventions, such as variable port gate pricing, PT fare incentives and parking pricing were still considered and assessed within the shortlist options.
- **Hybrid Option:** There was support from Project Partners to include a hybrid Option 2/3 (“Option 3a”) in shortlist, to test effectiveness in the long or medium term given the lower cost.
- **Inclusion of Ferry:** The group agreed keep the ferry service as an intervention, given the live trial and the potential to provide an additional public transport connection. The group agreed to include this at the shortlist stage.

The details of the workshop and meetings can be found in Appendix B.

4 MCA Outcome

A summary of the MCA for the longlist is included in Figure 4-1 and Figure 4-2. This includes Option 3a, which was developed and scored following feedback that was received from Project Partners during the workshop.

BENEFIT	INVESTMENT OBJECTIVE	MEASURE / KPI	Do Minimum	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 3a	Ngāi Tukairangi Option
			SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE
Improved transport system reliability, permeability, and throughput of people and goods	To improve reliability, permeability, and throughput of people and goods	People throughput	0	0	-1	1	1	2	2	2	3	1	2
		Travel time reliability for freight movements	0	0	2	1	2	2	3	3	0	2	2
		Travel time reliability for public transport	0	1	0	0	-2	2	2	2	3	1	2
		Freight throughput value	0	0	0	1	2	2	3	3	0	0	2
A multi-modal transport system that supports safer and healthier journeys	To reduce road deaths and serious injuries for all users by at least 40%	Risk of death and serious injuries (collective risk)	0	0	1	1	-1	3	0	0	2	1	0
Improved transport choice for access to social and economic opportunities	To provide better mode choice options and increase public transport and active travel mode share	Public transport mode share	0	1	1	0	-1	2	1	0	3	1	1
		Walking and cycling mode share	0	2	1	0	-1	3	-1	-1	2	1	2
		Public transport travel time compared to general vehicle travel time	0	1	0	-1	0	2	0	1	2	0	1
		Access to social and economic destinations by PT, walk and cycle	0	2	0	0	1	2	2	2	3	0	2
Reduced impact on the environment and climate change impacts from transport related carbon emissions	To reduce the transport related effects on water, air quality and noise	Ambient air quality - (NO_2 and PM_{10}) and Noise level	0	-1	0	-1	-1	1	-1	-1	1	0	0
		Water quality	*No differential between options. Will become a principal to be developed through the design process.*										
	To reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	CO_2 emissions	0	1	1	-1	0	2	0	-1	2	0	1
		Mode shift of freight from road to rail	0	0	0	0	0	0	1	1	0	0	1

Figure 4-1: MCA Assessment Summary - Investment Objectives

BENEFIT	INVESTMENT OBJECTIVE	MEASURE / KPI	Do Minimum	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 3a	Ngāi Tukairangi Option
Technical / Feasibility Criteria													
			SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE
Feasibility	Constructability/Implementability	Assessment of Constructability / complexity of facility including stormwater infrastructure	0	-3	-1	-1	-2	-1	-2	-2	-2	-1	-3
Consenting & property impacts	Planning and Consenting	Likelihood of obtaining approval and Qualitative assessment of impacts on property	0	-3	-1	-2	-1	-1	-3	-3	-3	-1	-3
Cost	CAPEX	High level $ estimate of capital costs of physical works and affordability	0	-1	-1	-1	-1	-1	-2	-3	-3	-1	-2
	Operating Cost/ Efficiency	Assessment of operational costs including infrastructure maintenance	0	-1	-1	-1	-1	-1	-2	-3	-2	-1	-1
Value for Money	High-level assessment of value for money		0	1	1	0	1	1	1	0	0	1	1
Meeting customer needs	Qualitative assessment of the options against the specific customer needs and pain points		0	2	1	1	2	3	3	3	2	1	3
Climate Change Mitigation (Mandatory)	Assessment of mode shift and traffic reduction, VKT, land use		*Assessed as per Investment Objective above*										
Alignment with Whareroa Marae's Strategy	The extent to which the option complements Whareroa Marae's strategy for future land use		0	2	-1	-1	-1	-1	-1	-1	-1	-1	2
Impacts on Te Ao Māori (Mandatory)	Assessment of impact on Te Ao Māori including areas of significance for Māori, Māori land and Kaitiakitanga		0	2	1	1	2	1	-1	-2	2	1	3

Figure 4-2: MCA Assessment Summary – Technical / Feasibility

4.1 Assessment Outcome Summary

Based on the outcomes of the MCA assessment and the Longlist Option Assessment Workshop, the following options are recommended to proceed to the shortlist stage, for more detailed development and assessment:

Option 5 – At grade improvements and mode shift: Scores well against all investment outcomes. Recommended to be taken forward to shortlist.

Option 6 – Improving goods throughput: Scores well against most outcomes. Appears to provide a good balance of mode shift, and throughput. Recommended to be taken forward to shortlist.

Option 3a – Throughput focus: Performs reasonably well against the outcomes. The option includes elements from Options 2 and 3, including additional focus on limiting access on SH2 and enhancing role of Newton Rd (or parallel corridor). Recommended to be taken forward to shortlist.

It is recommended that the following options do not proceed to the shortlist:

Option 1 – Land use change: Land use change can be applied to any option and could be implemented over time. There are significant issues in terms of deliverability, and the responsibility to advance this option lies with TCC as it is planning led.

Option 2 – Reallocation of space and pricing: Doesn't achieve the outcomes on its own. Elements will be incorporated into other options e.g., Option 3a.

Option 3 – Throughput focus: Performs reasonably well against the outcomes. Recommended to be taken forward to shortlist with some amends (including elements taken from Option 2), developed as Option 3a.

Option 4 – Dynamic lanes: Improves throughput but has complex safety issues to overcome. Issues could be resolved if concept applied more widely across transport network.

Option 7 – Increase throughput and capacity: Scores well against most outcomes, poor against mode shift outcomes which is a weakness.

Option 8 – Increase people throughput (BRT & Ferry): Scores well against outcomes, but unviable without a wider BRT system and network to tie into across Tauranga and Bay of Plenty. There is no current expectation that a wider BRT network will be planned. It is acknowledged that BRT is best run as a wider network. Any future system would potentially include a public transport and/or passenger rail service over the Matapihi Bridge.

Ngāi Tukairangi Option: Scores well against outcomes, however there are significant issues in terms of deliverability. Several major components, including improvements to local roads, green spaces, airport and land use changes, would require TCC to lead. Hence the responsibility to advance with this option lies with TCC.

Appendix A Longlist MCA Assessment Sheet

Appendix B Longlist MCA Workshop

Miro board & meeting minutes

Longlist MCA Workshop Miro board

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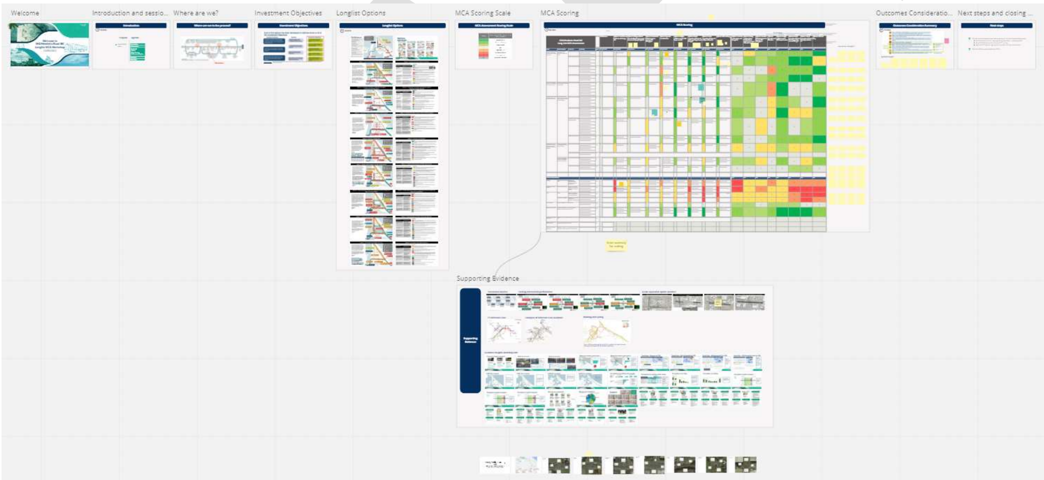

Appendix C Existing Corridors with Study Area

Hewletts Road

The existing Hewletts Road corridor is generally 35m in width boundary-boundary, typically providing for:

- Two lanes of general vehicle traffic in each direction;
- A bus lane in each direction (cyclist and motorcyclists are permitted to use);
- A central median;
- Narrow pedestrian footpath on southern side (approximately 1.3m in width); and
- 2m wide shared path on the northern side from Tōtara Street to Aerodrome Road. This is shown in the typical cross-section (Figure 4-3) below:

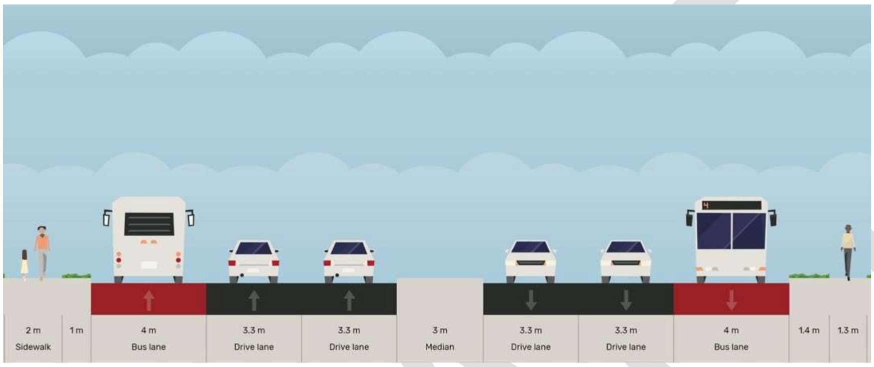

Figure 4-3: Typical Cross-Section of Hewletts Road Corridor

There are some level differences along parts of Hewletts Road and amenity within the corridor is limited, with grass berms but no street trees or other vegetation. Several wide vehicle crossings along the road corridor result in large crossing distances (up to 25m) for pedestrians and / or cyclists. This means that while it is possible to bike and walk, facilities are minimal. Waka Kotahi is currently widening the existing footpath to a shared path facility on the northern side of SH2 Hewletts Road from Tōtara Street to Aerodrome Road, to make it safer for people who are walking and cycling.

Tōtara Street

The existing Tōtara Street corridor is generally 30m in width boundary-boundary, typically providing for:

- One lane of general vehicle traffic in each direction;
- One narrow lane of on-road cycle traffic in each direction;
- A painted central median;
- A separated 3m wide shared path on the eastern side of the road corridor from Hewletts Road to Kawaka Street;
- A 2.5m off-road cycleway on the western side of the road corridor from Kawaka Street to Rata Street;
- A narrow pedestrian footpath on the eastern side of the road corridor (approximately 1.3m in width) from Kawaka Street to Rata Street.

This is shown in the typical cross-sections (Figure 4-4 and Figure 4-5) below:

Figure 4-4: Typical Cross-Section Tōtara Street from Hewletts Road to Kawaka Street

Figure 4-5: Typical Cross-Section of Tōtara Street Corridor from Kawaka Street to Rata Street

There are on-road narrow cycle lanes along both sides of Tōtara Street, demarked with yellow no-parking lines. There is a 2.5m wide parking lane between the cycle lane and footpath/berm on the eastern side of the road near northern Tōtara Street towards Rata Street.

For most of the length of Tōtara Street, pedestrian facilities are along the eastern side of the road, with a 3m shared path separated from the road space by grass berm that varies in width along the corridor. Towards the northern end of Tōtara Street from Kawaka Street to Rata Street, there is a separated cycleway along the western side of the road corridor. A signalised crossing near Kawaka Street links the shared path to the separated cycleway. There is a small section of Tōtara Street near the southern end where the footpath is on the western side of the road.

There are slight level differences along some parts of Tōtara Street. Amenity within the road corridor is limited, with grass berms and some trees along the western side of the road. There are several wide vehicle crossings along the road corridor which result in large crossing distances (as wide as 20m) for pedestrians and/or cyclists. In addition, there are two rail level crossings along Tōtara Street near the Port of Tauranga. Both crossings have barrier arms and signals for vehicle and pedestrians.

Hull Road

The existing Hull Road corridor is generally 30m in width boundary-boundary, typically providing for:

- One lane of general vehicle traffic in each direction;
- One parking lane in each direction;
- A central median; and
- A narrow pedestrian footpath on one side of the road corridor (approximately 1.2-1.8m in width). This is shown in the typical cross-section (Figure 4-6):

Figure 4-6: Typical Cross-Section of Hull Road Corridor

There are no cycling facilities along Hull Road. Pedestrian facilities are provided by a footpath along the southern side of Hull Road. There is a slightly wider vehicle crossing located along the southern side of the road near the Caltex fuel station which results in a 15m crossing distance for pedestrians and/or cyclists. The rail level crossing along Hull Road has barrier arms and signals for vehicles but not for pedestrians.

Maunganui Road

The existing Maunganui Road corridor is generally 30m in width boundary-boundary, typically providing for:

- One lane of general vehicle traffic in each direction;
- One parking lane in each direction;
- A central median; and
- A narrow pedestrian footpath on one side of the road corridor (approximately 1.2m in width). This is shown in the typical cross-section (Figure 4-7):

Figure 4-7: Typical Cross-Section of Maunganui Road

There are on-road cycle lanes along most of the road corridor excluding the northern section of Maunganui Road up to Tawa Street. There is generally a parking lane on both sides of the road for most the road corridor, but this space is sometimes allocated to bus stops, parallel parking spaces and often includes the on-road cycle lane space running adjacent to the parked cars. Several pedestrian crossings are located along the road corridor and there are two rail level crossings along Tōtara Street near the Port of Tauranga.

Surrounding road network within study area

Other notable roading elements in the study area include:

- Residential local roads in northern section (between Maunganui Road and Tōtara Street) such as Miro Street and Tawa Street have one lane per direction and generally footpaths on one side of the road.
- Local industrial roads (with cul-de-sacs) such as Maru Street and Aerodrome Road have one lane per direction, design features to suit heavy vehicles such as wide lanes and large radii curves, and minimal pedestrian facilities with generally a footpath on one side of the road only and long sections of vehicle crossings.
- Several Port access roads including Tasman Quay, Maui Street, Hull Road and Rata Street. Each of these have controlled access points, with barrier arms allowing authorised vehicles only. Tasman Quay runs the length of the Port area as a private road on a north-south alignment.
- At-grade rail crossings on Hewletts Road (below the SH2 flyover), on Hull Road near the intersection with Maunganui Road, on Tōtara Street north of the intersection with Hull Road and a shunting only crossing on Tōtara Street south of the intersection with Hull Road. All rail crossings include barrier arms for traffic. The Golf Road Maunganui Road rail crossing has no protection (barriers or signals) for active mode users.

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Bringing ideas to life

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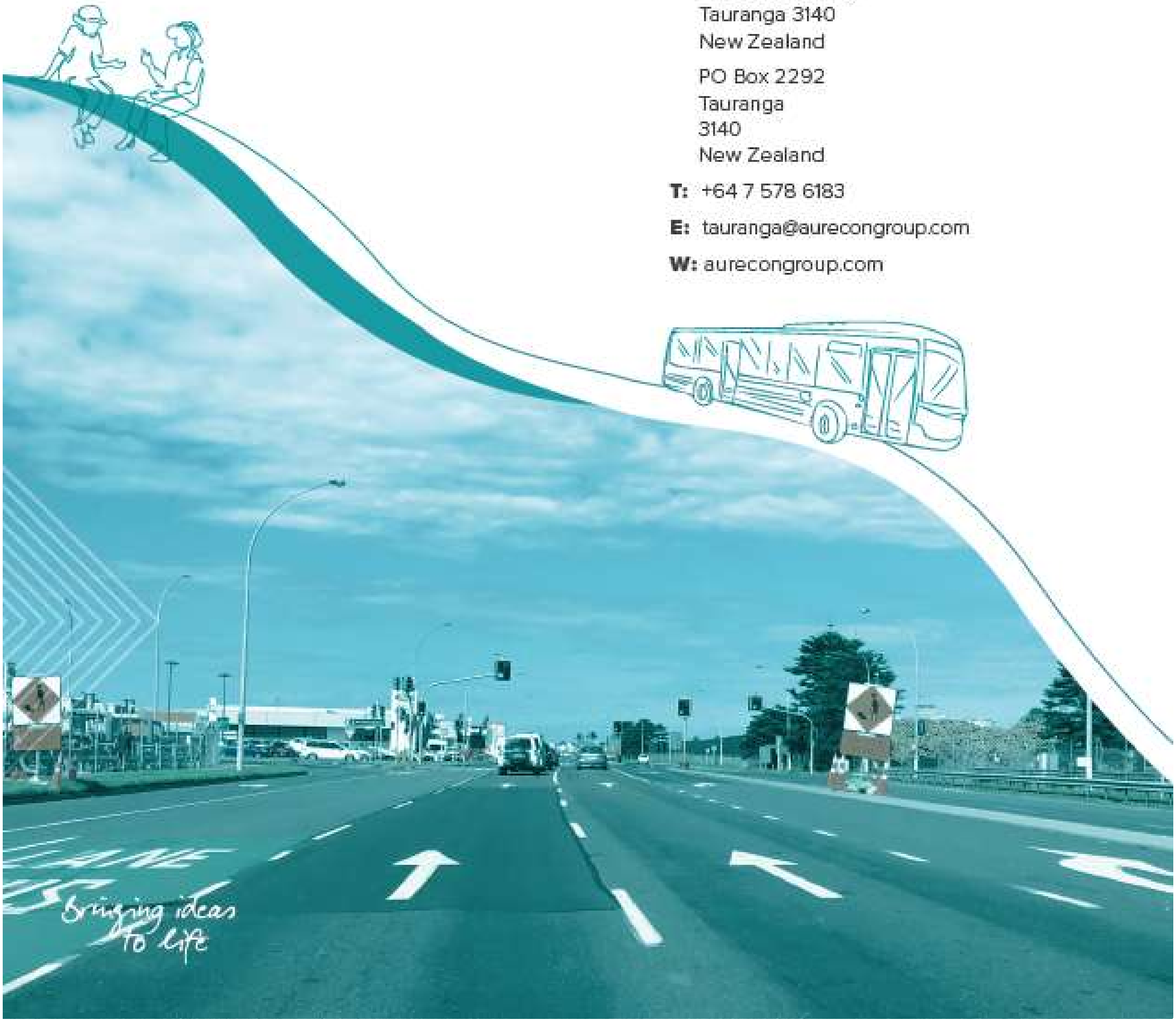

Ngai Tukairangi Hapu Kowhiri Iwa

Ngai Tukairangi Hapu Kowhiri Iwa

Following is a bespoke Ngai Tukairangi Hapu Kowhiri Iwa (Option 9) made up of various interventions included in the 8 Connecting Mount Maunganui (CMM) Indicative Business Case (IBC) Long List Options[1] Ngai Tukairangi hapū are comfortable supporting.

CMM IBC Long List Interventions	Te Ao Maori Lens
City plan changes to enable mixed use with master planned blocks and local networks *(Derived from Option 1 – Land use and local network change led)* Land use change presents opportunity to remove Balance Industrial land use adjacent Whareroa Marae. Land use change to accommodate a mix of residential and commercial areas to avoid reverse sensitivity effects on industrial land uses/areas retained. Generous planted green space buffer areas and managed stormwater reserves incorporated to treat stormwater runoff from roading infrastructure should be established. Active and passive reserve space can be used as a further intermediary to transition between new commercial and residential areas. Heavy freight traffic intensity on Totara Street south is a safety concern for Whareroa residents and whanau who frequent the area. Particularly for children and other whanau who cycle along Totara Street. Careful planning for use change from industrial to commercial and residential should be planned and designed to reduce long term heavy traffic intensity on Totara St south.	Ngai Tukairangi hapu support Option 1 city plan changes as an opportunity to repurpose/change existing heavy polluting industrial land uses, particularly surrounding Whareroa Marae, to a mix of residential, commercial, active and passive greenspaces. Provision should be made to expand the existing Whareroa Marae and papakainga with associated remediation of contaminated lands including onto neighboring Tauranga airport land. Care needs to be had to ensure land use changes are balanced to minimise/avoid reverse sensitivity effects on industrial land uses/areas retained. Will require careful planning of greenspace buffer areas at the interface of industrial land uses retained. Will also need to balance potential increased population and congestion that might occur with any mixed land use zone changes, particularly where high rise development may occur. Priority should be placed on protecting and restoring cultural view shafts from waahi tapu and sites of cultural significance particularly from Whareroa Marae to Mauao. Increased population and accompanying intensity in traffic movements will need to be carefully planned to minimize disruption to existing congestion along the Hewletts Rd corridor.
Streetscape improvements, incorporating biophilic design, throughout the entire CMM area although investment should be prioritised along Hewletts Rd, Totara St, Hull Rd and Maunganui Rd. Improvements to include high quality landscaping (utilising native species), paving, benches and bins. To improve visual surrounds for all transport users, cyclists, runner and walkers. Should incorporate water sensitive	Hapu want to ensure tangata whenua are reflected in the built/physical environment. This should be implemented through an artists collective to design and incorporate te Ao Maori narrative throughout the CMM area. Support opportunities to increase connectivity to the natural environment and green spaces through the use of direct and indirect nature (i.e. biophilic design), landscaping incorporating and prioritizing use of indigenous flora species underpinned by

[1] Further bespoke Ngāi Tukairangi interventions including passenger rail, water sensitive design, and an artist collective are also proposed.

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design including restoring/establishing wetlands/daylighting waterways and memorialising Te Awa o Tukorako (ancestral waterway) which historically meandered through the CMM area. *(Derived from Option 1 – Land use and local network change led and Option 5 – Freight, public transport and walking and cycling)*	principles of water sensitive design. Design of community spaces and places to facilitate community interaction and connections so natural spaces connect seamlessly with urban spaces. With any daylighting or wetland restoration projects seek the re-establishment of contemporary rawa tuturu/customary resources. For example places for gathering rongoa (natural medicines), or food. These could include (but not be limited to) wetlands, mahinga kai/community gardens.
Water sensitive design (WSD), stormwater treatment and attenuation Ngāi Tukairangi seek water sensitive design measures are incorporated across all DBC interventions to: 1. Intercept, manage and treat stormwater runoff from roading and paved surfaces prior to discharging into piped infrastructure and release into Tauranga Moana; 2. Promote opportunities for efficient water use, including re-use; 3. Use source control and a treatment train approach to minimise contaminant generation and delivery to receiving water bodies, particularly Tauranga Moana; 4. Maintains natural hydrology to the extent practicable; 5. Restoring water course extent and values, including through daylighting and memorialising awa tupuna Te Awa o Tukorako; 6. Integrates and restores urban ecology and biodiversity through the design process; and 7. Minimises impermeable surface areas.	Ngāi Tukairangi seek WSD measures are integrated across all physical funded DBC project works. WSD is consistent with *Ngāi Tukairangi, Ngāti Tapu Hapū Management Plan 2014* policy statements for protecting the mauri of Te Awanui and its tributaries, te taiao me te whenua. The Plan's policy statements in relation to te taiao me te whenua emphasis practicing kaitiakitanga, adopting good resource management practice and hapū significant cultural values take precedence over development activity. Opportunities to memorialise awa Tupuna Te Awa o Tukorako are strongly encouraged. This could include retelling its historical significance through cultural narratives incorporated into design of places and spaces throughout the CMM area.

Ngāi Tukairangi hapū support WSD measures as aligning with aspirations to reducing stormwater pollution impacts on mauri o te wai – papatuanuku me Tangaroa.	
Behaviour change / travel choices programme to support mode shift. Key elements commonly found in behaviour change programs in relation to transport infrastructure include awareness and education, incentives and rewards, appropriate infrastructure to support sustainable transportation (e.g. upgrading cycle lanes, walking connectivity and infrastructure and public transport systems) information and planning tools, behavioural nudging, partnerships and collaboration, monitoring and evaluation.	Hapū support behaviour change and travel choice programme to encourage increased mode shift away from heavy reliance on private vehicle use to increase public transport and active modes (walking/cycling). Public transport and active mode benefits over private vehicle use well documented including reducing effects on rangi (air quality) and te mana o te wai (water quality). Incorporating key elements of behaviour change programs in synergy with transport infrastructure can promote sustainable and efficient modes of transportation, reduce traffic congestion, improve

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Behaviour change programmes aim to encourage individuals to adopt sustainable and efficient transportation choices, namely moving away from private vehicle dominant travel to public transport use, or active modes like walking and cycling. Can also include ride share. *(Behaviour change intervention included in Options 1, 4, 5, 6, 7, 8)*	air quality, and contribute to overall environmental sustainability.
Rail interventions **Electric passenger rail service between Mount Maunganui and Tauranga CBD** *(Bespoke Ngai Tukairangi intervention – not part of any CMM options)* **Immediate safety improvements for cyclists/ pedestrians** at key road/walking/cycling intersections particularly the stretch of rail between the netball courts/skate park and Golf Rd/Maunganui Rd/Hewletts Rd roundabout. **Complete rail loop** with at grade crossing on Newton St, to reduce the impact of level crossings on the wider network and support the shift of more freight from road to rail. *(Derived from Options 6 & 7)* Manage rail timing including rail conflicts at crossing points to mitigate road network impact of rail movements at level crossings during peak times. Workplace travel planning and behaviour change programmes. *(Derived from Options 2 & 4)*	While not part of the 8 CMM IBCC options Ngāi Tukairangi hapū support electric passenger rail services between the Mount and Tauranga CBD with the ability for whānau at Matapihi to use/catch any service. Electric rail aligns with te taiao benefits particularly to rangi (air quality) and te mana o te wai (water quality) by removing private vehicle movements on the local and state highway roading network. Will improve reliability, permeability, and throughput of people. Currently not included as an intervention. Although the infrastructure exists, Kiwi Rail is not a project partner. It is understood the existing rail line between Sulphur Point and the Mount may need to be upgraded/widened to accommodate two lines running parallel to another to accommodate additional rail usage. Also understand a national study is underway investigating reinstating a passenger rail service between Tauranga and Hamilton. The recent death of our young rangatahi at the rail crossing intersection with Hewletts Rd/Maunganui Rd/Golf Rd has highlighted the need to prioritise immediate safety improvements to avoid unnecessary deaths or injury. Whānau are concerned about the safety of the rail corridor extending from Hewletts Rd north up to and including the new Skateboard park in the vicinity of Hull Road/Maunganui Road. Hapu are concerned at the extent which a completed rail loop might cause traffic disruption on Newton Road. Anticipate this should be offset by increased local road connectivity if that intervention is included in the funded DBC. The hapu support managed rail timings particularly during avoid disruptions wherever possible during peak times. General support for workplace travel planning and behaviour change programmes.

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Heavy freight traffic interventions Freight lanes along Hewletts Rd, to give priority during off peak commute times repurposing the existing bus lanes outside of am/pm peak direction to bus/freight when bus frequencies are lower. *(Derived from Option 3)* More efficient and reliable freight trips by allowing freight to use the bus lanes at off-peak times/direction along Hewletts Rd and improved freight priority at intersections with Totara St and Jean Batten Drive off peak times. *(Derived from Option 4)*	Support heavy freight interventions to reduce conflict with private vehicle users and intensity of heavy freight during peak times. A number of whānau have raised safety concerns with heavy freight intensity particularly on Totara Street south near Whareroa. Support dual use of bus lanes by heavy freight if reduces heavy freight pressure on existing lanes.
New local connections from Tukorako Dr and Portside Drive to Te Maire St, Aerodrome Rd to Te Maire St, Hocking St to Maru St, Aviation Ave to MacDonald St, and Totara St to Kereiti St and Te Maire St to improve local network optimization, circulation and permeability. .	Will improve local roading connectivity and permeability and may reduce traffic disruptions to Hewletts Rd and Totara St. Will increase options for accessing industrial sites and businesses within industrial areas serviced by streets. May reduce traffic demand and intensity along key roads Maungnui Rd, Hewletts Rd and Totara St.
Event based management (eg, special lane arrangements, PT only events, Mount to CBD ferry service coordinated with cruise ship arrival times). *(Derived from Option 4)*	Hapū consider event-based management should be a standard matter for large concerts or events in the city. Careful event transport planning should help reduce disruptions to traffic peak volume while focusing on reduce road deaths and injuries associated with events.
District plans for communities in Eastern Corridor to be 'self-contained' to reduce demand for travel on Hewletts Rd. *(Derived from Option 1 – Land use and local network change led)* **Park and ride in new Eastern Communities** (assumed to be located in new Eastern Communities with 300 spaces, subject to PTS&I BC. *(Derived from Option 8)*	Hapu support planning for a self-contained urban community in the eastern corridor. This has potential to alleviate traffic demand and congestion in the CMM area and facilitate relocating some heavy industry currently located in CMM/Port area that doesn't rely on a port location. This option provides potential to relocate Tauranga airport to eastern corridor also. Park and ride facilities located in the eastern community works in synergy with district plan change and structure planning for self-contained eastern urban community.
Managed motorway on SH2 flyover and harbour bridge including variable speed limits and metering of the SH2 flyover into Hewletts on eastern side to optimize traffic flow and improve throughput. *(Derived from Option 3)*	Relatively low-cost mechanism that may help improve reliability, permeability, and throughput of people and goods. May reduce road deaths and injuries associated with large-planned events.
Widen Totara St to three lanes between Hull Road and Hewletts Rd to provide additional southbound stacking capacity. *(Derived from Options 3a, 5, 6, 7)*	Will assist traffic throughput and reduce traffic disruptions along Totara Street. Preference for 4 lanes not 3 (i.e. Option 7). Widening Totara Street specifically contributes to safety concerns re traffic along Hewletts Rd and Totara Street particularly long wait times at traffic lights and heavy vehicle congestion.

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Public transport investments/improvements – continuous bus lanes along Maunganui Rd and Hewletts Rd, with bus stop upgrades. Bus priority at Golf Rd intersection (21 to be major stops and 7 to be minor stops). *(Derived from Options 1, 2, 3, 3a, 4, 5, 6)* Public transport fare incentives (e.g. reduced fares, transfer discounts, loyalty discounts, capped fees). *(Derived from Options 2, 5, 6, 7, 8)* District plan change (land use) around Bus Rapid Transit stops on Hewletts Rd. *(Derived from Option 8)* Bus Rapid Transit cross section includes bi-directional cycle lanes on both sides of road, walking and cycling access to stations and cross improvements and bike parking/E bike charging. *(Derived from Option 8)* Fully separated BRT (Bus Rapid Transit) along the length of Hewletts Rd and Maunganui Rd. Includes high quality stations and full-length cycleways. Bus signal pre-emption. Bus right turn only into Jean Batten Dr. Bus lanes at Dive St interchange. *(Derived from Option 8)* Bus layover facility at the airport (assumed 15 bus capacity) *(Derived from Option 8)* Hapu seek public bus service routes provide direct access to or are in close proximity to existing papakainga and kaumatua housing at Mangatawa and Matapihi.	Hapū support the full suite of public transport interventions including: 1. Investment and improvements in public transport facilities and services across the network; 2. Public transport fare incentives; 3. District plan change to support bus rapid transport stops on Hewletts Rd; 4. Bi-directional cycle lanes and walking access to stations, cross improvements and e bike charging facilities; 5. Bus layover facility at Tauranga airport; and 6. Fully separated bus rapid transit along the length of Hewletts Rd/Maunganui Rd. Furthermore hapū seek improved public transport access for Kaumātua/residents of key papakāinga and marae including for Mangatawa and Matapihi residents. Increased public transport investment and improvements outlined will promote increase public use, reduce private vehicle use with associated te taiao benefits particularly rangi (air quality) and te mana o te wai (water quality). Potential social and economic benefits to whānau who save by using public transport and from reduced private vehicle usage and maintenance costs. Synergies noted with investment in active modes of transport (cycling and walking) are also supported except past Whareroa Marae.
High quality walking and cycling connections to city centre and Mauao (bi-directional cycle paths along Maunganui Rd, Hull Rd and throughout the master planned area(s)). Improve connections to planned cycleways. Pedestrian and cyclist overbridge over Totara St near Hewletts Rd, to provide connectivity between Totara St shared path and harbour bridge shared path. *(Derived from Options 1, 2, 3, 3a, 4, 5, 6)*	Increased mode shift to cycling and walking will promote te taiao, health and well-being benefits. Taiao benefits to rangi (air quality) through reduced emissions and te mana o te wai (water quality) through reduced private vehicle use. Support walking and cycling connections generally except oppose formalizing/providing cycleway past Whareroa Marae/papakainga and through Tauranga airport – noted this issue was raised at a historical hui and Whareroa whanau were opposed to such.
Signal optimisation to prioritise through movements over-turning movements during peak traffic and improve freight priority at Totara St/Hewletts Rd intersection and Jean Batten Dr/Maru St/Hewletts Rd off-peak. *(Derived from Options 3, 3a)*	Hapū support signal optimisation techniques where this has the potential to facilitate better flow of traffic during peak times to improve reliability, permeability and throughput of people and goods. Consider this a low-cost option. Hapū support phase time adjustments to the Totara Street/Hewletts Rd lights to allow whānau entering and existing Totara Street to Whareroa Marae more time to exit/enter. Support is subject to access to and from Whareroa Marae being

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	maintained or improved for current and future residents.
Passenger ferry service from Mount Maunganui to the CBD. *(Derived from Option 8)* If included in DBC hapu seek option for whanau to tender for a ferry service.	Existing infrastructure exists to support a ferry service between Mount Maunganui and Tauranga CBD. Viability (cost wise) has proven to be an issue with a trial in summer 2022/2023 only proving economic during cruise ship season. Otherwise currently unviable and needing heavy subsidizing. A ferry service is an example of an intervention that could be offered to tangata whenua to manage and run.
Procurement and employment An MoU should be established with the hapu with minimum requirements around employment and long-term training/skills programs for rangatahi.	Ngai Tukairangi seek meaningful opportunities for whanau employment and upskilling through works funded as part of the DBC. The hapu want to ensure procurement policies provide benefits to whanau.
Māori Artists Collective Ngāi Tukairangi seek to ensure a Māori Artists Collective is funded/resourced as part of the DBC to ensure tangata whenua history, cultural narratives are imbedded across the CMM area. This should be incorporated through the design and construction of roading infrastructure, landscaping, water sensitive design (wetlands/waterways restoration and enhancement), public spaces and areas developed as part of the DBC	Ngai Tukairangi hapu seek to ensure their history and cultures are reflected through the design and construction of infrastructure and community spaces/places and facilities.

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Ngati Kuku Hapu Kowhiri

Connecting Mount Maunganui Project

Waka Kotahi requested Ngati Kuku hapū assess the 8 Connecting Mount Maunganui (CMM) Indicative Business Case (IBC) Long List Options to understand which options/interventions are better or worse from a te ao Maori perspective.

On behalf of the Ngati Kuku Board, Awhina Ngatuere submitted a Cultural Insights Paper dated 26 April 2023. It sets out a high-level overview of Ngati Kuku and Whareroa Marae cultural views including from a Whareroa Marae workshop on Monday 20 March 2023. The Cultural Insights Paper also sets out the following strategic imperatives captured by Ngati Kuku descendants during an earlier wananga in 2021 to inform an intergenerational strategy being:

Oranga Tangata	*Thriving people;*
Te Taiao	*Thriving natural environment;*
Mana Motuhake	*Self-determination;*
Ahurea	*Thriving Culture and identity and;*
Te Ao Ohanga	*Future economies.*

Ngati Kuku reluctance to engage with government agencies stems from historical grievances and their inability to provide redress and active protection of Whareroa marae community interests. Despite such, Ngati Kuku agree to engage in the CMM project to ensure hapū priorities are clearly communicated and imbedded into the project in a meaningful way.

Purpose of Paper

The purpose of this paper is to present a set of interventions, including those from the CMM IBC Long List Option, which Ngati Kuku hapū support subject to the caveats set out below. A key element of these interventions is they align with the above strategic imperatives and address specific hapu concerns outlined in the cultural insights paper.

Ngāti Kuku highlight from the outset that the critical priority is for Whareroa and its people (and those living in the tribal boundaries of Ngāti Kuku) can live on their ancestral lands without fear of ongoing poisons to our air, waterways and land. These environmental impacts exacerbate fear of displacement and disconnection to cultural identity and way of being.

The removal of noxious industries away from the long-established community of Whareroa is a human rights issue caused by intentional government planning and must be rectified with urgency. Any intervention outlined in the CMM project that compromises this priority is a breach of tangata whenua rights under Te Tiriti o Waitangi and as indigenous peoples under the United Nations Rights of Indigenous Peoples.

Ngati Kuku request that all interventions in the final detailed business case (DBC) provide an analysis on how each will impact air quality in the Mount Air shed zone and by how much (%).

It is also important to note if there is no support for removing noxious industries away from Zone 1 and Zone 2 then any support given by Ngati Kuku for other interventions in this paper, or otherwise, should be deemed null and void.

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Waka Kotahi Premise

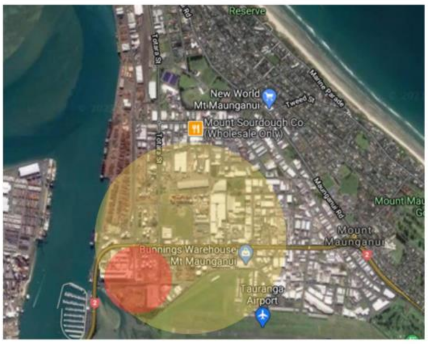
On Friday 3 March 2023 former Waka Kotahi Senior Project Manager Will Bamford advised comfort with hapū developing and providing their own option (made up of interventions from the 8 CCM options). This is conditional on the Ngati Kuku hapu option needing to be assessed using the following criteria:

1. Improve reliability, permeability, and throughput of people and goods;
2. Reduce road deaths and serious injuries for all users in line with Vision Zero targets;
3. Provide better mode choice options and increase public transport and active travel mode share;
4. Reduce transport related effects on water, air quality and noise; and
5. Reduce transport related carbon emissions in line with the Emissions Reduction Plan directive.

Te Ao Māori consideration will enable Waka Kotahi to document why the options, or interventions currently being considered, are harmful from a cultural lens and why new options are proposed. Criteria 2, 4 and 5 align strongly with Ngati Kuku strategic imperatives orange tangata me te taiao. To confirm the following Ngati Kuku hapu kowhiri has been assessed with consideration of the above criteria.

Ngati Kuku Hapu Kowhiri

Following is the Ngati Kuku Hapu Kowhiri (Option) comprising interventions whanau are comfortable supporting as part of the package of shortlisted interventions to be included in the CMM DBC. The focus is on interventions which align closest to Ngati Kuku strategic imperatives and responds to the concerns, issues and aspirations articulated by whanau during various hui held at Whareroa in 2022 and set out in the Cultural Insights paper. The hapu kowhiri has also considered the above criteria.

CMM IBC Long List Interventions	Te Ao Maori Lens
City plan changes to enable mixed use with master planned blocks and local networks PROJECT IMPACTED AREA 	Option 1 land use change provides opportunity to remove hazardous and noxious industry in Zone 1 the priority area of impact for Whareroa marae. **If removing noxious industries away from Zone 1 and Zone 2 is not supported then Ngati Kuku support for other interventions is deemed null and void.** The hapu preference is to enable remediation of surrounding contaminated industrial sites to enable long term expansion of the existing Urban marae community zone to provide additional whanau housing/papakainga development. For the avoidance of doubt, Ngati Kuku also seek expansion of the Urban marae community zone into the neighboring Industrial zoned airport land to the south east. A Greenbelt zone, generously planted in endemic native species, to be established immediately adjoining the Industrial zone land retained to the east. Potential to utilize zone area to develop stormwater retention/detention ponds through wetland enhancement. Prioritise opportunities to

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Zone 1 Primary area of impact **Zone 2** Secondary area of impact Option 1 *'Land use and local network change led'* aligns with Ngati Kuku hapū future vision for Whareroa Block. Ngati Kuku seek city plan changes prioritize rezoning Industry in the Whareroa Block (i.e. Zone 1 red circle) to a mix of: 1. Urban marae community zone 2. Active open space zone 3. Passive open space zone 4. Greenbelt zone 5. Commercial zone; and 6. Suburban residential zone. Ngati Kuku vision for Zone 1 is for the managed retreat of heavy noxious industry to be replaced with a mix of commercial and residential zoned land along the edges (of undetermined width) parallel to Hewletts Road separated from the expanded Urban marae community zone by a generous buffer or Greenbelt zone merging into areas of Active and Passive open space zones. The passive and active open space zoned areas to promote whanau-oriented oranga taiao oranga tangata areas with high quality paving, benches, bins and landscaping and include: 1. Māra kai 2. Māra rongoā 3. Ki-o-rahi field 4. BBQ area 5. Sports grounds 6. Play-grounds 7. Parks and reserves 8. Skate park; and 9. Cycle and walkway connections. *(Derived from Option 1 – Land use and local network change led)*	open closed/piped waterways throughout CMM area. Seek the re-establishment of contemporary rawa tuturu/customary resources. For example places for gathering rongoa (natural medicines) or food. These could include (but not be limited to) wetlands, mahinga kai/community gardens. Outcomes anticipated for Whareroa community resulting from the Option 1 (including land use and zone changes in Zone 1) include: • Remove heavy industry immediately adjoining Whareroa marae and papakainga in turn reducing significant health (including air pollution) and adverse environmental (e.g. noise) impacts • Re-establish significant cultural viewshaft to Mauao from marae atea whilst protecting/maintaining existing viewshafts • Enhance hau kainga mana and well-being • Remove heavy traffic intensity movements along Totara Street (south of Hewletts Road intersection) Will also need to balance potential increased population and congestion that might occur with any mixed use zones, particularly where high rise development might result • Reduce non-essential vehicle movements near Whareroa marae • Provide whanau business opportunities within newly established Commercial zone • Remove/reduce and buffer extent of existing container terminal • Provide green belt to buffer noise and visual impacts and enable native flora establishment • Provide more park and green space for active and passive recreation and use; and • Provide more space for papakainga housing. Ngati Kuku seek opportunities to increase connectivity to the natural environment and green spaces through the use of direct and indirect nature (i.e. biophilic design), landscaping incorporating and prioritizing use of indigenous flora species underpinned by principles of water sensitive design. Design of community spaces and places to facilitate community interaction and connections so natural spaces connect seamlessly with urban spaces.
Tuku Ihotanga / Ahurea Generational knowledge systems are restored and invigorated, and whanau are connected and standing strong in their unique cultural identity.	Ngati Kuku expect naming right for streets, significant infrastructure and buildings. Further that provision is made to ensure mana whenua can activate cultural narratives across the CMM area.

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Ngati Kuku hapu seek to ensure tangata whenua presence/history is reflected in the built/physical environment, infrastructure and projects including through: 1. Cultural markers (e.g. pou) and whakairo embedded into concrete or other final surface design 2. Renaming streets and infrastructure to revitalize ancestral names and tangata whenua history 3. Cultural ceremonies 4. Respecting kawa and tikanga. *(Ngati Kuku request - Not included in any CMM options)*	Embed mana whenua protocols into CMM projects to ensure tikanga and kawa processes are appropriate throughout the course of projects. Ngati Kuku also seek opportunities for the return of ancestral lands in the CMM area. Ngati Kuku seek to increase their presence in the CMM area through the installation of cultural touchpoints or narratives across the CMM area. As part of a network of upgraded walkways, cycleways and passive/active open spaces Ngati Kuku seek the development of wayfinding and interpretation signage which shares the cultural and historical narratives and history of the area. The planning and design of community spaces and places to facilitate community interaction and connections so natural spaces connect seamlessly with urban spaces.
Whareroa Marae access options enhanced by: 1. Securing formalised limited alternative marae access adjacent to the northern Tauranga airport boundary linking in the west with Te Awanui Way and to the east with Seawind Lane; and 2. Ensuring existing direct access options to and from the Totara Street/Hewletts Road intersection are maintained. 3. Ensuring the southern Totara Street section of road (i.e. south of Hewletts Rd) is retained as part of the CMM transport solution. 4. Altering green light timing for lights at Totara Street/Hewletts Rd so whānau entering and exiting Whareroa Marae have greater time to exit/enter. Currently the green lights are too short and only allow for 3 vehicles to exit during each light rotation. 5. Invoke a permit system for Whareroa papakāinga whānau/residents to enable use of the bus lane when turning from Hewletts Rd onto Totara Street south. *(Ngati Kuku request - Not included in any CMM options)* **Note: Ngāti Kuku oppose grade separation (i.e. a new flyover) at the Hewletts Road/Totara Street intersection.**	Specifically contributes to Whareroa community project aspiration to improve their quality of life by investing in interventions that do not compromise the health and wellbeing of Whareora that prioritises Māori interests, values and aspirations specifically 'tangata whenua only access to/from Whareroa from the main street.' Ngati Kuku seek: 1. To ensure any upgrades to the Hewletts Road/Totara Street intersection do not further restrict whanau options for exiting/accessing Whareroa Marae; 2. That as part of the CMM transport solution the southern end of Totara Street is retained; and 3. An alternative publicly restricted access to the marae using card propelled security arms (e.g. like those used to access Tauranga Airport) is formally secured in perpetuity and constructed for the benefit of Whareroa community. Securing a formal alternative formed access to Whareroa is a opportunity to provide *redress* and *active protection* to Whareroa Marae community for the loss of land (through forced public works act confiscation) and intentional establishment of noxious in proximity. Recognises Whareroa Marae access is intermittently restricted and alternative safe access is highly desirable. Places priority on wellbeing of ahi kaa and restoring/rebuilding connection to whenua tupuna/Whareroa marae.
Iho Pumanawa – Ngati Kuku whanau are utilizing their natural talents and realising their potential. Procurement (employment and business) opportunities for hapū through approved CMM	Ngāti Kuku seek meaningful opportunities for hapū/whānau employment and business through works/projects initiated to implement CMM project. Ngāti Kuku seek to ensure Waka Kotahi provide a talent and skills programme in partnership with

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projects. An example is mana whenua being contracted to run the ferry service from Mauao to Tauranga CBD (derived from Option 8) if this forms part of the approved CMM detailed business case. Regardless what interventions comprise the final approved CMM projects, Ngati Kuku seek meaningful opportunities for enduring whanau business and employment opportunities. *(Derived from Cultural Insights paper - Not included in any CMM options)*	hapū board to facilitate enduring skills/talent enhancement and full-time employment opportunities for their descendants. Ngati Kuku seek to be involved in framing procurement policies and procedures including co-designing of progressive procurement targets.
High quality **walking and cycling connections** to city centre and Mauao **except past Whareroa Marae.** Bi-directional cycle paths along Maunganui Rd, Hull Rd, Hewletts Road, Totara Street including throughout master planned area(s). Walking and cycling access to bus stations and cross street/road improvements and bike parking/E bike charging infrastructure. *(Derived from Option 8)* Improve connections to planned cycleways. Pedestrian and cyclist overbridge over Totara St near Hewletts Rd, to provide connectivity between Totara St shared path and harbour bridge shared path. *(Derived from Options 1, 2, 3, 3a, 4, 5, 6)*	Increased mode shift to cycling and walking will promote te taiao, health and well-being benefits. Taiao benefits to rangi (air quality) through reduced emissions and te mana o te wai (water quality) through reduced private vehicle use. Support walking and cycling connections generally except oppose formalizing/providing cycleway past Whareroa Marae/papakainga and through Tauranga airport – noted this issue was raised at a historical hui and Whareroa whanau were opposed to such. Increased cycling and walking will help improve whānau health, fitness and wellbeing by promoting more active forms of transport and activity.
Immediate improvements to cyclists/ pedestrian safety at the rail crossing intersection with Hewletts Rd/Maunganui Rd/Golf Rd. Can rail timings be restricted to avoid peak traffic times.	The recent death of our young rangatahi at the rail crossing intersection with Hewletts Rd/Maunganui Rd/Golf Rd has highlighted the need to prioritise immediate safety improvements to avoid unnecessary deaths or injury. Ngāti Kuku do not support an overpass or underpass solution but do consider other interventions can be undertaken at pace to alleviate this risk.
Public transport improvements/incentives - Electric passenger rail and ferry services Electric passenger rail and ferry services established between Mount Maunganui and Tauranga CBD. *(Electric rail not included in any CMM options. - Passenger ferry service from Mount Maunganui to the CBD derived from Option 8)* Public transport improvements and incentives include: 1. Continuous bus lanes along Maunganui Rd and Hewletts Rd, with bus stop upgrades. Bus priority at Golf Rd intersection (21 to be major stops and 7 to be minor stops). *(derived from Options 1, 2, 3, 3a, 4, 5, 6.*	Electric passenger rail usage will contribute to a zero-carbon future and similarly promote te taiao benefits particularly to rangi (air quality) and te mana o te wai (water quality) by removing private vehicle movements on the local and state highway roading network. Rail is currently not included as a CMM intervention although infrastructure exists. Ngāti Kuku support investment in public transport infrastructure, services and related incentives to increase public use of public transport services while simultaneously reducing private vehicle use. Recognise reduced private vehicle use will in turn promote taiao benefits particularly rangi (air quality) and te mana o te wai (water quality). Will promote wider mode choice options with potential social and cultural benefits to whānau who will be

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2. PT fare incentives (e.g. reduced fares, transfer discounts, loyalty discounts, capped fees). *(Derived from Options 2, 5, 6, 7, 8)* 3. Fully separated Bus Rapid Transit (BRT) along the length of Hewletts Rd and Maunganui Rd. Includes high quality stations and full-length cycleways. Bus signal pre-emption. Bus right turn only into Jean Batten Dr. Bus lanes at Dive St interchange. *(Derived from Option 8)* 4. Bus layover facility at the airport (assumed 15 bus capacity) *(Derived from Option 8)* 5. District plan change (land use) around Bus Rapid Transit stops on Hewletts Rd. *(Derived from Option 8)* 6. Park and ride in new Eastern Communities (assumed to be located in new Eastern Communities with 300 spaces, subject to PTS&I BC. *(Derived from Option 8)*	incentivised to use PT and potential savings from reduced private vehicle usage. Ngāti Kuku seek that if a ferry service is established from Mauao to Tauranga CBD (i.e. Option 8) a separate and more robust conversation is expected to be had with Ngati Kuku as customary protectors and mana whenua. A business case from a tangata whenua point of view will be required for this. All going well, mana whenua do expect to be involved at all levels of the opportunities. This outcome aligns with **Iho Pumanawa** and Ngati Kuku vision of realising their potential through procurement (employment and business) opportunities through approved CMM projects. Will help reduce transport related carbon emissions in line with the Emissions Reduction Plan directive.
District plan change for communities in Eastern Corridor to be 'self-contained' to reduce demand for travel on Hewletts Rd. *(Derived from Option 1 – Land use and local network change led)*	Ngati Kuku consider a plan change to provide for a new self-contained urban community in the Eastern Corridor will have synergies with its vision to relocate and/or reduce the footprint of existing noxious industry in Zone 1. The Rangiuru Business Park is now under construction and will provide large scale industrial land availability to incentivize industrial relocations from Zone 1. A change to the Western Bay of Plenty District Plan could help enable the development of a new self-contained, well planned, compact and serviced (infrastructure) community. Offers potential to also relocate Tauranga airport to eastern corridor also.
Water sensitive design (WSD), stormwater treatment and attenuation Ngāti Kuku seek a concerted effort to prioritise, plan for and integrate WSD measures to: 1. Restore Te Awa o Tukorako – Ngāti Kuku awa tupuna that was filled during industrial development in the CMM area. 2. Manage stormwater through mechanisms including biofiltration, rain gardens, permeable pavements and constructed wetlands in order to reduce the volume of water runoff and improve the qualify of stormwater runoff and reduce pollution of receiving waterbodies 3. Enhance water efficiency by using drought tolerant landscaping, using water efficient irrigation systems, the harvesting and reuse of rain water; 4. Promote climate resilience by factoring the likely impacts of climate change into infrastructure design; and	In relation to transport infrastructure projects funded as part of the final suite of CMM programmed works Ngati Kuku seek physical project works integrate WSD measures. Specifically contributes to Whareroa community worries about this project and in turn aspirations to improve their quality of life by investing in interventions that do not compromise the health and wellbeing of Whareora namely: • Reducing stormwater pollution impacts on mauri o wai – papatuanuku me tangaroa • Green spaces everywhere namely the creation of more parklands, park reserves and green spaces; and • Planting of native flora. Ngati Kuku awa tupuna Te Awa o Turako was destroyed during industrial development without any consultation. This added insult to injury compounding the myriad of other grievances that occurred during the taking and industrialisation of traditional hapu lands. Ngati Kuku seek spatial

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5. Integrate biodiversity and ecological benefits through generous and wide use of green infrastructure and natural systems.	planning and the CMM projects seek synergistic opportunities to restore Te Awa o Tukorako.
Streetscape improvements (across entire CMM area) prioritised along Hewletts Rd, Totara St, Hull Rd and Maunganui Rd to include high quality paving, benches, bins and landscaping. To improve surrounds for active mode and PT users. *(Derived from Option 1 – Land use and local network change led)*	Ngati Kuku support in principle streetscape improvements throughout the CMM area. Seek opportunities to incorporate water sensitive design, indigenous planting, commission and install cultural markers (e.g. pou) and whakairo embedded into hard and exposed surface design features.
Complete rail loop and manage rail timing Complete rail loop with at grade crossing on Newton St, to reduce the impact of level crossings on the wider network and support the shift of more freight from road to rail. *(Derived from Options 6, 7)* Manage rail timing to mitigate road network impact of rail movements at level crossings during peak times. *(Derived from Option 2)*	Ngati Kuku view these rail loop and timing interventions as potentially integrating with future electric passenger rail transport (refer above) for the city. May help improve reliability, permeability, and throughput of people and goods. Ngati Kuku require more research to understand the opportunities and risks associated with completing the rail loop and managing rail timing.
New local connections provided this occurs in conjunction with Option 1 (above) involving City plan changes to enable mixed use with master planned blocks and local networks extended to Zone 2. **New local connections** to improve connectivity and reduce disruption to Hewletts Rd/Totara St **and street renaming** to remove street names of government soldiers involved in Te Ranga massacre. Note support for this option is contingent on new local road connections New local connections from Tukorako Dr and Portside Drive to Te Maire St, Aerodrome Rd to Te Maire St, Hocking St to Maru St, Aviation Ave to MacDonald St, and Totara St to Kereiti St and Te Maire St to improve local circulation and permeability. *(Derived from Options 3a, 5, 6)*	Involves removing a series of dead-end industrial streets by using the Public Works Act to purchase properties and construct physical roading connections between them. Improving local road connectivity involving creation of physical road connections to improve permeability throughout industrial area and reduce traffic disruptions to Hewletts Rd and Totara St. Will reduce heavy traffic and trade use on Hewletts Road and Totara Street by enabling greater permeability and access to industrial sites.' Specifically contributes to Whareroa community: 1. Project aspiration to improve their quality of life by diverting heavy traffic off Hewletts Road and Totara Street; 2. Safety concerns re traffic along Hewletts Rd and Totara Street particularly long wait times at traffic lights; and 3. Heavy vehicle congestion.

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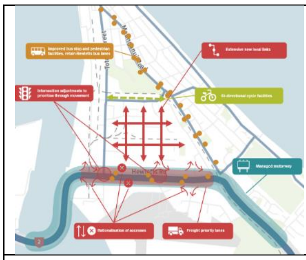	
Widen Totara St to three or four lanes between Hull Road and Hewletts Rd to provide additional southbound stacking capacity. *(Derived from Options 3a, 5, 6, 7)*	Widening Totara Street to three or four lanes specifically contributes to Whareroa community safety concerns re traffic along Hewletts Rd and Totara Street particularly long wait times at traffic lights and heavy vehicle congestion.
Behaviour change / workplace travel choice programme to support mode shift Behaviour change programmes aim to encourage individuals to adopt sustainable and efficient transportation choices, namely moving away from private vehicle dominant travel to public transport use, or active modes like walking and cycling. Can also include ride share. By incorporating key elements of behaviour change programs in relation to transport infrastructure can effectively promote sustainable and efficient modes of transportation, reduce traffic congestion, improve air quality, and contribute to overall environmental sustainability. *(Behaviour change interventions included in Options 1, 4, 5, 6, 7, 8)*	Key elements commonly found in behaviour change programs in relation to transport infrastructure include awareness and education, incentives and rewards, appropriate infrastructure to support sustainable transportation (e.g. upgrading cycle lanes, walking connectivity and infrastructure and public transport systems) information and planning tools, behavioural nudging, partnerships and collaboration, monitoring and evaluation. Specifically contributes to addressing Whareroa community priorities for the project namely: • People on bikes and walking • Better utilisation of public transport • More eco-friendly transport modes • Investing in meaningful sustainable pathways that lead to a low carbon future Increased mode away from private vehicle use to cycling/walking and public transport will promote te taiao benefits reducing effects on rangi (air quality) and te mana o te wai (water quality).
Managed motorway on SH2 flyover and harbour bridge including variable speed limits and metering of the SH2 flyover into Hewletts Road on eastern side to optimize traffic flow and improve throughput. *(Derived from Option 3)* **Note: Ngāti Kuku oppose grade separation (i.e. a new flyover) at the Hewletts Road/Totara Street intersection.**	Specifically contributes to addressing Whareroa community priorities for the project namely: • Project aspiration to improve their quality of life by diverting heavy traffic off Hewletts Road and Totara Street; • Safety concerns re traffic along Hewletts Rd and Totara Street particularly long wait times at traffic lights; • Heavy vehicle congestion; and • Will help improve reliability, permeability, and throughput of people and goods

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Connecting Mount Maunganui IBC Short List MCA Assessment			Do Minimum		Option 3A		Option 5		Option 6		Option 6a		Economic Efficient	
Benefit	Investment Objective	KPI	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments
Improved transport system reliability, permeability, and throughput of people and goods	To improve reliability, permeability, and throughput of people and goods	People throughput	0	Baseline Scoring	1	Slight increase to people throughput capacity overall. Increased capacity on Hull Rd (cycle lanes) and Totara St (widened), slight improvement to Hewletts Rd. Sum of the four corridors is estimated to be approximately 19,000 people per hour compared to do min of ~16,000)	2	Slight increase to people throughput capacity overall. Increased capacity on Hull Rd (cycle lanes), Maunganui Rd (bus and cycle lanes) and Totara St (widened). Sum of the four corridors is estimated to be approximately 25,000 people per hour	2	Moderate increase to people throughput capacity overall. Increased capacity on Hull Rd (cycle lanes), Maunganui Rd (bus and cycle lanes) and Totara St (4-laned w/ grade sep). Sum of the four corridors is estimated to be approximately 27,000 people per hour	2	Significant increase to people throughput capacity overall. Increased capacity on Hull Rd (cycle lanes), Maunganui Rd (bus and cycle lanes), Totara St (4-laned) and Hewletts Rd with 4-lane flyovers. Sum of the four corridors is estimated to be approximately 27,000 people per hour	2	Significant increase to people throughput capacity overall. Increased capacity on Hull Rd (cycle lanes), Maunganui Rd (cycle lanes), Totara St (4-laned) and Hewletts Rd with 4-lane flyovers. Sum of the four corridors is estimated to be approximately 21,000 people per hour
		Travel time savings for freight movements	0	Baseline Scoring	2	Movement restrictions along Hewletts will concentrate movements on Hewletts/Totara, which is already a critical intersection. However, this will be offset by new local connections - and the modelling indicates significant travel time savings in AM peak. Pricing mechanisms will lead to some mode change (away from private car travel). Inter peak freight priority will clearly assist freight reliability, unless general traffic queues extend beyond freight lanes	1	Movement restrictions along Hewletts will concentrate movements on Hewletts/Totara, although this will be offset by new local connections - and the modelling indicates moderate travel time savings in AM peak. Pricing mechanisms will lead to some mode change (away from private car travel). Inter peak freight priority will clearly assist freight reliability, unless general traffic queues extend beyond freight lanes	2	Grade separation of Totara to Hewletts west will reduce pressure at that intersection, directly assisting freight from the Port, and indirectly assisting through freight along Hewletts. The modelling indicates significant travel time savings (similar to Option 3a).Pricing mechanisms will lead to some mode change (away from private car travel)	3	Grade separation of Hewletts Road (at Totara) will reduce pressure at that intersection, directly assisting through freight along Hewletts, but also indirectly assisting freight from the Port. The modelling indicates substantial travel time savings (greater than Option 6). Pricing mechanisms will lead to some mode change (away from private car travel)	2	Grade separation of Hewletts Road (at Totara) will reduce pressure at that intersection, directly assisting through freight along Hewletts, but also indirectly assisting freight from the Port. The modelling indicates substantial travel time savings (greater than Option 3a). Pricing mechanisms will lead to some mode change (away from private car travel)
A multi-modal transport system that supports safer and healthier journeys	To reduce road deaths and serious injuries for all users by at least 40%	Risk of death and serious injuries (collective risk)	0	Baseline Scoring	1	Slight improvement. Average 29% reduction in DSI compared to crash history state	3	Significant improvement. Average 48% reduction in DSI compared to crash history state	2	Moderate improvement. Average 41% reduction in DSI compared to crash history state	3	Significant improvement. Average 45% reduction in DSI compared to crash history state	1	Slight improvement. Average 18% reduction in DSI compared to crash history state. Increased risk on Hewletts Road due to increased speed environment and introduction of weaving and merging crash risk.
Improved transport choice for access to social and economic opportunities	To provide better mode choice options and increase public transport and active travel mode share	Public transport travel time compared to general vehicle travel time	0	Baseline Scoring	0	Modelled travel time along key routes shows similar improvements for both buses and general vehicles. Model shows bus travel time 3% higher than general vehicle travel time.	2	Modelled travel time along key routes shows improvements for both buses and general vehicles, with greater savings for buses. Model shows bus travel time 8% lower than general vehicle travel time.	1	Modelled travel time along key routes shows improvements for both buses and general vehicles, with greater savings for buses. Model shows bus travel time 5% lower than general vehicle travel time.	2	Modelled travel time along key routes shows improvements for both buses and general vehicles, with greater savings for buses. Model shows bus travel time 5% lower than general vehicle travel time.	0	Modelled travel time along key routes shows similar improvements for both buses and general vehicles, relating to no proposed bus lanes across the study area. Model shows bus travel time 3% higher than general vehicle travel time.
		Access to social and economic destinations by PT, walk and cycle	0	Baseline Scoring 2031 30 min catchment: CBD: 88,495 Port & Marae: 59,424 Hospital: 53,131 Mauao: 35,485	0	Population within 30 min catchment is similar but slightly less than do-min, especially for CBD and Port& Marae 30 min catchment: CBD: 85,384 Port & Marae: 58,873 Hospital: 53,131 Mauao: 35,485	1	Population within 30 min catchment are similar but slightly more than do-min for all key destinations, especially for Mauao. 30 min catchment: CBD: 88,876 Port & Marae: 59,821 Hospital: 53,433 Mauao: 36,262	0	Population within 30 minutes catchment are similar but slightly more than do-min. 30 min catchment: CBD: 88,437 Port & Marae: 59,424 Hospital: 53,433 Mauao: 35,485 doesn't' induce cwalking and cycling demand - no streetscape provision.	1	Population within 30 minutes catchment are similar, but for CBD slightly less, and for port & Marae slightly more than do-min. 30 min catchment: CBD: 84,530 Port & Marae: 61,350 Hospital: 53,131 Mauao: 35,485 based on active modes of each option.	0	Population within 30 minutes catchment are similar, but for CBD slightly less, and for port & Marae slightly more than do-min. 30 min catchment: CBD: 84,530 Port & Marae: 61,350 Hospital: 53,131 Mauao: 35,485 No PT provision
Reduced impact on the environment and climate change impacts from transport related carbon emissions	To reduce the transport related effects on water, air quality and noise	Ambient air quality - (NO_2 and PM_{10}) and Noise level	0	Baseline Scoring	-1	Increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions. This is also likely to induce additional through traffic demands into the corridor.	1	Planting throughout the area through streetscape improvements expected to improve air quality near sensitive receivers.	-2	Increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions, with the effects likely to be greater than with Option 3a. This is also likely to induce additional through traffic demands into the corridor. The TTSM model predicts NO2 emissions in the Mount Maunganui area and city-wide increase in comparison to do min.	1	Increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions, with the effects likely to be greater than with Option 3a. This is also likely to induce additional through traffic demands into the corridor. The TTSM model predicts NO2 and PM10 emissions in the Mount Maunganui area and city-wide increase in comparison to do min.	-2	Increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions, with the effects likely to be greater than with Option 3a. This is also likely to induce additional through traffic demands into the corridor. The TTSM model predicts NO2 and PM10 emissions in the Mount Maunganui area and city-wide increase in comparison to do min.
	To reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	CO_2 emissions (Mode shift from single occupancy private vehicle)	0	Baseline Scoring	-1	Increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions. This is also likely to induce additional through traffic demands into the corridor. Low level of embodied carbon predicted due to minimal new infrastructure.	1	Reduced traffic volumes on corridors in the study area and increased active mode and public transport uptake for short trips expected to result in lower emissions. Low level of embodied carbon predicted due to minimal new infrastructure (however more than Option 3a due to works on Maunganui Rd). No grade separation, would not induce additional demand and emissions.	-1	Increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions, with the effects likely to be greater than with Option 3a, but less than Option 7. This is also likely to induce additional through traffic demands into the corridor. The TTSM model predicts carbon emissions in the Mount Maunganui area and city-wide increase in comparison to the do min. Moderate level of embodied carbon expected due to extent of new infrastructure including grade separated flyover.	0	Increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions, with the effects likely to be greater than with Option 6. This is also likely to induce additional through traffic demands into the corridor. The TTSM model predicts carbon emissions in the Mount Maunganui area and city-wide increase in comparison to the do min. Highest level of embodied carbon expected due to greatest level of new infrastructure. Alternative mode provision, cycle lanes and bus upgrades, streetscape, intersection optimisionation along Hewletts Road - reduce and offset CO2 emissions	-1	Increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions, with the effects likely to be greater than with Option 6. This is also likely to induce additional through traffic demands into the corridor. The TTSM model predicts carbon emissions in the Mount Maunganui area and city-wide increase in comparison to the do min. Highest level of embodied carbon expected due to greatest level of new infrastructure.
Technical / Feasibility Assessment criteria			Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments
Feasibility	Constructability/Implementability	Assessment of Constructability / complexity of facility including stormwater infrastructure	0	Baseline Scoring	-1	Major construction works but nothing unusual. Widespread traffic management across multiple roads. Infrastructure improvements limited to managed motorway, intersection improvements reallocation of carriageway space for priority lanes and W&C improvements. Reallocation of existing carriageway to enable demand management. Possible stormwater adjustments required where there are changes to intersection and lane layouts and an increase in net impervious areas, eg increasing to 3 lanes.	-1	Moderate construction works. Less disruptive traffic management across spine roads only. Infrastructure improvements limited to streetscape, reallocation of carriageway space for PT and W&C improvements.	-2	Major construction works but nothing unusual. Traffic management focused on Hewletts Rd & Totara Street. Infrastructure improvements include grade separation of one intersection and widening of Totara St which will be disruptive. PT and W&C improvements. As impervious areas are increased, stormwater treatment will be required (which may be difficult in these locations). Other issues for consideration are that it may be difficult to get council's acceptance/ approval if increases in flood levels are demonstrated, via flood modelling of the proposed works. Grade separations at the Totara Street Hewletts Road intersection would encroach into an area of flooding and overland flow, and so this would likely also increase flood levels. May need additional reticulation or flood storage.	-2	Major and prolonged traffic disruption on Hewletts Road corridor expected to construct grade separated flyovers. Extensive property aquisition challenges to enable construction, especially if through traffic and property access is to be maintained to a level of service similar to existing. Construction is complex but not uncommon in New Zealand. As impervious areas are increased, stormwater treatment will be required (which may be difficult in these locations).	-2	Major and prolonged traffic disruption on Hewletts Road corridor expected to construct grade separated flyovers. Extensive property aquisition challenges to enable construction, especially if through traffic and property access is to be maintained to a level of service similar to existing. Construction is complex but not uncommon in New Zealand. As impervious areas are increased, stormwater treatment will be required (which may be difficult in these locations).
Consenting & property impacts	Planning and Consenting	Likelihood of obtaining approval and Qualitative assessment of impacts on property	0	Baseline Scoring	-1	All improvements are within the existing corridors. Minor consents are likely to be required.	-1	All improvements are within the existing corridors with a moderate scale of land acquisition. Minor consents are likely to be required.	-2	Moderately complex consenting process likely given grade separated interchange proposed, and four laning of Totara Street. Land acquisition likely around four laning of Totara St, rail connection and crossings, and grade separated infrastructure - lower scored than Option 6a due to lesser property impacts	-3	Moderately complex consenting process likely given grade separated interchanges proposed, and four laning of Totara Street. This option presents slightly more consenting risk compared to Option 6 but substantially more property aquisition when compared to Option 6. Land acquisition likely around four laning of Totara St, rail connection and crossings, and grade separated infrastructure	-2	Moderately complex consenting process likely given grade separated interchange proposed, and four laning of Totara Street. Land acquisition likely around four laning of Totara St, and grade separated infrastructure - lower scored than Option 6a due to lesser property impacts
Cost	CAPEX	High level $ estimate of capital costs of physical works and affordability	0	Baseline	-1	Expected estimate in range of $200-300m	-2	Expected estimate in range of $300 - 450m	-2	Expected estimate in range of $400-600m	-2	Expected estimate > $500m	-2	Expected estimate in range of $300 - 400m
	Operating Cost/ Efficiency	Assessment of operational costs including infrastructure maintenance	0	Baseline	-1	OPEX below $5m annually	-2	OPEX between $5m and $10m annually	-2	OPEX between $5m and $10m annually	-2	OPEX between $5m and $10m annually	-2	OPEX below $5m annually
Value for Money	High-level assessment of value for money		0	Baseline Scoring	0	BCR < 1 (0.85)	0	BCR < 1 (0.65)	1	BCR < 1 (0.91)	1	BCR < 1 (0.86)	2	BCR > 1 (1.29)
Meeting customer needs	Qualitative assessment of the options against the specific customer needs and pain points		0	Baseline Scoring	1	Intersection priority provides reliability for freight trips. Minor improvements to PT and W&C for customers (commuter, shift workers, students, sport events attendees, recreational).	3	Significant alternative choices both PT and W&C provided for customers (commuter, shift worker, leisure/recreational, students). Streetscaping provides for Whareroa Marae. Freight priority provision off peak. VMS to advise regional travellers.	3	Grade separation of Totara right turn, and four laning Totara benefits freight, trade/servicing, commuter, shift worker from Mount via private travel. Significant alternative choices both PT and W&C provided for customers (commuter, shift worker, leisure/recreational, students).	3	Grade separation of Hewletts, and four laning Totara benefits freight, trade/servicing, commuter, shift worker from Eastern BOP, and Mount communities via private travel. Significant alternative choices both PT and W&C provided for customers (commuter, shift worker, leisure/recreational, students).	2	Grade separation of Hewletts, and four laning Totara benefits freight, trade/servicing, commuter, shift worker from Eastern BOP, and Mount communities via private travel. Significant alternative choices for W&C provided for customers (commuter, shift worker, leisure/recreational, students).
Climate Change Mitigation (Mandatory)	Assessment of mode shift and traffic reduction, VKT, land use		Assessed as per Investment Objective above											
Alignment with Whareroa Marae's vision	The extent to which the option complements Whareroa Marae's vision for future land use		0	Baseline Scoring	-1	Does not align with Whareroa Marae's strategy of industry retreat.	-1	Does not align with Whareroa Marae's strategy of industry retreat.	-1	Does not align with Whareroa Marae's strategy of industry retreat.	0	Does not align with Whareroa Marae's strategy of industry retreat. However, this option includes streetscape inprovements, such as planting, iwi input into the design of street art and provides additional cycleways, which iwi are favourable towards.	-1	Does not align with Whareroa Marae's strategy of industry retreat.
Impacts on Te Ao Māori (Mandatory)	Assessment of impact on Te Ao Māori including areas of significance for Māori, Māori land and Kaitiakitanga		0	Baseline Scoring	1	Ngāi Tukairangi supports signal optimisation, upgrade of bus stops, cycle improvements, local network organisation, widening Totara. However, Ngāi Tukairangi opposes intersection signalisation, rationalisation of access, port/parking pricing.	1	Ngāi Tukairangi supports public transport, walking/cycling improvements, widening Totara St, local road network organsation, streetscpae improvements. However, Ngāi Tukairangi opposes removal of parking and parking pricing.	-1	Ngāi Tukairangi supports public transport, walking/cycling improvements, widening Totara St, local road network organisation, behaviour change, PT fare incentive. However, Ngāi Tukairangi opposes parking removal, rationalisation of access, and grade separation. Ngāti Kuku are opposed to grade seperation of any form. Ngāi Tukairangi are supportive of grade separation on the basis that a full CBA has been carried out to demonstrate the value.	-1	Ngāi Tukairangi supports public transport, walking/cycling improvements, widening Totara St. However, Ngāi Tukairangi opposes parking pricing, grade separation, rationalise local access. Ngāti Kuku are opposed to grade seperation of any form. Ngāi Tukairangi are supportive on the basis that a full CBA has been carried out to demonstrate the value.	-1	Ngāi Tukairangi supports public transport, walking/cycling improvements, widening Totara St. However, Ngāi Tukairangi opposes parking pricing, grade separation, rationalise local access. Ngāti Kuku are opposed to grade seperation of any form. Ngāi Tukairangi are supportive on the basis that a full CBA has been carried out to demonstrate the value.

SH2 / Hewletts Rd IBC

Short List Options Development and Assessment Report

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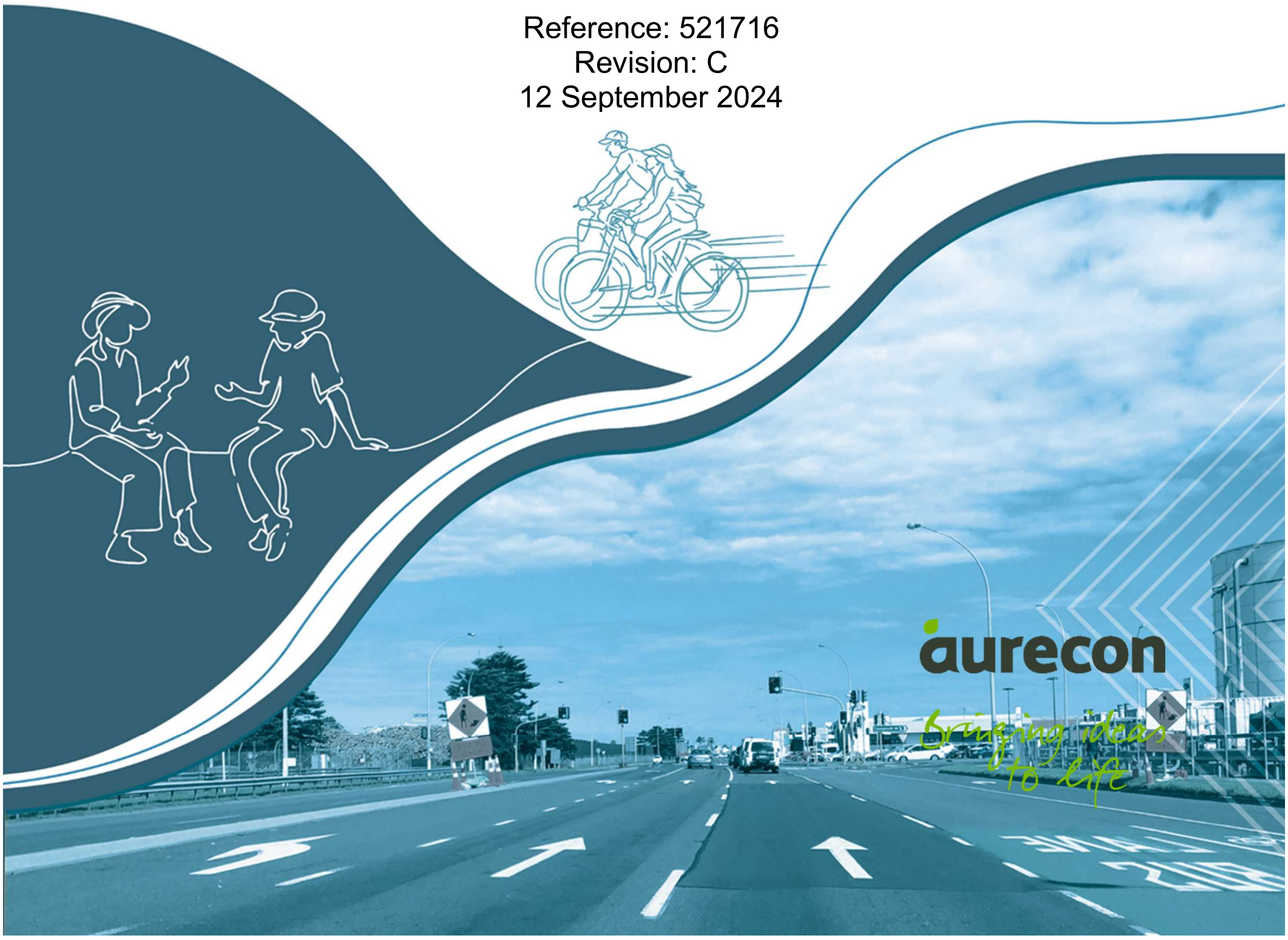

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1 Introduction

1.1 Background

The SH2/Hewletts Rd Indicative Business Case (IBC) project area covers the Mount Maunganui transport system including SH2 / Hewletts Rd and the wider local road network to the north and south of SH2 / Hewletts Rd (including, amongst others, Maunganui Rd, Hull Rd, Totara St, Jean Batten Drive, and Aerodrome Rd). Within the transport system, State Highway 2 (SH2) / Hewletts Rd is a nationally strategic corridor, with multiple and competing functions. Collectively, the transport system in the project area provides access to:

- Mount Maunganui, Pāpāmoa, and eastern communities within Western Bay of Plenty (WBOP).
- Several community facilities such as Mauao, beaches and sport and recreational facilities.
- Provides freight access to the Mount Maunganui side of the Port of Tauranga and the Mount Maunganui industrial area.
- Access to the Whareroa Marae and
- Access to the Tauranga airport.

With significant traffic volumes using SH2 / Hewlett Rd and further growth expected in the eastern corridor, it is critical that a suite of interventions be identified to support a reliable and improved multi-modal journey experience that maintains the effective operation of SH2 / Hewlett Rd, and the wider WBOP transport system, now and into the future (2048). This IBC considers the future to be a minimum of 30 years (2053).

The project scope is to prepare and deliver an IBC identifying a recommended package of interventions for the Mount Maunganui transport system which addresses the identified problems, delivers on the desired transport outcomes and helps deliver elements of the Urban Form and Transport Initiative (UFTI) Connected Centres Programme.

1.2 Purpose of this Report

The project partners are seeking to confirm the recommended option for a range of interventions in the vicinity of the SH2 / Hewletts Rd sub area, outlined in Figure 1-1.

This report outlines the short list options development and assessment undertaken to respond to the problems and investment objectives identified for SH2 / Hewletts Rd Indicative Business Case (IBC). A set of short list options for change were developed and assessed to determine their ability to contribute to achieving the objectives and the outcomes sought.

Figure 1-1: Geographical Scope of the SH2 / Hewletts Rd IBC

1.3 Optioneering Approach

The assessment methodology for this project entails a four-stage process including a two-stage longlist assessment process, followed by a shortlist assessment to confirm the recommended option.

The approach is illustrated in Figure 1-2 and was presented and agreed with Waka Kotahi, Tauranga City Council (TCC), Bay of Plenty Regional Council (BOPRC) on 26 July 2022.

Further detail is provided below. This report covers the third stage of the assessment process.

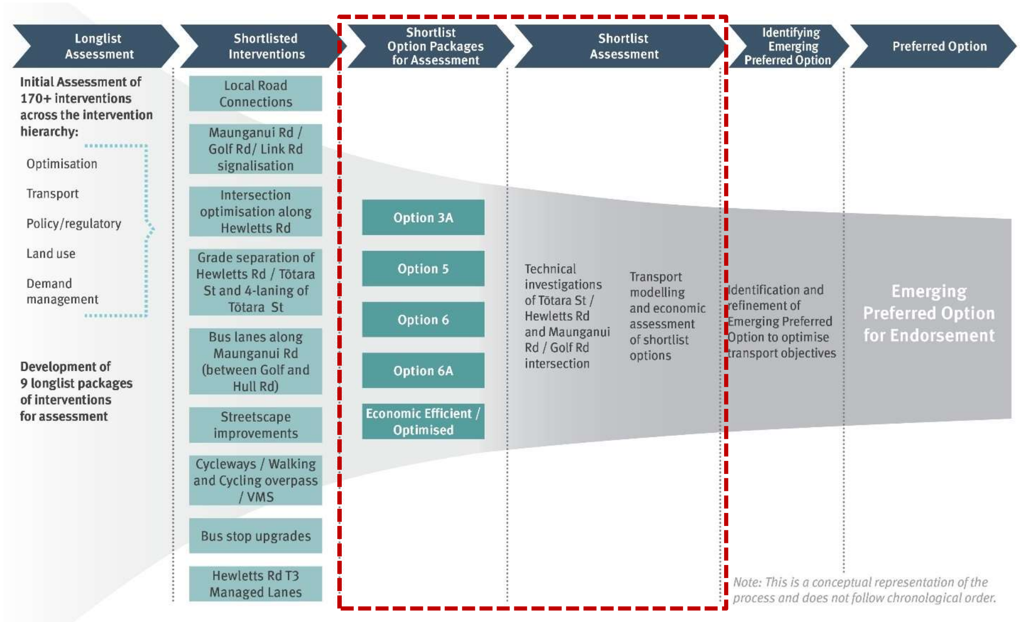

Figure 1-2: Overall Assessment Approach

The assessment methodology has been developed to allow for the following components as shown below.

1. Longlist Sieving

- Define the 'do-minimum' based on funded / committed projects (see Section 2.2 for details).
- Sieving processes in parallel:
    - **Strategic Options Sieve:** High-level sieving of skeleton options, focused on the strategic alignment of each option, to ensure options would not contradict the outcomes and direction established by the UFTI, the Transport System Plan (TSP) and other strategic policy documents such as the Government Policy Statement on land transport (GPS) and Emissions Reduction Plan (ERP) documents.
    - **Feasible Interventions Sieve**: High-level sieving of detailed and specific interventions, focused on the feasibility and achievability of each intervention, to ensure options which have fatal flaws can be excluded from the process early. This is designed to ensure we have a focused set of interventions to analyse at the later stages.

2. Longlist Assessment

- Develop up to 8 options based on the options with greatest strategic alignment, incorporating feasible interventions.

A qualitative Multi-Criteria Analysis (MCA) assessment was undertaken on these options, including a high-level assessment using Waka Kotahi's Indicative Efficiency Rating (IER) tool.

3. Shortlist Assessment

- Develop up to 4 shortlist options, based on best performing longlist options. These options will be fully developed with extensive suite of interventions.

A quantitative MCA assessment will be undertaken on these options, using more defined and enhanced measures using modelling, economic, and transport analysis tools to help determine the quantum of benefits possible.

4. Recommended Option

- Develop a recommended option consisting of a package of interventions, based on best performing shortlist options.
- Include specific timing and sequencing for the identified interventions.
- Undertake financial, commercial and delivery analysis to support the IBC.

The recommended option will be investigated further in the Detailed Business Case (DBC). The recommended package is likely to be made up of multiple interventions across the transport system and could include land use, regulatory and policy recommendations.

2 Short List Options

This section provides a description of the short list option development process and details the five short list options developed for assessment against the agreed MCA framework.

A do-minimum option scenario was also included as a reference case.

2.1 Short List Options Development and Assessment Approach

Based on the outcomes of the Longlist MCA Assessment and stakeholder feedback, the following options were recommended to proceed to the shortlist stage, for more detailed development and assessment:

- ***Option 3a – Rationalising Access:*** Performs reasonably well against the outcomes. Includes elements from Options 2 and 3, including additional focus on limiting access on SH2 and enhancing role of Newton Rd (or parallel corridor). Recommended to be taken forward to short list.
- ***Option 5 – At grade improvements:*** Scores well against the outcomes. Recommended to be taken forward to short list.
- ***Option 6 – Grade Separation of Hewletts Road / Totara Street:*** Scores well against most outcomes. Appears to provide a good balance of mode shift, and throughput. Recommended to be taken forward to short list.

The other options considered were not progressed to the short list stage. The reasoning behind this can be found in the Long List Options Development and Assessment Report.

Ahead of the formal short list MCA workshop, one-on-one meetings were held with each of the Project Partners to discuss the four options assessed, run through the initial assessment outcomes and take on board any initial feedback.

The Short List MCA workshop was held with project partners on 29 November 2022. Assessments were completed by the consultant team prior to the workshop and the findings were summarised. The MCA assessment can be found in Appendix A and minutes of the workshop can be found in Appendix B.

Additional short-list options were developed in response to stakeholder feedback. This option was assessed, and findings summarised following the Short List MCA workshop and subsequent meetings with the project partners and stakeholders.

- ***Option 6a – A hybrid option of Options 5 and 6***. This option comprises the at-grade improvements from Option 5 with the grade-separation of the Hewletts Rd/Tōtara St intersection.

Waka Kotahi engaged with both hapū, Ngāi Tukairangi and Ngāti Kuku, to understand which proposed options/interventions aligned with a te ao Māori perspective. Both hapū's feedback and considerations have been incorporated into the scoring.

Following the release of the new Government Policy Statement on Land Transport 2024 (GPS 2024), various modelling scenarios were developed based on the short list options to evaluate the relative benefits of each individual intervention. By comparing between the modelled scenarios, the relative isolated benefits of each intervention would be recognised. In reality, these interventions would not be delivered in isolation as there are a number of interdependencies between the different interventions.

Table 2-1: Development of Modelling Scenarios to individually assess interventions

Improvements	DM	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
New Local Road connections	✗	✓	✓	✓	✓	✓
Signalisation of Golf Road intersections	✗	✗	✓	✓	✓	✓
Intersection optimization[1]	✗	✗	✗	✓	✓	✓
Totara Road widening and flyover connection	✗	✗	✗	✗	✓	✓
New Bus Lanes	✗	✗	✗	✗	✗	✓

Table 2-2: Performance of Individual Shortlist Interventions

Benefit	New local road connections	Signalisation of Golf Road intersections	Intersection optimization	Totara Road widening and flyover connection	New bus lanes along Maunganui Road	Streetscape improvements	Cycleways, walking and cycling overpass	Bus stop upgrades
Travel Time Costs	$31.0	-$36.6	$17.2	$114.8	$0.0	n/a	n/a	n/a
Congestion Relief (CRV)	$9.9	-$14.4	-$1.4	$87.4	$0.0	n/a	n/a	n/a
Vehicle Operating costs	$8.1	$6.5	-$13.4	$24.6	$0.0	n/a	n/a	n/a
Crash costs	$4.8	$11.6	$19.1	-$17.5	$0.0	n/a	n/a	n/a
Public Transport Travel Times	$0.0	$0.0	$14.2	$0.0	$30.7	n/a	n/a	n/a
Public Transport Facility	$0.0	$0.0	$0.0	$0.0	$0.0	n/a	n/a	$19.7
Emissions	$6.1	$2.5	-$8.0	-$7.7	$0.0	n/a	n/a	n/a
Cycle Health	$0.0	$0.0	$0.0	$0.0	$0.0	n/a	$91.1	n/a
Urban Realm	$0.0	$0.0	$0.0	$0.0	$0.0	$43.7	n/a	n/a
Total discounted benefits (NPV):	**$59.9**	**-$30.4**	**$27.6**	**$201.5**	**$30.7**	**$43.7**	**$91.1**	**$19.7**
Total discounted costs (NPV):	**$91.6**	**$37.0**	**$39.9**	**$146.2**	**$79.2**	**$50.8**	**$23.1**	**$28.8**

Following individual assessment of interventions, the most cost-effective items were grouped together to form the Economic Efficient option.

Economic Efficient / Optimised: This option is designed to be a cost-effective programme of interventions in line with the latest GPS 2024

The following table provides an overview of the various interventions that make up each short list option.

[1] The intersection optimization treatments are slightly different between Scenario 3, 4 and 5, as described in sections above.

Table 2-3: Summary of Interventions by Shortlist Option

Interventions	Options					
	Do-min	Option 3A	Option 5	Option 6	Option 6a	Economic Efficient/ Optimised
Local Road Connections	✗	✓	✓	✓	✓	✓
Maunganui Road/Golf Rd & Link Rd signalisation	✗	✓	✓	✓	✓	✗
Intersection optimisation along Hewletts	✗	✓	✗	✓	✓	✗
Grade Separation of Hewletts/Tōtara + 4-laning Tōtara	✗	✗	✗	✓	✓	✓
Bus lanes along Maunganui Rd (between Golf and Hull Rd)	✗	✗	✓	✓	✓	✗
Streetscape Improvements	✗	✗	✓	✗	✓	✗
Cycleways/ Walking and Cycling Overpass / VMS	✗	✓	✓	✓	✓	✓
Bus Stop Upgrades	✗	✓	✓	✓	✓	✓

The five short list options were further developed and refined by the project team, developing the interventions in more detail, and taking onboard feedback received from the project partners throughout project meetings.

2.2 Do-Minimum

Do Minimum

The do minimum is comprised of financially committed projects that will impact the Connecting Mount Maunganui area. These interventions are assumed to be implemented separated to this project. All options include do minimum interventions.

- **Totara St Active Travel Safety Upgrades:** Off-road shared path / with signalised crossings on side roads; signalised crossing across Totara St near Hewletts Rd
- **Maunganui Rd Active Travel Safety Improvements:** Shared path and crossing improvements
- **Hewletts Rd Active Travel shared Path:** Widening of the footpath on the northern side of Hewletts Rd from Totara St to Aerodrome Rd
- **Cameron Road Upgrades*:** Improved public transport and active mode facilities along Cameron Rd (Stage 1)
- **Baypark to Bayfair Link:** A new SH2/SH29A interchange, a new flyover taking SH2 traffic over the Bayfair roundabout, and improved walking and cycling connections
- **PT network changes:** Increased bus frequency along Hewletts Road and Maunganui Road with no bus services on Totara St (not committed, but expected to be delivered by others and considered to be in all options)
- **The Wednesday Challenge Ferry:** Trial Ferry Service Mt Maunganui – CBD ferry on Wednesdays

**Note that Cameron Rd Stage 2 is not construction committed*

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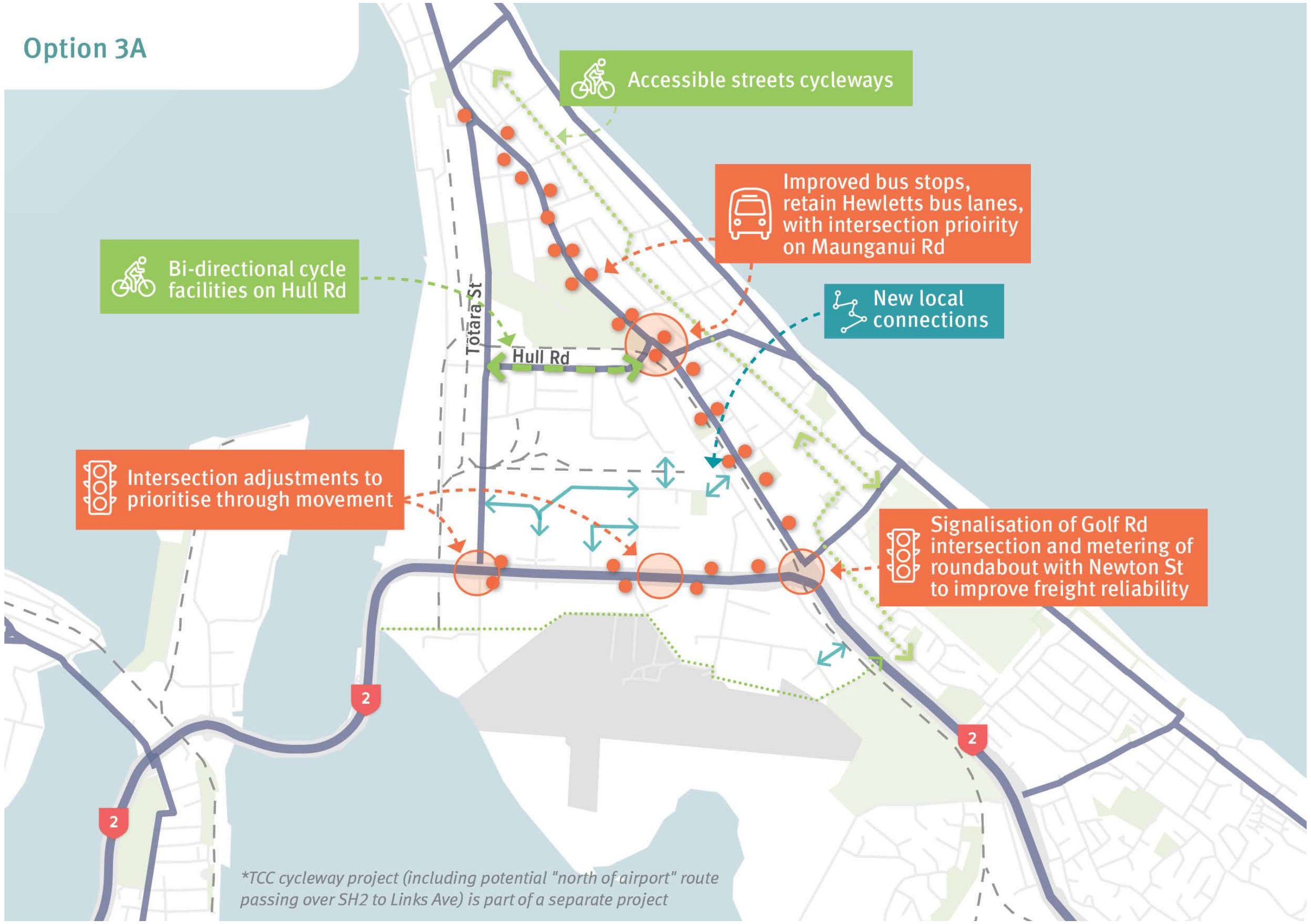
2.3 Option 3a – Rationalising Access



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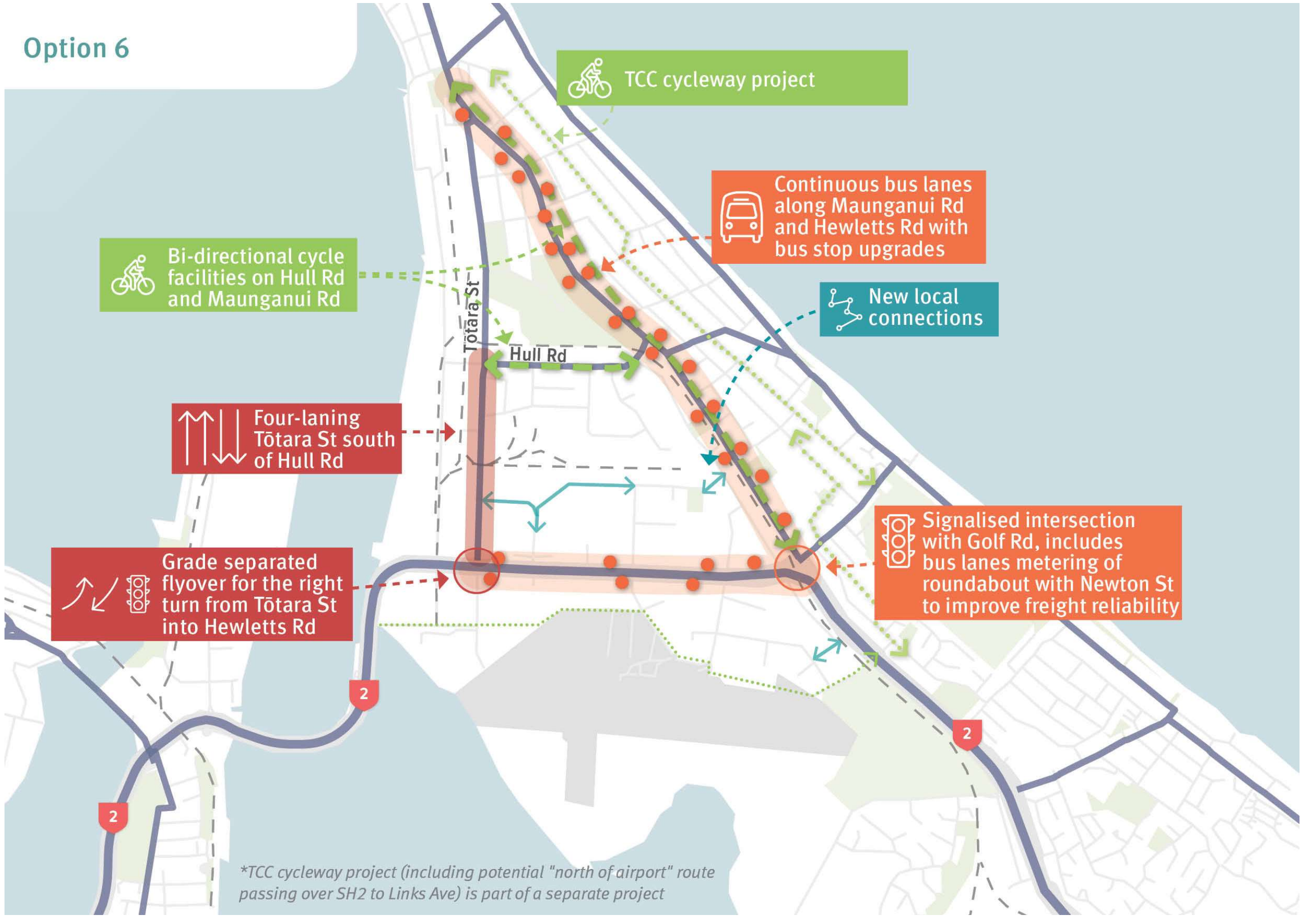
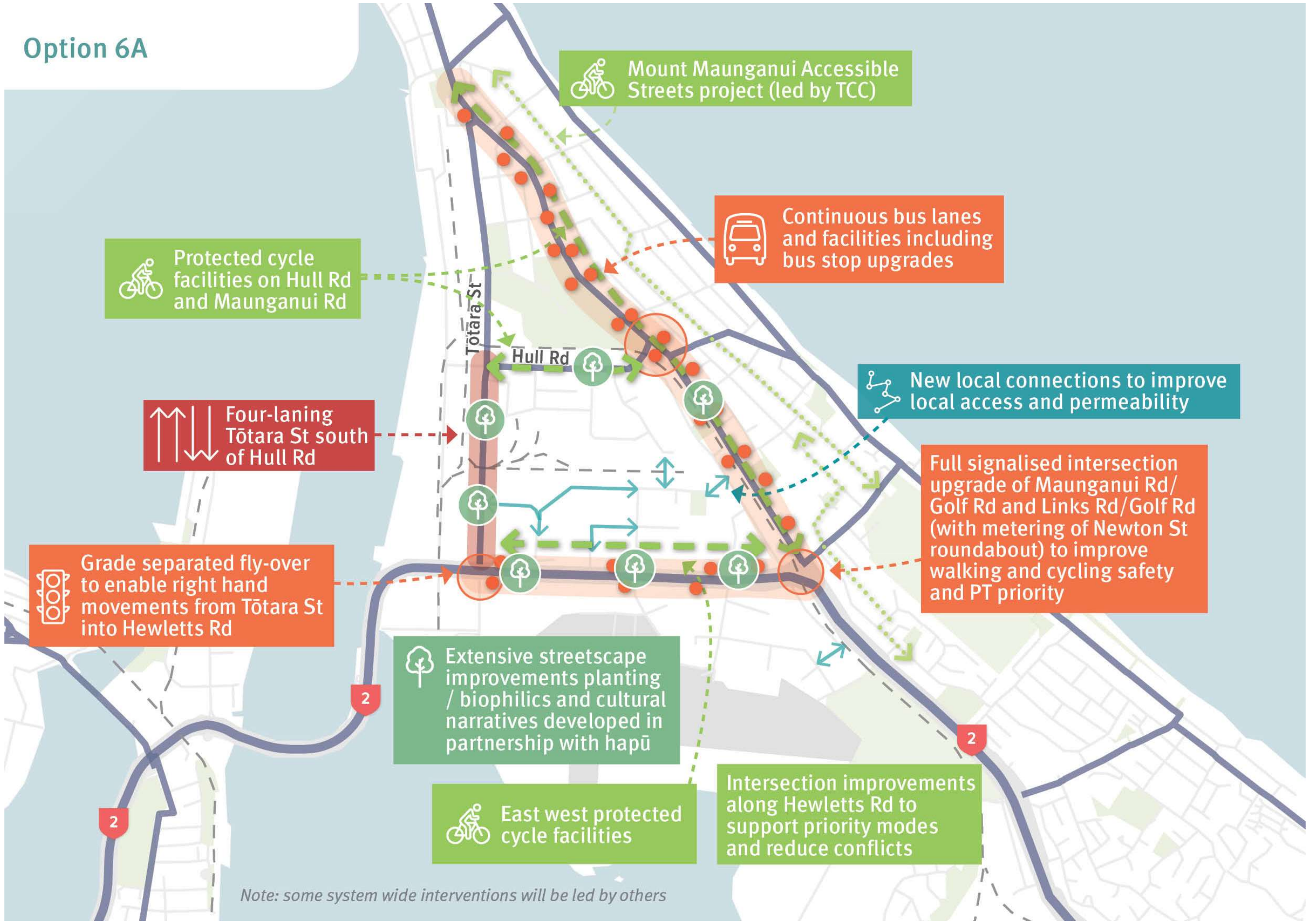
2.4 Option 5 – At Grade Improvements

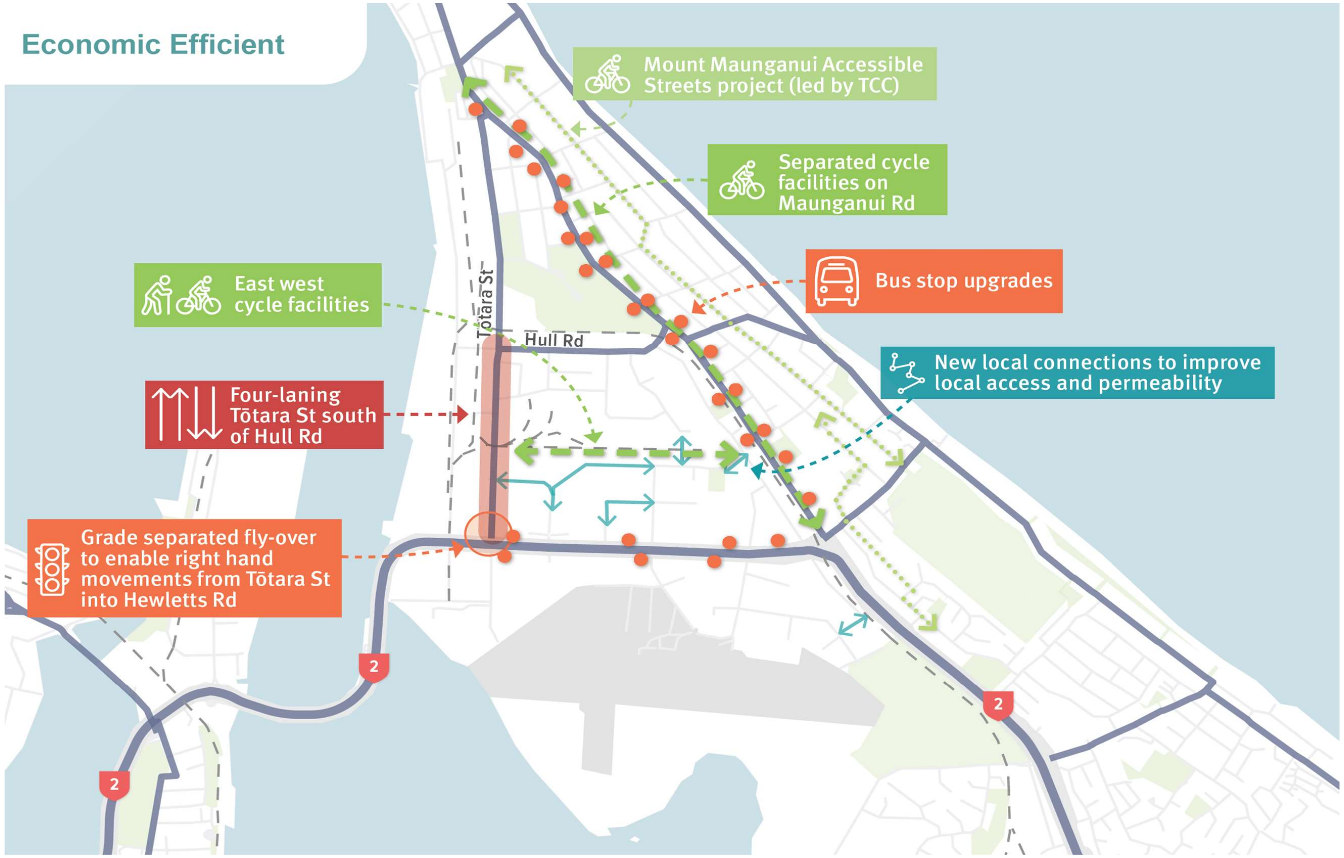
2.5 Option 6 – Grade Separation of Hewletts Road / Totara Street



2.6 Option 6a – Hybrid Option of Option 5 and Option 6



2.7 Economic Efficient Option



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3 Short List Options Assessment

3.1 Multi-Criteria Analysis Framework

The longlist options were evaluated against the criteria of the MCA framework agreed with Project Partners in August 2022. This included:

- Benefit and Investment Objectives.
- Technical/feasibility criteria.

The project aims to address the following problems identified in the Investment Logic Map (ILM), as shown in Figure 3-1 below.

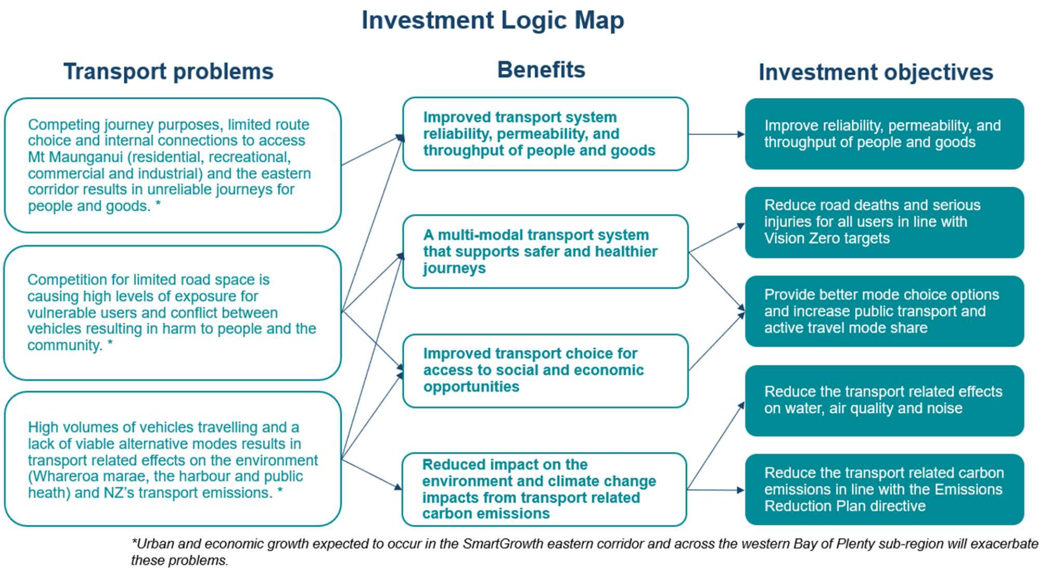

Figure 3-1: Investment Logic Map

3.1.1 Benefits and Investment Objectives

All options developed will be assessed against the benefit and investment objectives shown in Table 3-1 below.

Table 3-1: Investment Objectives and KPIs

Benefit	Investment Objective	KPI
Improved transport system reliability, permeability, and throughput of people and goods	To improve reliability, permeability, and throughput of people and goods	People throughput
		Travel time reliability for freight movements

Benefit	Investment Objective	KPI
A multi-modal transport system that supports safer and healthier journeys	To reduce road deaths and serious injuries for all users by at least 40%	Risk of death and serious injuries (collective risk)
Improved transport choice for access to social and economic opportunities	To provide better mode choice options and increase public transport and active travel mode share	Public transport travel time compared to general vehicle travel time
		Access to social and economic destinations by PT, walk and cycle
Reduced impact on the environment and climate change impacts from transport related carbon emissions	To reduce the transport related effects on water, air quality and noise	Ambient air quality - (NO2 and PM10) and Noise level
	To reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	CO2 emissions (Mode shift from single occupancy private vehicle)

3.1.2 Technical and Feasibility Criteria

The agreed technical and/or feasibility criteria are outlined in Table 3-2 below.

Table 3-2: Technical / Feasibility Assessment Criteria

Category	Description
Feasibility	Assessment of Constructability / complexity of facility including stormwater infrastructure
Consenting & property impacts	Likelihood of obtaining approval and Qualitative assessment of impacts on property
Cost	High level estimate of capital costs of physical works and affordability
	Assessment of operational costs including infrastructure maintenance
Value for Money	High-level assessment of value for money
Meeting customer needs	Qualitative assessment of the options against the specific customer needs and pain points
Climate Change Mitigation	Assessment of mode shift and traffic reduction, Vehicle Kilometres Travelled (VKT), land use
Alignment with Whareroa Marae's Vision	The extent to which the option complements Whareroa Marae's vision for future land use
Impacts on Te Ao Māori	Assessment of impact on Te Ao Māori including areas of significance for Māori, Māori land and Kiatiakitanga

3.1.3 Assessment scale

Each of the options was assessed based on a 7-point scale as shown in Table 3-3 below. The methodology and detail of assessment is outlined in the sections below.

Table 3-3: Assessment scale

Rating	All assessments will be made in reference to the do-minimum
3	Significantly positive
2	Moderate positive
1	Slight positive
0	Neutral (Do-Minimum)
-1	Slight negative
-2	Moderate negative
-3	Significantly negative

3.2 Multi-Criteria Assessment Summary

The following section describes the methodology and rationale of assessment for each criterion.

3.2.1 Assessment against investment objectives

People throughput

Methodology

Quantitative estimates of people throughput capacity were carried out on Hewletts Road, Hull Road, Maunganui Road, and Totara Street. Summation of the total number of pedestrians, cyclists, public transport passengers and motor vehicle passengers that can move through each lane and at intersections were considered.

Note that capacity on any corridor is best defined in terms of level of service. There is no absolute capacity for any corridor cross section, as with increasing throughput the level of service for travel decreases. For this criteria assessment, we have taken what is considered to be an upper limit of capacity for each lane type. There could be further work to adjust these capacity values, however as they are applied across all options, changes to the capacity values used are not likely to result in changes in the MCA score given.

The assumed capacity of each lane type is:

- Traffic lane: 1,700 people per hour assumed for free flow lanes, and 1,000 people per hour assumed with signalised intersections (assuming 60% green time at signals)[2].
- Bus lane: 2,480 people per hour (assuming 31 buses per hour with 80 passengers per bus). Note that the theoretical capacity of a bus lane is greater than this, however, due to realistic upper limits of demand expected, this number has been used. The 31 buses per hour matches the maximum planned bus service frequency in the area (Hewletts Road).

[2] https://austroads.com.au/__data/assets/pdf_file/0023/392054/Module_3-3_Capacity_Analysis.pdf

- Cycle lane: 500 people per hour assumed for protected cycle lanes (theoretically, a cycle lane can carry over 2,000 cyclists per hour[3], however, this far exceeds the level that could be realistically expected, therefore a value of 500 is assumed as the theoretical capacity). This aligns with the Auckland Transport Design Manual (AT TDM) capacity given as 150-750 bikes in peak hour a 2m cycle lane. Unprotected cycle lanes are not considered, as they are not suitable for all user types. Forecast 2043 average annual daily cyclists in the Tauranga Cycle Programme shows Maunganui Road, Totara Street, and an off-SH2 cycle route having between 300 – 500 cyclists per day, per direction. Recent cycle counts for Auckland cycle lanes show that the maximum usage is typically 1000 – 2000 cyclists per day.
- Footpaths: 200 people per hour for paths narrower than 2m, growing to 400 people per hour for those 2m or wider. 400 people per hour is assumed for off-road shared paths 2m or wider (again these have a theoretical capacity far in excess of what is realistic for this area[4]). This value (400 people per hour) is an assumed two-way capacity and aligns with LOS A[5].
- Negligible capacity change is expected for the off-peak reallocation of general traffic lanes to freight / HOV lanes. Furthermore, the off-peak capacity is likely to be less critical than the peak capacity – at which times there is no change to the cross section.

It is also assumed that the following elements will increase people throughput:

- Grade separations.
- Restriction of intersections to left-in left-out only.
- Pedestrian/cyclist overpass infrastructure.
- Streetscape enhancements.

Table 3-4: Scoring rationale - People throughput.

Score	Description
3	Significant increase in people throughput (i.e. sum of estimated potential throughput on the Hewletts Road, Hull Road, Maunganui Road, and Totara Street corridors is over 28,000 people per hour).
2	Moderate increase in people throughput (i.e. sum of estimated potential throughput on the Hewletts Road, Hull Road, Maunganui Road, and Totara Street is in the range of 23,000 - 28,000 people per hour).
1	Slight increase in people throughput (i.e. sum of estimated potential throughput on the Hewletts Road, Hull Road, Maunganui Road, and Totara Street corridors is in the range of 18,000 - 23,000 people per hour).
0	No overall impact on people throughput (Do minimum sum of estimated potential throughput on the Hewletts Road, Hull Road, Maunganui Road, and Totara Street]is approximately 16,000 people per hour).

Assessment commentary

Table 3-5: People throughput summary information

	Do min	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
Hewletts Road	**~9,560 people per hour** Four traffic lanes with signalised intersections, two bus lanes,	**Slight improvement compared to do min** Several intersections	Potential **slight improvement compared to do min** given streetscape enhancements	**~10,060 Moderate improvement compared to do min**	**~10,060 people per hour** Grade separations effectively upgrade the	**~10,060 people per hour** Grade separations effectively upgrade the

[3] https://www.cycling-embassy.org.uk/dictionary/capacity https://at.govt.nz/about-us/manuals-guidelines/transport-design-manual/
[4] https://www.cycling-embassy.org.uk/dictionary/capacity
[5] **Transport Research Board. Highway Capacity Manual. Washington DC: Special report 209,1985. Chapter 13**

	Do min	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
	one footpath below 2m and one footpath over 2m.	restricted to left in left out. Turning movements still permitted at the Totara St and Jean Batten intersections, however the through movement on Hewletts given greater green time.	likely to improve pedestrian and cyclist environment.	Increased throughput potential on Hewletts Rd due to grade separated right turn as through movement has more green time.	traffic lanes to free flow.	traffic lanes to free flow.
Hull Road	**~2,200 people per hour** Two general traffic lanes with signalised intersection (at Maunganui Rd end) and one footpath below 2m.	**~3,400 people per hour** The addition of a protected bi-directional cycle facility, and widening of footpath has the potential to increase people throughput	**~3,400 people per hour** As per Option 3a. Potentially slightly better than Option 3a due to streetscape enhancements.	**~3,400 people per hour** As per Option 3a.	**~3,400 people per hour** As per Option 3a.	**~3,400 people per hour** As per Option 3a.
Maunganui Road	**~2,200 people per hour** Two general traffic lanes with signalised intersection (at Hull Rd) and one footpath below 2m (southern section).	**No change from do min**	**~8,360 people per hour** The addition of a protected bi-directional cycle facility, two bus lanes, and a widened footpath significantly increases potential people throughput.	**~8,360 people per hour** As per Option 5.	**~8,360 people per hour** As per Option 5.	**~3,200 people per hour** Removal of bus lanes and footpaths reduces people throughput when compared to other options
Totara Street	**~2,400 people per hour** Two traffic lanes with signalised intersections and one off-road shared path over 2m wide.	**~3,400 people per hour** Additional southbound traffic lane.	**~3,400 people per hour** Additional southbound traffic lane and streetscape enhancements likely to improve pedestrian and cyclist environment. Walking and cycling overpass expected to increase attractiveness of cyclists using Totara St	**~5,100 people per hour** Four-laned Totara St with additional increase due to grade separated southbound right turn flyover	**~5,100 people per hour** Four-laned Totara St with additional increase due to grade separated southbound right turn flyover	**~5,100 people per hour** Four-laned Totara St with additional increase due to grade separated southbound right turn flyover
Sum of potential throughput	~16,360	~18,560	~24,720	~27,120	~27,120	~21,960

	Do min	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
on the four corridors						
MCA score	0	+1	+2	+2	+2	+2

Travel time reliability for freight movements

Methodology

This assessment was based a qualitative assessment of impacts of interventions on freight travel time reliability, supported by quantitative estimate of freight travel time reliability on routes between the Port/Mount industrial area and the CBD and between the Port/Mount industrial area and the eastern communities.

Table 3-6: Scoring rationale – Travel time reliability for freight movements

Score	Description
3	Infrastructure improves travel along key freight routes and model predicts substantial travel time savings on key freight routes
2	Infrastructure improves travel along key freight routes and model predicts significant travel time savings on key freight routes.
1	Infrastructure has mixed impacts along key freight routes and model predicts moderate travel time savings on key freight routes
0	No change from do minimum.

Assessment commentary

Option 3a scored a +2 as movement restrictions along Hewletts will concentrate movements on Hewletts/Totara, which is already a critical intersection, however, this will be offset by new local connections. The modelling indicates significant travel time savings in AM peak. Pricing mechanisms will lead to some mode change (away from private car travel). Interpeak freight priority will clearly assist freight reliability unless general traffic queues extend beyond freight lanes.

Option 5 scored a +1 as movement restrictions along Hewletts will concentrate movements on Hewletts/Totara, although this will be offset by new local connections. Modelling indicates moderate travel time savings in the AM peak. Pricing mechanisms will lead to some mode change (away from private car travel). Interpeak freight priority will clearly assist freight reliability unless general traffic queues extend beyond freight lanes.

Option 6 scored a +2 as grade separation of Totara to Hewletts west will reduce pressure at that intersection, directly assisting freight from the Port, and indirectly assisting through freight along Hewletts. The modelling indicates significant travel time savings (similar to Option 3a). Pricing mechanisms will lead to some mode change (away from private car travel).

Option 6a scored a +3 as grade separation of Totara to Hewletts west will reduce pressure at that intersection, directly assisting freight from the Port, and indirectly assisting through freight along Hewletts. The modelling indicates significant travel time savings (greater than Option 6). Pricing mechanisms will lead to some mode change (away from private car travel).

The Economic Efficient option scored a +2 as grade separation of Totara to Hewletts west will reduce pressure at that intersection, directly assisting freight from the Port, and indirectly assisting through freight along Hewletts. The modelling indicates moderate travel time savings (similar to Option 5). Pricing mechanisms will lead to some mode change (away from private car travel).

Risk of death and serious injuries (collective risk)

Methodology

Qualitative assessment of expected impact on DSIs based on Safe Systems Considerations[6] of exposure, likelihood and severity. The four main corridors (Hewletts Road, Hull Road, Maunganui Road and Totara Street) were assessed individually before combining into a single consideration.

This assessment considers the New Zealand Road Assessment Programme (KiwiRAP) rating and the five-year crash history, but also goes beyond these and considers any road safety risks present in the scope area, such as vehicle conflicts at intersections which are not represented in the crash history.

KiwiRAP is a crash-risk mapping tool which quantifies and compares historical road deaths and serious injuries (DSI) as recorded by Waka Kotahi Crash Analysis System crash data sets. It is a tool used to identify significant existing crash-risk areas on the transport network. The KiwiRAP tool indicated that Hewletts Road and Maunganui Road are in the Medium – Low Medium risk range and shows a pattern of vulnerable road user risk along Hewletts Road and at certain intersections along Maunganui Road.

The patterns identified in the crash history indicate the greatest historical risk is related to the lack of separated cycle facilities, the lack of safe pedestrian crossing facilities and the conflicts of property accesses with through movements.

A percentage DSI reduction has been estimated for each option, based on the overall extent of safety improvements. These have been benchmarked in the range of percentage improvements associated with Standard Safety Interventions evaluated by Waka Kotahi[7] (ie, up to 75% assumed DSI reduction for major physical infrastructure such as wire rope barriers, 35% for wide centre line, and 10% for signage and markings).

[6] Austroads Safe System Assessment Framework
[7] https://www.nzta.govt.nz/assets/resources/standard-safety-intervention-toolkit/standard-safety-intervention-toolkit.pdf

Crash history shows 16 DSIs in study area in last five years, with 13 of these along the key corridors: Hewletts Road (5); Totara Street (3); Maunganui Road (5); and Hull Road (0).

Table 3-7: Scoring rationale - Risk of death and serious injuries (collective risk)

Score	Description
3	Significant improvements (average percentage improvement on the four corridors is ~50% compared to crash history)
2	Moderate improvements (average percentage improvement on the four corridors is ~40% compared to crash history)
1	Slight improvements (average percentage improvement on the four corridors is ~30% compared to crash history)
0	No Change – do minimum (average percentage improvement on the four corridors is up to ~15% compared to crash history)

Assessment commentary

	Do min	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
Hewletts Rd	Hewletts Rd active travel shared path will **slightly improve** pedestrian and cyclist safety in comparison to that represented in crash history **~10% reduction compared to crash history**	**Slight improvement from do min** Several intersections restricted to left in left out only resulting in a reduction of conflict points for vehicle crashes. **~20% reduction compared to crash history**	**Moderate improvement from do min** Streetscape improvements expected to improve pedestrian and cyclist safety along Hewletts Rd. Continuous bus lanes along Hewletts likely to reduce likelihood of crashes between left turning vehicles and motorcycles which is represented in the crash history. **~30% reduction compared to crash history**	**Moderate improvement from do min** Several intersections restricted to left in left out only resulting in a reduction of conflict points for vehicle crashes. The grade separated flyover from Totara St has benefits as it removes conflict at the intersection, but introduces weaving and merging risk where the flyover re-joins Hewletts Rd. **~30% reduction compared to crash history**	**Moderate improvement from do min** Several intersections restricted to left in left out only resulting in a reduction of conflict points for vehicle crashes. The grade separated flyover from Totara St has benefits as it removes conflict at the intersection, but introduces weaving and merging risk where the flyover re-joins Hewletts Rd. **~30% reduction compared to crash history**	**Slight improvement from do min** The grade separated flyover from Totara St has benefits as it removes conflict at the intersection, but introduces weaving and merging risk where the flyover re-joins Hewletts Rd. **~20% reduction compared to crash history**
Hull Rd	**No change** in comparison to that represented in crash history **No change**	**Significant improvement from do min** Addition of separated bi-directional cycle facility and widening of footpath improves safety for pedestrians and cyclists. **~50% reduction compared to crash history**	**Significant improvement from do min** As per Option 3a. **~50% reduction compared to crash history**	**Significant improvement from do min** As per Option 3a **~50% reduction compared to crash history**	**Significant improvement from do min** As per Option 3a. **~50% reduction compared to crash history**	**No change** in comparison to that represented in crash history **No change**
Maunganui Rd	Maunganui Rd active travel safety upgrades may **slightly improve** pedestrian and cyclist safety in comparison to	**Moderate improvement from do min** Signalisation of Golf Rd intersection expected to improve pedestrian	**Significant improvement from do min** Addition of protected cycling facilities, wide footpaths likely to	**Significant improvement from do min** As per Option 5 **~50% reduction**	**Significant improvement from do min** As per Option 5 **~50% reduction**	**Slight improvement from do min** Maunganui Rd active travel safety upgrades including separated

	Do min	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
	that represented in crash history **~10% reduction compared to crash history**	safety with signalised crossing points. **~20% reduction compared to crash history**	improve safety for vulnerable users. **~50% reduction compared to crash history**	**compared to crash history**	**compared to crash history**	cycle facilities may **slightly improve** pedestrian and cyclist safety, in comparison to that represented in crash history **~20% reduction compared to crash history**
Totara St	Totara St active travel upgrades will **significantly improve** cyclist safety in comparison to that represented in crash history **~35% reduction compared to crash history**	**Slight decrease** from do min Widening of Totara St to 3 lanes south of Hull Rd may increase exposure to risk through increased vehicle volumes. **~25% reduction compared to crash history**	**Significant improvement from do min** Pedestrian/cyclist overpass expected to improve active mode safety and mitigates increased exposure from widening to 3 lanes. **~60% reduction compared to crash history**	**No change** from do min. Slight benefit due to grade separated right turn, but increased exposure due to assumed greater vehicle volumes on the widened corridor. Active mode users will have to cross an additional left turn lane. **~35% reduction compared to crash history**	**Moderate improvement from do min** Slight benefit due to grade separated right turn, but increased exposure due to assumed greater vehicle volumes on the widened corridor. Streetscape improvements will improve CPTED and perceived safety for pedestrians and cyclists. **~50% reduction compared to crash history**	**No change** from do min. Slight benefit due to grade separated right turn, but increased exposure due to assumed greater vehicle volumes on the widened corridor. Active mode users will have to cross an additional left turn lane. **~35% reduction compared to crash history**
Overall impact summary (Average improvement percentage for comparison)	Average 14% DSI reduction compared to crash history state	Average 29% DSI reduction compared to crash history state	Average 48% DSI reduction compared to crash history state	Average 41% DSI reduction compared to crash history state	Average 45% DSI reduction compared to crash history state	Average18% DSI reduction compared to crash history state
MCA score	0	+1	+3	+2	+3	+1

Public transport travel time compared to general vehicle travel time

Methodology

The assessment was based on a quantitative comparison of the modelled travel time between Papamoa and the CBD and Mt Maunganui North and the CBD[8] for both buses and general vehicles. The Tauranga Transport Hybrid Model (TTHM) was used, with the following routes considered:

- Route 1: between Port of Tauranga and Tauranga Harbour Bridge.
- Route 2: between Port of Tauranga and SH2 east (via Totara Street and Hewletts Road).
- Route 3: between SH2 east and Tauranga Harbour Bridge, via Hewletts Road overpass 4.
- Route 4: between Mount Maunganui and Tauranga Harbour Bridge, via Maunganui Road: Banks Avenue to Hull Road.
- Route 5: between Mount Maunganui and Tauranga Harbour Bridge, via Maunganui Road: Hull Road to Golf Road.
- Route 6: between Mount Maunganui and Tauranga Harbour Bridge, via Maunganui Road: Golf Road to Bridge.

[8] See TN5A230112 Short List Assessment, Flow, Jan 2023 for further details.

Figure 3-2 Routes for Travel Time Assessment

Table 3-8: Scoring rationale – Public transport travel time compared to general vehicle travel time

Score	Description
2	Moderate improvement for bus travel time in comparison to general vehicle travel time (model shows bus travel time 8% lower than general vehicle travel time)
1	Slight improvement for bus travel time in comparison to general vehicle travel time (model shows bus travel time 5% lower than general vehicle travel time).
0	Minimal change from do minimum (model shows bus travel time 3-5% higher than general vehicle travel time)
-1	Slight worsening for bus travel time in comparison to general vehicle travel time (model shows bus travel time 6% higher than general vehicle travel time).

Assessment commentary

Option 3a and Economic Efficient option scored a 0 as modelled travel time along key routes show similar improvements for both buses and general vehicles. Modelling shows bus travel time is 3% higher than general vehicle travel time. The Economic Efficient option has no provision for bus lanes along Maunganui Road, not inducing a mode shift from private vehicle to PT or active modes.

Option 5 scored a +2 as modelled travel time along key routes show improvements for both buses and general vehicles, with greater savings for buses. Modelling shows bus travel time is 8% lower than general vehicle travel time.

Option 6 scored a +1 as modelled travel time along key routes show improvements for both buses and general vehicles, with greater savings for buses. Model shows bus travel time 5% lower than general vehicle travel time.

Option 6a scored a +2 as modelled travel time along key routes show improvements for both buses and general vehicles, with greater savings for buses. Model shows bus travel time 6% lower than general vehicle travel time.

Access to social and economic destinations by public transport, walk and cycle

Methodology

The assessment was based on a quantitative measure of population living within 30 minutes of key destinations, i.e. Hospital, CBD, Mauao, and Port/Marae. The analysis is based on Tauranga Transport Strategic Model (TTSM) using AM bus journey time between zones (2031).

Table 3-9: Scoring rationale – Access to social and economic destinations by public transport, walk and cycle

Score	Description
1	Slight improvement (minor increase in population living within 30-min bus journey to key destinations compared to do-min)
0	Similar to do minimum

Assessment commentary

This measure did not prove to be a key differentiator between options, largely due to the fact that the majority of options shared the same bus service pattern and frequency and population distribution.

Option 5 and 6a scored a +1 as population within 30 min of key destinations are similar but slightly more than do-min, especially for Mauao and CBD.

Option 3a, 6, and Economic Efficient scored a 0 as the population within 30 min catchment of key destinations is similar to the do minimum.

Option 6 does not provide any streetscape or landscape design, which may have an influence on walking and cycling demand.

The Economic Efficient option does not provide any PT facilities along Maunganui Road., therefore access via PT to Mount Maunganui or Papamoa may be limited.

Ambient air quality and noise level

Methodology

The assessment was based on TTSM outputs for levels of NO2 and PM10 emissions for the Mount Maunganui area and city-wide, supported by qualitative consideration of how certain interventions will impact mode share, volumes and VKT on Hewletts (next to Marae), and Maunganui Rd noting the sensitive receivers nearby.

Table 3-10: Scoring rationale - Ambient air quality and noise level

Score	Description
1	Slight improvement in air quality and noise levels near sensitive receivers.
0	Do minimum
-1	Slightly negative impact on air quality and noise levels near sensitive receivers.
-2	Moderate negative impact on air quality and noise levels near sensitive receivers.

Assessment commentary

Option 3a scored a -1 as increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions. This is also likely to induce additional through traffic demands into the corridor.

Option 5 and 6a scored 1 as the planting and streetscape improvements are expected to improve air quality near sensitive receivers.

Options 6 and Economic Efficient scored a -2 as increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions. The effects are likely to be greater than Option 3a. This is also likely to induce additional through traffic demands into the corridor. The TTSM model predicts NO2 and PM10 emissions in the Mount Maunganui area and city-wide increase in comparison to do min.

CO2 emissions

Methodology

The assessment was based on a combination of TTSM outputs for levels of CO2 emissions for the Mount Maunganui area and city-wide, and consideration of how certain interventions will impact mode share, volumes and VKT. Additional consideration given to level of embodied carbon based on extent of new infrastructure.

Table 3-11: Scoring rationale - CO2 emissions

Score	Description
1	Minor expected reduction in traffic volumes and improvement in mode share
0	Do minimum
-1	Minor expected increase in traffic volumes due to capacity increase. Increased TTSM modelled CO2 emissions compared with do minimum. Moderate level of embodied carbon due to new infrastructure.
-2	Expected increase in traffic volumes due to capacity increase. Increased TTSM modelled CO2 emissions compared with do minimum. High level of embodied carbon due to significant new infrastructure.

Assessment commentary

Option 3a scored a -1 as increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions. This is also likely to induce additional through traffic demands into the corridor. Low level of embodied carbon predicted due to minimal new infrastructure.

Option 5 scored 1 as the expected reduction of traffic volumes on corridors, and increase in active mode and public transport uptake for short trips, are expected to result in lower emissions. Low level of embodied carbon is predicted due to minimal new infrastructure (however more than Option 3a due to works on Maunganui Rd).

Option 6 scored a -1 as increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions, with the effects likely to be greater than with Option 3a, but less than Option 6a. This is also likely to induce additional through traffic demands into the corridor. The TTSM model predicts carbon emissions in the Mount Maunganui area and city-wide increase in comparison to the do min. Moderate level of embodied carbon expected due to extent of new infrastructure including grade separated flyover.

Option 6a scored a 0 as increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions, with the effects likely to be greater than with other options. This is also likely to induce additional through traffic demands into the corridor. The TTSM model predicts carbon emissions in the Mount Maunganui area and city-wide increase in comparison to the do min. Moderate level of embodied carbon expected due to extent of new infrastructure including grade separated flyover. This option provides alternative mode facilities, including cycle lanes and bus upgrades, along with improved streetscape and landscape design encouraging people to use alternative modes. These factors will help to offset the significant level of carbon emissions produced.

The Economic Efficient option scored -1 as increasing throughput on SH2 is predicted to result in travel time reductions, therefore encouraging private vehicle trips and increase VKT/emissions, with the effects likely to be less than other options. With no bus provision along Maunganui Road, this will likely induce additional traffic demand via private vehicle into the corridor. This is also likely to induce additional through traffic demands into the corridor.

3.2.2 Technical and feasibility assessment

Constructability/Implementability

Methodology

This assessment was based on an estimation of the complexity of construction required to deliver the option, based on how common the construction techniques are, the extent of traffic disruption that would be involved with construction, and overall deliverability by partner agencies.

This criterion was scored on a -1 to -3 scale as all options were more complex to construct than the do minimum.

Table 3-12: Scoring rationale - Constructability/Implementability

Score	Description
0	Do minimum
-1	Moderate or straightforward works. Localised traffic management and disruption issues.
-2	Major construction works, but nothing uncommon. Wider traffic management and disruption issues
-3	Major disruption likely.

Assessment commentary

Options 3a and 5 scored a -1 as the construction required was not considered complex. Possible stormwater adjustments required where there are changes to intersection and lane layouts e.g. increasing to 3 lanes and an increase in net impervious areas.

Option 6, 6a and Economic Efficient scored -2 as major construction works required but nothing unusual. Traffic management focused on Hewletts Rd and Totara St. Infrastructure improvements include grade separation of one intersection and widening of Totara St which will be disruptive, and public transport, walking and cycling improvements. As impervious areas are increased, stormwater treatment will be required (which may be difficult in these locations). Other issues for consideration are that it may be difficult to get council's acceptance/ approval if increases in flood levels are demonstrated, via flood modelling of the proposed works. Grade separations at the Totara St/ Hewletts Rd intersection would encroach into an area of flooding and overland flow, and so this would likely also increase flood levels, and there may be a need for additional reticulation or flood storage.

Planning and Consenting

Methodology

This assessment was based on an expert evaluation of likelihood of obtaining planning approval, and a qualitative assessment of the extent of impacts on property.

Table 3-13: Scoring rationale - Planning and Consenting

Score	Description
0	Unlikely consents are required/within scope of current consents and planning framework
-1	Minor consenting process expected / minor property impacts
-2	Moderately complex consenting process expected / moderate property impacts
-3	Highly complex consenting processes expected / high number of property impacts

Assessment commentary

Options 3a and 5 scored a -1 as the majority of the improvements all fit within the existing road corridors, with localised property acquisition and minor consents required.

Option 6 and Economic Efficient scored a -2 as consenting process is likely to be moderately complex, given proposed grade separated interchange and four-laning of Totara St. Land acquisition is likely required around four-laning of Totara St, and grade separated infrastructure.

Option 6a scored a -3 as the option presents slightly more consenting risk compared to Option 6 but requires substantially more property acquisition when compared to Option 6. Land acquisition for the grade separated infrastructure, and four laning of Totara Stand is expected to be extensive, with notable risk around commercial property acquisition.

CAPEX

Methodology

This assessment was based on the indicative cost estimates prepared for the short list option packages. See Appendix C of the Connecting Mount Maunganui IBC for Cost Estimate.

This criterion was scored on a -1 to -3 scale as all options were more expensive to construct than the do minimum.

Table 3-14: Scoring rationale - CAPEX

Score	Description
-1	Capital cost expected estimate between $0 and $200m
-2	Capital cost expected estimate between $200m and $500m
-3	Capital cost expected estimate > $500m

Assessment commentary

Table 3-15: Option CAPEX

Option	Expected estimate (50th %ile)	Score
Option 3a	$199,643,843	-1
Option 5	$295,199,770	-2
Option 6	$422,836,646	-2
Option 6a	$471,344,747	-2
Economic Efficient	$276,091,954	-2

Operating Cost/ Efficiency

Methodology

This assessment assumed that operational expenditure (OPEX) is approximately 1% of total CAPEX, with a consideration of OPEX factors.

Table 3-16: Scoring rationale - Operating Cost/ Efficiency

Score	Description
-1	OPEX below $50m over project life
-2	OPEX between $50m and $150m over project life
-3	OPEX > $150m over project life

Assessment commentary

Table 3-17 Option OPEX

Option	Expected estimate (50th ile)	Score
Option 3a	$47,833,336	-1
Option 5	$77,974,742	-2
Option 6	$118,424,769	-2
Option 6a	$133,536,522	-2
Economic Efficient	$72,136,783	-2

Value for Money

Methodology

The assessment is based on the Short List Economics Assessment Report prepared by Flow, which assessed the five short list options. For the full report, see Appendix C of the Connecting Mount Maunganui IBC[9].

Table 3-18: Scoring rationale - Value for Money

Score	Description
2	BCR > 1.2
1	BCR > 0.85
0	BCR between 0 and 0.85
-1	BCR < 0

Assessment commentary

Table 3-19 below shows the benefit cost ratio of the short list options, and

Table 3-20 shows the corresponding scoring.

Table 3-19: Economic Outcome Summary

Options	3a	5	6	6a	Economic Efficient
Total Benefits (Discounted)	$177.5m	$202.5m	$405.2m	$427.7m	$372.3m
Total Costs (Discounted)	$208.6m	$309.9m	$445.2m	$496.6m	$289.7m
Benefit Cost Ratio (BCR)	**0.85**	**0.65**	**0.91**	**0.86**	**1.3**

Table 3-20: Option BCR for Value for Money

Option	Score
Option 3a	0
Option 5	0
Option 6	1
Option 6a	1
Economic Efficient	2

[9] Connecting Mount Maunganui IBC Appendix C – Transport Modelling and Economic Evaluation

Meeting customer needs

Methodology

This assessment is a qualitative assessment against the specific customer needs and pain points, which includes safety (for all customers, shift worker at night), trip lengths (commuter), reliability (commuter, freight operator, trade/servicing/commercial, regional travellers), choice (commuter, shift worker, sport facilities attendees, students, leisure), environment/urban realm/air quality (leisure and recreation, Whareroa Marae).

Table 3-21: Scoring rationale - Meeting customer needs

Score	Description
3	Significant improvement to 6 or more customer groups
2	Significant improvement to 4 or more customer groups
1	Significant improvement to 2 or more customer groups

Assessment commentary

Option 5, 6, 6a scored the best, scoring +3.

For Option 5, the significant additional alternative choices for public transport, walking and cycling are provided for customers (**commuter, shift worker, leisure/recreational, students**). Streetscaping improves air quality and urban realm and provides for **Whareroa Marae**. Variable Message Sign (VMS) intents to advise **regional travellers** of congestion and route choices.

Option 6 and 6a's grade separation, and four laning Totara provides improves travel time and reliability for **freight, trade/servicing, commuter, shift** worker from Mount communities, and Eastern Bay of Plenty (for Option 6a) via private travel. Significant additional alternative choices are provided for most customers (**commuter, shift worker, leisure/recreational, students**). Option 6 and 6a also have VMS to advise **regional travellers** of congestion and route choices.

Option 3a scored +1, as it provides significant improvement to mainly **freight** trips through freight priority and VMS for **regional travellers**.

The Economic Efficient option scored +2, as it provides improvements to **freight** trips through freight priority, alternative choices for walking and cycling are provided for customers (**commuter, shift worker, leisure/recreational, students**).

Climate Change Mitigation

This climate change mitigation is scored in the Investment Objective CO2 emissions.

Alignment with Whareroa Marae's Strategy

Methodology

This assessment is a qualitative assessment against the alignment of the options with Whareroa Marae's Strategy.

Table 3-22: Scoring rationale - Alignment with Whareroa Marae's Strategy

Score	Description
-1	Does not align with Whareroa Marae's Strategy

Assessment commentary

Options 3a, 5, 6 and Economic Efficient score a -1 as they do not align with Whareroa Marae's strategy for industrial retreat.

Option 6a scores a 0 as although this option does not align with the Whareroa Marae's Strategy for future land use, this option includes interventions such as street scape improvements, iwi design on the urban landscape and provides additional cycleways, which the Whareroa Marae is favourable towards.

Impacts on Te Ao Māori

Methodology

This assessment is a qualitative assessment based on a combination of feedback from Ngāi Tukairangi hapū and Ngāti Kuku. Further detailed commentary can be found in the Ngai Tukairangi Hapū Kowhiri Iwa (position paper) [10].

Table 3-23: Scoring rationale - Impacts on Te Ao Māori

Score	Description
2	Net 'support' (number of interventions supported minus the number of interventions opposed) provided by Ngāi Tukairangi >=4, and/or neutral feedback from Ngāti Kuku.
1	Net 'support' (number of interventions supported minus the number of interventions opposed) provided by Ngāi Tukairangi >=2, and/or neutral feedback from Ngāti Kuku.
0	Net 'support' around 0
-1	Minor grade separation not supported by Ngāti Kuku
-2	Major grade separation not supported by Ngāti Kuku

Assessment commentary

Option 3a and Option 5 scored a 1.

For Option 3a, the Ngāi Tukairangi Hapū supports the various interventions including signal optimisation, upgrade of bus stops, cycle improvements, local network organisation, widening Totara. However, the Ngāi Tukairangi Hapū opposes intersection signalisation, rationalisation of access, and port/parking pricing.

For Options 5, the Ngāi Tukairangi Hapū supports improvements to the public transport, cycling/walking infrastructure, widening of Totara St, upgrades to the local toad network organisation and streetscape. However, Ngāi Tukairangi Hapū opposes parking pricing and removal of parking.

Option 6, Option 6a and Economic Efficient options scored -1, as Ngāti Kuku oppose grade separation in any form. Ngāi Tukairangi are supportive on the basis that a full CBA has been carried out to demonstrate the value.

3.3 Shortlist Options Assessment Workshop

The Options Assessment Workshop was held with representatives of TCC, BOPRC, Waka Kotahi, Ngāti Kuku and Ngāi Tukairangi on 29th November 2022. A list of the workshop attendees is included in Table 3-24 below.

---

[10] Ngai Tukairangi Hapu Kowhiri Iwa (position paper)

Table 3-24: MCA Options Assessment Workshop Attendees

Name	Organisation
Will Bamford (WB)	Waka Kotahi
Sangamesh Chouka	Waka Kotahi
Jess Andrew	Waka Kotahi
Paul Willey	Waka Kotahi
Rodney Albertyn (RA)	Waka Kotahi
Francisca Simone (FS)	Waka Kotahi
Alistair Talbot (AT)	Tauranga City Council
Skip Fourie (SF)	Tauranga City Council
Tony Bonetti (TB)	Tauranga City Council
Tom McEntrye (TM)	Tauranga City Council
Nassah Rolleston-Steed (NR)	Ngāti Kuku and Ngāi Tukairangi
Marlene Bosch (MB)	BOPRC
Oliver Haycock (OH)	BOPRC
Steve Dudley (SD)	Aurecon
Flynn Roser (FR)	Aurecon
Harriet Henderson	Aurecon
Harriet McKee	Aurecon
Qing Li (QL)	Flow (for Aurecon)

The details of the workshop and meetings can be found in Appendix B.

4 MCA Outcome

A summary of the MCA for the shortlist is included in **Error! Reference source not found.** and **Error! Reference source not found.**.

As part of the MCA process, please note that scores are not added up, in line with NZ Transport Agency's MCA Guidance, but are used to aid decision makers understand the relative performance of options against each other, as well as across the Investment Objectives and Technical / Feasibility criteria.

Table 4-1: Shortlist MCA Assessment Summary

Investment Objectives		Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
BENEFIT	INVESTMENT OBJECTIVE	SCORE	SCORE	SCORE	SCORE	SCORE
Improved transport system reliability, permeability, and throughput of people and goods	To improve reliability, permeability, and throughput of people and goods	1	2	2	2	2
		2	1	2	3	2
A multi-modal transport system that supports safer and healthier journeys	To reduce road deaths and serious injuries for all users by at least 40%	1	3	2	3	1
Improved transport choice for access to social and economic opportunities	To provide better mode choice options and increase public transport and active travel mode share	0	2	1	2	0
		0	1	0	1	0
Reduced impact on the environment and climate change impacts from transport related carbon emissions	To reduce the transport related effects on water, air quality and noise	-1	1	-2	1	-2
	To reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	-1	1	-1	0	-1
Feasibility	Constructability/Implementability	-1	-1	-2	-2	-2
Consenting & property impacts	Planning and Consenting	-1	-1	-2	-3	-2
Cost	CAPEX	-1	-2	-2	-2	-2
	Operating Cost/ Efficiency	-1	-2	-2	-2	-2
Value for Money	High-level assessment of value for money	0	0	1	1	2
Meeting customer needs	Qualitative assessment of the options against the specific customer needs and pain points	1	3	3	3	2
Climate Change Mitigation (Mandatory)	Assessment of mode shift and traffic reduction, VKT, land use	*Assessed as per Investment Objective above*				
Alignment with Whareroa Marae's Strategy	The extent to which the option complements Whareroa Marae's strategy for future land use	-1	-1	-1	0	-1
Impacts on Te Ao Māori (Mandatory)	Assessment of impact on Te Ao Māori including areas of significance for Māori, Māori land and Kaitiakitanga	1	1	-1	-1	-1

4.1 Assessment Outcome Summary

Based on the outcomes of the MCA assessment, the Shortlist Option Assessment Workshop, and in collaboration with Project Partners, the recommended emerging option (

) is the Economic Efficient / Optimised option.

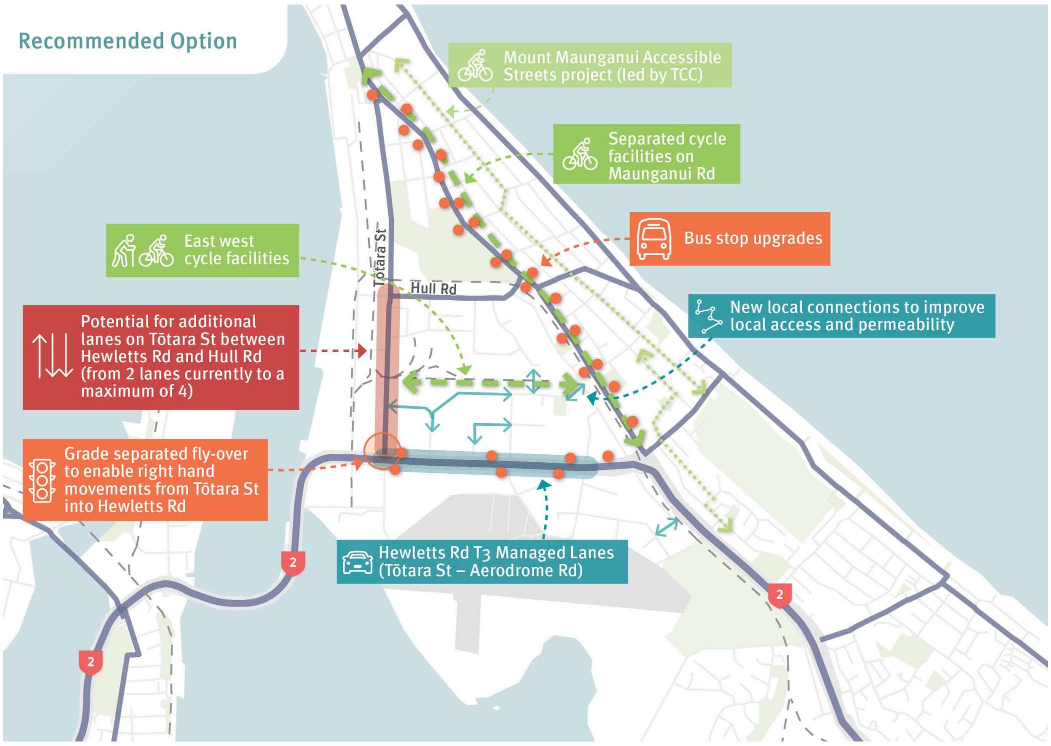

Figure 4-1: Recommended Option

Economic Efficient / Optimised: This option is designed to be a cost-effective programme of interventions in line with the latest GPS 2024.

It is recommended that the following options do not proceed:

Option 3a – Rationalising Access: Moderate benefits across the criteria but fails to deliver against the Investment Objectives in a compelling way. Slightly negative against emissions and air quality. Interpeak freight lanes don't score highly; no benefits

Option 5 – At grade improvements: Option 5 is effective against all investment objectives and is the overall highest performing option. Option 5 has the greatest crash risk reduction (~50%). The benefits for people using public transport are the highest.

Option 6 – Grade Separation of Hewletts Road / Totara Street: Option 6 performs well against most investment objectives except for air quality and emissions. Travel time results show the need to do more to address westbound travel along Hewletts Rd. A potential variant of Option 6 without the local road network has reduced cost and property impacts.

Option 6a – Hybrid Option: Given the nature of this option, and the additional capacity added, it scores the highest in terms of throughput of people and goods, but understandably scores worst for air quality and emissions. The cost and constructability challenges are very significant, noting that land acquisition would be extensive. On balance, the risks outweigh the benefits.


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Appendix A

Short List MCA Assessment

Appendix B

Shortlist MCA Workshop

Miro board & meeting minutes

Shortlist MCA Workshop Miro board

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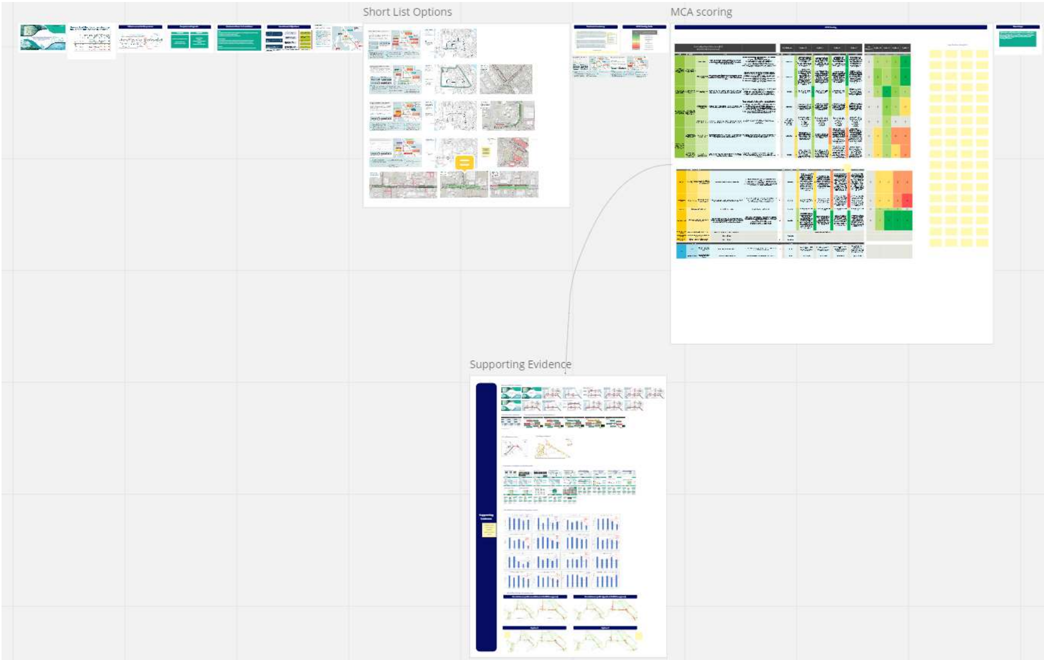

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technical note

PROJECT	**CONNECTING MOUNT MAUNGANUI INDICATIVE BUSINESS CASE**
SUBJECT	**SHORT LIST OPTIONS MODELLING AND ECONOMICS**
TO	**PROJECT TEAM**
FROM	QING LI
REVIEWED BY	IAN CLARK
DATE	20 SEPTEMBER 2024

1 INTRODUCTION

This technical note provides a summary of the transport modelling and economics analysis prepared for the Connecting Mt Maunganui project.

The Tauranga Transport Strategic Model (TTSM) has been used to inform the economic analysis of the proposed shortlist options. The modelled results have also been used to identify the anticipated monetised benefits associated with each individual intervention. The TTSM models include two forecast scenarios (2031 and 2048) and they cover the morning peak, midday peak, and evening peak periods.

This Business Case project is being led by Aurecon, with transport modelling being carried out by Flow Transportation Specialists.

The options proposed in this analysis have included all the short list options and a Do Minimum scenario. Section 2 below provides more details on the options modelled and how they have been used to calculate the incremental benefits for each individual improvements proposed.

2 TTSM RUNS

To assist the assessment of the proposed options and to understand the benefits and costs associated with each individual intervention, we have obtained the following TTSM runs, using the TTSM22.2 Do Minimum scenario. We note that this version of TTSM includes the proposed Western Bay of Plenty Public Transport Reference Case service lines and headway assumptions. The following improvements have been modelled:

- **Scenario 1 (Local Road Connection):** This option proposes a new local road connection between Newton Road and Tōtara Street. This will provide an additional east-west connection north of Hewletts Road by connecting and extending Waimarie Street and Te Maire Street.
- **Scenario 2 (Shortlist Option 5):** As Scenario 1, plus the signalisation of the Golf Road intersections, including the intersections of Mt Maunganui Road/Golf Road roundabout and Golf Road/ Links Ave. These improvements aim to enhance safety and facilitate bus movements in and out of Links Ave. We note that this option is similar to Shortlist Option 5 proposed
- **Scenario 3 (Shortlist Option 3a):** As Scenario 2, plus intersection layout optimization (Left-In and Left-Out, LILO) along Hewletts Road. This includes various movement bans at the existing local

road intersections along Hewletts Road, while retaining existing traffic signals to facilitate pedestrian movements across Hewletts Road. The following intersections have been included in the treatment package in this option:

- Hewletts Road/Tasman Quay intersection
- Hewletts Road/Waimarie Street intersection
- Hewletts Road/Maru Street intersection – LILO treatments have been proposed for the movements to/from Maru Road north approach
- Hewletts Road/Aerodrome Road intersection

We note that this option is similar to Shortlist Option 3a

- **Scenario 4 (Shortlist Option 6):** As Scenario 3, plus the widening of Tōtara Street and the addition of a new flyover connection from Totara Street to Hewletts Road west of Tōtara Street. In addition, the intersection optimization treatments have been slightly altered from Scenario 3 above, which includes the following:
  - Hewletts Road/Tasman Quay intersection
  - Hewletts Road/Waimarie Street intersection – includes closure of Waimarie Street north of Hewletts Road. This will effectively result in vehicles on Waimarie Street to re-route using the new local road connections to access the wider road network
  - Hewletts Road/Aerodrome Road intersection

  We note that this option is similar to Shortlist Option 6

- **Scenario 5 (Shortlist Option 6a):** As Scenario 4, plus new bus lanes along Mt Maunganui Road between Golf Road and Hull Road in both northbound and southbound directions. We note that this option is similar to Shortlist Option 6, but with bus lanes along Manganui Road. the intersection optimization treatments assumed for this option include the following:
  - Hewletts Road/Tasman Quay intersection
  - Hewletts Road/Maru Street intersection – LILO treatments have been proposed for the movements to/from Maru Road north approach
  - Hewletts Road/Aerodrome Road intersection

The modelled scenarios and the network improvement interventions they each include have been summarised in Table 1 below.

Table 1: TTSM scenarios – proposed interventions

Improvements	DM	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
New Local Road connections	✘	✓	✓	✓	✓	✓
Signalisation of Golf Road intersections	✘	✘	✓	✓	✓	✓
Intersection optimization[1]	✘	✘	✘	✓	✓	✓
Tōtara Street widening and flyover connection	✘	✘	✘	✘	✓	✓
New Bus Lanes	✘	✘	✘	✘	✘	✓

We note that Scenarios 2, 3 and 5 are similar to the shortlist options 5, 3a and 6 respectively, with slight differences in terms of the interventions included. For example, shortlist Option 5 included the Scenario 2 improvements and the bus lanes along Maunganui Road.

Each of the above TTSM runs have been undertaken for forecast years 2031 and 2048, so that the benefits can be interpolated/extrapolated for the economic analysis.

It is also noted that the intersection optimizations proposed in Scenarios 3, 4 and 5 vary slightly, particularly in the treatment of Waimarie Street and Maru Street, north of Hewletts Road. While these differences are predicted to have minor impacts in 2031, their effects are expected to be more significant in the 2048 forecast models. Further discussions regarding the model responses to the proposed scenarios are provided in Sections 2.1 and 2.2 below.

The economic benefits of the proposed scenarios have been used to calculate the incremental values of the proposed interventions first. These values are then used to estimate the benefits of the shortlist options based on the interventions proposed in each option.

2.1 TTSM results – economic outputs

The following results have been provided to assist the economics analysis for each option:

- Total travel time savings in vehicle hours - this is a direct output from TTSM, which considers the user costs and resource costs of the travel time benefits
- Congestion relief (CRV) savings in vehicle hours – this is also a direct output from TTSM that considers both user costs and resource costs
- Vehicle operating cost (VOC) savings in dollar values – this has been calculated by TTSM and has been given as a direct output
- Emission costs – this includes the predicted daily emissions for each option.

[1] The intersection optimization treatments are slightly different between Scenario 3, 4 and 5, as described in sections above.

Table 2 below provides a summary of the TTSM travel time saving results obtained from the model runs this time. A full list of the predicted benefit/disbenefits is provided in Appendix A of this technical note.

Table 2: TTSM predicted travel time savings –morning, midday and evening peak periods

Benefit	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
2031 Travel Time Savings (veh.hr)					
AM Peak	14	2	19	92	80
Inter Peak	6	-5	-10	26	22
PM Peak	8	2	1	80	79
2048 Travel Time Savings (veh.hr)					
AM Peak	44	-12	4	50	97
Inter Peak	7	-5	2	30	26
PM Peak	17	22	59	96	90

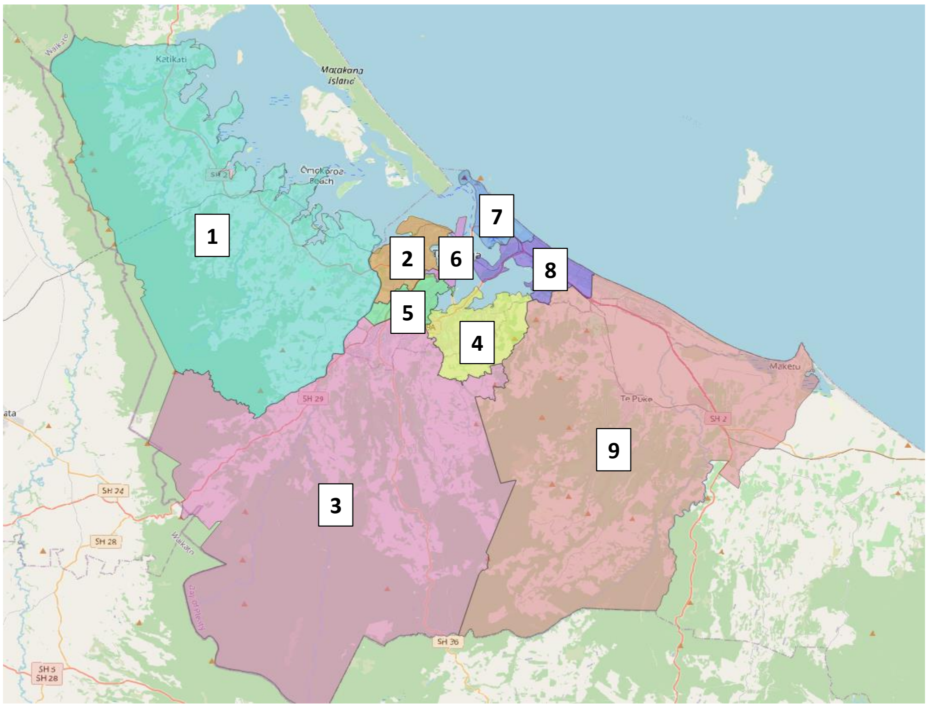
The following points have been noted from the above outputs:

- Scenarios 4 and 5 are predicted to provide the highest travel time savings in 2031 and 2048, by a significant amount in all three peak periods. This is as expected as both scenarios propose a grade separated connection between Tōtara Street and Hewletts Road west. It is noted that Scenario 5 is predicted to result in lower travel time benefits for general traffic compared to Scenario 4, possibly due to increased public transport users associated with the Maunganui Road bus lanes
- Scenario 2 predicts reduced travel time benefits compared to the Scenario 1 (Local Road Connection) option. This is considered plausible as the proposed traffic signals at the Maunganui Road/Golf Road and Golf Road/Links Ave intersections are likely to increase total travel times through the intersection, particularly during the midday periods. However, it is noted that the signalisation is expected to provide safety benefits, particularly for pedestrians and cyclists.
- Scenario 3 (Scenario 2 with intersection optimization) is predicted to provide modest travel time savings. It is noted that these savings are mainly predicted during the AM and PM peak periods, as the proposed optimizations are expected to improve through traffic delays along Hewletts Road. During the midday peak, travel time disbenefits are predicted as the corridor is less congested, and local road traffic will have to travel longer distances to reach their destination due to the Left-In-Left-Out (LILO) treatment proposed.
- We note that TTSM predicts reduced travel time benefits between 2031 and 2048, especially in Scenario 4. It is noted that the 2048 TTSM model indicates significant congestion in high-growth areas, particularly around Tauriko and along SH29A, which may have impacted the predicted travel time benefits outside the Mt Maunganui area. Additionally, the different intersection optimizations proposed at Waimarie Street and Maru Street between Scenario 2, 3 and 5 may have influenced the benefits projected for 2048.
- As such, we have obtained additional outputs from the TTSM 2031 and 2048 models. These include the sector-by-sector travel time saving comparisons, for Scenario 2, 3, 4 and 5, and they are discussed in the section below.

2.2 TTSM results – sector by sector travel time analysis

We have obtained detailed travel time savings predicted between each of the sectors below to understand the different trends predicted between the 2031 and 2048 model. We note that in 2048, high level of congestion is predicted in Sector 3 (Tauriko) and 4 (Hairini) due to anticipated growth in southwestern Tauranga. These may have resulted in some negative impacts to the travel times in the western part of Tauranga (Sectors 1 to 5), outside of the core project area (Hewletts Road and Mt Maunganui, Sectors 6 to 9).

Figure 1: Tauranga Transport Model Sectors



To understand the predicted travel time savings predicted in the area within and outside of the core project area, we have summarised the sector results for Sectors 1-5 and Sectors 6 - 9, for both 2031 and 2048. These are presented in tables below (positive values indicate travel time savings):

Table 3: TTSM sector travel time savings – Sectors 1 to 5, outside core project area (veh.hr/hr)

		Scenario 2	Scenario 3	Scenario 4	Scenario 5
AM peak	2031	-5	3	20	19
	2048	-27	-19	-18	-10
Interpeak	2031	0	1	2	1
	2048	1	1	2	0
PM Peak	2031	-2	3	7	5
	2048	1	21	0	-13

We note the following from the above comparisons:

- Overall, the travel time impacts outside the core project area are predicted to be low in all options, relative to the total benefits in Table 2. We also note that the travel time changes in 2048 are predicted to be higher than those in 2031, which is as expected
- While minor travel time savings are predicted for all options in 2031 AM peak (outside of the core are), negative travel time savings are predicted in the 2048 AM peak. A detailed review suggests that these negative benefits are primarily related to travel times between Sector 4 and Sectors 2, 4, and 5, where high congestion is predicted in the 2048 models
- In the evening peak, some inconsistencies are observed outside the core project area, particularly in Scenario 3, where a notable travel time saving (14 vehicle hours) is predicted between Sectors 5 and 3. This may be due to the proposed LILO restrictions proposed along the Hewletts Road traffic signals, which may have reduced traffic volumes in these sectors, resulting in travel time savings by 2048
- During the interpeak period, travel time impacts outside the core project area are predicted to be negligible in both 2031 and 2048.

Table 4: TTSM sector travel time savings – Sectors 6 to 9, within core project area (veh.hr/hr)

		Scenario 2	Scenario 3	Scenario 4	Scenario 5
AM peak	2031	6	16	72	61
	2048	15	23	68	107
Interpeak	2031	-6	-11	24	21
	2048	-6	1	27	26
PM Peak	2031	3	-2	74	74
	2048	22	38	96	103

Table 4 above indicates the following:

- The proposed interventions in Scenarios 2 and 3 are expected to have lower travel time impacts within the core project area compared to Scenarios 4 and 5. This aligns with expectations, as the Totara Street improvements (widening and grade separation) are anticipated to generate greater benefits than the local road connections, intersection optimizations along Hewletts Road, and signalizations along Golf Road.
- While Scenario 5 is projected to deliver similar travel time savings as Scenario 4 in 2031, additional savings are forecast for 2048, particularly during the morning and evening peaks. This difference is likely attributed to the intersection optimization treatments proposed: Scenario 5 includes a LILO treatment at Maru Street, whereas Scenario 4 proposes closing the Waimarie Street connection to Hewletts Road. While these differences are expected to have minor impacts in 2031, they are predicted to have more significant effects in 2048, especially during morning and evening peak periods
- It is observed that during the interpeak period, both Scenario 4 and Scenario 5 exhibit similar travel time savings, despite differing intersection optimization treatments. This suggests that the variations in morning and evening travel time savings in 2048 may result in a limited impact on

the benefit comparisons, as the interpeak results are scaled up by a factor of approximately 10 to represent daily flows. Consequently, these interpeak results have a significantly greater influence on the economic appraisal compared to the peak periods, which only account for 2 hours each day.

Based on the above, it is noted that while the 2031 models provide more consistent trends between options, the slightly divergent results observed in the 2048 outcomes are considered a reasonable reflection of the proposed options under a more congested future network. To understand the impacts of the 2048 results on the BCR, a sensitivity test has been included where only the 2031 results have been used to calculate project benefits for each option.

2.3 TTSM results – model travel times

The total travel time analysis indicates that the interventions proposed in Scenario 4 and Scenario 5 are likely to provide significant travel time savings. To understand the predicted travel time savings associated with the trips along Tōtara Street and Hewletts Road, the model predicted travel times have been obtained from the Do Minimum and Scenario 4[2] models. The following routes have been included in this comparison:

- Tōtara Street southbound/westbound between Hull Road and SH2 Harbour Bridge
- Hewletts Road westbound between Aerodome Road and SH2 Harbour Bridge

Table 5: Predicted Traffic Volumes and Travel Times - Tōtara Street to SH2 Harbour Bridge

	2031		**2048**	
	Volumes (veh/hr)	**Travel Time (mins)**	**Volumes (veh/hr)**	**Travel Time (mins)**
Do Minimum				
AM Peak	660	6.1	670	7.4
Inter Peak	710	4.6	720	5.3
PM Peak	770	8.1	780	9.6
Daily[3]	9,950	53,300	10,050	62,850
Scenario 4				
AM Peak	930	3.3	1,030	3.2
Inter Peak	1,010	2.7	1,050	3.0
PM Peak	1,250	3.8	1,260	4.2
Daily	14,400	42,700	15,100	48,500
Average travel time per vehicle				
Do Minimum	5.3		6.3	
Scenario 4	3.0		3.2	
Travel Time Savings	**2.3 mins, or 45%**		**3.1 mins, or 49%**	

2 Only Scenario 4 results are used here as the improvements proposed along Tōtara Street and Hewletts Road are similar between Scenario 4, 5 and the Economic Efficient option (IBC recommended option).
3 Daily volumes have been calculated by 2 x AM Peak + 10 x Interpeak + 2 x PM Peak traffic volumes.

Table 6: Predicted Traffic Volumes and Travel Times – Hewletts Road from Aerodome Road to SH2 Harbour Bridge

	2031		2048	
	Volumes (veh/hr)	**Travel Time (mins)**	**Volumes (veh/hr)**	**Travel Time (mins)**
Do Minimum				
AM Peak	1,570	8.6	1,610	10.0
Inter Peak	1,380	5.2	1,450	6.6
PM Peak	1,490	8.0	1,560	10.3
Daily[4]	19,950	123,200	20,850	159,950
Scenario 4				
AM Peak	1,560	5.3	1,580	6.1
Inter Peak	1,310	4.0	1,430	4.3
PM Peak	1,420	5.0	1,520	4.6
Daily	19,000	83,500	20,450	94,700
Average travel time per vehicle				
Do Minimum	6.2		7.7	
Scenario 4	4.4		4.6	
Travel Time Savings	**1.8 mins, or 29%**		**3.1 mins, or 40%**	

We note the following from the above tables:

- The proposed flyover connection is expected to deliver travel time savings for traffic fromTōtara Street to SH2 in the westbound direction across all three peak periods. Similar savings are predicted along Hewletts Road, though to a lesser extent
- The proposed flyover is also predicted to increase total throughput o SH2 westbound (west of Tōtara Street) by approximately 3,500 vehicles per day in 2031 and 4,650 vehicles per day in 2048
- Additionally, increased travel time savings along bothTōtara Street and Hewletts Road between 2031 and 2048 suggest that the proposed option is likely to offer long-term travel time benefits along Tōtara Street and SH2
- The predicted travel time savings along Hewletts Road suggest that the proposed intersection optimizations will yield additional benefits by 2048, particularly as congestion along Hewletts Road is expected to be more substantial by that time.

3 ECONOMIC EVALUATION

The economic analysis of the short list options has been completed based on the procedure specified in the Monetised Benefits and Costs Manual (MBCM, version 1.7). The road user benefits, which include travel time savings, congestion relief and vehicle operating costs, have been calculated using the latest

[4] Daily volumes have been calculated by 2 x AM Peak + 10 x Interpeak + 2 x PM Peak traffic volumes

TTSM results. The project benefits associated with cycle health, urban realm, road safety and bus stop facilities have also been estimated based on the following assumptions:

- Travel time costs, based on outputs from the TTSM. These have been separately evaluated for different trip purposes included in TTSM. The travel time costs for public transport users have been based on the patronage predicted by TTSM and bus travel time savings estimated by high level model results
- Congestion relief, based on outputs from the TTSM
- Vehicle operating costs, these have been provided as directly outputs from TTSM
- For crash reduction benefits, PT facility improvement benefits, health benefits for new cycling trips and urban realm benefits, we have used the benefits evaluation procedure established during the shortlist stage. Minor adjustments have been made to the assumptions to incorporate refinements made to the options after the shortlist assessment. The key assumptions used to calculate these benefits are discussed in Appendix B of this technical note.
- Emission reduction benefits. We have assessed emission reductions based on outputs from the TTSM. NZTA Waka Kotahi's Vehicle Emission Prediction Model (VEPM) has been used to calculate the predicted emissions associated with each option
- We have used the standard TTSM annualisation factors to calculate the project benefits
- The following inputs informed the economic assessment:
  - Construction start: July 2024[5]
  - Construction period: the project has been assumed to be constructed in 5 years. This has been assumed for all options to ensure consistency when calculating incremental benefits between individual interventions
  - Benefit period: 35 years
  - Annual discount rate: 4%
  - Construction payment: these have been based on the cost estimates provided by Aurecon (P50). The payment has been assumed at the mid-point of the construction period
  - Pre-implementation costs has been estimated and provide by Aurecon. These are assumed to be paid at the beginning of the construction period

3.1 Travel Time Benefits Discussion

As discussed in Section 2.1 above, inconsistent model results have been noted between the 2031 and 2048 models. We also note that the individual AM, IP and PM results provided in Table 2 may be misleading, in terms of predicting project benefits over the forecast years. To inform the economics, the model predicted travel time benefits/disbenefits are required to be applied with annualisation factors, value of time and resource cost corrections, as required by MBCM. Based on the model results provided, the following yearly benefits are predicted for each option:

[5] Clearly construction will not now start in July 2024, but this was the start date assumed for the previous economic analysis. Given that the main purpose of this updated assessment is to compare the options on a like for like basis, this assumption is not considered to affect the comparison of options

Table 7: Predicted travel time savings – morning, midday and evening peak and yearly

Benefit	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
2031 Travel Time Savings ($Million)					
AM Peak - annualised	0.3	0.1	0.4	1.8	1.6
Inter Peak - annualised	1.0	-0.6	-1.4	4.3	3.8
PM Peak - annualised	0.2	0.1	0.1	1.5	1.5
Total 2031	**1.5**	**-0.4**	**-1.0**	**7.7**	**6.9**
2048 Travel Time Savings ($Million)					
AM Peak - annualised	0.9	-0.1	0.2	1.2	2.1
Inter Peak - annualised	1.0	-0.7	0.4	4.9	4.4
PM Peak - annualised	0.4	0.5	1.0	1.9	1.7
Total 2031	**2.2**	**-0.3**	**1.6**	**8.0**	**8.2**

The above table indicates that:

- The total benefits for each scenario are predicted to increase between 2031 and 2048.
- Conversely, an increase in AM peak benefits is predicted with Scenario 5 in 2048, possibly due to the proposed LILO treatment at the Hewletts Road/Maru Street intersection
- Nevertheless, the interpeak benefits for all scenarios are predicted to increase, and they are predicted to contribute a significant proportion of the total benefits, particularly for Scenarios 4 and 5. This indicates that the different trends between 2031 and 2048 results may have only modest impacts on Scenario 4 and 5 benefits

3.2 Project Costs

P50 construction costs for options have been estimated and provided by Aurecon. Annual maintenance costs have been assumed to be some 1% of the P50 construction costs. A list of the estimated costs for each shortlist Option is provided in Table 8 below:

Table 8: Estimated P50 costs ($millions) – undiscounted (referring to the original Option numbers, not the modelled scenarios)

Costs	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
Pre-implementation	$63.0 Million	$72.4 Million	$84.5 Million	$89.8 Million	$70.0 Million
Construction	$136.7 Million	$222.8 Million	$338.4 Million	$381.5 Million	$206.1 Million
Maintenance – 35 Years	$47.8 Million	$78.0 Million	$118.4 Million	$133.5 Million	$72.1 Million

3.3 Individual intervention costs and benefits

The benefits of key individual interventions have been calculated by comparing the scenarios with mutually exclusive improvements. This is summarised in the table below:

Table 9: Individual intervention assessment - benefits and costs

Interventions	Informed by
New local road connections	Scenario 1 compared with Do Minimum
Signalisation of Golf Road intersections	Scenario 2 compared with Scenario 1
Intersection optimization	Scenario 3 compared with Scenario 2 (noting Scenario 3 includes Maru Road treatments)
Tōtara Street widening and flyover connection	Scenario 4 compared with Scenario 3
New bus lanes along Maunganui Road	Scenario 5 compared with Scenario 4
Streetscape	Informed by urban realm benefits
Cycleways, walking and cycling overpass	Informed by cycle health benefits
Bus stop upgrades	Informed by Public Transport facility benefits

The benefits and costs of each of the individual interventions above are provided in Table 10 overleaf. We note the following from the results:

- The proposed signalisation of the Golf Road/Maunganui Road and Golf Road/Links Ave intersections is predicted to result in overall negative benefits (particularly in 2031), as the travel time disbenefits are predicted to outweigh the crash cost savings
- The intersection optimization (LILO treatments) proposed at this stage is also predicted to result in only modest travel time benefits. This is somewhat unexpected, as travel time savings are generally expected with intersection optimizations. A closer look at the TTSM results indicate that the LILO treatments are predicted to reduce travel times in the morning and evening peaks, when the Hewletts Road corridor experiences congestion. However, travel time disbenefits are predicted for the midday peak, which offset the benefits predicted in the morning and evening peak periods, as the midday peak represents a much longer period during the day. Additionally, while not currently part of the Economic Efficient option, the intersection optimization is forecasted to

deliver overall positive benefits by 2048. This suggests that delaying the implementation of the LILO treatment could improve its BCR, a consideration that should be factored into the Detailed Business Case (DBC).

- The proposed bus lanes along Maunganui Road are predicted to result in moderate benefits (some $31 million) compared to the estimated costs (some $79 million). This may be associated with the low public transport patronage predicted along Maunganui Road (600 trips per day in 2031 and 700 trips per day in 2048, north of Golf Road). We also note that the TTSM is predicting that implementing the bus lanes along with the road improvements (such as grade separation and new local road connections) is likely to offset some travel time benefits predicted for general traffic
- The proposed Tōtara Street widening and a flyover connection from Totara Street to Hewletts Road are predicted to result in the highest benefits (some $200 million). However, this intervention is also predicted with the highest costs ($146 million) compared to the other options
- The improvements predicted for the bi-directional cycleway and the walking and cycling overpass are predicted to result in high benefits ($91 million) relative to its cost ($23 million). This is considered reasonable as the proposed cycle facilities are expected to provide high quality cycle connections between Mt Maunganui and SH2 Harbour Crossing/surrounding suburbs

Table 10: Individual intervention benefits and costs ($millions)

Benefit	New local road connections	Signalisation of Golf Road intersections	Intersection optimization	Tōtara Street widening and flyover connection	New bus lanes along Maunganui Road	Streetscape improvements	Cycleways, walking and cycling overpass	Bus stop upgrades
Travel Time Costs	$31.0	-$36.6	$17.2	$114.8	$0.0	n/a	n/a	n/a
Congestion Relief (CRV)	$9.9	-$14.4	-$1.4	$87.4	$0.0	n/a	n/a	n/a
Vehicle Operating costs	$8.1	$6.5	-$13.4	$24.6	$0.0	n/a	n/a	n/a
Crash costs	$4.8	$11.6	$19.1	-$17.5	$0.0	n/a	n/a	n/a
Public Transport Travel Times	$0.0	$0.0	$14.2	$0.0	$30.7	n/a	n/a	n/a
Public Transport Facility	$0.0	$0.0	$0.0	$0.0	$0.0	n/a	n/a	$19.7
Emissions	$6.1	$2.5	-$8.0	-$7.7	$0.0	n/a	n/a	n/a
Cycle Health	$0.0	$0.0	$0.0	$0.0	$0.0	n/a	$91.1	n/a
Urban Realm	$0.0	$0.0	$0.0	$0.0	$0.0	$43.7	n/a	n/a
Total discounted benefits (NPV):	**$59.9**	**-$30.4**	**$27.6**	**$201.5**	**$30.7**	**$43.7**	**$91.1**	**$19.7**
Total discounted costs (NPV):	**$91.6**	**$37.0**	**$39.9**	**$146.2**	**$79.2**	**$50.8**	**$23.1**	**$28.8**

3.4 Shortlist options assessment

After calculating the costs and benefits of each individual intervention, these have been used to evaluate the benefit-cost ratios (BCRs) of the shortlist options. The interventions proposed in each option, along with the benefits and costs analysis for each option, are summarized in Table 11 and Table 12, respectively:

Table 11: Shortlist options and IBC recommended option (referring to the original Option numbers, not the modelled scenarios)

Improvements	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient Option
New local road connections	✓	✓	✓	✓	✓
Signalisation of Golf Road intersections	✓	✓	✓	✓	✗
Intersection optimization	✓	✗	✓	✓	✗
Tōtara Street widening and flyover connection	✗	✗	✓	✓	✓
New bus lanes	✗	✓	✓	✓	✗
Streetscape improvements	✗	✓	✗	✓	✗
Cycle improvements	✓	✓	✓	✓	✓
Bus stop upgrades	✓	✓	✓	✓	✓

Table 12: Economic benefits and costs ($millions)

Benefit	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient Option
Travel Time Costs	$11.6	-$5.6	$123.8	$123.8	$145.8
Congestion Relief (CRV)	-$6.0	-$4.6	$73.1	$73.1	$97.2
Vehicle Operating costs	$1.2	$14.6	$25.2	$25.2	$32.7
Crash costs	$35.6	$16.5	$18.1	$18.1	-$12.7
Public Transport Travel Time	$14.2	$-	$44.8	$44.8	$-
Public Transport Facility	$11.8	$19.7	$15.8	$15.8	$19.7
Emissions	$0.6	$8.6	-$8.0	-$8.0	-$1.6
Cycle Health	$91.1	$91.1	$91.1	$91.1	$91.1
Urban Realm	$17.4	$43.7	$21.2	$43.7	$-
Total discounted benefits (NPV):	**$177.5**	**$184.2**	**$405.2**	**$427.7**	**$372.3**

Benefit	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
Total discounted costs (NPV):	**$208.7**	**$309.9**	**$445.2**	**$496.6**	**$289.7**
BCR	**0.85**	**0.65**	**0.91**	**0.86**	**1.3**

An incremental BCR analysis have also been undertaken for the above proposed options. These are summarised in Table 9 below and a more detailed incremental BCR worksheet is provided in Appendix C of this technical note.

Table 13: Incremental BCR analysis ($millions) (referring to the original Option numbers, not the modelled scenarios)

Base Option	Next higher cost option	Incremental BCR	Target incremental BCR	Base option for next step
Option 3a	Economic Efficient	2.4	1.0	Economic Efficient
Economic Efficient	Option 5	-8.4	1.0	Economic Efficient
Economic Efficient	Option 6	0.2	1.0	Economic Efficient
Economic Efficient	Option 6a	0.3	1.0	Economic Efficient

The incremental BCR analysis indicates that the Economic Efficient option will be the preferred option when compared to the other options.

3.5 Sensitivity tests

To investigate the uncertainties surrounding the project's costs and 2048 forecasts, we have prepared a number of sensitivity tests, including:

- **Capital costs:** the base BCR assumes P50 costs, while this sensitivity test uses P95 costs, as provided by Aurecon
- **Operation and maintenance costs:** the base assumption is that annual operation and maintenance costs will be 1% of capital costs. This has been increased to 2.5% for the sensitivity test
- **Discount rate:** a 6% discount rate is applied in this test
- **2031 and 2048 benefits:** Given the differing trends predicted between 2031 and 2048 in the morning and evening peaks, this test assumes that benefits will be capped beyond 2031.

Table 14: Sensitivity Tests Results – Base BCR = 1.3 (Economic Efficient Option)

Options	Lower Bound		Upper Bound	
	Value	BCR	Value	BCR
Capital costs: **base – P50**	P50	1.3	P95	0.98
Operation and maintenance costs: **base – 1%**	2.5%	1.1	1%	1.3
Discount rate: **base – 4%**	4%	1.3	6%	1.0
Forecast benefits: **base – 2031 and 2048**	2031 and 2048	1.3	Capped at 2031	1.4

We note the following from the sensitivity test results:

- The sensitivity tests indicate that increased costs or a higher discount rate may lead to a reduction in BCR values, which is expected
- The capping of project benefits at 2031 levels are predicted to have only a modest impact on the BCR for the Economic Efficient option.

Appendix A – TTSM Outputs for Each Option (TTSM Outputs)

Scenario Name	Year	Description
DM	2031	Hewletts Road IBC Do Minimum scenarios, as per TTSM22 Do Minimum scenario with network refinement
Scenario 1	2031	DM + Local Road Connections
Scenario 2	2031	LRC + Maunganui Road Signals
Scenario 3	2031	Opt5 + LILO Treatments on Hewletts Road Intersections
Scenario 4	2031	Opt3A + Grade Separated Right Turn for Westbound traffic coming from Tōtara Street
Scenario 5	2031	Opt6 + Maunganui Road Bus Lanes

Travel Time Savings Outputs (veh.hr/hr)

		Total Travel Time Savings (R+U)				
Year	**Peak/Scenario**	**LRC**	**Opt5**	**Opt3A**	**Opt6**	**Opt6_MRBL**
2031	AM	14	2	19	92	80
	IP	6	-5	-10	26	22
	PM	8	2	1	80	79
2048	AM	44	-12	4	50	97
	IP	7	-5	2	30	26
	PM	17	22	59	96	90

CRV Savings (veh.hr/hr)

		Total CRV Savings (R+U)				
Year	**Peak/Scenario**	**LRC**	**Opt5**	**Opt3A**	**Opt6**	**Opt6_MRBL**
2031	AM	18	1	13	103	87
	IP	5	-9	-7	26	20
	PM	-2	6	5	69	58
2048	AM	18	-26	-25	35	85
	IP	5	-7	-5	22	14
	PM	-2	31	42	87	62

VOC Savings ($/hr)

		Total VOC Savings (R+U)				
Year	Peak/Scenario	LRC	Opt5	Opt3A	Opt6	Opt6_MRBL
2031	AM	-2	114	-63	146	183
	IP	41	155	-52	129	218
	PM	88	38	-208	39	37
2048	AM	-2	-58	-224	-88	56
	IP	41	212	39	198	170
	PM	88	58	172	-4	-201

Emission Outputs

Average Annual Vehicle Emission Outputs			Raw Outputs						Compared to DM				
Measure / Scenario			DM_31	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
TTSM Notation	Vehicle Emission Factor	Units											
AADE_CO	Carbon monoxide (CO)	Kg/day	2,950	2,949	2,946	2,951	2,954	2,955	1	4	0	-4	-5
AADE_CO2-e	Carbon dioxide (CO2) equivalent	Kg/day	1,274,529	1,273,815	1,272,980	1,274,680	1,276,318	1,276,714	714	1,549	-151	-1,789	-2,184
AADE_VOC	Volatile organic compounds (VOC)	Kg/day	100	100	100	100	100	100	0	0	0	0	0
AADE_NOX	Nitrogen oxides (NOx)	Kg/day	2,871	2,868	2,867	2,870	2,871	2,872	3	4	0	0	-1
AADE_NO2	Nitrogen dioxide (NO2)	Kg/day	584	584	584	584	585	585	0	1	0	-1	-1
AADE_PM2.5E	PM2.5 E	Kg/day	76	76	76	76	76	76	0	0	0	0	0
AADE_PM10BT	PM10.0 BT	Kg/day	118	118	118	118	118	118	0	0	0	0	0
AADE_FC	Fuel Consumption	l/day	506,232	505,948	505,632	506,300	506,946	507,112	284	600	-68	-714	-880
Measure / Scenario			DM_48	LRC_48	Opt5_48	Opt3A_48	Opt6_48	pt6_MRBL_	LRC - DM 31	Opt5 - DM 31	pt3A - DM 3	pt6 - DM 31	_MRBL - DM
TTSM Notation	Vehicle Emission Factor	Units											
AADE_CO	Carbon monoxide (CO)	Kg/day	815	815	815	816	817	817	0	1	0	-2	-2
AADE_CO2-e	Carbon dioxide (CO2) equivalent	Kg/day	766,404	766,036	765,719	766,534	768,345	768,113	368	685	-130	-1,941	-1,708
AADE_VOC	Volatile organic compounds (VOC)	Kg/day	27	27	27	27	27	27	0	0	0	0	0
AADE_NOX	Nitrogen oxides (NOx)	Kg/day	712	711	711	712	713	713	1	0	0	-1	-1
AADE_NO2	Nitrogen dioxide (NO2)	Kg/day	145	145	145	145	145	145	0	0	0	0	0
AADE_PM2.5E	PM2.5 E	Kg/day	14	14	14	14	14	14	0	0	0	0	0
AADE_PM10BT	PM10.0 BT	Kg/day	140	140	140	141	141	141	0	0	0	-1	-1
AADE_FC	Fuel Consumption	l/day	296,758	296,618	296,499	296,812	297,515	297,425	140	259	-54	-757	-667

Appendix B – Sector-by-Sector Travel Time Benefit Analysis

Figure B1 – TTSM Sectors

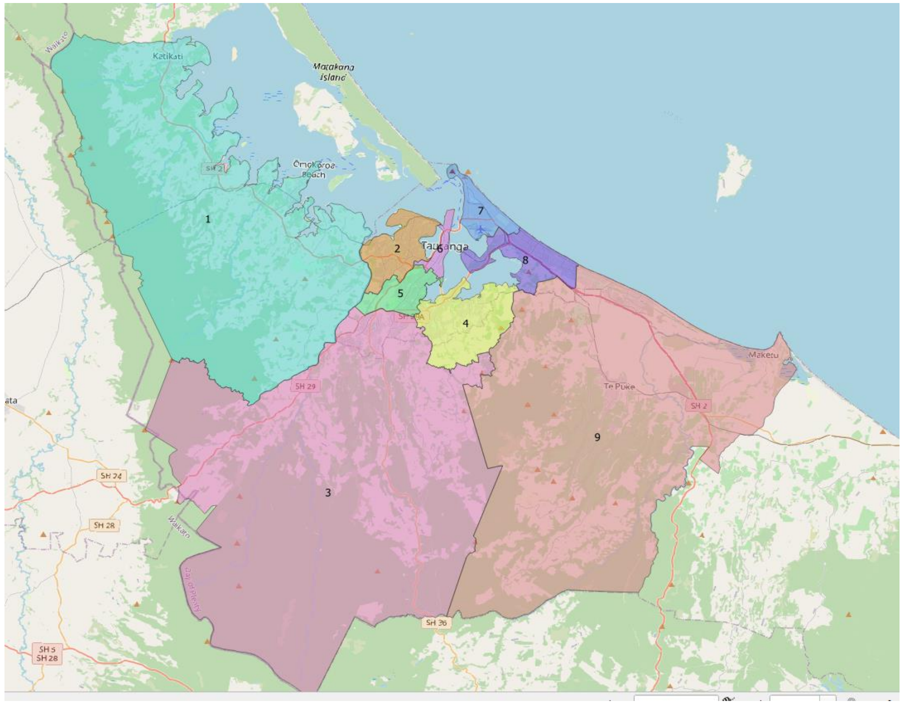


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Figure B2 - Scenario 2 Sector-by-Sector travel time savings

2031 Scen2 — **Travel Time Benefits (Veh Hr)**

AM	1	2	3	4	5	6	7	8	9	Total
1	0.1	0.0	0.2	0.0	0.1	0.2	0.1	0.0	0.0	0.8
2	0.0	-0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2
3	-0.1	-0.2	0.0	-0.3	0.4	-0.1	-0.1	-0.2	-0.6	-1.1
4	-0.7	-1.9	-0.2	-0.2	-1.4	-2.8	0.1	0.0	0.0	-7.1
5	-0.1	-0.5	-0.1	-0.1	-0.1	-0.9	-0.1	-0.1	-0.1	-2.1
6	0.0	-0.1	0.0	0.0	-0.1	-0.1	0.1	0.0	0.0	-0.1
7	0.4	0.7	0.5	-0.3	0.1	2.2	1.2	-0.9	-1.2	2.7
8	0.1	1.0	0.1	0.0	-0.3	2.4	-0.1	0.0	0.0	3.2
9	-0.3	0.9	0.3	0.1	-0.2	3.4	1.0	0.0	0.0	5.1
Total	-0.5	-0.3	0.9	-0.6	-1.4	4.5	2.2	-1.3	-1.8	1.6

IP	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	-0.1	0.2
2	0.0	0.0	0.0	0.0	0.1	0.1	0.2	-0.1	-0.1	0.3
3	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.3
4	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.2	0.0	0.0	-0.5
5	0.0	-0.1	0.0	0.1	0.1	-0.4	-0.1	0.0	0.0	-0.4
6	0.0	-0.1	0.0	0.0	-0.2	-0.1	0.5	-0.2	-0.2	-0.2
7	-0.2	-0.5	-0.2	-0.2	-0.2	-0.8	0.8	-1.5	-1.2	-4.0
8	0.0	0.0	0.0	0.0	0.0	0.0	-0.8	0.0	0.1	-0.5
9	0.0	0.0	0.0	0.0	0.0	0.0	-0.7	0.0	0.0	-0.5
Total	0.0	-0.6	-0.3	-0.1	-0.1	-1.0	0.0	-1.7	-1.5	-5.3

PM	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.1	0.3	0.7
2	0.1	0.0	-0.1	-0.1	0.5	0.0	0.2	0.4	0.5	1.6
3	-0.2	0.1	0.2	0.1	-1.2	-0.1	0.4	1.2	2.2	2.7
4	0.1	0.4	-0.3	-0.4	-0.2	-0.2	-0.4	-0.1	0.1	-1.1
5	0.0	0.2	-0.4	-0.4	-0.1	0.1	0.3	0.7	1.2	1.6
6	-0.4	-0.2	-0.5	-0.2	0.3	-0.1	0.6	0.8	1.3	1.6
7	-1.9	-4.5	-1.3	1.1	-0.5	-3.3	5.5	0.0	0.3	-4.5
8	0.1	-0.4	0.5	0.3	0.5	-0.2	-1.3	0.0	0.0	-0.3
9	0.9	-0.2	0.3	-0.4	0.4	-0.2	-1.2	0.0	-0.1	-0.6
Total	-1.4	-4.5	-1.7	-0.1	0.0	-3.8	4.3	3.1	5.7	1.7

2048 Scen2

AM	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.0	0.1	0.0	-0.2	-0.1	-0.9	0.0	-0.1	-1.2
2	0.0	0.1	0.3	-0.1	-0.3	0.0	-2.2	-0.1	-0.2	-2.4
3	0.0	-0.7	-0.1	-2.8	-0.6	-1.1	-2.1	-0.3	-0.6	-8.4
4	-2.0	-3.4	-0.6	-9.0	-3.5	-6.3	1.7	0.3	0.5	-22.3
5	-0.5	-1.1	-0.9	-0.6	-0.9	-1.3	-0.5	0.0	-0.1	-6.0
6	0.0	0.0	0.0	0.2	0.3	0.3	-1.8	0.1	0.1	-0.7
7	0.8	1.2	0.9	0.0	0.7	3.7	1.3	-1.8	-1.6	5.2
8	0.4	1.4	0.6	0.4	0.4	4.0	1.9	-0.1	0.0	9.1
9	0.2	1.7	1.0	0.3	-0.1	6.1	5.9	-0.1	0.0	15.1
Total	-1.1	-0.7	1.4	-11.7	-4.2	5.3	3.3	-1.9	-2.0	-11.6

IP	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.0	0.6	0.0	-0.1	-0.1	0.0	-0.1	-0.5	-0.1
2	0.0	-0.1	-0.1	-0.1	-0.2	0.0	0.0	-0.3	-0.4	-1.1
3	-0.3	-0.1	-0.1	0.0	0.3	-0.5	-0.1	0.0	0.0	-0.7
4	0.0	0.1	0.4	0.2	0.3	0.2	0.0	0.1	0.1	1.4
5	0.0	0.0	-0.1	0.0	0.0	-0.4	0.0	0.0	0.0	-0.4
6	0.3	0.2	0.5	-0.2	-0.3	0.0	0.4	-0.5	-0.6	-0.3
7	-0.3	-0.6	-0.1	-0.2	-0.3	-0.7	2.1	-0.9	-0.8	-1.7
8	0.0	0.0	-0.2	0.0	0.0	0.0	-1.1	0.0	0.0	-1.3
9	0.0	0.0	-0.3	0.0	0.0	0.0	-0.7	0.0	0.0	-1.0
Total	-0.2	-0.6	0.6	-0.3	-0.3	-1.3	0.6	-1.7	-2.1	-5.4

PM	1	2	3	4	5	6	7	8	9	Total
1	0.0	-0.1	2.7	0.1	0.0	0.0	-0.3	-0.1	-0.2	2.3
2	-0.1	-0.2	-1.2	0.6	0.0	0.3	-0.7	-0.1	-0.2	-1.7
3	0.1	-0.3	-0.5	0.2	-4.6	0.0	-0.3	0.4	1.5	-3.4
4	0.2	0.3	0.5	0.2	0.3	0.4	0.5	0.7	0.6	3.7
5	0.2	-0.2	1.6	0.2	0.6	0.6	-0.2	0.3	0.4	3.5
6	0.0	0.6	-0.9	2.0	2.4	0.3	-1.4	0.0	-0.1	2.9
7	-2.5	-5.0	1.3	2.5	0.7	-4.1	10.3	4.6	3.7	11.6
8	-0.1	-0.7	3.1	0.9	1.0	-0.5	-1.4	0.0	-0.2	2.1
9	0.2	-0.8	4.1	-1.4	1.0	-0.6	-1.4	0.3	0.0	1.4
Total	-2.1	-6.1	10.6	5.3	1.3	-3.5	5.3	6.1	5.6	22.5

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Figure B3 - Scenario 2 Sector-by-Sector travel time savings

2031 Scen3 — **Travel Time Benefits (Veh Hr)**

AM	1	2	3	4	5	6	7	8	9	Total
1	-0.2	-0.3	-0.4	-0.1	-0.3	-0.4	-1.4	-0.1	-0.5	-3.8
2	0.0	-0.2	-0.1	-0.1	-0.3	-0.3	-3.3	-0.3	-0.4	-5.1
3	0.0	-0.1	0.0	-0.6	-0.1	0.0	-1.8	-0.3	-0.7	-3.7
4	0.0	0.0	2.8	0.3	2.6	0.4	-0.7	0.0	0.0	5.5
5	0.1	-0.2	0.2	-0.2	0.1	-0.2	-1.2	-0.1	-0.2	-1.6
6	0.0	-0.2	-0.1	0.0	0.0	0.0	-2.7	-0.2	-0.2	-3.4
7	0.9	2.2	1.3	-0.2	0.9	6.0	-0.1	-1.1	-1.3	8.6
8	0.7	2.8	1.1	0.2	0.7	6.9	-1.7	0.0	0.0	10.6
9	1.0	2.7	1.4	0.2	0.7	8.4	-2.3	0.0	-0.1	12.0
Total	2.5	6.8	6.2	-0.5	4.2	20.7	-15.2	-2.2	-3.4	19.1

IP	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.5
2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.8
3	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.4
4	0.1	0.3	0.4	0.1	0.3	0.1	-0.2	0.0	0.0	1.3
5	0.0	-0.2	-0.4	0.1	0.1	-0.4	-0.1	0.1	0.1	-0.8
6	-0.1	-0.2	-0.1	-0.1	0.1	-0.2	0.3	0.3	0.3	0.3
7	-0.9	-2.2	-1.7	-0.3	-1.2	-5.1	-0.1	-1.9	-1.5	-14.9
8	0.2	0.5	0.0	0.0	0.1	1.0	-0.8	0.0	0.0	1.0
9	0.6	0.6	0.0	0.0	0.1	1.1	-0.8	0.0	0.1	1.7
Total	-0.1	-1.2	-1.7	-0.1	-0.3	-3.6	-1.5	-1.0	-0.4	-9.7

PM	1	2	3	4	5	6	7	8	9	Total
1	-0.1	0.1	0.0	0.0	-0.2	-0.2	-0.1	0.2	0.4	0.0
2	-0.2	0.2	-0.2	0.2	-0.3	-0.4	-0.3	0.5	0.6	0.2
3	-0.3	0.3	0.1	-0.6	-1.0	-0.3	-0.2	0.2	0.3	-1.5
4	0.3	1.1	0.6	0.3	0.4	0.3	0.0	0.2	0.2	3.3
5	0.6	1.6	0.2	0.1	0.1	0.3	-0.2	0.1	0.4	3.3
6	-0.6	-0.1	-0.4	1.1	0.1	-0.1	-0.7	1.1	1.7	2.1
7	-2.2	-4.4	-2.7	0.1	-1.2	-4.0	1.6	-1.1	-2.3	-16.3
8	0.6	1.3	0.6	0.4	0.9	1.2	-1.2	0.0	0.0	3.9
9	1.7	2.0	1.1	0.3	0.9	1.4	-1.2	0.0	0.0	6.2
Total	-0.2	2.1	-0.6	1.9	-0.3	-1.9	-2.3	1.2	1.3	1.3

2048 Scen3

AM	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.1	-0.3	0.0	0.0	0.4	-1.4	0.0	0.0	-1.3
2	-0.1	0.0	-0.1	-0.1	-0.7	-1.2	-3.9	-0.2	-0.4	-6.6
3	0.6	-0.1	-0.2	-2.8	-2.7	-0.3	-3.1	-1.0	-1.4	-11.0
4	-0.9	-1.4	-2.1	-4.8	-1.9	-1.8	0.3	-0.1	0.1	-12.7
5	-0.2	-0.4	-0.1	-0.6	-0.4	-0.3	-1.3	-0.2	-0.2	-3.6
6	-0.1	-0.1	-0.1	0.1	0.0	0.1	-3.2	-0.1	-0.1	-3.3
7	0.8	1.7	1.4	0.1	0.7	5.0	0.3	-2.0	-1.8	6.2
8	1.0	3.0	1.0	0.6	0.6	8.2	0.7	-0.1	0.0	15.0
9	1.9	3.7	0.7	0.0	0.2	11.7	3.4	-0.2	0.0	21.4
Total	3.1	6.5	0.0	-7.5	-4.2	22.0	-8.2	-3.8	-3.8	4.1

IP	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.0	0.5	0.0	-0.1	-0.1	-0.1	0.0	0.2	0.4
2	0.0	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.1	0.1	-0.3
3	-0.1	0.0	-0.1	-0.1	-0.2	-0.3	-0.2	0.0	0.0	-1.1
4	0.3	0.5	0.2	0.1	0.3	0.4	0.0	0.1	0.0	1.8
5	0.1	0.1	0.6	0.0	-0.3	-0.8	-0.2	0.0	0.0	-0.5
6	0.0	0.0	0.6	0.0	0.0	0.0	-0.3	0.2	0.2	0.7
7	-0.2	-0.2	-0.7	-0.1	-0.4	-1.1	0.0	-1.9	-1.5	-6.0
8	0.4	1.0	0.2	0.1	0.3	2.3	-1.3	0.0	0.0	3.0
9	1.0	1.1	0.3	0.1	0.4	2.5	-1.1	0.0	0.1	4.4
Total	1.4	2.4	1.5	0.0	-0.1	2.9	-3.4	-1.5	-0.9	2.4

PM	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.0	2.5	0.1	0.0	-0.3	-0.3	0.2	0.5	2.8
2	0.0	-0.1	1.1	0.7	0.0	0.0	-0.5	0.5	0.7	2.4
3	-0.7	-0.2	-0.3	0.4	-0.1	-0.5	-0.2	2.2	6.0	6.7
4	-0.2	-0.2	-0.4	0.2	0.1	0.4	0.6	0.8	0.9	2.2
5	0.6	0.9	13.5	0.2	2.6	0.4	0.4	1.3	1.8	21.6
6	0.0	2.0	0.1	1.4	3.5	0.8	-1.0	1.3	1.9	10.0
7	-2.5	-4.8	0.7	2.9	0.7	-5.0	6.2	0.9	0.3	-0.5
8	0.2	1.0	3.5	1.5	1.5	0.8	-1.2	0.0	0.0	7.4
9	0.2	1.0	4.5	-0.8	1.5	1.0	-1.4	0.2	0.0	6.2
Total	-2.3	-0.3	25.2	6.8	9.7	-2.5	2.5	7.5	12.2	58.8

Figure B4 - Scenario 2 Sector-by-Sector travel time savings

Travel Time Benefits (Veh Hr)

2031 Scen4

AM	1	2	3	4	5	6	7	8	9	Total
1	-0.1	-0.2	-0.3	-0.1	-0.3	-0.5	-2.2	-0.2	-0.7	-4.6
2	0.0	-0.2	-0.1	-0.1	-0.5	-1.1	-5.7	-0.5	-0.7	-8.7
3	0.0	0.0	0.0	-0.7	-0.2	-0.1	-3.1	-0.5	-1.2	-5.8
4	1.1	3.0	7.9	1.1	9.3	6.5	-2.0	-0.2	0.0	26.6
5	0.2	0.4	-0.1	-0.2	0.3	0.1	-2.2	-0.2	-0.3	-2.0
6	-0.1	-0.2	-0.2	0.0	-0.1	-0.2	-4.7	-0.3	-0.4	-6.2
7	4.6	10.6	8.0	0.1	6.1	28.8	0.0	-0.7	-1.1	56.4
8	1.1	3.9	2.5	0.5	2.5	10.1	-3.5	0.0	0.1	17.1
9	1.8	3.8	4.4	0.5	3.1	12.0	-6.3	-0.1	0.0	19.2
Total	8.6	21.1	22.2	1.2	20.2	55.5	-29.7	-2.7	-4.3	92.0

IP	1	2	3	4	5	6	7	8	9	Total
1	-0.1	0.0	-0.1	0.0	0.0	-0.1	-0.2	0.1	0.3	-0.1
2	0.0	0.0	0.0	0.0	0.0	-0.3	-0.7	0.2	0.2	-0.4
3	0.0	0.0	0.0	0.1	0.1	-0.1	-0.4	0.1	0.1	0.0
4	0.2	0.3	0.4	0.1	0.3	0.2	-0.2	0.0	0.0	1.2
5	0.0	-0.1	0.0	0.1	0.2	-0.4	-0.5	0.1	0.1	-0.6
6	-0.3	-0.7	-0.5	0.0	-1.0	-0.7	-1.6	0.3	0.3	-4.1
7	2.8	6.8	3.3	-0.2	2.2	14.4	-0.7	-1.9	-1.6	25.1
8	0.3	0.8	0.1	0.1	0.1	1.5	-1.2	0.0	0.1	1.9
9	1.0	0.9	0.3	0.0	0.2	1.7	-1.1	0.0	0.0	2.9
Total	3.9	8.0	3.6	0.2	2.1	16.1	-6.6	-1.0	-0.4	26.0

PM	1	2	3	4	5	6	7	8	9	Total
1	-0.2	0.0	-0.5	-0.3	-0.1	0.0	-1.1	-0.1	-0.1	-2.3
2	-0.4	-0.3	-0.6	-0.9	-0.4	-0.6	-3.3	-0.2	-0.2	-7.1
3	-0.2	0.6	0.3	-0.7	0.0	0.1	-2.1	-0.3	-0.4	-2.9
4	0.6	1.7	2.4	0.5	1.2	0.3	-0.2	0.1	0.1	6.6
5	1.0	3.3	1.0	-1.5	0.4	0.8	-1.7	-0.6	-0.5	2.3
6	-1.3	-1.4	-3.0	-2.1	-2.5	-1.0	-8.3	-0.9	-0.9	-21.5
7	8.5	25.5	11.1	1.8	8.9	23.4	1.6	0.1	-0.4	80.4
8	1.2	3.0	1.9	0.8	1.7	2.7	-1.3	0.0	0.2	10.2
9	2.8	4.3	3.5	0.3	2.0	3.2	-1.5	0.0	0.0	14.5
Total	12.0	36.7	16.0	-2.1	11.1	28.8	-17.9	-2.0	-2.4	80.4

2048 Scen4

AM	1	2	3	4	5	6	7	8	9	Total
1	-0.1	-0.2	-1.4	-0.4	-1.2	-1.8	-4.3	-0.5	-1.5	-11.2
2	0.1	-0.4	-1.0	-0.4	-2.1	-3.1	-8.8	-1.0	-1.5	-18.2
3	0.0	-1.0	-0.5	-4.1	-4.7	-2.7	-7.2	-2.4	-5.0	-27.6
4	1.1	2.1	2.3	-4.6	3.6	5.6	-2.2	-0.4	-0.3	7.2
5	0.0	-0.4	-1.3	-1.6	-1.8	-0.9	-4.1	-1.1	-1.5	-12.6
6	-0.2	-0.1	-0.7	0.0	-0.8	-0.5	-7.7	-0.6	-0.9	-11.5
7	6.5	12.6	10.4	0.6	7.2	38.3	0.4	-1.2	-1.3	73.6
8	1.9	4.4	3.1	1.0	3.2	12.7	-2.2	-0.1	0.0	24.0
9	3.0	4.6	5.4	0.6	3.6	16.0	-5.9	-0.5	-0.1	26.8
Total	12.4	21.7	16.4	-8.9	7.1	63.6	-42.0	-7.8	-11.9	50.5

IP	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.0	0.0	-0.1	-0.2	-0.4	-1.1	0.0	-0.1	-2.0
2	0.0	-0.1	-0.2	-0.2	-0.4	-1.0	-2.5	-0.1	-0.1	-4.6
3	-0.1	0.0	0.0	-0.4	0.1	-0.8	-1.8	-0.2	-0.4	-3.6
4	0.4	0.7	1.6	0.3	1.2	0.9	0.0	0.1	0.1	5.1
5	0.3	0.2	0.4	-0.3	-0.6	-0.8	-1.1	-0.1	-0.1	-2.1
6	-0.5	-0.9	-0.7	-0.3	-1.3	-0.6	-5.3	-0.1	-0.1	-9.8
7	3.9	8.8	4.4	0.0	2.9	19.4	-0.1	-1.3	-1.2	36.8
8	0.6	1.3	0.3	0.1	0.5	2.8	-1.7	0.0	0.0	3.9
9	1.4	1.4	0.7	0.1	0.6	3.2	-1.6	0.0	0.0	5.8
Total	5.8	11.4	6.4	-0.8	2.6	22.8	-15.3	-1.7	-1.8	29.5

PM	1	2	3	4	5	6	7	8	9	Total
1	-0.2	0.0	-0.4	-0.4	-0.4	-0.5	-2.1	-0.3	-0.6	-4.9
2	-0.4	-0.5	-1.7	-0.5	-1.0	-1.0	-4.6	-0.7	-0.8	-11.3
3	0.7	0.6	0.0	-3.3	-1.7	0.0	-2.9	-0.7	-2.2	-9.5
4	0.7	1.2	2.1	0.4	1.5	0.7	0.0	0.2	0.2	7.0
5	1.9	2.9	2.0	-3.2	-0.5	0.1	-2.0	-0.4	-0.8	0.1
6	-1.6	0.5	-4.1	-2.7	-3.9	-0.6	-10.6	-1.3	-1.8	-26.0
7	11.1	28.8	13.0	2.5	9.3	27.7	4.7	2.4	2.0	101.6
8	1.8	4.7	3.5	1.5	2.4	4.0	-1.7	0.0	0.4	16.5
9	3.4	6.1	5.3	2.3	2.6	4.7	-2.0	0.0	0.1	22.4
Total	17.4	44.3	19.7	-3.4	8.2	35.0	-21.2	-0.7	-3.5	95.8

Figure B5 - Scenario 2 Sector-by-Sector travel time savings

Travel Time Benefits (Veh Hr)

2031 Scen5

AM	1	2	3	4	5	6	7	8	9	Total
1	-0.1	-0.1	-0.3	-0.1	-0.4	-0.6	-2.4	-0.3	-1.1	-5.5
2	0.0	-0.1	-0.2	-0.1	-0.7	-1.3	-6.3	-0.8	-1.2	-10.8
3	0.0	0.1	0.0	-0.8	-0.4	-0.2	-3.3	-0.6	-1.3	-6.5
4	1.1	3.1	7.6	1.2	8.9	6.6	-2.2	-0.1	0.0	26.2
5	0.2	0.5	-0.1	-0.2	0.2	0.2	-2.2	-0.2	-0.3	-2.0
6	0.0	-0.3	-0.2	0.0	-0.1	-0.1	-5.1	-0.5	-0.7	-7.1
7	4.5	10.5	8.0	0.0	6.1	28.5	-0.5	-0.7	-1.2	55.2
8	1.0	3.4	2.1	0.4	2.3	8.9	-3.4	-0.1	0.0	14.6
9	1.6	3.2	4.1	0.4	3.0	10.3	-6.8	-0.1	-0.1	15.5
Total	8.3	20.2	20.9	0.8	18.7	52.3	-32.4	-3.5	-5.8	79.7

IP	1	2	3	4	5	6	7	8	9	Total
1	-0.1	0.0	-0.1	0.0	-0.1	-0.2	-0.4	0.0	-0.1	-0.9
2	0.0	0.0	0.0	0.0	-0.1	-0.4	-0.9	-0.1	-0.1	-1.6
3	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.6	-0.1	-0.3	-1.4
4	0.1	0.3	0.7	0.1	0.5	0.1	-0.2	0.0	0.0	1.6
5	0.0	0.0	0.2	0.0	0.1	-0.4	-0.6	0.0	0.0	-0.7
6	-0.3	-0.6	-0.5	-0.1	-0.9	-0.7	-2.0	-0.1	-0.1	-5.3
7	2.8	6.8	3.5	-0.2	2.4	14.6	-0.1	-1.7	-1.3	26.8
8	0.3	0.7	0.2	0.1	0.1	1.2	-1.3	0.0	0.1	1.3
9	0.8	0.7	0.4	0.0	0.2	1.3	-1.0	0.0	0.0	2.3
Total	3.7	7.7	4.4	-0.2	2.2	15.3	-7.1	-2.1	-1.8	22.2

PM	1	2	3	4	5	6	7	8	9	Total
1	-0.3	0.1	-0.4	-0.4	-0.2	-0.2	-1.2	-0.2	-0.4	-3.3
2	-0.5	-0.1	-0.7	-1.2	-0.8	-0.7	-3.5	-0.6	-0.8	-8.8
3	-0.2	0.6	0.1	-0.7	0.0	-0.1	-2.2	-0.3	-0.4	-3.2
4	0.6	1.6	2.5	0.5	1.3	0.3	-0.4	0.0	0.1	6.3
5	0.9	3.2	0.6	-1.9	0.4	0.9	-1.7	-0.5	-0.4	1.5
6	-1.8	-1.4	-2.9	-2.3	-2.6	-1.0	-8.8	-1.8	-2.1	-24.7
7	8.5	26.2	11.4	2.1	9.1	24.3	3.4	0.9	1.0	87.0
8	1.1	2.9	1.8	0.8	1.7	2.6	-1.6	0.0	0.2	9.5
9	2.6	4.0	3.5	0.8	1.9	3.0	-1.6	0.1	0.0	14.3
Total	10.8	37.1	16.0	-2.4	10.7	29.0	-17.4	-2.4	-2.9	78.5

2048 Scen5

AM	1	2	3	4	5	6	7	8	9	Total
1	-0.1	-0.2	-0.7	-0.3	-0.9	-1.6	-3.8	-0.4	-1.4	-9.5
2	0.0	-1.0	-1.9	-0.5	-2.0	-3.2	-7.9	-1.0	-1.6	-19.1
3	-0.3	-0.6	-0.6	-2.2	-7.8	-1.8	-4.5	-0.5	-1.0	-19.4
4	0.1	0.7	8.6	-3.0	7.6	4.7	-0.4	-0.2	0.1	18.2
5	0.1	0.3	-2.7	-0.9	-1.6	-0.3	-2.4	-0.4	-0.4	-8.2
6	-0.2	-0.1	-0.8	-0.1	-0.9	-0.2	-7.0	-0.6	-0.9	-10.8
7	6.9	13.1	10.0	0.5	7.3	39.9	-0.2	-1.2	-1.3	74.9
8	2.1	5.3	2.6	0.9	2.4	14.7	-0.6	-0.1	0.0	27.2
9	4.4	6.4	6.3	0.8	3.0	20.4	2.2	-0.2	0.1	43.6
Total	13.0	23.9	20.7	-4.9	7.1	72.6	-24.7	-4.5	-6.3	97.0

IP	1	2	3	4	5	6	7	8	9	Total
1	0.0	0.0	0.5	-0.1	-0.3	-0.3	-1.2	-0.1	-0.5	-2.1
2	0.0	-0.2	-0.4	-0.2	-0.7	-0.8	-2.6	-0.3	-0.4	-5.7
3	-0.1	0.0	-0.1	-0.5	-0.3	-0.6	-1.8	-0.2	-0.5	-4.0
4	0.4	0.7	1.0	0.2	0.9	0.9	0.0	0.1	0.1	4.3
5	0.1	0.0	0.6	-0.3	-1.1	-1.2	-1.1	-0.1	-0.1	-3.1
6	-0.3	-0.8	-0.7	-0.2	-1.2	-0.5	-5.4	-0.6	-0.7	-10.4
7	4.0	9.0	4.4	0.0	3.0	20.1	0.5	-1.0	-0.9	39.1
8	0.5	1.2	0.2	0.1	0.4	2.6	-1.8	0.0	0.0	3.2
9	1.3	1.3	0.4	0.1	0.4	2.8	-1.6	0.0	0.0	4.8
Total	5.8	11.2	5.9	-1.1	1.2	23.0	-15.0	-2.2	-2.9	25.9

PM	1	2	3	4	5	6	7	8	9	Total
1	-0.2	-0.1	-0.7	-0.4	-0.1	-0.3	-2.2	-0.5	-1.0	-5.4
2	-0.4	-0.5	-1.8	-0.7	-0.3	-1.0	-4.8	-1.1	-1.5	-12.1
3	0.1	0.4	-0.6	-5.4	-2.8	-0.1	-3.5	-1.7	-4.6	-18.2
4	0.2	0.3	1.6	-0.1	1.4	0.6	-0.3	0.0	-0.2	3.4
5	1.2	1.8	-1.4	-4.6	0.0	0.8	-2.2	-1.0	-1.7	-6.9
6	-0.6	-0.6	-3.2	-2.2	-2.3	-0.6	-11.2	-2.4	-3.4	-26.4
7	10.0	28.1	14.4	6.7	9.4	27.7	8.5	3.8	4.5	113.0
8	1.3	4.0	5.6	3.1	3.2	3.7	-1.7	0.1	0.2	19.5
9	2.2	5.2	8.1	1.5	3.4	4.3	-2.0	0.0	0.0	22.8
Total	13.8	38.5	22.2	-2.0	11.8	35.1	-19.3	-2.8	-7.6	89.7

Appendix C – Crash reduction, Urban Realm, Cyclist Health and PT Facility Improvement benefits assumptions

Crash Cost Reduction Assumptions – based on Table 12, Hewletts Road IBC Economics Assessment Report, September 2023, by MR Cagney (NZ) Limited, modified to align with the options proposed this time

	Crash reduction % compared to crash history state - **Do min**	Crash reduction % compared to crash history state - **Option 3a**	Crash reduction % compared to crash history state - **Option 5**	Crash reduction % compared to crash history state - **Option 6**	Crash reduction % compared to crash history state - **Option 6 MRBL**
Hewletts Road	10%	40%	20%	30%	30%
Tōtara Street	35%	35%	35%	20%	20%
Maunganui Road	10%	20%	20%	20%	30%
Hull Road	0%	50%	50%	50%	50%

Urban Realm Benefits Assumptions – based on Hewletts Road IBC Economics Assessment Report, September 2023, by MR Cagney (NZ) Limited, modified to align with the options proposed this time

- The number of pedestrians in the study area in the future will range from 400 at the low end (approximately the number of pedestrians and cyclists counted recently) to 2300 at the high end (based on double the number of bus riders assumed to be in the area).
- The average distance spent walking in the study area is 1km, with an average time spent walking of 12 minutes.
- The value of time of pedestrians is a weighted average of workers, commuters, and others – based on Table A50 of the MBCM.
- Percentage of further people would walk for each option is provided below

Option	Do Min	Option 3a	Option 5	Option 6	Option 6 MRBL
Percent further people would walk		31%	78%	41%	78%

Cyclist Health Benefits Assumptions – based on Hewletts Road IBC Economics Assessment Report, September 2023, by MR Cagney (NZ) Limited, modified to align with the options proposed this time

- All cyclists are commuters and their value of time is the commuter value of time from the MBCM

- This means that their benefits are annualised at a factor of 245 – the number of workdays in a year
- All cyclists travel 9km per day, which is an assumption based on data from the New Zealand Travel Survey 2010/14.
- Cycling health benefits are monetised at the rate specified in the MBCM, with an annual cap.
- Cyclists are 25% e-bikers and 75% conventional cyclists.
- Uptake of cycling has been based on the high-end estimate of 900 cyclists per day as all options propose high quality cycle connections between Mt Maunganui and SH2 Harbour Bridge and surrounding suburbs.

PT Facility Benefits Assumptions – based on Hewletts Road IBC Economics Assessment Report, September 2023, by MR Cagney (NZ) Limited, modified to align with the options proposed this time

- PT users will use two improved bus stops
    - One bus stop on their outbound trip and one on their return trip.
- The number of PT users is based on the ranges provided in the PT travel times savings (1150 passengers per day per direction)
- The new bus stops will be of high quality and have the following amenities:
    - Seating
    - Lighting
    - Maps
    - Countdown signs showing next arriving bus and its estimated time of arrival
    - Easily read timetables

Anticipated increase of bus passengers for each option:

	Option 3a	Option 5	Option 6	Option 6 MRBL
Increased Daily PT Users	100%	300%	100%	200%

Appendix C – Economic Worksheet – Shortlist Options

COST-BENEFIT ANALYSIS OF THE OPTIONS: **WORKSHEET 3**

Shortlist Options

1.	Project Options	**Option 3a Shorlist vs Do Minimum**	**Option 5 Shorlist vs Do Minimum**	**Option 6 Shorlist vs Do Minimum**	**Option 6a Shortlist vs Do Minimum**	**Economic Efficient vs Do Minimum**
COSTS:						
2.	Capital Costs	$186,879,443	$274,392,089	$391,234,812	$435,710,319	$256,842,142
3.	Maintenance Costs	$21,804,607	$35,544,429	$53,983,388	$60,872,012	$32,883,222
4.	Total Costs (2) + (3)	$208,684,050	$309,936,518	$445,218,201	$496,582,330	$289,725,364
BENEFITS:						
5.	Travel Time Costs	$11,586,472	-$8,162,868	$123,754,421	$123,754,421	$145,787,790
5a.	Congestion Relief (CRV)	-$5,976,928	-$12,837,092	$73,132,704	$73,132,704	$97,222,508
6.	Vehicle Operating Costs	$1,226,241	$14,055,209	$25,242,808	$25,242,808	$32,666,411
7.	Crash Costs	$35,562,780	$16,481,091	$18,076,550	$18,076,550	-$12,651,990
8.	PT TT Benefit	$14,156,484	$30,675,493	$44,831,978	$44,831,978	$0
9.	PT Facility Benefit	$11,833,560	$19,722,601	$15,778,080	$15,778,080	$19,722,601
10.	Emissions	$615,289	$7,742,218	-$7,995,530	-$7,995,530	-$1,589,550
11	Cycle Health Benefit	$91,141,623	$91,141,623	$91,141,623	$91,141,623	$91,141,623
12.	Urban Realm Benefit	$17,379,891	$43,730,050	$21,232,024	$43,730,050	$0
13	Tangible Benefits (5) to (9)	$177,525,413	$202,548,325	$405,194,657	$427,692,683	$372,299,392
14	Tangible B/C Ratio (12) / (4)	**0.85**	**0.65**	**0.91**	**0.86**	**1.3**
15	Ranking B/C Ratio	n/a	n/a	n/a	n/a	n/a

INCREMENTAL COST-BENEFIT ANALYSIS OF PROJECT OPTIONS: **WORKSHEET 5**

Step	BASE OPTION FOR COMPARISON			NEXT HIGHER COST OPTION			INCREMENTAL ANALYSIS			
	Option	Costs	Benefits	Option	Costs	Benefits	Incremental Costs	Incremental Benefits	Incremental B/C Ratio	Base Option for Next Step
	(1)	(2)	(3)	(4)	(5)	(6)	(7)=(5) - (2)	(8)=(6)-(3)	(9)=(8)/(7)	(10)
1	Option 3a	208,684,050	177,525,413	Economic Efficient	289,725,364	372,299,392	81,041,314	194,773,979	2.4	Economic Efficient
2	Economic Efficient	289,725,364	372,299,392	Option 5	309,936,518	202,548,325	20,211,155	(169,751,068)	-8.4	Economic Efficient
3	Economic Efficient	289,725,364	372,299,392	Option 6	445,218,201	405,194,657	155,492,837	32,895,265	0.2	Economic Efficient
4	Economic Efficient	289,725,364	372,299,392	Option 6a	496,582,330	427,692,683	206,856,967	55,393,291	0.3	Economic Efficient
5										
6										
7										
8										

11. Preferred Project Option: Economic Efficient

12. Other Factors:

Reference: P:\aure\023 SH2 Hewletts Road IBC\4.0 Reporting\TN6C240913 Incremental Analysis.docx – qli

CMM IBC - Shortlist Cost Estimates (P50)					
	Option 3a	Option 5	Option 6	Option 6a	Economic Efficient
Construction					
Hewletts Road / Totara Street Fly-Over	$ -	$ -	$ 52,050,000	$ 52,050,000	$ 52,050,000
Maunganui Road / Golf Road Full Signalisation	$ 17,100,000	$ 17,100,000	$ 17,100,000	$ 17,100,000	$ -
TCC major stops	$ 13,305,600	$ 13,305,600	$ 13,305,600	$ 13,305,600	$ 13,305,600
Continuous Bus Lanes - Maunganui Road	$ -	$ 35,424,047	$ 35,424,047	$ 35,424,047	$ -
Continuous Bus Lanes - Hewletts Road	$ -	$ 907,500	$ 907,500	$ 907,500	$ -
Walking and cycling Overpass	$ -	$ 3,936,000	$ 3,936,000	$ 3,936,000	$ 3,936,000
VMS	$ -	$ 1,492,500	$ 1,492,500	$ 1,492,500	$ 1,492,500
Streetscape improvements	$ -	$ 23,460,000	$ -	$ 23,460,000	$ -
Bi-Directional Cycleway	$ 5,269,500	$ 5,269,500	$ 5,269,500	$ 5,269,500	$ 5,269,500
New local connections	$ -	$ -	$ -	$ -	$ -
Tukorako Dr to Te Maire St	$ 3,522,000	$ 3,522,000	$ 3,522,000	$ 3,522,000	$ 3,522,000
Aerodrome Rd to Te Maire St	$ 3,418,500	$ 3,418,500	$ 3,418,500	$ 3,418,500	$ 3,418,500
Hocking St to Maru St	$ 5,934,000	$ 5,934,000	$ 5,934,000	$ 5,934,000	$ 5,934,000
Aviation to MacDonald	$ 3,276,000	$ 3,276,000	$ 3,276,000	$ 3,276,000	$ 3,276,000
Totara St to Te Maire St	$ 4,005,000	$ 4,005,000	$ 4,005,000	$ 4,005,000	$ 4,005,000
4 Lane - Totara Street	$ -	$ -	$ 15,778,500	$ 15,778,500	$ 15,778,500
Rationalise access - Signals	$ 15,979,500	$ -	$ 15,979,500	$ 15,979,500	$ -
Rationalise access - LILO	$ 2,448,000	$ -	$ 2,448,000	$ 2,448,000	$ -
Traffic management (7%)	$ 5,198,067	$ 8,473,545	$ 12,869,265	$ 14,511,465	$ 7,839,132
Preliminary and General (32%)	$ 25,425,973	$ 41,447,741	$ 62,949,092	$ 70,981,796	$ 38,344,554
Contractors Margin (19%)	$ 19,927,607	$ 32,484,667	$ 49,336,351	$ 55,631,983	$ 30,052,544
Sub-total base physical works	$ 124,809,747	$ 203,456,601	$ 309,001,355	$ 348,431,891	$ 188,223,831
MSQA					
- Consultancy fees (4%)	$ 4,992,390	$ 8,138,264	$ 12,360,054	$ 13,937,276	$ 7,528,953
- Client managed costs (2.5%)	$ 3,120,244	$ 5,086,415	$ 7,725,034	$ 8,710,797	$ 4,705,596
- Consent monitoring fees (3%)	$ 3,744,292	$ 6,103,698	$ 9,270,041	$ 10,452,957	$ 5,646,715
Total Construction [Undiscounted]	**$ 136,666,673**	**$ 222,784,978**	**$ 338,356,484**	**$ 381,532,920**	**$ 206,105,095**
Investigation and reporting:					
- Consultancy fees (2%)	$ 2,496,195	$ 4,069,132	$ 6,180,027	$ 6,968,638	$ 3,764,477
- Client managed costs (2%)	$ 2,496,195	$ 4,069,132	$ 6,180,027	$ 6,968,638	$ 3,764,477
Design & Investigation					
Design and project documentation:					
- Consultancy fees (6%)	$ 7,488,585	$ 12,207,396	$ 18,540,081	$ 20,905,913	$ 11,293,430
- Client managed costs (2%)	$ 2,496,195	$ 4,069,132	$ 6,180,027	$ 6,968,638	$ 3,764,477
Property	$ 48,000,000	$ 48,000,000	$ 48,000,000	$ 48,000,000	$ 48,000,000
Total Pre-implementation [Undiscounted]	**$ 62,977,170**	**$ 72,414,792**	**$ 84,480,163**	**$ 89,811,827**	**$ 69,986,860**
Total Undiscounted Costs (P50)	**$ 199,643,843**	**$ 295,199,770**	**$ 422,836,646**	**$ 471,344,747**	**$ 276,091,954**
Final Costs Used for Shortlist Options Economic Assessment					
Pre-Imp	$ 62,977,170	$ 72,414,792	$ 84,480,163	$ 89,811,827	$ 69,986,860
Construction	$ 123,902,273	$ 201,977,297	$ 306,754,650	$ 345,898,492	$ 186,855,282
OPEX - 1%	$ 21,804,607	$ 35,544,429	$ 53,983,388	$ 60,872,012	$ 32,883,222
Total Net Present Value (P50, 40-years)	**$ 208,684,050**	**$ 309,936,518**	**$ 445,218,201**	**$ 496,582,330**	**$ 289,725,364**

SH2 HEWLETTS ROAD

Economic Efficient Option

INDICATIVE BUSINESS CASE ESTIMATE

ITEM	DESCRIPTION			BASE ESTIMATE	CONTINGENCY	FUNDING RISK
A	Nett project property cost			32000000	16000000	16640000
	Investigation and reporting:					
	- Consultancy fees (2%)			2,500,000		
	- Client managed costs (2%)			2,500,000		
B	Total investigation and reporting			5,000,000	2,500,000	2,625,000
	Design and project documentation:					
	- Consultancy fees (6%)			7520000		
	- Client managed costs (2%)			2,500,000		
C	Total design and project documentation			10,020,000	5,010,000	5,261,000
	Construction					
	NOTE:As limited documentation has been provided for this estimate, it is based on design assumptions from the civil/structural engineer and the experiance of the Quantity Surveyor based on historic projects of similar nature. As stated within the Waka Kotahi Cost Estimation Manual the level of accuracy of this estimate is -40% to +70%.					
	MSQA					
	- Consultancy fees (4%)			5,010,000		
	- Client managed costs (2.5%)			3,130,000		
	- Consent monitoring fees (3%)			3,760,000		
	Sub-total base MSQA			11,900,000		
	Physical works	*QTY*	*Rate $*			
1	Hewletts Road / Totara Street Fly-Over	1	34,700,000	34,700,000		
2	TCC major stops	28	316,800	8,870,000		
3	Walking and cycling Overpass	1	2,624,000	2,624,000		
4	VMS	5	199,000	995,000		
5	Bi-Directional Cycleway	5	199,000	3513000		
6	New local connections			-		
7	Tukorako Dr to Te Maire St	1	2,340,000	2,340,000		
8	Aerodrome Rd to Te Maire St			2270000		
9	Hocking St to Maru St	1	2,348,000	3,900,000		
10	Aviation to MacDonald	1	2,279,000	2,130,000		
11	Totara St to Te Maire St	1	3,956,000	2,600,000		
12	4 Lane - Totara Street	1	2,184,000	10,500,000		
13	Traffic management (7%)			5,200,000		
14	Preliminary and General (32%)			25,500,000		
15	Contractors Margin (19%)			20,000,000		
	Sub-total base physical works			125,140,000		
D	Total construction			137,040,000	68,520,000	71,950,000
E	Project base estimate (A+B+C+D)			184,060,000		
F	**Contingency** (Assessed/Analysed)			**(A+B+C+D)**	92,030,000	
G	Project expected estimate			(E+F)	276,090,000	
Project property cost expected estimate					48,000,000	
Investigation and reporting expected estimate					7,500,000	
Design and project documentation expected estimate					15,030,000	
Construction expected estimate					205,560,000	
H	**Funding risk** (Assessed/Analysed)				**(A+B+C+D)**	96,480,000
I	95th percentile Project Estimate				(G+H)	372,570,000
Project property cost 95th percentile estimate						excl
Investigation and reporting 95th percentile estimate						10,125,000
Design and project documentation 95th percentile estimate						20,291,000
Construction 95th percentile estimate						277,510,000
Cost index (Qtr/Year): Q1-23						
Estimate prepared by : Les Lewer				Signed		
Estimate internal peer review by : True-cost				Signed		
Estimate external peer review by :				Signed		
Estimate accepted by the NZTA				Signed		

Note: (1) These estimates are exclusive of escalation and GST.

Hewletts Road IBC - Recommended Cost Estimate_Flow_June2024_Final_unlinked.xlsb.xlsx 1 of 1 21/10/2024

Appraisal Summary Table - CMM IBC - Recommended Option

Date:	9/09/2024	**Evaluation Period: (baseline and forecast year) e.g 2020 - 2060**	40 years	**Option Name:**	Recommended Option	**This is the preferred option**

Problem/opportunity statement:	**Investment objectives:**	**How project gives effect to GPS:**	**How project gives effect to local community outcomes:**
Problem Statement 1: Competing journey purposes, limited route choice and internal connections to access Mount Maunganui (residential, recreational, commercial and industrial) and the eastern corridor results in unreliable journeys for people and goods; Problem Statement 2: Competition for limited road space is causing high levels of exposure for vulnerable users and conflict between vehicles resulting in harm to people and the community; and Problem Statement 3: High volumes of vehicles travelling and a lack of viable alternative options results in transport related effects impacting on the environment (Whareroa marae, the harbour and public health) and NZ's transport emissions.	IO1: Improve reliability, access, and throughput of people and goods IO2: Reduce road deaths and serious injuries for all users in line with Vision Zero targets IO3: Provide better mode choice options and increase public transport and active travel mode share IO4: Reduce the transport related effects on water, air quality and noise IO5: Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	Very high ratings recorded for Safety and Economic Growth and Productivity. Economic Growth and Productivity: 40-50% reduction in journey times time on key freight routes along Hewletts Road and Tōtara Street to the Mount Industrial Area. Improving connections to nationally significant production and distribution points - Port of Tauranga. Safety: Significant safety improvements expected to provide an average 20% reduction in DSIs compared to the current crash history record.	Each element of the programme will target the specific problems of different customer groups and deliver benefits that will effectively address the customer needs. The area wide transport initiatives, including the Mount Spatial and Mount Industrial plans, aim to cater for all customers, but specifically enhance the wellbeing of the Whareroa Marae community. It also maximises multi-modal choices for leisure and recreation users. The new, safe cycle connections will make cycling far more attractive, especially for short to medium trips. This means a healthier option available for customers, especially, 9-5 CBD commuters, sport facilities/event attendees, students, those accessing leisure and recreation opportunities, and the Whareroa Marae community.

1. Summary of Non-Monetised Impacts (Description)	**2. Summary of Financial Impacts (nominal, non-discounted)**		**3. Summary of Monetised Option Impacts (present value, discounted)**	
• Travel time, VOC and congestion relief benefits from local road connections improving local access and permeability onto Hewletts Road, Totara Street, Hull Road and Maunganui Road • Significant travel time, VOC and congestion relief benefits from the grade separation of Hewletts/Totara intersection and four laning of Totara Street between Hewletts Road and Hull Road • Health benefits related to improvements of walking and cycling facilities along Manganui Road	Capital Costs	$276,091,954	Total Monetised Benefits, excluding Wider Economic	$372,299,392
			Total Monetised Benefits, including Wider Economic	$372,299,392
	Operating Costs	$72,136,783	Total Economic Costs	$289,725,364
			BCR (excluding WEBs)	1.3
	Total Financial Costs	$348,228,737	BCR (including WEBs)	1.3

Transport Outcomes			**Non-Monetised Impact:**		**Monetised Impact:**	
Name of Benefit	**Name of Measure:**	**Baseline:**	**Do Minimum Impact:**	**Option Impact:**	**Do Minimum Impact:**	**Option Impact:**
Healthy and safe people *(Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)*						
1.1 Impact on social cost and incidents of crashes	1.1.3 Deaths and serious injuries					
1.1 Impact on social cost and incidents of crashes	1.1.1 Collective risk (crash density)	422 crashes across the study area between 2017 and 2022	The issues with high vehicle volumes, competing journey of freight, community, recreational and through route travel, inefficient use of current road corridor will continue to result in a high level of exposure for vulnerable users and conflict between vehicles.	The grade separation of Hewletts Road at Totara, local road intersection improvements, protected walking and cycling facilities and PT facility upgrades is likely to reduce the exposure to deaths and serious injuries by 28%. There is a slight increase in risk due to the increase in the speed environment and introduction of	$0	-$12,651,990
3.1 Impact of mode on physical and mental health	3.1.1 Physical health benefits from active modes	Active modes such as walking and cycling are not popular as a viable alternative to private vehicle and there are currently no protected cycle facilities within the study area	NA	A reduction in private vehicle travel and the installation of separated cycle facilities will contribute positively to provide benefits in public health and reducing the transport related effects on noise.	$0	$91,141,623
3.2 Impact of air emissions on health	3.2.1 Ambient air quality - NO2	Motor vehicles contribute to approximately 30% of NOx emissionons				
3.2 Impact of air emissions on health	3.2.2 Ambient air quality - PM10	Motor vehicles contribute to approximately 6% of PM10 emissions	NA	An increase in PT and active mode share will help to reduce congestion and and encourage efficient traffic movement. This leads to positive emission outcomes.	NA	NA
Economic prosperity *(Please copy the row below to add an additional benefit or measure, and delete rows as appropriate)*						
5.1 Impact on system reliability	5.1.2 Travel time reliability - motor vehicles	85th percentile travel time for general traffic is over twice that of median travel time from east of Hewletts Road, Mount Maunganui and Pāpāmoa to the CBD.	Low travel time reliability due to high congestion.	Grade separation of Tōtara Street and Hewletts Road reduces pressure and improves access for journeys to and from the Port, resulting in improved reliability for freight journeys.	NA	NA
5.2 Impact on network productivity and utilisation	5.2.4 Freight - throughput value	In future, freight volumes in the Bay of Plenty are expected to grow significantly based on forecast export growth and interregional demand. Between 2020-2030, freight volumes at the Port of Tauranga are anticipated to increase by 49-61%, with freight volumes on the SH2 Waihi to Tauranga Corridor anticipated to increase by 24-49% . Given the port location, this will increase pressure on the local transport network	NA	The preferred option results in significant travel time savings along Hewletts Road and Totara Street, improving freight reliability to the Mount Industrial Area.	NA	NA
Environmental sustainability						
8.1 Impact on greenhouse gas emissions	8.1.1 CO2 emissions	Over 60% of Tauranga City's overall gross emissions are contributed from transportation sources. This equates to 463,960 tonnes of carbon dioxide in 2015-2016.	High car dependency leading to high traffic and congestion rates will continue to contribute negatively towards the environment and public health and wellbeing.	Reduced congestion, reduced idling of freight trucks waiting to turn into the port and increased walking and cycling will contribute to a reduction in carbon emissions.	$0	-$1,589,550
Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.						
Inclusive access						
12.1 Impact on Te Ao Māori	12.1.1 Te Ao Māori	Nagi Tukairangi and Ngati Kuku do not currently support the proposed development of the Mount Industrial Area, as per Mount to	NA	Totara St. However, Ngāi Tukairangi opposes parking pricing, grade separation, rationalise local access. Ngāti Kuku are opposed to grade seperation of any form. Ngāi Tukairangi are supportive on the basis that a full CBA has been carried out to demonstrate the	NA	NA
10.1 Impact on user experience of the transport system	10.1.6 People - throughput	Sum of four corridors is approximately 16,000 people per hour	NA	Increase to people throughput capacity overall. By reducing congestion and improving traffic flow along Hewletts Road and Totara Street, more people and goods will be able to move through the same area during a given period of time. This is likely to be most beneficial during peak demand periods. Sum of the four corridors is estimated to be approximately 21,000 people per hour, and increase of up to 34% in comparison to the Do Min.	NA	NA
10.1 Impact on user experience of the transport system	10.1.9 Travel time	Reliable travel times are a key concern for local resient and businesses.	The expected increase in population and economic growth will exacerbate poor travel time due to increasing competing journeys with limited route choice.	Between 40-50% travel time savings for trips along Hewletts Road and Totara Street for general traffic and freight in the AM and PM peaks by 2048	$0	$275,676,709
10.2 Impact on mode choice	10.2.1 People - mode share	**Journey to work in Tauranga (Census 2018):** 80% car 13% work from home 5% walk and cycle 2% use Public Transport **Journey to work in Mount Maunganui (Census 2018):** 85% car 14% walk and cycle 1% use Public Transport	The network changes and improvements in the Do Min does not make public transport and active mode attractive enough to cater for mode shift.	Travel time along key routes shows similar improvements for both buses and general vehicles, with very little difference between buses and general vehicle. Likely relating to no bus lane provision across the study area.	NA	$19,722,601
Please copy the row above to add an additional benefit or measure, and delete rows as appropriate.						

Rationale for option selection decision

Based on the technical analysis undertaken to date, and through the development of this IBC, a grade separated solution is the recommended treatment to address the issues identified at the intersection of Hewletts Road and Tōtara Street. By separating this major movement conflict point, pressure is reduced at the intersection resulting in improved access for journeys to and from the port, as well as travel time efficiencies for freight. This option performs effectively against most investment criteria with significant benefits associated with the health and wellbeing of walking and cycling improvements.

SH2 / Hewletts Road IBC

Environmental Screen– Contract No 5909

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Revision: B
24 November 2022

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Current revision		**B**				

Approval			
Author signature		Approver signature	
Name	Harriet McKee	Name	Erica Walker
Title	Associate, Environment and Planning	Title	Associate, Integrated Transport and Mobility

Project number 521716 **File** P521716_SH2 Hewletts Road IBC_Environmental Screen.docx 2022-05-09 Revision B

Contents

Appendices

Figures

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1 Introduction

This purpose of this report is to provide an environmental screen outlining the Resource Management Act (RMA) 1991 national, regional and district documents that are necessary to consider for the Hewletts Road IBC Project (the project).

The purpose of this Indicative Business Case (IBC) is to improve the SH2 / Hewletts Road and adjacent local transport system to:

- Support the implementation of the Urban Form + Transport Initiative (UFTI) Connected Centres Programme Business Case (PBC); and to
- Enable safe access to economic, education, and social opportunities within Tauranga and the western Bay of Plenty.

This IBC forms part of a wider package of works which is one of a number of business cases being prepared for the region, including the Turret Road / 15th Avenue / Welcome Bay Road SSBC, Cameron Road Business Cases (Stage 2[1]), the Public Transport Services and Infrastructure Business Case and Tauriko West Connections (SH29/SH29A) Business Case.

This report includes an assessment of the following:

- Tauranga City Plan (TCP);
- Bay of Plenty Regional Council Regional Natural Resources Plan (RNRP);
- Heritage New Zealand Pouhere Taonga Act;
- National Environmental Standards for Fresh Water (NES-FW);
- National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (NES-CS).

State Highway 2 (SH2) / Hewletts Road is a nationally strategic corridor, with multiple and competing functions including providing access to Mount Maunganui, Papamoa, and eastern communities within Western Bay of Plenty (WBOP); providing access to several community facilities such as Mauao, beaches and sport and recreational facilities; and providing freight access to the Mount Maunganui side of the Port of Tauranga and the Mount Maunganui industrial area.

With significant traffic volumes using SH2 / Hewlett Road and further growth expecting in the eastern corridor, it is now critical that a suite of interventions be identified to support a reliable and improved multi-modal journey experience that maintains the effective operation of SH2 / Hewlett Road now and the wider Western Bay of Plenty (WBOP) transport system, now and into the future (2048)[2].

The purpose of this Indicative Business Case (IBC) is to improve the SH2 / Hewletts Road and adjacent local transport system to:

- support the implementation of the Urban Form and Transport Initiative (UFTI) Connected Centres programme and the corresponding resulting Transport System Plan (TSP); and to
- enable access to economic, education, and social opportunities within Tauranga and the western Bay of Plenty.

The IBC forms part of a wider package of works which is one of three business cases being prepared for the region, the other two being the Turret Road / 15th Avenue / Welcome Bay Road SSBC and Tauriko West Connections (SH29/SH29A) Business Case.

The project scope is to prepare and deliver an IBC identifying a recommended package of interventions for the SH2 / Hewletts Road corridor and surrounding local transport system which addresses the identified

[1] The Cameron Road Stage 2 Business Case (from 17th Avenue to Pyes Pa, excluding Barkes Corner) is currently underway scheduled for finalisation at the end of 2022. It follows construction commencing for Stage 1 (https://www.tauranga.govt.nz/exploring/transportation-and-roads/transportation-projects/building-our-future-cameron-road-te-papa).

[2] The Highway model used for this IBC comprises a 2018 base, with 2031 and 2048 as the future years.

problems, delivers on the desired transport outcomes and gives effect to the UFTI Objective and Connected Centres Programme.

Modelling analysis undertaken for the TSP indicates that adding additional capacity within the Hewletts Rd corridor would require additional capacity to the SH2 harbour crossing and other aspects of the SH2 corridor. Additional capacity on the SH2 harbour crossing is not in the scope for the Hewletts Rd business case/ investigation.

The geographical scope for this IBC is shown in Figure 1-1. It includes the SH2 / Hewletts Road corridor and the adjacent Mount Maunganui local road network. In terms of roads, this includes:

- SH2 from the SH2 / Tauranga Bridge Marine intersection to SH2 / Northern boundary of the Link Avenue Reserve;
- SH2 / Maunganui Road to Manganui Road / Rata Street; and
- Rata Street / Tasman Quay to the end of Tasman Quay.

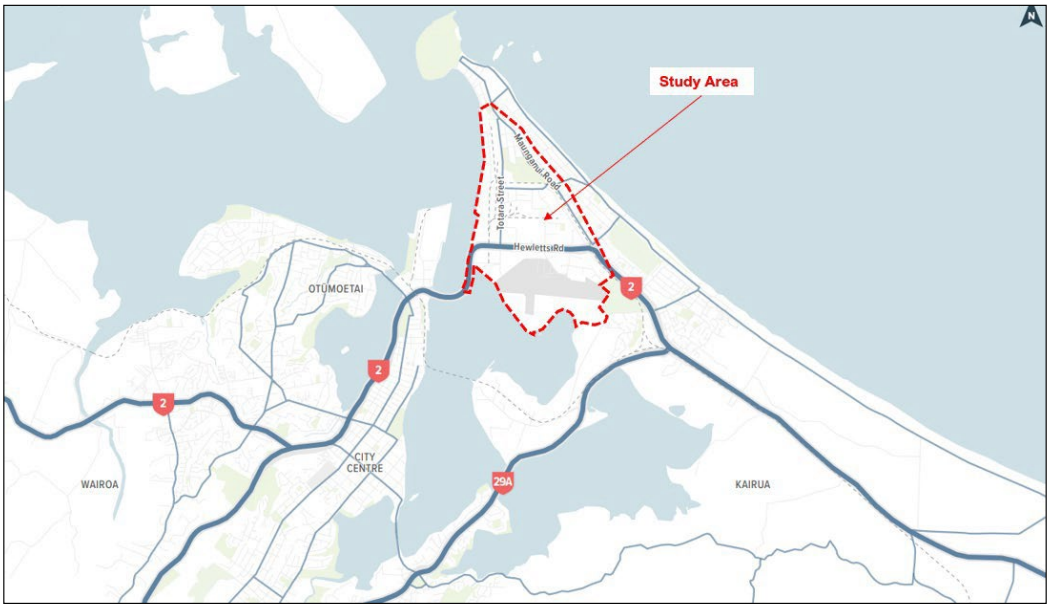

Figure 1-1: Geographical Scope of the Hewletts Road IBC

SH2/Hewletts Rd is a nationally strategic corridor and one of three current routes available between the two sides of the Tauranga Harbour (the other two being 15th Avenue / Turret Road and SH29A). The corridor has multiple and often competing functions, including:

- Providing access to Mount Maunganui, Papamoa, and eastern communities within WBOP;
- Providing access to several community facilities such as sport and recreational facilities; and
- Providing freight access to the Mount Maunganui side of the Port of Tauranga and the Mount Maunganui industrial area which also includes the airport and other key commercial activities such as building supply sites;
- Hewletts Road is well known as a pinch point in the local traffic network, identified as a location where people driving across the city or through the region are likely to get stuck (Figure 1-2).

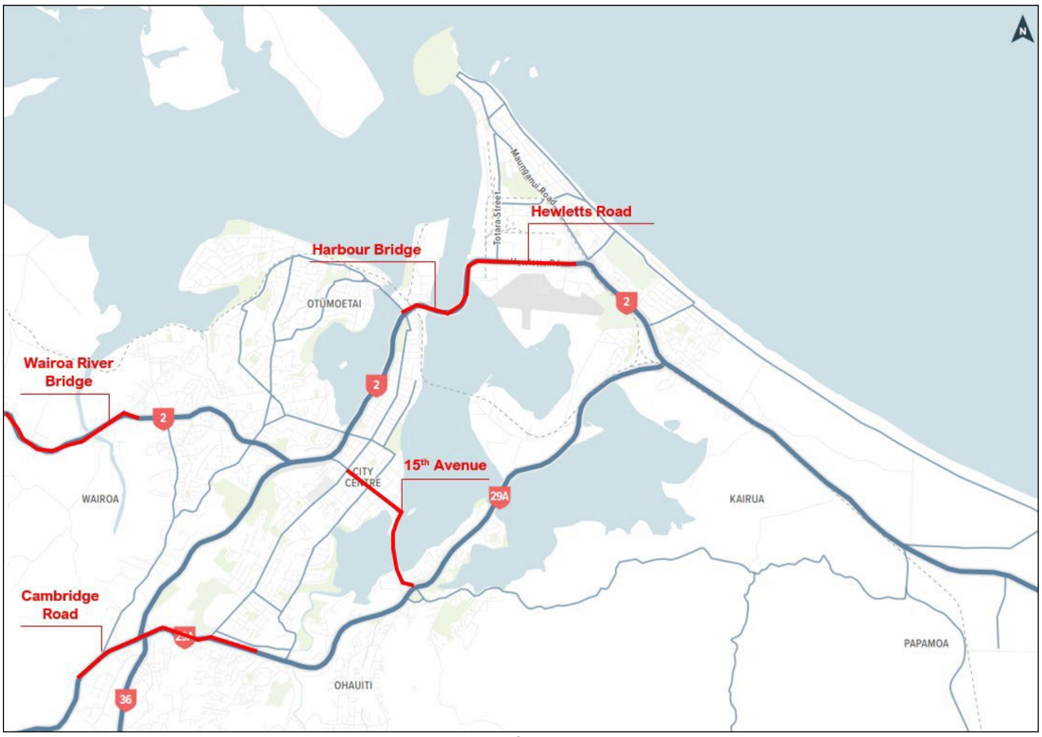

Figure 1-2. Pinch Points in the Tauranga City Traffic Network[3]

With significant traffic volumes (~24k (2019) annual average daily traffic (AADT) before Totara Rd, and ~17k AADT near Jean Batten Dr in each direction, approximately 9-12% heavy commercial vehicle share)[4] using Hewletts Rd and further growth expected in the eastern corridor (the SmartGrowth endorsed UFTI Connected Centres programme estimates a further 40,000 plus dwellings), identifying the interventions to support a reliable and multi-modal journey experience is critical to maintaining the effective operation of Hewletts Rd and the WBOP transport system.

If Hewletts Rd is unable to appropriately support the functions planned for in the Connected Centres programme and confirmed via the (TSP), additional demand will be applied to Turret Rd/15th Ave and SH29A which also provide access between the two sides of the harbour.

The study area and surrounding environment includes the following features/aspect/landmarks (refer to Figure 1-3 for their location):

- 1. Mt Maunganui communities – The Mount Maunganui residential suburb is one of the largest suburbs in Tauranga.
- 2. Port and freight – The Port, Quayside, and surrounding industrial area is a key area of freight traffic. It is also a key contributor to the local and national economy, with plans to expand operations.
- 3. CBD connection – Te Awanui Drive provides the connection between the Tauranga CBD and Hewletts Road / Mt Maunganui beach area.
- 4. SH2 – SH2 runs north–south through eastern parts of the North Island of New Zealand from the outskirts of Auckland to Wellington. It runs through Tauranga (skirting the outskirts of the Tauranga Harbour along Takimu Drive, Te Awanui Drive before travelling along Hewletts Road and connecting to Maunganui Road.

[3] https://www.tauranga.govt.nz/Portals/0/data/future/growth/files/transport-system-plan-executive-summary.pdf p.12
[4] https://maphub.nzta.govt.nz/public/?appid=31305d4c1c794c1188a87da0d3e85d04

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- 5. Airport and industrial land uses – The Tauranga Airport is a key strategic asset for Tauranga and is the eight busiest airport in the country[5] . Surrounding the airport is an area of industrial land use.
- 6. Whareroa Marae – Whareroa marae is located just across the harbour from Tauranga in Mount Maunganui and is the primary hapū for the marae are Ngāi Tukairangi and Ngāti Kuku of Ngāi Te Rangi. The marae was the central hub of Ngāi Tukairangi prior to the development of the area and its subsequent industrialisation. Whareroa was renowned for its size and prominence as one of the biggest communities in the late 1800s, and at one time a majestic native school was nestled within the community. Whareroa marae is affected by environmental issues as a result of the mixture of residential and heavy industrial activities.
- 7. Sport, recreation and community facilities – Mauao, Pilot Bay and Mt Maunganui beach are key recreational destinations for locals and tourists. In addition, the Mount Maunganui Sports Centre, Blake Park (used for cricket, hockey, rugby, sevens and touch), the Mount Maunganui Community Centre, Mount Drury Reserve and Mount Mauao Reserve are just some of the sport, recreation and community facilities located within the study area.
- 8. Retail and Nightlife – the Mount Maunganui retail area and night life location is a destination within the study area.
- 9. Schools – Several schools are located within Mount Maunganui including Mount Maunganui Primary School (13 Orkney Road), Mount Maunganui Intermediate School (21 Lodge Avenue) and Mount Maunganui College (565 Maunganui Road).

Figure 1-3. Key Features of the Study Area and Surrounding Environment

[5] https://airport.tauranga.govt.nz/about-us

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2 Statutory Context

All roads included within this proposal are located within Tauranga City and are subject to the Tauranga City Plan (TCP). A full assessment of the TCP and the relevant zone, overlays and features has been undertaken for each section, as detailed below.

The TCP is currently subject to the following plan changes, which are relevant to the project study area:

- Plan Change 20 (PPC27) – flooding from intense rainfall; and
- Plan Change 30 (PPC30) – earthworks.

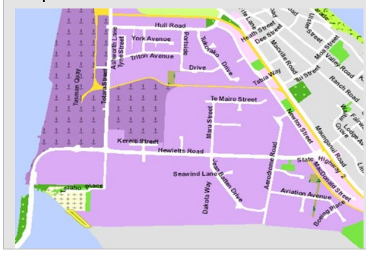
PPC27 has been notified, and due to its impact on the water resource, the plan change has immediate legal effect. Many of the roads subject to this environmental screen are identified as containing a Floodplains, Flood Hazard Area, and Major/Minor Overland Flowpaths whereby consideration against the relevant rules under Chapter 8D of the TCP is required. The rules under Chapter 8D restrict activities within identified Floodplains, Flood Hazard Area, and Major/Minor Overland Flowpaths. PPC27 has been appealed to the Environment Court by approximately four parties, both in part, and as a whole.

In terms of PPC30, a decision was made by the panel of independent Hearings Commissioners on 14 March 2022, and it is understood the plan change has now become operative following the conclusion of the appeals period. Consideration against Chapter 4C of the TCP is required, which relates to earthworks within identified Floodplains, Flood Hazard Area, and Major/Minor Overland Flowpaths.

The following sections set out the planning context for each site with respect to the TCP.

2.1 Hewletts Road

2.1.1 Zoning

Location in comparison to Hewletts Road	Zone
North and south – Eight roads	Road
North and south	Industry
North-West - 'Tasman Quay'	Port Industry
North - adjoining to the eastern end of Hewletts Road	Rail
North	Green Belt
South	Urban Marae Community
Adjoining to Hewletts Road, and approximately four parcels of land to the north and south.	Passive Open Space
South	Active Open Space
South	Conservation
Map 	

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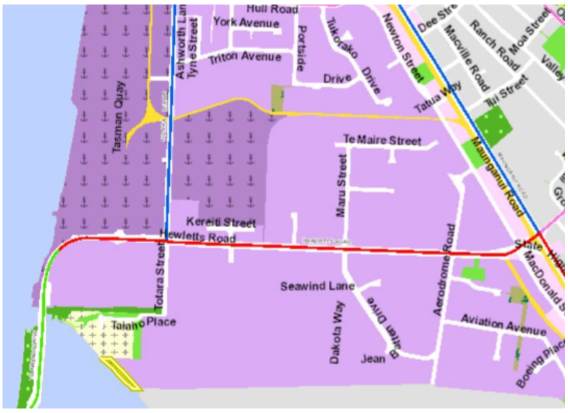
2.1.2 Overlays

Section 4 – General Rules	
Overlay	**Map**
Road Hierarchy ■ Hewletts Road – Primary Arterial ■ Maunganui Road – Secondary Arterial ■ Highway 2 – Primary arterial ■ Te Awanui Drive – Expressway Motorway ■ Totara Street - Secondary Arterial ■ All other roads – Local	
Limited Access Road Hewletts Road is a Limited Access Road.	
Iwi / Hapu The applicable Iwi / Hapu within the vicinity of Hewletts Road is Ngati Kuku and Ngai Tukairangi.	

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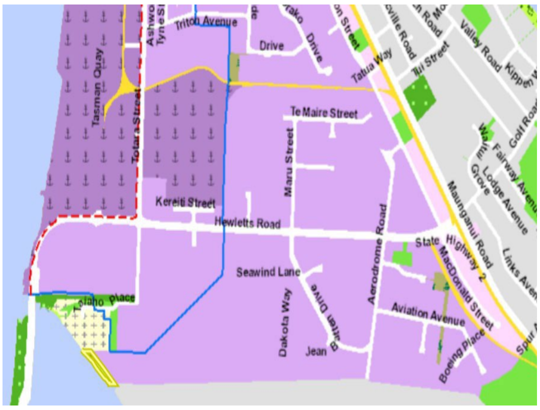
Section 5 – Natural Environment	
Overlay	**Map**
Airport Heights Slope and Surface The Airport Slope and Surface markers overlay Hewletts Road.	
Port Noise Control Boundary ■ 55dBA boundary (red) is located north-west of Hewletts Road and adjoins to the western end of Hewletts Road. ■ 65dBA boundary (blue) travels over Hewletts Road and includes approximately half of Hewletts Road within the boundary.	

Section 6 – Natural Features and Landscapes	
Overlay	**Map**
Viewshaft Protection Areas ■ Two viewshaft protection areas travel through Hewletts Road. ■ The numbers range from 0 to 20 within close proximity to the road.	

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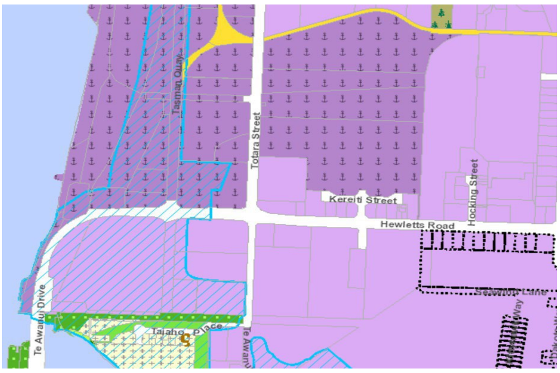
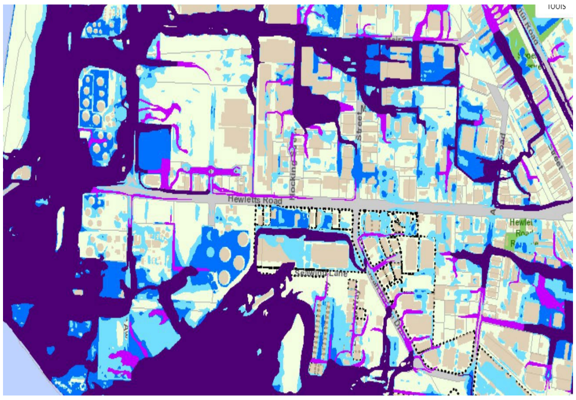
Section 7 - Heritage	
Overlay	**Map**
A single heritage site is noted between Aerodrome Road and Jean Batten Drive acknowledged as 'U14_3236' Destroyed Site (Midden).	

Section 8 – Natural Hazards	
Overlay	**Map**
Flood Hazard A flood hazard area is located within the western portion of Hewletts Road which adjoins to the harbour.	
Overland Flowpath A major overland Flowpath (dark purple) encroaches onto the western portion of Hewletts Road and overlays a majority of the surrounding land to the north and south. Minor overland flowpaths (light purple) is seen extending off the major overland Flowpath surrounding Hewletts Road. In terms of the road itself, major and minor overland flowpaths are dominant.	
Flood Prone Area Depth >300mm flood prone areas (dark blue) and Depth 100-300mm flood prone areas (light blue) surround Hewletts Road.	

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Section 13 – Open Space	
Overlay	**Map**
There are a number of reserves within close proximity to Hewletts Road, comprising: ▪ Whareroa Reserve ▪ Aviation Avenue Reserve ▪ Soper Reserve ▪ Portside Drive Drainage Reserve ▪ Tukorako Drive Stormwater Pond Hewletts Road reserve also adjoins to the eastern portion of Hewletts Road.	

2.1.3 Zoning

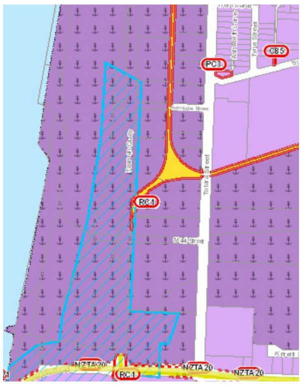
Location in comparison to Maunganui Road	Zone
Nine Roads adjoin to Totara Street (also within the Road Zone) predominantly to the east and west.	Road
Land along the western length of Totara Street.	Rail
Approximately 120m along the western length of Totara Street, known as Tasman Quay.	Port industrial
East-west of Totara Street.	Industrial
East-west of Totara Street.	Active Open Space (Major)
West of Totara Street.	Active Open Space (Major)
West of Totara Street.	Industrial
West of Totara Street.	Commercial Business
North of Totara Street	Commercial Business
Approximately 130m east of Totara Street.	High Density Urban Residential
Map	

2.1.4 Overlays

Section 4 – General Rules	
Overlay	**Map**
Road Hierarchy Totara Street is a Secondary Arterial Road. The northern intersection of Totara Street adjoins to Rata Street which is also Secondary Arterial. The southern intersection of Totara Street adjoins to Hewletts Road which is a Primary Arterial Road. The central portion of Totara Street adjoins to Hull Road to the east which is a Collector Road. All other connecting roads are considered to be local roads under the Tauranga City Plan.	
Iwi / Hapu The applicable Iwi / Hapu within the vicinity of Hewletts Road is Ngati Kuku and Ngai Tukairangi.	

Section 6 – Natural Features and Landscapes	
Overlay	**Map**
Viewshaft Protection Areas Viewshaft protection areas travel through Totara Street. The number range varies considerably.	

Section 7 - Heritage	
Overlay	**Map**
A single heritage site, which has been destroyed is located between Aerodrome Road and Jean Batten Drive, acknowledged as 'U14_3236' (Midden).	

Section 8 – Natural Hazards	
Overlay	**Map**
Flood Hazard A flood hazard area is located near the southern portion of Totara Street. Additionally, a small portion of the northern end of Totara Street is within the flood hazard area.	

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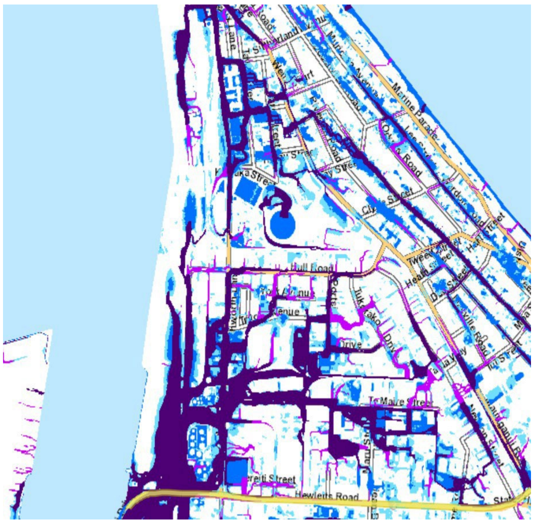
Overland Flowpath A major overland Flowpath (dark purple) covers a majority of Totara Street, with a small section near Hull Road being free of the flowpath. Minor overland flowpaths (light purple) are seen extending off the major overland Flowpath surrounding Totara Street. In terms of the road itself, major and minor overland flowpaths are dominant.	
Flood Prone Area Depth >300mm flood prone areas (dark blue) and Depth 100-300mm flood prone areas (light blue) surround Totara Street.	

Section 13 – Open Space	
Overlay	**Map**
Totara Street adjoins to Blake Park to the east.	

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2.1.5 Zoning

Location in comparison to Maunganui Road	Zone
Within the identified portion, 6 roads adjoin to Maunganui Road (also within the Road Zone) to the east.	Road
Land adjoining to the east of Maunganui road	Predominantly Suburban Residential
Park adjoining to the east of Maunganui Road	Active Open Space
Land adjoining to the northern portion of Maunganui Road	Commercial Business Active Open Space
Land adjoining to the west of Maunganui Road	Rail
Land to the west of Maunganui Road	Commercial Business Passive Open Space
Map	

2.1.6 Overlays

Section 4 – General Rules	
Overlay	**Map**
Road Hierarchy Maunganui Road is a Secondary Arterial Road. The northern intersection of Maunganui Road adjoins to Rata Street which is also Secondary Arterial. The southern intersection of Maunganui Road adjoins to Hewletts Road which is a Primary Arterial Road. The central portion of Maunganui Road adjoins to Hull Road to the east which is a Collector Road. All other connecting roads are considered to be local roads under the Tauranga City Plan.	
Iwi / Hapu The applicable Iwi / Hapu within the vicinity of Hewletts Road is Ngati Kuku and Ngai Tukairangi.	

Section 6 – Natural Features and Landscapes	
Overlay	**Map**
Viewshaft Protection Areas Viewshaft protection areas travel through Maunganui Road. The number range varies considerably.	

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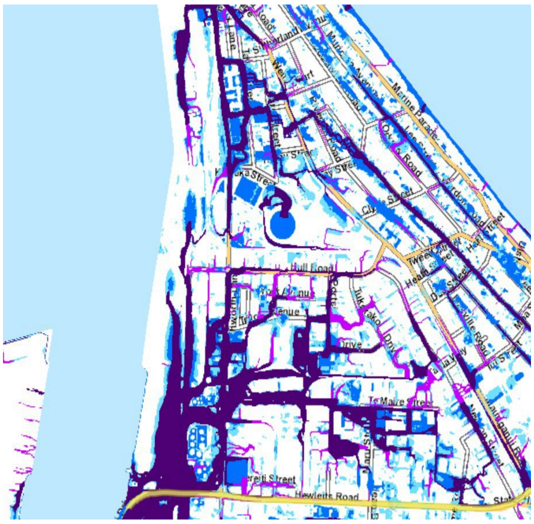
Section 7 - Heritage	
Overlay	**Map**
There are three notable trees along Manganui Road which may be within the works area: ▪ #223, #224 and #225 – L17 – Norfolk Island Pine, Araucaria heterophylla	

Section 8 – Natural Hazards	
Overlay	**Map**
Flood Hazard A Flood Hazard Area is located at the northern end of Totara Street is within the flood hazard area.	
Overland Flowpath A major overland Flowpath (dark purple) covers a majority of Totara Street, with a small section near Hull Road being free of the flowpath. Minor overland flowpaths (light purple) are seen extending off the major overland Flowpath surrounding Totara Street. In terms of the road itself, major and minor overland flowpaths are dominant.	
Flood Prone Area Depth >300mm flood prone areas (dark blue) and Depth 100-300mm flood prone areas (light blue) surround Totara Street.	

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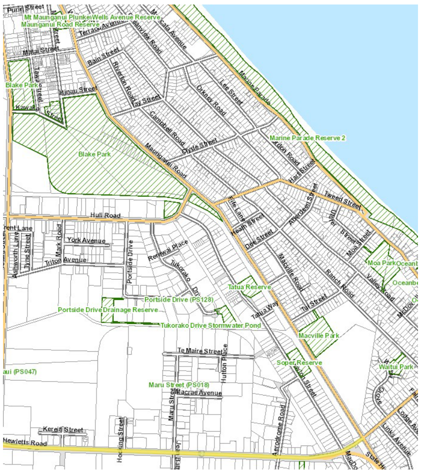
Section 13 – Open Space	
Overlay	**Map**
Maunganui Road adjoins to the following parks and open space: ▪ Macville Park ▪ Soper Reserve ▪ Tatua Reserve ▪ Blake Park ▪ Mt Maunganui Plunket ▪ Maunganui Road Reserve ▪ Wells Avenue Reserve	

Designation Reference	Purpose	Location	Duration	RC Reference
NZTA 20	Road for the purpose of access to a State Highway – corner splays	Hewletts Road / Maru Street, Hewletts /Aerodrome Roads, Tasman Quay / Hewletts Road, Totara Street / Hewletts Road	Term of Plan	RC12074 (attached at Appendix B)
NZTA 26	Road purposes: Road as State Highway including planning, design, research, supervision, operation and maintenance and including the control of property access relating to all land within the State Highway designation in accordance with the Government Road Powers Act.	Stub Road (off Hewletts Road) State Highway 29 LOT 2 DPS 17288 Pt SEC 70 BLK Vii Tga SD	Term of Plan	RC12597 (attached at Appendix B)
RC 1	Railway purposes	Tauranga District – Mount Maunganui Branch Railway	Term of Plan	No reference

NZTA 1	Road purposes: Road as State Highway including planning, design, research, supervision, operation and maintenance, and including the control of property access relating to all land within the State Highway designation in accordance with the Government Road Powers Act	State Highway 2 including Harbour Link, Hewletts Road and Maunganui Road State Highway 2A State Highway 29 State Highway 29 Hewletts Road and Maunganui Road State Highway 36	Term of Plan	Term of Plan (Refer RC 14355 for SH2A)

Maunganui Road is subject to the following designations:

Designation Reference	Purpose	Location	Duration	RC Reference
NZTA 12	Road purposes: proposed Maunganui Road widening	Mount Maunganui Branch Railway	Term of Plan	No reference
ME11	Secondary school, accommodation and education facilities	565 Maunganui Road PT LOT 2 DP 31875	Term of Plan	RC12611 (Alteration to Designation)
ME14	Primary school and education facilities	22 Tui Street LOT205 DPS 904, LOT 206 DPS 904, and LOT 232 DPS 904	Term of Plan	RC12611 (Alteration to Designation)
RC 1	Railway purposes	Tauranga District – Mount Maunganui Branch Railway	Term of Plan	No reference

Totara Street is not affected by any designations other than where RC 1 crosses at two points over the road.

2.1.7 Zoning/Overlay Summary

The road improvement corridors outlined within the scope of this environmental screen are subject to a number of overlays and other matters under the TCP that have the potential to affect the proposed design and may trigger the need for resource consent.

As outlined above, many of the sites are subject to the Flood Prone Area, Flood Hazard Area, and Major/Minor Overland Flowpaths as a result of Plan Change 27 (Flooding in Intense Rainfall). There is the potential for consent being required for earthworks within the extent of the identified overlays, which may trigger resource consent under Chapter 4C of the TCP. As identified above, due to the nature of nature of the road reserve and adjacent activities, the road is potentially considered as contaminated land under the TCP. Therefore, for any land disturbance on contaminated land, consent may be required under Chapter 4C of the TCP as a Restricted Discretionary Activity. Additional technical assessments in the form of a PSI or DSI will be required to confirm whether or not consent will be required.

In terms of the potential construction noise, consideration against Chapter 4E (Noise Provision) will be required, in particular, confirmation of compliance or non-compliance with NZS 6803: 1999 Acoustics

Construction Noise. Should the permitted noise levels be exceeded, consent may be required as a Restricted Discretionary Activity.

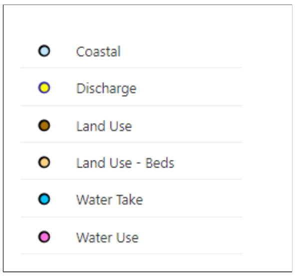
With regards to the identified notable trees, any earthworks and the laying or forming of impervious surface which would impact the identified notable trees along Manganui Road will require consent as a Restricted Discretionary Activity under Chapter 6B of the TCP. Special consideration will be required in terms of the methodology to minimise any potential effects on the around the identified notable trees.

Due to the location of the proposed works, an assessment against the relevant Bay of Plenty Regional Council plans is required, in particular the Regional Natural Resources Plan (RNRP) and the Regional Coastal Environment Plan (RCEP).

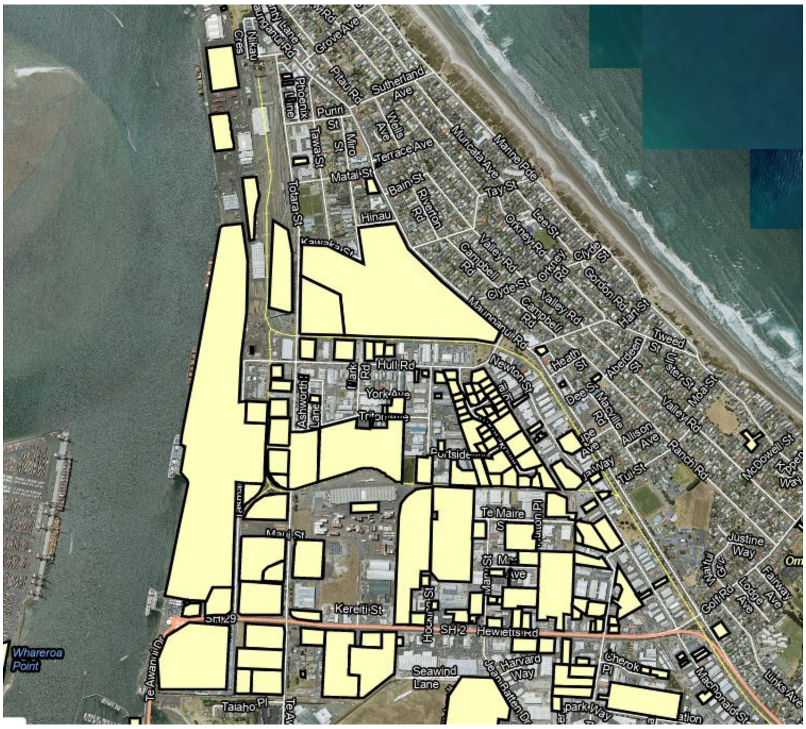
2.1.8 Current consents in the surrounding area

There are several Regional consents which have been identified within the vicinity of the project area, comprising:

- Coastal
- Discharge
- Land Use
- Water Take



Much of the project area is covered in HAIL sites for activities such as landfill, bulk storage tanks, chemical manufacturing storage, and industrial workshops, which are identified in yellow on the plan below:



3 Air Quality

3.1 Airshed in Mount Maunganui

There are 74 airsheds within New Zealand, these are otherwise known as legally designated air quality management areas. In the Bay of Plenty region there is one collective airshed, which is separated into two separate airshed areas for Rotorua and Mount Maunganui. At present, the Mount Maunganui airshed which applies to this project has a poor air quality record. A large area of the project area is within the Mount Maunganui Airshed area. The boundary includes Totara Street and Hewletts Road and excludes Maunganui Road.

The National Environmental Standards for Air Quality (NES-AQ) legally describes the air quality within this area to be polluted. The dominant issue within this specific airshed relates to airborne particulate matter (APM). The APM is specifically smaller than 10 millionths of a metre (PM10). It is considered that this pollution is dominantly caused by industrial discharges occurring in the within the port.

3.2 Purpose of airshed overlay

Bay of Plenty Regional Council monitoring has shown that the dust which settles in these areas is made up of the following natural and man-made substances:

- Sea spray and soil particles;
- Industrial activities – fertiliser and concrete manufacturers and dry bulk material distributes; and
- Vehicles – emissions from shipping or rail, and exhaust, tyre and brake wear.

The purpose of creating the airshed around the Mount Maunganui area is to ensure Bay of Plenty Regional Council can manage issues. To do this, rules have been tightened therefore making resource consents within the area more difficult to obtain. Overall, this means that new consent applications in which discharge PM10 will not be granted if they are likely to increase offside PM10 concentrations.[6]

3.3 Regional Air Plan / Plan Change 13

Plan Change 13 (Air Quality) has replaced the Regional Air Plan. The Plan Change was proposed to enable Bay of Plenty Regional Council to create controls around some activities within the airshed, through the Regional Air Plan and the consenting process. However, it must be noted that vehicle movements, shipping movements, and freight movements (logging transport) are permitted activities.[7]

Most of the provisions of Plan Change 13 (Air Quality) are now beyond appeal and must be treated as operative. AQ R22 Handling of bulk solid materials – Discretionary – (tba) – Ka whiriwhirihia remains under appeal. Rules and restrictions in Plan Change 13 predominantly relate to the following:

- Agrichemical spraying;
- Fumigation;
- Open Burning;
- Soil fuel burners.

From a review of Plan Change 13 with respect to the project, it is unlikely that any specific rules will be triggered beyond the boundaries of the road corridors. Specific dust control measures and management plans will need to be imposed and will be carefully monitored by Council during any earthworks.

[6] https://www.boprc.govt.nz/environment/air/airshed
[7] https://www.boprc.govt.nz/our-projects/mount-maunganui-industrial-air-quality

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4 Stormwater

The following table outlines the existing comprehensive stormwater consents and catchment management plans which are in place and will need to be addressed during any consenting process for Hewletts Road.

Table 4-1: Stormwater Consents and Management Plans

Stormwater Infrastructure	
Information	**Summary**
Stormwater Catchment Management Plan 66823 2013-11-01 BECA - Stormwater Catchment Management Plan - Module 4 Mount Industrial and Sulphur Point Catchment (CSC1)#2.pdf	The Mount Industrial and Sulphur Point stormwater infrastructure is regionally significant and must be managed efficiently and effectively in order to maintain the productive economic value of the key industrial area for the Bat of Plenty Region. Primary issue in the catchment is flooding. **CSC1** (as shown within the District Plan designation overlay) is represented by sub-catchments that are low lying with a high-water table and a large part of the stormwater network is subject to tidal influences. Mount Industrial area and Sulphur Point catchment is effectively fully developed and there is little room for large treatment devices.
Comprehensive Stormwater Consent – Aerodrome RC 66823 TCC Comprehensive Stormwater Consent.pdf	**Extracted from consent:** ▪ In 2012, Tauranga City Council obtained resource consent from Bay of Plenty Regional Council for the discharge of stormwater, works on freshwater structures, and works on coastal structures for a term of 35 years (expiring 2047) (Appendix D). ▪ The regional consent covered the Mount Industrial and Sulphur Point Catchment and its receiving environment, and specifically the Aerodrome Road (25) sub-catchment area including the area subject to this resource consent application. ▪ The stormwater consent noted that the sub-catchment contains a number of potentially contaminating activities that could result in potential stormwater contamination, for example old oil, battery fluid, hazardous substances, and discharge of paint residue and metal filings. Under the Stormwater Catchment Management Plan (SCMP), the Aerodrome Road sub-catchment area has recorded probable freshwater and marine quality issues. ▪ To address this, the management plan outlines a number of Stormwater Catchment Management Concepts. In particular, a comprehensive stormwater quality management and enforcement programme was required with a focus on improving stormwater discharge quality from the catchment. This would be achieved through the requirement of private and public sites to implement treatment, and/or change management procedures to reduce potential for pollution. ▪ Should consent be granted for the proposed treatment device, this will be included in the SCMP's

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	schedule of consents and schedule of outlets for future monitoring purposes. Purpose of the consent: ▪ Authorising the discharge of stormwater from the Tauranga City Council stormwater network. ▪ Authorise associated activities such as the use, maintenance and reconstruction of structures (in streams, rivers and the CMA) and authorise the damming of water. ▪ Authorise additional stormwater discharges and structures over and above the existing network at the time of granting this consent.

5 Other Legislation and Policy Documents

National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health regulations (NES-CS)

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health regulations (NES-CS) applies to any activity described in Regulation 5 subclauses (2) to (6) which is proposed to occur within land classified as a Piece of Land by Regulation 5 subclauses (7) or (8). Based on the current and past use of the sites, they contain activities included on the Hazardous Activities and Industries List (HAIL) and therefore meet the classification as a piece of land and therefore are subject to the NES-CS.

Under Regulation 8 of the NES-CS, the disturbance of soils on a piece of land is a permitted activity subject to compliance with (a)-(g). Of note, to be a permitted activity the volume of disturbance of the soil on the piece of land must be no more than 25m3 per 500m2 as per Regulation 8(3)(c). To confirm compliance with this regulation, the total level of earthworks for each site will be required.

Should the proposed works exceed the permitted level of disturbance on a piece of land, consent may be required as either a Controlled Activity (Regulation 9(1)) or a Restricted Discretionary Activity (Regulation 10).

National Environmental Standards for Freshwater (NES-FW)

The National Environmental Standards for Freshwater (NES-FW) applies to new structures (including culverts) and reclamations within the beds of streams, rivers and lakes and earthworks, vegetation clearance or the taking, use, diversion, damming and/or discharge of water within, or within 100m of, natural wetlands. There are no identified wetlands located within a 100m buffer of the corridor extent. Whilst it is not anticipated that works will be undertaken within 100m of the identified wetlands, it is worth noting that if the scope of the works is to change, or additional wetlands are identified within the corridor extent, an assessment against the NES-FW will be required.

Vegetation clearance, earthworks and land disturbance within a 10m setback from a natural wetland for the construction of specified infrastructure is a Discretionary Activity. Additionally, the taking, use, damming, diversion or discharge of water within, or within a 100m setback of a natural wetland is a Discretionary Activity for the purpose of constructing specified infrastructure.

Heritage New Zealand Pouhere Taonga Act 2014

There is a destroyed archaeological site located within the study area at the end of Harvard Way. There are no other archaeological features within 200m of the study area.

Whilst there have been no features identified within the road corridor itself, there is the potential that sites do exist and have not been recorded on TCC’s mapping database. A desktop assessment is recommended to be undertaken by a suitably qualified archaeologist to determine if a Archaeological Authority under the Heritage New Zealand Pouhere Taonga Act 2014 is required. Alternatively, based on the conclusions reached by that assessment, the use of Accidental Discovery Protocols (ADPs) may be considered appropriate.

National Policy Statement – Freshwater Management

The fundamental concept of the National Policy Statement for Freshwater Management (NPS-FM) is Te Mana o Te Wai. Te Mana o Te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. Objective 1 of the NPS-FM sets out a hierarchy of obligations. The hierarchy of obligations is as follows:

a. The health and well-being of water bodies and freshwater ecosystems

b. The health needs of people

c. The ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future

It is anticipated that with particular consideration of potential movement of contaminants, appropriate erosion and control measures will be provided for stormwater discharges arising from the works.

Hapū/Iwi Management Plan(s)

The relevant Iwi groups relevant to the project area Ngati Kuku and Ngai Tukairangi. Consultation with the relevant Iwi groups is required throughout the entire lifecycle of the project. Issues raised during consultation should be communicated readily to the project team to reinforce partnership with Iwi groups and co-design principles.

Land Transport Management Act 2003

Land Transport Management Act 2003 (LTMA) is the guiding legal framework for managing and funding of land transport activities in order to achieve an affordable, integrated, sage, responsive and sustainable land transport system. The LTA also provides for the Government Policy Statement on Land Transport 2021/22–2030/31.

Government Policy Statement on Land Transport 2021/22–2030/31

The Government Policy Statement on Land Transport 2021/22–2030/31 (GPS) guides Waka Kotahi's decision-making on transport funding over the next 10 years. The project seeks to improve freight movement, public transport and cycling infrastructure in a way which connects to the wider transport network. As such, the project is strongly consistent with the Transport Outcomes Framework of the GPS.

Bay of Plenty Regional Land Transport Plan 2018

The Bay of Plenty Regional Land Transport Plan 2021-2031 (RLTP) sets out the strategic direction for land transport in the BOP region over a 30-year period. The project is strongly consistent with all the Transport Objective Priorities identified by the RLTP.

Tauranga Cycling Plan 2018

A key focus of the Tauranga Cycle Plan 2018 is to make Tauranga safer and easier for people on bikes. The study area contains priority cycle routes identified by The Tauranga Cycle which prioritizes investment in cycling infrastructure. The project is considered to support the Tauranga Cycle Plan by prioritizing these routes for cycle infrastructure upgrades in a way which is integrated to the surrounding cycle projects.

Urban Form and Transport Initiative Final Report 2020

The Urban Form and Transport Initiative (UFTI) is a collaborative project led by SmartGrowth and Waka Kotahi which includes the Tauranga City Council. As discussed in Section 1, the project is being developed to support the implementation of the UFTI Connected Centres Programme Business Case (PBC). Hence, it is considered the project is strongly consistent with the Urban Form and Transport Initiative Final Report 2020.

Public Works Act 1981

The Public Works Act 1998 (PWA) authorises Waka Kotahi to acquire land from private landowners for public works. It is anticipated that the project will involve some partial and full acquisition to enable space for development. Some land may also be leased in order to facilitate construction activities.

6 Technical Assessments Required

This section outlines the potential technical assessments which may be required to support the future statutory applications for the proposed works. The key social and environmental issues of the proposed works are considered to relate to hydrology, contamination, construction noise and protection of notable trees.

The extent of the potential assessments outlined in Table 6-1 below will determine the level of assessment in which is required for each of the issues.

Table 6-1: Technical assessments required to support statutory approvals

Assessments Required	Notes
Archaeological	As acknowledged within Section 2.8, some archaeological sites may be located within the study area which have not been recorded. An archaeological assessment undertaken by a suitably qualified archaeologist will acknowledge potential effects arising from the proposed works and if an Archaeological Authority will be required.
Landscape and Visual Assessment	An assessment of landscape and visual effects may be required depending on the final design.
Construction Noise and Vibration Management Plan	Assessment to determine the environmental and social effects of construction noise and vibration, including recommending mitigation options.
Drawings Package	A resource consent application will require a drawings package outlining the technical details of the proposed works. These will need to include: ▪ Cut and fill earthworks plans ▪ Location and elevations of proposed flood lighting ▪ Drainage plan / servicing plans
Stormwater / Civil Engineering	An assessment of stormwater discharge effects from proposed impervious surfaces, including design consideration to stormwater quality matters.
Erosion and Sediment Control Plan	Technical report and detailed drawings outlining methodologies to be implemented during earthworks and construction to comply with TCC and BOPRC guidelines. The ESCP should also include measures relating to potential spills and dust management.
Construction Traffic Management Plan (CTMP)	A CTMP is likely required for the proposal to assess the traffic effects during construction.
Preliminary Site Investigation (PSI) / Detailed Site Investigation (DSI)	As acknowledged in Section 2.8, the road corridor is identified as potentially contaminated land due to the current use and adjacent site activities. Therefore, a PSI will be required to understand whether the soil disturbance as per the proposed works is likely to create potential effects on the environment and what level of consent is required under the NES-CS.
Cultural Values Assessment	A cultural values assessment may be required as determined by consultation with the relevant Iwi groups.

Traffic Assessment	A Traffic Assessment will be required and be supported by appropriate traffic modelling.
Stakeholder Engagement Plan	A Stakeholder Engagement Plan will be required, which should provide clear direction on the engagement approach for specific stakeholders and landowners.
Temporary Traffic Management Plan	A Temporary Traffic Management Plan may be required if proposed works will involve disturbances to normal traffic flow and road closures. The requirement of this plan should be confirmed in the Traffic Assessment.

7 Summary

This environmental screen has been prepared to outline the relevant planning requirements for the Hewletts Road IBC project. This environmental screen provides a high-level assessment of the statutory framework applicable to the project scope and identifies key factors that should be taken into account and guide the design of the project.

Based on a high-level review of the statutory environment and the project information provided to date, it anticipated that the likely planning approvals will include a combination of NoR’s for new designation(s) and/or alteration to existing designation NZTA 20, as well as various resource consents for matters pertaining to pertaining to land disturbance, stormwater discharge, contaminated land, works within identified floodplains, and works within the dripline of notable trees. An Outline Plan of Works will also be required prior to construction.

It is also advised that the consenting approach is tested with TCC and BOPRC as part of a consultation prior to lodgement of the NoR(s). This will help identify and minimise consenting risks at early stages, as well as confirm minimum information requirements and opportunities to streamline the consenting process.

As identified in Section 2.16, various technical assessments will be required to support resource consent applications for the project. Following the completion of detailed design, a comprehensive consenting strategy can be prepared which will detail the reasons for consent and any other consenting risks such as the potential for notification.

Appendix A

Waka Kotahi Environmental Screen Form

Environmental screen

The environmental screen is a deliverable required by *Z/19 Taumata taiao – environmental and sustainability standard* for all Waka Kotahi NZ Transport Agency projects and projects funded by the National Land Transport Fund. It applies regardless of project size; however, input is to be commensurate to the nature and effects of the project. The screen can be applied at a programme level (e.g. low cost, low risk) or project level. The purpose of the screen is to identify:

- environmental and sustainability opportunities and constraints
- inform option selection
- identify further technical assessments, and
- support other project workstreams (e.g. consenting and public engagement).

It shall be completed in the indicative business case and finalised in the detailed business case/single-stage business case by a suitably qualified and experienced professional. Outcomes of the screen are to be incorporated into the multi-criteria analysis assessment of options.

Waka Kotahi MapHub contains information layers to assist in its completion. Please contact your project lead for access. Contact environment@nzta.govt.nz for support.

PROJECT DETAILS

1. **Project location and name.** Include locality, state highway number, etc.

SH2/Hewletts Rd is a nationally strategic corridor and one of three current routes available between the two sides of the Tauranga Harbour (the other two being 15th Avenue / Turret Road and SH29A).

2. **Project description (summary).** Include project length, location and a description of works, eg. New 2km passing bay between Bays and Granite roads; New two-lane bridge over Waiau River including flood protection works.

SH2/Hewletts Road has multiple and often competing functions, including:

Providing access to Mount Maunganui, Papamoa, and eastern communities within WBOP;

Providing access to several community facilities such as sport and recreational facilities; and

Providing freight access to the Mount Maunganui side of the Port of Tauranga and the Mount Maunganui industrial area which also includes the airport and other key commercial activities such as building supply sites;

Hewletts Road is well known as a pinch point in the local traffic network, identified as a location where people driving across the city or through the region are likely to get stuck.

The purpose of this Indicative Business Case (IBC) is to improve the SH2 / Hewletts Road and adjacent local transport system to:

- support the implementation of the Urban Form and Transport Initiative (UFTI) Connected Centres programme and the corresponding resulting Transport System Plan (TSP); and to
- enable access to economic, education, and social opportunities within Tauranga and the western Bay of Plenty.

This IBC forms part of a wider package of works which is one of three business cases being prepared for the region, the other two being the Turret Road / 15th Avenue / Welcome Bay Road SSBC and Tauriko West Connections (SH29/SH29A) Business Case.

3. **Screen assessment scope.** Assessing multiple options together may be appropriate where options are similar in scale, effects and receiving environment.

   - [x] Single option
   - [ ] Multiple options

4. **Option description.** Describe option in detail. Where multiple options are assessed, highlight any key differences in options in terms of spatial extent, types of works proposed and receiving environment.

Not applicable at this stage.

5. **What business case stage is the screen being completed for?**
   - [x] Indicative business case (IBC)
   - [ ] Detailed business case (DBC)
   - [ ] Single-stage business case (SSBC)

LAND LIMITATIONS

6. **Are there any known or likely encumbrances on the land which could impact on the option?** Examples include conservation covenants (e.g. QEII covenants), Climate Change Response Act 2002, Reserves Act 1977 status, public access easements and other reserve/covenants. Refer MapHub Environment and Social Risk – Natural Environment map to identify areas protected by QEII covenants.

   - [ ] Yes. If yes, go to Question 7
   - [x] No. If no, go to Question 8

7. **If encumbrances are present, describe them and indicate if they restrict activities or require additional statutory processes to be followed in order to implement the option.**

8. **Are works proposed on land managed by the Department of Conservation (DoC) and/or Māori land?** Refer to MapHub Environment and Social Risk – Natural Environment map to identify DoC land and Māori Land Online for Māori land: https://www.maorilandonline.govt.nz/gis/map/search.htm.

   - [ ] Yes. If yes, go to Question 9
   - [x] No. If no, go to Question 10

9. **If the option impacts DoC-managed land, describe any additional legislative requirements to consider.** For example Wildlife Act 1953, National Parks Act 1980, Conservation Act 1987,

Biosecurity Act 1993. If option impacts Māori land contact the Property Team at Waka Kotahi.

Not Applicable

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10. **Are other legislative (existing or proposed) requirements triggered?** Examples include proposed national policy statements or environmental standards (eg indigenous biodiversity or highly productive soils), Treaty of Waitangi settlements, Marine and Coastal Area (Takutai Moana) Act 2011, and national environmental standards (NES) which are not included in the screen, eg. the National Environmental Standards for Electricity Transmission Activities.

- [ ] Yes. If yes, go to Question 11.
- [ ] No. If no, go to Question 12.

11. **Explain the effects on the option of the existing or proposed legislative requirements.**

NETWORK UTILITIES

12. **Are other infrastructure networks or facilities potentially impacted by the option?** Check district plans for designations.

- [x] Yes. Please identify network utility approvals required in final question.
- [ ] No.

NATURAL ENVIRONMENT

13. **Will the option potentially (directly or with works nearby) impact areas of known significance for biodiversity, or known habitats of uncommon or threatened species (including effects beyond the option footprint on ecosystem services)?** Threatened species and their ranking can be found here: https://www.doc.govt.nz/about-us/science-publications/conservation-publications/nz-threat-classification-system/ or consult your project ecologist.

- [ ] Yes. If yes, go to Question 14.
- [x] No. If no, go to Question 15.

14. **Describe the impacts on any biodiversity or known habitats of uncommon species and outline any opportunities for avoidance, enhancement and/or mitigation. Identify any wildlife permit requirements.**

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15. **Does the option impact (directly or with works nearby) on areas of known or potential indigenous mobile fauna habitat?** Examples of mobile fauna includes bats, seabirds (Hutton's shearwaters, Westland petrels), and mobile species that use habitats seasonally such as North Island New Zealand dotterel.

    ☐ Yes. If yes, go to Question 16.
    ☑ No. If no, go to Question 17.

16. **Describe the impacts on any mobile fauna habitats and outline any opportunities to avoid, remedy or mitigate effects or opportunities for enhancement. Identify any wildlife permit requirements.**

17. **Are there any outstanding or significant natural features or landscapes?** Review district and regional plans to identify natural features along with specific feature characteristics. Examples include outstanding natural features, landscapes and character, geological or geothermal landscapes.

    ☐ Yes. If yes, go to Question 18.
    ☑ No. If no, go to Question 19.

18. **Describe the impacts on any outstanding/significant natural features and landscapes and outline any opportunities to avoid, remedy or mitigate effects or opportunities for enhancement.**

19. **Is any indigenous or exotic vegetation removal required?** Land Cover Database (LCDB) classifications or MapHub Environment and Social Risk – Natural environment (land cover) can be used to make a primary assessment of vegetation type to describe the types of vegetation or landcover that may be directly affected.

    ☐ Yes. If yes, go to Question 20.
    ☑ No. If no, go to Question 21.

20. **Specify type and area of vegetation/landcover to be removed**

    ☐ Indigenous vegetation, including shrublands, grasslands and bush. A milling statement from Te Uru Rākau –New Zealand Forest Service may be required for native vegetation https://www.mpi.govt.nz/dmsdocument/53-Indigenous-forestry-milling-statement-Application-form. Specify m^2

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- [ ] Exotic vegetable, including shelter belts. Specify m²
- [ ] Forest land under the Emissions Trading Scheme (ETS). Refer to https://www.mpi.govt.nz/forestry/forestry-in-the-emissions-trading-scheme/forest-land-in-the-ets/. An ETS specialist may be required to assess compliance, determine any financial liability and/or consider off-set planting. Specify m²
- [ ] Wetlands. Specify m²

21. **Will the option affect the coastal marine area, wetlands, lakes, rivers, and/or streams (including water quality)?** Check definitions of each within the National Policy Statement for Freshwater Management, NES for Freshwater, relevant regional plan and the New Zealand Coastal Policy Statement.

- [ ] Yes. If yes, go to Question 22.
- [x] No. If no, go to Question 23.

22. **Describe the impacts on any coastal, wetland and other water habitats and outline any opportunities to avoid, remedy or mitigate effects or opportunities for enhancement. Provide area reference numbers (significant natural area (SNA) number, wetland name).**

23. **Will the option affect the ground water systems including aquifers?**

- [ ] Yes. If yes, go to Question 24.
- [ ] No. If no, go to Question 25.

24. **Describe the impacts on groundwater systems and outline any opportunities to avoid, remedy or mitigate effects or opportunities for enhancement.**

25. **Does the option require soil disturbance?**

- [x] Yes. If yes, go to Question 26.
- [ ] No. If no, go to Question 27.

26. **Describe any effects of construction generated sediment discharge on water and opportunities to avoid, remedy or mitigate effects or opportunities for enhancement.**

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27. **Does the option have the potential to impact fish passage or have opportunities to provide new fish passage?**

- ☐ Yes. If yes, go to Question 28.
- ☒ No. If no, go to Question 29.

28. **Describe opportunities to improve or create fish passage.**

29. **Does the option have the potential to affect drinking water?** Locate drinking water sources (including bores, drinking water protection zones, and surface water takes).

- ☐ Yes. If yes, go to Question 30.
- ☒ No. If no, go to Question 31.

30. **Describe methods to avoid or mitigate impacts on drinking water. Identify any opportunities to protect drinking water quality.**

31. **Are there any natural hazards within or near the option?** For example: fault lines, earthquakes

- ☐ Yes. If yes, go to Question 32.
- ☒ No. If no, go to Question 33.

32. **Describe the natural hazards for the option and opportunities for avoidance, mitigation and/or management.**

CLIMATE CHANGE

33. **Does the option result in an increase in transport(enabled) greenhouse gas (GHG) emissions?**
Enabled emissions are the GHG emissions that arise from use of the infrastructure, for example from the cars, buses, trucks, and trains using the transport system. Enabled emissions generally increase when vehicle kilometres travelled (VKT) increases, but are avoided by mode shifts (e.g. through encouraging uptake of low-emissions modes such as cycling or public transport). Enabled emissions are the most significant component of GHGs from the New Zealand transport sector.

- ☐ Yes. Transport modelling will be required to quantify changes in VKT and emissions and assess relative to any relevant transport emissions reduction plan. Please contact environment@nzta.govt.nz for guidance on technical assessment requirements.
- ☐ No. If no, go to Question 34.

Note: All construction projects have embodied GHG emissions (in materials and fuel use). Opportunities to reduce construction emissions should be considered during option selection and forms part of the construction sustainability assessment (refer to Q47).

34. **Are there climate related hazards associated with the option?** Climate related hazards include *chronic hazards* (eg. sea-level rise, temperature increases) and *acute hazards* (eg. heat waves, increased storm intensity and flooding, drought and wildfires). Consider both risks to the option and potential downstream risks (from the infrastructure).

- ☐ Yes. If yes, go to Question 35.
- ☐ No. If no, go to Question 36.

35. **Where and what are the climate related hazards and risks?** What timeframe scenarios are considered? How will climate change hazard risks be managed? Are there opportunities to improve resilience/adaptation, e.g. nature-based solutions to mitigate the impacts of climate change**?** A climate risk assessment should be prepared.

CONTAMINATED LAND

36. **Are there potentially contaminated sites (including (Hazardous Activities and Industries List (HAIL) activities) within 200m of the option?** The HAIL can be obtained from the Ministry for the Environment here https://environment.govt.nz/publications/hazardous-activities-and-industries-list-hail/, and regional councils generally hold information on historic land use that may have resulted in contaminated land. Disturbance of contaminated sites can result in the discharge of contaminants (primarily during construction but also in some instances post construction), which may result in risk to site workers, sensitive receivers and ecological receptors.

- [x] Yes. A technical assessment may be required, refer NES for Assessing and Managing Contaminants in Soil to Protect Human Health.
- [ ] No. If no, go to Question 37.

37. Is there potential to encounter coal tar material within or near the option?
Coal tar material is toxic to human health and ecological receptors, and can be costly to dispose of at landfill facilities. Coal tar was commonly used for road construction in New Zealand until the 1970's. Information on known coal tar locations may be available in MapHub or the Road Assessment and Maintenance Management database (RAMM).

- [ ] Yes. A technical assessment may be required.
- [x] No. If no, go to Question 38.

HUMAN HEALTH

38. Are there potential activities sensitive to noise, vibration or air quality (including dust) effects located within 200m of the option during construction and operation activities? Activities sensitive to noise, vibration and air quality include medical sites, rest homes, schools, childcare sites, residential properties, marae, community facilities, horticultural use or ecological receivers. In general, the greater the number of potential receivers, and the closer the option is to sensitive receivers, the higher the risk of the option. Utilise the One Network Road Classification as a proxy for traffic flow; heavy vehicle movements on higher classification roads (national/regional) may have greater effects.

- [x] Yes. If yes, go to Question 38.
- [ ] No. If no, go to Question 39.

39. What are the design, management or mitigation opportunities to address noise, vibration or air quality (including dust) issues?

Whareroa Marae is located just over 300 metres from Hewletts Road. While beyond 200 metres from the site, consideration will need to be provided to this sensitive receiving environment.

40. **Is the option in an area of existing elevated state highway noise.** Utilise the One Network Road Classification as a proxy for traffic flow and heavy vehicle movements. Refer to MapHub Environmental and Social Risk– Human Health and Community maps, which includes land transport noise contours.

- [ ] Yes. If yes, go to Question 41
- [x] No. If no, go to Question 42.

41. Describe what opportunities are available to address existing noise effects.

TBC

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42. **Is the area of interest designated as a non-compliance airshed?** Refer to MapHub Environmental and Social Risk – Human Health and Community maps for designated airsheds (including One Network Road Classification) – highly sensitive receivers. These airsheds have been identified by regional councils and unitary authorities as areas that are not compliant or may not be compliant with air quality standards. In these areas there is a greater risk that the incremental effect of additional vehicle movements may cause human health effects and also make it more difficult to meet air quality standards.

    ☑ Yes. A technical assessment may be required.
    ☐ No. If no, go to Question 43.

SOCIAL & CULTURAL

43. **Does the option result in changes to community character, cohesiveness, connectivity, access to community and recreational facilities, construction impacts and potential to increase or remove social severance, either temporarily or permanently?**

    ☐ Yes. If yes, go to Question 44.
    ☑ No. If no, go to Question 45.

44. **Describe how the option could provide opportunities to enhance or impact on residential, retail and businesses, employment, education, social services, places of worship, recreation/social/amenity, character/identity, culture/heritage, natural environment, health and wellbeing, personal and property rights. A Social Impact assessment and Cultural assessment may be required.**

HISTORIC HERITAGE

45. **Is there potential historic heritage near the option or its surrounds?** Refer to the definition of historic heritage in the Resource Management Act 1991. In addition to heritage schedules in district and regional plans, Heritage New Zealand Pouhere Taonga (HNZPT) list, and the New Zealand Archaeological Association (NZAA, Archsite) register, consider if there are locations which may have unrecorded historic heritage, e.g. adjacent to water, hilltops, landmarks, including bridges and structures. Discussions with mana whenua, local government and HNZPT staff, local museums and historic societies will assist with identifying known sites that are not yet recorded or listed. Refer to MapHub. Consider if there is potential for taonga. tūturu: https://mch.govt.nz/nz-identity-heritage/protected-objects/taongatuturu.

    ☐ Yes. If yes, go to Question 46.
    ☑ No. If no, go to Question 47.

46. **Describe impacts on historic heritage sites (provide reference numbers).** Consider the potential for archaeology in all earthworks including cycleways, landscaping, signage installation and upgrades to storm water systems as well as existing or future public access to any historic heritage sites or areas. Outline any opportunities to avoid, remedy or mitigate effects or opportunities for enhancement (e.g. interpretation of heritage values, conservation, etc.). Identify any archaeological authority requirements under the Heritage New Zealand Pouhere Taonga Act 2014 or building consents for built heritage.

CONSTRUCTION SUSTAINABILITY

47. **What opportunities are there for resource efficiency during design?** Apply "build nothing, build less, build clever, build efficiently" principles to reduce material use, energy use, GHG emissions (carbon footprint), water consumption and waste generation during early business case development. Refer to *Resource efficiency policy for infrastructure delivery & maintenance* and *P48: Specification for resource efficiency for infrastructure delivery and guidelines.*

48. **Is the project required to complete ISC certification?** ISC certification is required for projects over $100 million (unless exceptions apply). For projects over $15 million, consider the merits of ISC certification.
    - Yes. Refer to Sustainability rating scheme policy.
    - No. If no, go to Question 49.

URBAN AND LANDSCAPE DESIGN

49. **What potential risk or opportunities does the option present for transport and land use integration and good urban form?** Review any relevant regulatory (spatial, regional and district, structure, area and precinct plans) and non-regulatory plans (e.g. masterplans) to understand the existing and future urban context, form and character, and values of the place (townscape and landscape). This should include consideration of the connections with urban growth and development areas, centres, public transport corridors, nodes, stations and stops, cycling networks and respective walkable catchments. Use this urban planning context to help determine potential risks and opportunities that may impact on or help create 'well-functioning urban environments' (refer to the National Policy Statement on Urban Development 2020).

Yes, there are opportunities to incorporate Urban and Landscape design into the project once the detailed design phase is reached.

50. **What opportunities are there to enhance, improve access to, or create new local, regional or national infrastructure for public transport, electric vehicles and/or active modes of travel such as walking and cycling?** Consider what additional infrastructure is or could be provided to further enhance these modes and facilities. For cycle information refer to https://nzcycletrail.com/, and for walking refer to https://www.teararoa.org.nz/. Refer to *Bridging the gap: NZTA urban design guidelines* for further information.

51. **Is the option located near to or part of a tourism route, or themed or scenic highway?** Refer to MapHub Environmental and Social Risk – Natural Environment (Scenic Routes) map.

- ☑ Yes. If yes, go to Question 52.
- ☐ No. If no, go to Question 53.

52. **Describe how the option reflects the journey and user experience in relation to the tourist route, themed or scenic highway.** Include the name of the highway in your response. Have stopping places, motorway service centres or electric vehicle charging been considered?

TBC

53. **Is the option:**

- ☑ In an urban or peri-urban area? An urban design framework or urban and landscape design framework is likely to be required.
- ☐ In a rural area with high environmental, cultural or heritage values? A landscape framework, or a cultural and environmental framework is likely to be required.
- Of limited complexity or small scale? A masterplan, urban design statement, concept plan or site-specific design may be appropriate. Please contact urbandesign@nzta.govt.nz for further information.

TECHNICAL ASSESSMENT REQUIREMENTS

54. **List preliminary technical assessments or further information required for the option to help understand risks and opportunities or to support the development of the detailed business case.**

- ☑ Ecology (flora and fauna in terrestrial, marine, wetland and freshwater environments)
- ☑ Ground water (including bores and drinking water)
- ☑ Landscape and visual effects assessment (natural character assessment)
- ☑ Natural hazards (including flooding and ground stability)
- ☐ Climate change (greenhouse gases and climate change hazards)

- [x] Contaminated land
- [x] Noise and vibration
- [x] Air quality
- [ ] Social impact assessment
- [ ] Cultural assessment
- [ ] Historic heritage (archaeology and/or built heritage)
- [ ] Construction sustainability (ISC or *Resource efficiency policy* P48 assessment)
- [x] Urban design assessment/framework
- [ ] Other

55. Confirm that you are suitably qualified to make the assessments required by this form and that all information provided is accurate and complete.

- [x] Yes.
- [ ] No.

56. Your name and email

Harriet McKee, Associate, Environment and Planning, Aurecon

57. Date

2 August 2022

A copy of the completed environmental screen is to be emailed to your Waka Kotahi project manager

Please send any suggestions on the screen to environment@nzta.govt.nz

aurecon

Bringing ideas to life

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Contract Risk Register

Risk identifier	Date raised (dd/mm/yyyy)	Risk Description (include whether this is a threat or an opportunity)	Risk Cause(s)	Risk Consequence(s)	Risk Owning Organisation	Risk Owner	Controls	Current Risk Likelihood	Current Risk Consequence	Consequence Category	Current Controlled Risk Level	Level of risk acceptable, when compared to Risk Tolerance	Planned Risk Trmt Actions *Note: If more than one treatment action, either:* *. Include numbers to identify separate treatments, or:* *. Refer to Actions Register on separate tab*	Treatment Owner(s)	Planned Treatment Implementation Date(s) (dd/mm/yyyy)	Risk Treatment Progress Updates	Residual (Target) Risk Likelihood	Residual (Target) Risk Consequence	Residual (Target) Risk Level	Risk status	Expected Date for Closure	Comments
1	22/06/2022	Adjacent project interdependencies: There is a threat of adjacent projects (i.e. 15th Ave / Welcome Bay) impacting on the project (constraining options) or the ability to achieve objectives.	The cause of the threat is: - the SSBC that is being developed for Turret Road / 15th Avenue, and the significant interdependencies between the two projects, particularly regarding the balance between the across the harbour and around the harbour movements. - The Bayfar to Bayneck scheme may result in more traffic through the project corridor (as it re-routes from Bayfar to Bayneck corridor).	The consequence of the threat is: - scheme objectives not achieved; - redesign needed, additional effort & rework, - programme delays and cost impacts, benefits not optimised or realised.	Waka Kotahi	Will Bamford	Coordination with interfacing project teams	Possible	Moderate	Benefits Realisation	Medium	Y	1. Undertake initial analysis to understand the impact , risks and opportunities linked to the interdependent projects, the 15th Avenue SSBC as well as the public transport and active modes harbour crossing identified in the TSP. We can establish assumptions /options around and across harbour connections to be agreed with project partners. 2. Reach out early to the PM for the 15th Ave SSBC to establish ways of working and exchange programmes, so that critical convergence points for the two projects can be identified and agreed. 3. Establish opportunities for joint workshops. 4. Agree escalation points in case of lack of agreement / resolution.	Erica Walker, Will Bamford		PM for 15th Avenue SSBC identified. 8 Jun 22 - Joint business case workshop held with TCC to agree areas where work could be more closely joined up 14 June - Update confirmed to TTSH which better take account of around and across the harbour options 20 June 22 - Modelling meeting scheduled with TCC to discuss assumptions.	Possible	Moderate	Medium	Live-Treat	Project Completion	
2	22/06/2022	Preferred Option Endorsement by the Project Partners: There is a threat that the project team/ PSG can not reach agreement on a preferred option to endorse.	This is caused by: - Misalignment between the project partners in their views and priorities. - Project partner has rights to veto through the Governance Group.	This may result in: - Failure to progress - Relitigating of previous options, new options being suggested late in the day	Project Waka Kotahi TCC	Will Bamford Ben Peacey Greg Bassam	1. Programme: Approvals process is clearly documented in the programme and articulated to all parties. 2. Weekly Meetings: With project partners, working on a 'no surprises approach', so that when things come for approval, partners should already know what's coming 3. Clear assessment methodology and gateway decisions by PSG	Likely	Severe	Reputational	Critical	Y	1. Develop set of principles to manage stale mate and minimise relitigating issues as the project progresses. 2. Ensure clear, transparent and robust assessment methodology and seek endorsement from PSG. Confirmation of requirements very early on in the project, including analysis to be undertaken and how interfacing projects will tie in. 3. Clear and continuous management of risks and assumption registers. 4. Early proactive discussions on key deliverables to ensure no surprise environments.	Erica Walker, Will Bamford		25 May - Inception hui held setting out clear roles and responsibilities xxx- PSG ToR developed and first meeting on x date	Possible	Moderate	Medium	Live-Treat	Project Completion	
3	22/06/2022	Governance approvals: There is a threat that decisions made (or consensus reached) at the PSG are overruled.	This is caused by: - Options agreed through the project representatives may be questioned by individual project partners decision makers. - While the approvals process is understood and documented, project partners may not be aligned in their views. Any project partner has rights to veto through the Governance Group, and options agreed through the project representatives may be questioned by individual project partners decision makers.	This may result in: - Project delays as works can not be progressed based on PSG decisions / endorsement alone. - Failure to progress - Relitigating of previous options, new options being suggested late in the day	Project Waka Kotahi TCC	Will Bamford Ben Peacey Greg Bassam	1. Programme: Approvals process is clearly documented in the programme and articulated to all parties. 2. Weekly Meetings: With project partners, working on a 'no surprises approach', so that when things come for approval, partners should already know what's coming	Likely	Severe	Reputational	Critical	Y	1. Propose appropriate time in programme to allow enough time for hold / review points. 2. Develop set of principles to manage stale mate and minimise relitigating issues as the project progresses. 3. Make clear at what level and by whom decisions and approvals are made. 4, Ensure clear, transparent and robust assessment methodology and seek endorsement from PSG. Confirmation of requirements very early on in the project, including analysis to be undertaken and how interfacing projects will tie in. 5. Clear and continuous management of risks and assumption registers. 6. Early proactive discussions on key deliverables to ensure no surprise environments.	Erica Walker, Will Bamford						Live-Treat		
4	22/06/2022	Future land use: There is a threat due to the high level of uncertainty regarding future land use in the area	The cause of the threat is: - time of Mt Maunganui Spatial Plan - unclear where and how densities and land use will change in local area - wider land use changes coming forward faster than expected	The consequence of the threat is: - preferred option does not meet future requirements - failure to understand how people will use and move through the area - interventions not suitable or acceptable - failure to realise benefits	TCC	Greg Bassam	Close contact with TCC spatial planning team Early insights into direction of travel Agreement of assumptions for inclusion in the assumptions register, to be updated as plans become clearer Agree assumptions for the assumptions register	Possible	Moderate	Benefits Realisation	Medium	Y	Project team to ensure that spatial development plans are fully understood early so we can review linkages through project stages, e.g. as the new spatial plan for Mt Maunganui emerges. Attend briefings with teams working on the various spatial planning elements to discuss timescales, impacts, risks, and opportunities, and agree assumptions for the business case.	Erica Walker, Will Bamford			Possible	Moderate	Medium	Live-Treat	Project Completion	
5	22/06/2022	IBC Analysis: There is a threat that additional analysis / modelling to support the IBC (particularly associated with the expected modal shift) is requested by the Project Partners.	The cause of the threat: - Requirement from the Project Partners for additional layers of technical analysis to prove or disprove organisational assumptions and expectations.	The consequence of the threat: - time and cost of the additional analysis, noting that this often outweighs the value of insight gained. - failure to progress to a DBC with a single preferred option. - is lost opportunity for land acquisition, high expectations - market costs for land, additional costs to progress purchases, complaints / reputational impacts	Project Aurecon	Will Bamford Erica Walker	1.Tight, well defined and well communicated project scope.	Unlikely	Minor	Benefits Realisation	Low	Y	1. Work with WK to understand wider mode shift initiatives and timings for that work. 2. Work with TCC to understand TDM plans, e.g. parking management 3. Support for a sub-regional narrative explaining the overall ambitions to support mode shift objectives.	Erica Walker, Will Bamford			Unlikely	Minor	Low	Live-Treat	Project Completion	
6	22/06/2022	Modal Shift: There is a threat that the required levels of modal shift required to achieve the project objectives can not be demonstrated.	The cause of the threat is: - Very high levels of car usage in the area and community expectations around unencumbered private car trips, making ability to achieve required mode shift challenging.	The consequence of this threat is: - additional time and cost impacts - failure to progress to DBC with a single preferred option	Project Aurecon	Will Bamford Erica Walker	1. Behaviour change support 2. Travel demand management 3. Clear C&E plan	Unlikely	Moderate	Delivery	Medium	Y	1. Work with WK to understand wider mode shift initiatives and timings for that work. 2. Work with TCC to understand TDM plans, e.g. parking management 3. Support for a sub-regional narrative explaining the overall ambitions to support mode shift objectives.	Erica Walker, Will Bamford			Rare	Moderate	Low	Live-Treat	Project Completion	
7	22/06/2022	Project support: There is a threat of opposition or lack of support from the community	The cause of this threat is: - Public and stakeholder expectations around private car use and the status quo - any activities that challenge the prevailing car culture and expectations are highly likely to meet significant resistance. - Expectations with the community over the level of engagement and consultation with them.	The consequence is: - delay (redesign / consenting processes). - Cost increases, - Project not proceeding as intended.	Project Aurecon	Will Bamford Erica Walker	1. Communication Plan: Based on informing the public (not consulting) at this time. Propose to go with the public with a preferred option (in the DBC) that they can influence within agreed parameters. 2. Key Stakeholder Consultation: Consulting with Key Stakeholder Groups on key parameter during the IBC.	Unlikely	Moderate	Public/Media	Medium	Y	1. Make best use of existing information and move forward without unnecessarily reopening or revisiting issues. 2. Confirmation of requirements very early on in the project, including analysis to be undertaken and how interfacing projects will tie in. Clear and continuous management of risks and assumptions registers 3. Early proactive discussions on any slippages / scope changes to ensure no surprises environment.	Erica Walker, Will Bamford			Likely	Moderate	Medium	Live-Treat	Project Completion	
8	22/06/2022	Project support: There is a threat of opposition or lack of support from project partners and key stakeholders	The cause of the threat is: - a potential lack of alignment amongst project partners about what the potential interventions should be. - breakdown in communication with key stakeholders.	The consequence of the threat is: - that the project fails to progress or be funded	Project Aurecon	Will Bamford Erica Walker	1. Early identification and understanding of project partner / stakeholder views. 2. Key Stakeholder Consultation Plan: Consulting with Key Stakeholder Groups on key parameter during the IBC. 3. Customer insights to help achieve a 'common language' 4. Clear governance and decision-	Possible	Moderate	Delivery	Medium	Y	Early on, we will facilitate one on one meetings with project partners and key stakeholders to explore what success looks like and to ensure aligned understanding and support. Align project partners, using customer insights to help deliver a successful outcome, Establish a cross-project (15th Avenue / Turret Road) communication and engagement panel to work together to monitor and manage stakeholder and reputational risks Clear and robust assessment framework	Erica Walker, Will Bamford		121 held with Regional Council intro meeting with the Port Customer insights workshop planned 121 with TCC planned	Unlikely	Moderate	Medium	Live-Treat	Project Completion	
9	22/06/2022	Project support: There is a threat of opposition for the project from Mana Whenua	The cause of the threat is: - a desire by Mana Whenua to see the managed decline of industry in the area and this project potentially being seen as an enabler for expanded activities (misalignment of expectations). - poor communication and engagement	The consequence of the threat is: - that the project fails to progress, - reputational damage and/or legal action	Project Aurecon	Will Bamford Erica Walker	1. PSG and governance arrangements 3. Mana Whenua Consultation Plan: Timely and continued engagement with Mana Whenu (as a key stakeholder) from IBC onwards.	Possible	Moderate	Stakeholders	Medium	Y	Ngāti Kuku and Ngāi Tukairangi will have representatives on the PSG. We will utilise Te Pangapū Mana Whenua o Tauranga for wider iwi engagement. Lessons learnt from the Port in regards to having a wider level of engagement outside of Ngāti Kuku and Ngāi Tukairangi. Guidance from TSP member Wayne Bielby.	Will Bamford			Unlikely	Moderate	Medium	Live-Treat	Project Completion	
10	22/06/2022	Trade offs: There is a threat that trade offs in the recommended option lead to benefits not being realised	The cause of the threat is: - significant public opposition to plans that deliver modal priority and watered down options that fail to achieve sufficient mode shift, and negatively impact on other	The consequence of the threat is: - scheme objectives not achieved and funding not being secured to progress to the DBC	Project Aurecon	Will Bamford Erica Walker	1. Close working with interdependent projects 2. Assessment methodology reinforces outcomes 3. Wider mode shift support	Possible	Moderate	Benefits Realisation	Medium	Y		Erica Walker, Will Bamford			Possible	Moderate	Medium	Live-Treat	Project Completion	
11	22/06/2022	Emissions: There is a threat of project can not align with Emissions Reduction Plan / new Infrastructure Targets	The cause of the threat is: - Guidance for embodied carbon targets for new infrastructure are still in development (due to be released September 2022).	This may result in: - Redesign and delays. - Threat is that the project is not progressed due to inability to meet new ERP requirements	Waka Kotahi	Will Bamford	1. Review of draft and final guidance.	Possible	Moderate	Delivery	Medium	Y		Erica Walker, Will Bamford			Possible	Moderate	Medium	Live-Treat	Project Completion	
12	22/06/2022	Political influences: There is a threat of project cancellation due to a change in political leadership and a misalignment with new policies	The cause is: - the preferred option is not aligned to Transport Outcomes but political investment priorities.	The consequence is: - threat is that the project is not progressed due to lack of funding or support	Waka Kotahi	Will Bamford	1. outlining preferred options to Transport Outcomes investment priorities.	Rare	Moderate	Delivery	Low	Y		Erica Walker, Will Bamford			Possible	Moderate	Medium	Live-Treat	Project Completion	
13	22/06/2022	Resourcing: There is a threat that key project resources may become unavailable	The cause of the threat is: - Key staff leaving, moving onto other projects, or becoming unwell within the Project Partners and Consultant teams.	The consequence of this is: - a lack of continuity impacting on the programme and ability to complete project, as well as loss of project knowledge from the team / project partner organisations	Waka Kotahi	Will Bamford	1. 2IC arrangement in place and succession planning	Possible	Moderate	Sustainability	Medium	Y	Team structured for resilience, with backups for all key roles and people with multiple skillsets, enabling people to step up into roles if key personnel become unavailable. Proven ability to remote work, and have significant digital capability to ensure continuity	Erica Walker, Will Bamford			Unlikely	Moderate	Medium	Live-Treat	Project Completion	
14	22/06/2022	Regulatory Uncertainty: There is a threat that aspects of the Preferred Option are dependent on timely Regulatory changes (local government / national policy change).	This is caused by: - Uncertainty over timing and extent of regulatory change on items such as dynamic road pricing.	The consequence of this is: - benefits can not be demonstrated through the IBC without these interventions. - delivery delays (IBC) and cost	Project Waka Kotahi TCC	Will Bamford Ben Peacey Greg Bassam	1. Review of draft and final guidance	Unlikely	Moderate	Delivery	Medium	Y					Unlikely	Moderate	Medium	Live-Treat	Project Completion	
15	22/06/2022	Preferred option: There is a threat that inventions proposed as part of the Preferred Option may require investment by private entities (i.e. Port of Tauranga, Tauranga Airport, private landowners).	This is caused by: - Inventions to enable the objectives to be achieved may necessitate changes by private developers.	The consequence of this is: - reputational impacts / loss of support for the project from private entities.	Aurecon Project	Erica Walker Will Bamford		Unlikely	Minor	Reputational	Low	Y					Unlikely	Minor	Low	Live-Treat	Project Completion	
16	22/06/2022	Funding: There is a threat that the preferred options (programme) is not aligned with funding.	This is caused by: - Funding availability from the project partners. - change in priorities from the project partners.	The consequence of this is: - benefits can not be realised. - reputational damage	Project Waka Kotahi TCC	Will Bamford Ben Peacey Greg Bassam		Possible	Moderate	Delivery	Medium	Y					Possible	Moderate	Medium	Live-Treat	Project Completion	
17	22/06/2022	Adjacent developments: There is a threat the preferred option is impacted by private entity developments (changes in land use and / or increased traffic generators).	This is caused by: - Adjacent private entity developments that the project team are not aware of. - Tauranga Airport and adjacent large retail landowners (Bunnings, Farmers etc) development plans changing / being accelerated.	The consequence of this is: - Objectives are not achieved as preferred option can not be delivered as planned. - rework / redesign to accommodate these developments.	TCC	Greg Bassam		Unlikely	Minor	Delivery	Low	Y					Unlikely	Minor	Low	Live-Treat	Project Completion	
18	22/06/2022	Airshed: There is a threat the preferred option can not be implemented due to the air quality (PM10)	This is caused by: - There is an Airshed Consent in place	The consequence of this is: - Objectives can not be achieved.	Aurecon Project	Erica Walker Will Bamford	1. Airshed review: Review by Planners to identify what the Airshed means for the project and constraints it may place.	Unlikely	Severe	Delivery	Medium	Y					Unlikely	Severe	Medium	Live-Treat	Project Completion	
19	22/06/2022	Smart Growth Development: There is a threat of additional traffic movements/ generation from the eastern corridor / Mt Maunganui intensification earlier than expected.	This is caused by: - WBOP identify the Eastern Corridor as a Smart Growth area; also planning further development changes in Mt Maunganui (to enable intensification). WBOP may look to accelerate these developments. - These developments are not currently provided for in the traffic models as timing is seen further down the traffic.	The consequence of this is: - Recommendation option does not achieve the project objectives (modal shift, reduced emissions) due to additional vehicle movements. - Rework / design to respond to the additional traffic.	TCC	Greg Bassam		Possible	Moderate	Delivery	Medium	Y					Possible	Moderate	Medium	Live-Treat	Project Completion	
20	22/06/2022	IBC Scope: There is a threat that project partners expectations for the IBC Phase is greater than the agreed contractual scope.	This is caused by: - Contracts have been set based on fit for purpose IBC scope.	The consequence of this: - Lost time / additional resource reiterating the fit for purpose scope. - Cost variations	Aurecon Project	Erica Walker Will Bamford	1. Scope: Clearly defined scope and process to review any internal requests against agreed scope. 2. Communication with the Project Lead: Any instruction / scope request outside Aurecon's contractual scope needs to be endorsed and approved by the Project Lead (Will Bamford). Aurecon (Erica Walker) to engage with Project Lead.	Possible	Minor	Cost	Medium	Y					Possible	Minor	Medium	Live-Treat	Project Completion	

Connecting Mount Maunganui IBC

BENEFIT REALISATION AND MONITORING PLAN

Contract No 5909

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Contents

Figures

Tables

1 Introduction

This document is a Benefits Realisation and Management Plan (BRP), which sets out the approach to identification, analysis, planning and reporting of benefits related to the SH2 Hewletts Road IBC.

The BRP is consistent with the requirements of Waka Kotahi New Zealand Transport Agency's (Waka Kotahi) Land Transport Benefits Framework and Management Approach of July 2021[1].

The BRP is intended to be a living document that will be reviewed and updated over time as required to remain current with the project.

1.1 Connecting Mount Maunganui IBC

This Indicative Business Case (IBC) defines and progresses the Connecting Mount Maunganui project, an optimisation package to improve throughput, encourage mode shift from private vehicles and support freight accessibility. This project forms part of the Waka Kotahi endorsed Urban Form + Transport Initiative (UFTI) Connected Centres Programme, a high level, future-focused land use and transport planning programme.

It sets out a recommended programme of investment to improve the State Highway 2 / Hewletts Road and adjacent transport system, noting that it is one of a number of business cases being progressed for the region. It builds on previous transport planning and analysis of interventions for the study area which form the point of entry for this business case.

Through the Transport System Plan (TSP), the Hewletts Road sub area has been identified as the second highest priority in the region. Travel through Hewletts Road (as well as Totara Street, Hull Road and Maunganui Road), must be more consistent and predictable to support economic growth. This critical pinch point has economic impacts on our wider sub-region and investment is needed so the area functions properly to meet everyone's needs.

The geographical scope for this IBC is shown in Figure 1. It includes the SH2 / Hewletts Road corridor and the adjacent Mount Maunganui local road network:

- SH2 from the SH2 / Tauranga Bridge Marine intersection to SH2 / Northern boundary of the Link Avenue Reserve.
- SH2 / Maunganui Road to Manganui Road / Rata Street; and
- Rata Street / Totara Street to the end of Totara Street

[1] *Waka Kotahi (2021) Land transport benefits management framework measures manual. Accessed 21 August 2023. https://www.nzta.govt.nz/assets/resources/land-transport-benefits-framework-measures-manual/Land-Transport-Benefits-Framework-measures-manual.pdf*

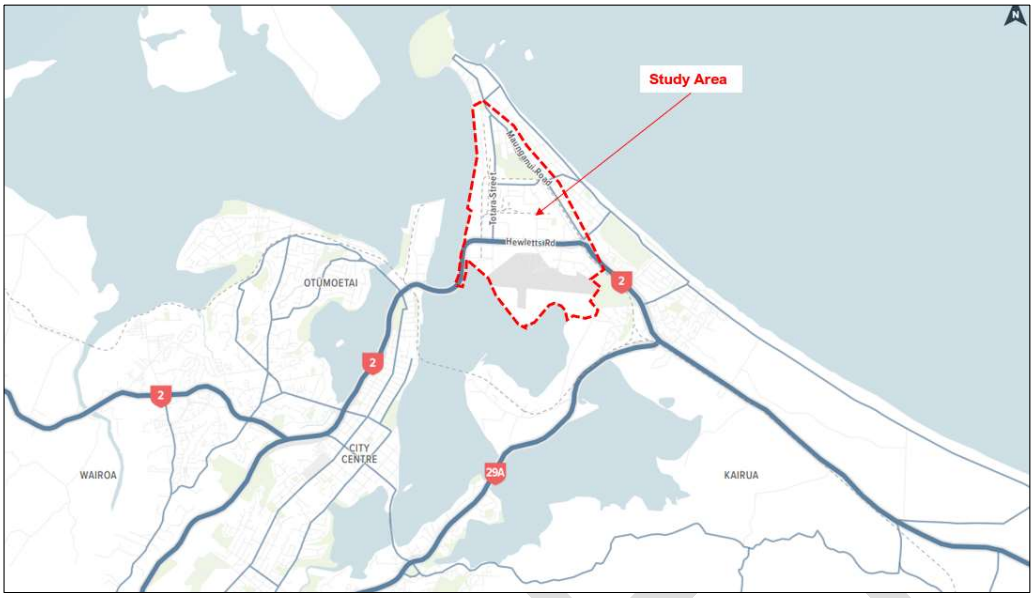

Figure 1 : Geographical Scope of Hewletts Road IBC

2 Purpose and structure of this document

The purpose of this Benefits Realisation and Management Plan (BRP) is set out the approach to identification, analysis, planning and reporting of benefits related to the Hewletts Road IBC.

This BRP is intended to be a living document that will be reviewed and updated over time as required to remain current with the delivery of the programme and relevant guidelines.

Figure 2 below summarises the structure of this document and the information flow leading to the identification of performance measures and next steps.

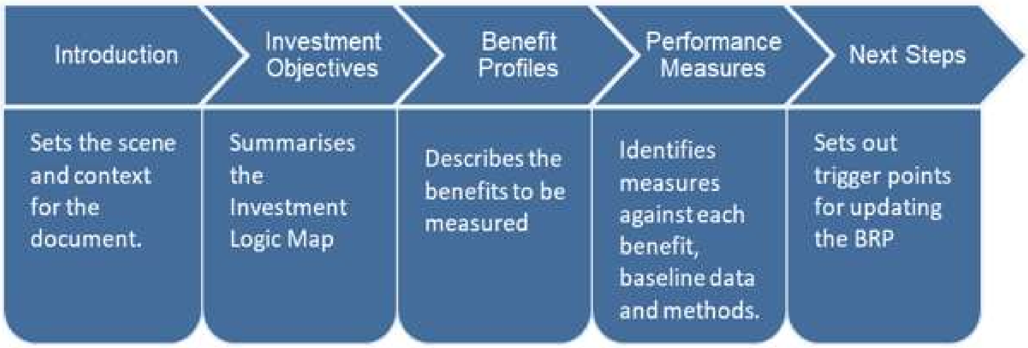

Figure 2 : Structure of this Benefit Realisation Plan

The development of this BRP aligns with Waka Kotahi's Benefit Realisation Framework2, Land Transport Benefits Framework and Management Approach3, as well as New Zealand Treasury benefits management guidance[4].

Benefit realisation monitoring and reporting is a requirement of Waka Kotahi for the Business Case Approach. The Waka Kotahi guidance notes that "there are significant gains from having a robust benefit realisation monitoring programme, such as increased investor confidence and demonstration of public value."

As identified in Waka Kotahi and Treasury guidelines, the BRP is a live document. The benefits should be monitored and revisited "whenever there are changes in scope, timing or cost as these will have an impact on the approved benefits" (Treasury, 2020, p. 30).

3 Investment Objectives

This section sets out the context of the development of the Investment Logic Map (ILM) and outlines the following:

- Problems, Opportunities and Constraints – describes the problems identified in the ILM.
- Objectives and Benefits of Investment – describes the Investment Objectives of the project, aligned to government strategy, and the benefits of addressing these objectives and the above problems.

1.2 Problems, Opportunities and Constraints

Problem statements were developed at a standard investment logic map (ILM) workshop. The ILM identifies three problems that the business case responds to:

The problems identified were:

1) Competing journey purposes, limited route choice and internal connections to access Mt Maunganui (residential, recreational, commercial and industrial) and the eastern corridor results in unreliable journeys for people and goods.
2) Competition for limited road space is causing high levels of exposure for vulnerable users and conflict between vehicles resulting in harm to people and the community.
3) High volumes of vehicles travelling and a lack of viable alternative options results in transport related effects impacting on the environment (Whareroa marae, the harbour and public health) and NZ's transport emissions.

1.3 Objectives and Benefits of Investment

A problem definition session workshop was held on 1 July 2022 with representatives from Waka Kotahi, Tauranga City Council (TCC) and Bay of Plenty Regional Council (BOPRC) along with the Project team to confirm the problems and benefits associated with SH2 / Hewletts Road IBC that build on the work previously undertaken.

The final ILM is shown in Figure 3 below.

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[2] Waka Kotahi (2021) *Using the benefits framework in planning and business cases.* Accessed 21 August 2023. *https://www.nzta.govt.nz/planning-and-investment/learning-and-resources/benefits-management-guidance/using-the-benefits-framework-in-planning-and-business-cases/*

[3] Waka Kotahi (2021) *Land transport benefits management framework measures manual.* Accessed 21 August 2023. *https://www.nzta.govt.nz/assets/resources/land-transport-benefits-framework-measures-manual/Land-Transport-Benefits-Framework-measures-manual.pdf*

[4] *The Treasury (2020) Benefits guidance. Accessed 21 September 2021 https://www.treasury.govt.nz/information-and-services/state-sector-leadership/investment-management/plan-investment-choices/benefits-guidance*

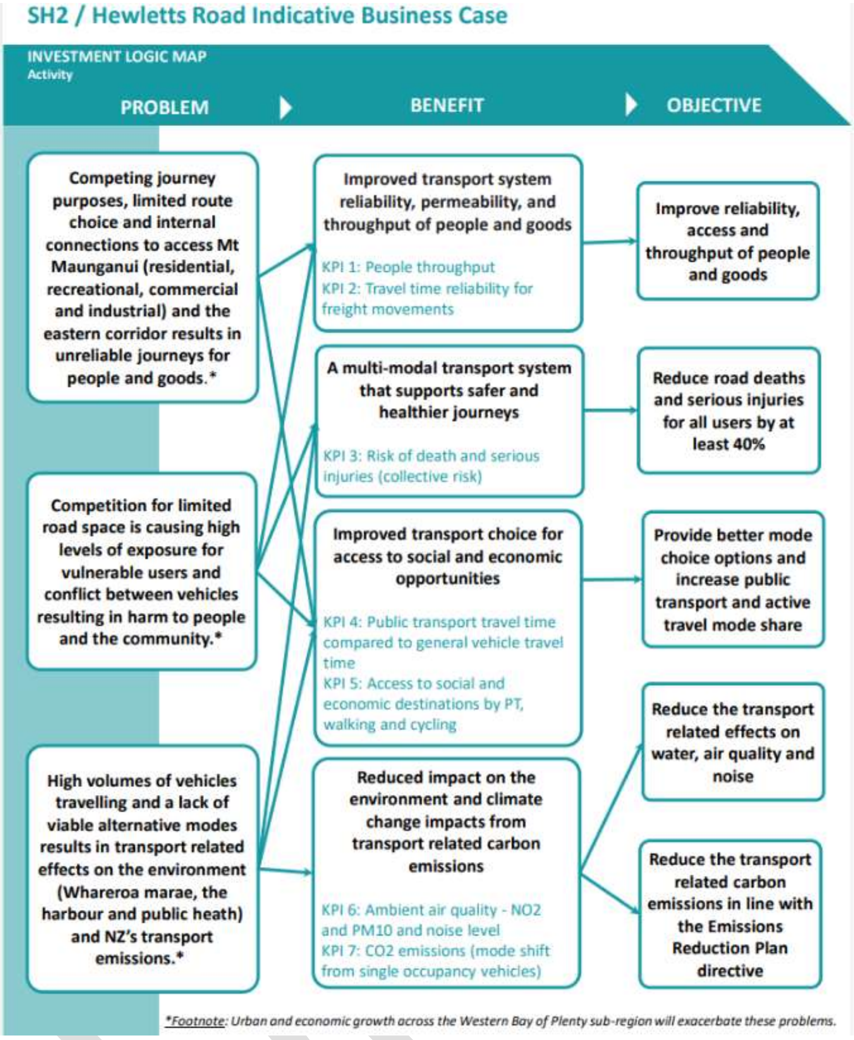


Figure 3 : Investment Logic Map Summary

4 Key Performance Indicators

To assess options against the identified Investment Objectives and to determine the level of ‘’benefit’’ that could be derived, a set of Key Performance Indicators (KPIs) were developed.

Table 1 : Benefits, objectives and KPIs

Benefits	Investment Objectives	KPIs/Measure
Improved transport system reliability, permeability, and throughput of people and goods	Improve reliability, permeability, and throughput of people and goods	KPI 1: People throughput KPI 2: Travel time reliability for freight
A multi-modal transport system that supports safer and healthier journeys	Reduce road deaths and serious injuries for all users in line with Vision Zero targets	KPI 3: Risk of death and serious injuries
Improved transport choice for access to social and economic opportunities	Provide better mode choice options and increase public transport and active travel mode share	KPI 4: Public transport travel time compared to general vehicle travel time KPI 5: Access to social and economic destinations
Reduced impact on the environment and climate change impacts from transport related carbon emissions	Reduce the transport related effects on water, air quality and noise	KPI 6: Ambient air quality - NO2 and PM10 KPI 7: CO2 emissions
	Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	

5 Benefits Realisation and Monitoring

The realisation of the benefits sought will be measured and monitored as shown in Table 2 below.

Table 2 : Benefits profiles for Hewletts Road IBC

IBC Benefits	Investment Objective	MoT Transport Outcomes Framework, Land Transport Benefits Framework and Management Approach Benefit Cluster	Land Transport Benefits Framework and Management Approach Benefit	Land Transport Benefits Framework and Management Approach - Quantitative and qualitative benefits measures (primary associations)			Specific PIs and Performance Measures for this business case
				No.	Name	Measure	
Improved transport system reliability, permeability, and throughput of people and goods	Improve reliability, permeability, and throughput of people and goods	**Inclusive access**. 10. Changes in access to social and economic opportunities.	10.1 Impact on user experience of the transport system	10.1.1	People-throughput of pedestrians, cyclists and public transport boardings	Number of pedestrians, cyclists and public transport boardings	People throughput
		Economic prosperity 5. Changes in transport costs	5.1 Impact on system reliability	5.1.2	Travel time reliability – road-based freight	Coefficient of variation; standard deviation of travel time DIVIDED BY average minutes travel time (as per Austroads)	Travel time reliability for freight
A multi-modal transport system that supports safer and healthier journeys	Reduce road deaths and serious injuries for all users in line with Vision Zero targets	**Health and safe people** 1. Changes in user safety	1.1 Impact on social cost of deaths and serious injuries	1.1.1	Collective risk (crash density)	Average annual fatal and serious injury crashes per kilometre of road section	Risk of death and serious injuries
				1.1.3	Deaths and serious injuries	Number of deaths and serious injuries	
Improved transport choice for access to social and economic opportunities	Provide better mode choice options and increase public transport and active travel mode share.	**Economic prosperity** 5. Changes in transport costs	5.2 Impact on network productivity and utilisation	5.2.6	Access to key economic destinations (all modes)	Proportion of population living within travel threshold (15 minutes, 30 minutes or 45 minutes) of key economic opportunities (including work) by different modes (walking, cycling, public transport, private motor vehicle) in the morning peak.	Access to social and economic destinations

		Inclusive Access 10. Change in access to social and economic opportunities	10.1 Impact on user experience of the transport system	10.1.9	Travel time	Average travel time in minutes	Public transport travel time compared to general vehicle travel time
			10.2 Impact on mode choice	10.2.1	People – mode share	Number of pedestrians, cyclists, public transport boardings and motor vehicles TIMES number of people per vehicle, expressed as percentages.	Public transport mode share
Reduced impact on the environment and climate change impacts from transport related carbon emissions.	Reduce the transport related effects on water, air quality and noise	**Healthy and safe people** 3. Changes in human health	3.2 Impact of air emissions on health	3.2.1.	Ambient air quality – NO_2	Concentration of NO_2 in µg/m^3	Ambient air quality - NO_2 and PM_{10}
				3.2.2	Ambient air quality PM_{10}	Concentration of PM_{10} in µg/m^3	
			3.3 Impact of noise and vibration on health	3.3.1	Noise level	Noise level in dB L_{Aeq} (24h)	Noise level
	Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	**Environmental sustainability** 8. Changes in climate	8.1 Impact on greenhouse gas emissions	8.1.1	CO_2 emissions	Tonnes of CO_2 equivalents emitted	CO_2 emissions (mode shift from single occupancy private vehicle)

5.1 SMART Key Performance Indicators

KPI	Investment Objective	KPI / Measure	Baseline	Target	Rationale
1	Improve reliability, access, and throughput of people and goods	10.1.6 Increase people throughput	Existing State	Increase people throughput capacity for all modes in the morning peak by 40% by 2048	In line with projected WBOP population growth to 2050
2		5.1.2 Improve travel time reliability for freight *Or* 5.1.3 Travel time delay	Hewletts Rd from Aerodrome Rd to Totara St travel time: 6 mins Totara St to Hewletts Rd travel time: 5 mins	Hewletts Rd from Aerodrome Rd to Totara St travel time: 4 mins Totara St to Hewletts Rd travel time: 3 mins	Routes assessed include Totara Street between Hull Road and SH2 Harbour Bridge & Hewletts Road westbound between Aerodrome Road and SH2 Harbour Bridge
3	Reduce road deaths and serious injuries for all users	1.1.3 Reduce the risk of death and serious injuries	13 DSIs (2017-22)	Reduction in deaths and serious injuries	Aligned with Road Safety strategy
4	Provide better mode choice options and increase public transport and active travel mode share	10.1.9 Reduce public transport travel time *Or* 8.1.2 Mode shift from single occupancy private vehicle	For the route East of Hewletts Rd to Tauranga CBD General Traffic Travel Time (Median): 10minutes Bus Travel Time (Median): 12minutes	Reduce public transport travel time in the morning peak to private vehicle travel times by 2048 between Mt Maunganui and CBD.	Used to measure the potential for mode shift on to PT as a more attractive means of travel than driving by private vehicle.
5		5.2.6 Increase access to social and economic destinations	2031 30 min catchment: CBD: 88,000 Port & Marae: 59,000 Hospital: 53,000 Mauao: 35,000	Increase access for people living within 30 mins of key economic and social destinations by PT in the morning peak by 50% by 2048.	Support UFTI aspiration of 15min local and 45min subregional accessibility.
6	Reduce the transport related effects on water, air quality and noise	3.2.1 / 3.2.2 Improve ambient air quality by reducing concentrations of transport related NO2 and PM10 emissions	584kg/day (VEPM6.3)	Reduce transport related NO2 concentrations by 20% by 2035	In line with the Emissions Reduction Plan
			118kg/day (VEPM6.3)	Reduce transport related PM10 concentrations by 20%	In line with the Emissions Reduction Plan
7	Reduce the transport related carbon emissions in line with the Emissions Reduction Plan directive	8.1.1 Reduce transport related CO2 emissions	7.1kg of CO2 per person per day. (UFTI)	Reduce transport related harmful emissions to 2.1kg of CO2 per person per day (UFTI)	In line with the TSP and UFTI

6 Next steps – Benefits Management & Monitoring

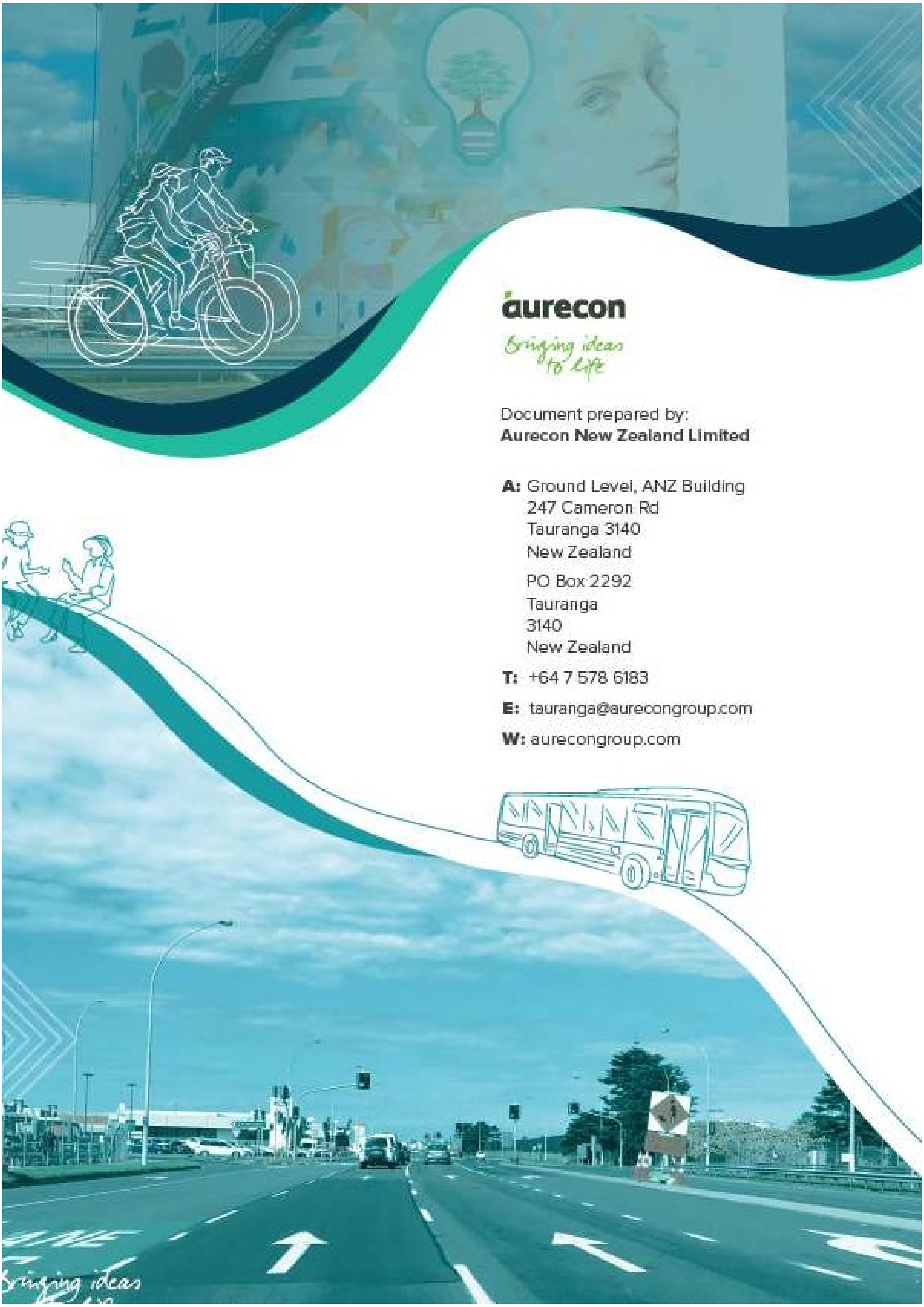
This BRP provides a comprehensive set of performance measures and baseline data (or suggested methods to gather required data) to enable the effective monitoring of the SH2 Hewletts Road IBC in line with the overall Investment Objectives.

This BRP is a live document and as per Treasury guidelines, should be monitored and revisited when there are changes in scope, timing or costs as these will have an impact on the approved benefits. Examples of these natural reviews / updates are summarised in Table 3 below.

Table 3 : Trigger and review points

Trigger	Derived From	Period / Date
DBC stage – Review ownership of the outcomes of this BRP and ensure clear governance.	Managing Benefits from Projects and Programmes: Guide for Practitioners, Page 30.	DBC
DBC and/or pre-implementation: Determine all outstanding (or update existing) baseline measures.	Managing Benefits from Projects and Programmes: Guide for Practitioners, Page 30.	As required for the proposed measures.
Revisit the benefits whenever there are material changes in scope, timing or cost as these will have an impact on the approved benefits.	Managing Benefits from Projects and Programmes: Guide for Practitioners, Page 30.	If triggered.
Updates to Waka Kotahi approach to benefits management: Should benefits management be the subject of updated thinking and approaches; this benefits management plan should be updated to reflect the latest thinking.	Good benefits management practice.	If triggered.

To ensure effective management of the benefits realisation monitoring process, Benefits Management should be included in the governance and delivery management plans for the Hewletts Road IBC.



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Sensitivity: General

Hewletts Road Managed Lanes Study

Prepared for NZ Transport Agency
Prepared by Beca Limited

1 August 2024

Sensitivity: General

Contents

Sensitivity: General

Revision History

Revision Nº	Prepared By	Description	Date
01	Zoe Chen/Subramanyam Uppuluri	Draft Report for Client Review	10 July 2024
02	Maf Cipriano/Subramanyam Uppuluri	Revised report	29 July 2024
03	Craig Richards	Final report	01 August 2024

Document Acceptance

Action	Name	Signed	Date
Prepared by	Zoe Chen/Subramanyam Uppuluri	URURSubramanyam Zoe	29 July 2024
Reviewed by	Craig Richards	CRichards.	29 July 2024
Approved by	Craig Richards	CRichards.	29 July 2024
on behalf of	Beca Limited		

Sensitivity: General

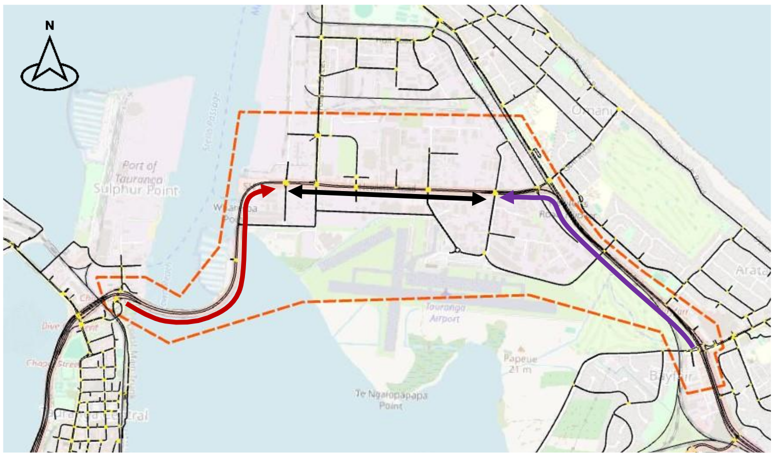
Executive Summary

This study investigates the potential benefits and impacts of converting the existing Hewletts Road bus lanes to managed lanes. Managed lanes enable a level of private car access depending on vehicle occupancy.

Two potential options have been considered:

1. Convert the existing bus lanes to T2 which permits cars with two or more occupants to use the lanes (accessible to approximately 22% of private cars)
2. Convert the existing bus lanes to T3 which permits cars with three or more occupants to use the lanes (accessible to approximately 5% of private cars).

A microscopic subnetwork transport model was created from the Tauranga Transport Hybrid Model (TTHM) to assess the benefits and impacts of the options. The subnetwork encompasses Sulphur Point to the east and Bayfair to the west, as shown below.



Travel time routes:

- **Hewletts Road Eastbound / Westbound**, between Tasman Quay and Aerodrome Road
- **SH2 Eastbound**, from Sulphur Point interchange to Tasman Quay
- **SH2 Westbound**, from Bayfair to Aerodrome Road (purple route).

Figure 1: Subnetwork Extent and Travel Time Routes

Travel Time Findings

AM Peak

In the AM peak[1], westbound (toward the CBD, peak direction) travel times show a saving for all private vehicles (7-13% or 14-26 seconds) and a small increase in travel times for buses along Hewletts Road (1-3% or 2-5 seconds).

[1] Travel time results for the AM (6:30-9:30am) and PM (3:30-6:30pm) peak periods are weighted averages across the 3-hour peak periods.

Sensitivity: General

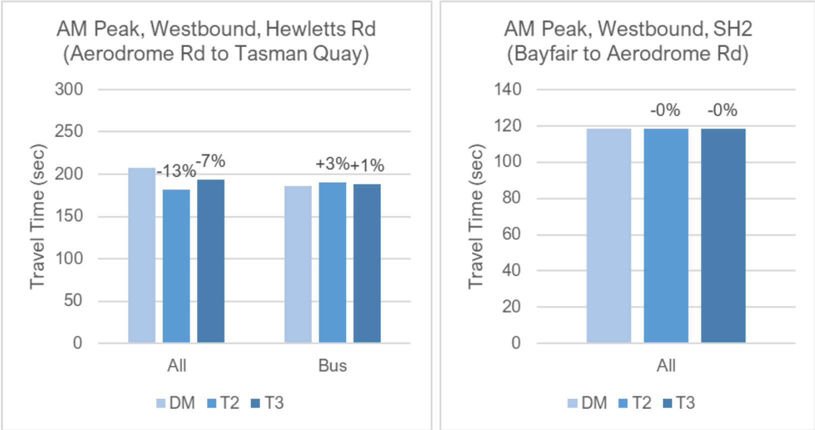


Figure 2: AM Peak, Westbound

PM Peak

During the PM peak, eastbound traffic (outbound) on Hewletts Road experiences significant congestion (backed up to Sulphur Point). A T2 lane improves flow at the key intersection (Hewletts/Tōtara) reducing queues on SH2 by 13% (67 seconds) for cars, trucks, and high-occupancy vehicles (HOVs), with buses experiencing a 6% (27 seconds) improvement. However, the congestion moves further west to the Maunganui Road flyover where merging traffic creates disruption that negates travel time savings. T3 lanes have less impact on bus travel times due to there being less cars using the lanes when compared with the T2 scenario.

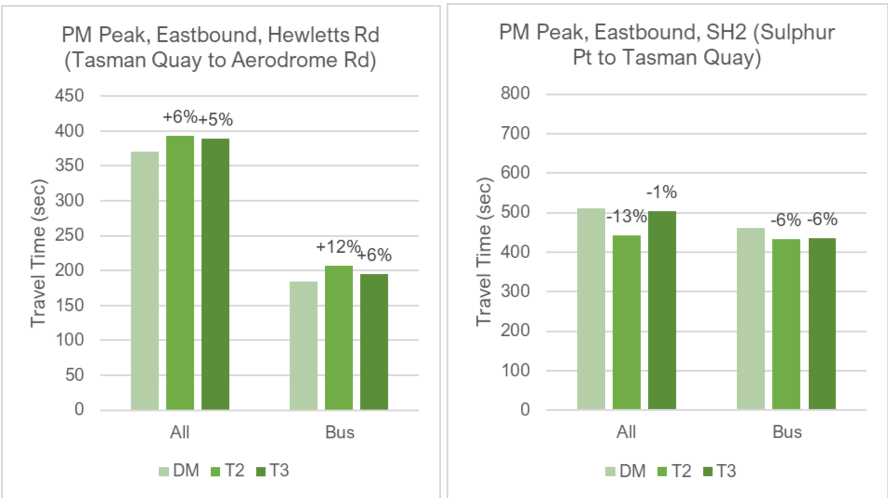


Figure 3: PM Peak, Eastbound

Sensitivity: General

A notable risk has been identified in regard to the need for vehicles to merge in the eastbound direction prior to the Maunganui Road flyover. The team has discussed potential mitigation, such as a priority 'head start' for HOVs at the Jean Batten Drive intersection, but this has not been considered / evaluated further at this stage. This issue is more significant in the T2 scenario with a higher volume of merging vehicles.

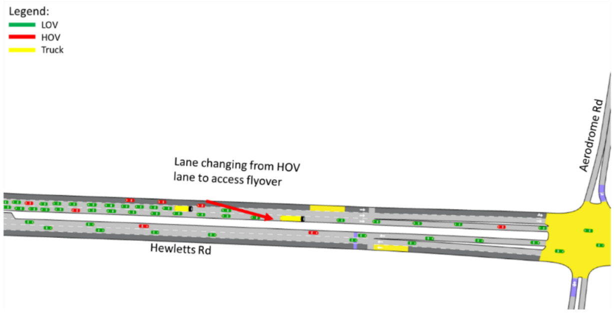


Figure 4: Lane changing in the PM peak

Indicative Economic Analysis

An Indicative Benefit Cost Ratio (BCR) assessment has been undertaken for the T2 and T3 options. The results are shown in **Table 0-1**. T2 has higher economic benefits at $14.7 million (10 years) and $40 million (40 years) than T3. The Benefit-Cost Ratio (BCR) for 10 years is 11.4 for T2 and 7.7 for T3, making both options economically positive.

Table 0-1: Economic Analysis Results

Analysis period	10 years		40 years	
Items	**T2**	**T3**	**T2**	**T3**
Construction Cost, $m	2.5	2.5	2.5	2.5
Total Costs (Construction and Maintenance Cost), $m NPV	**4.0**	**4.0**	**6.2**	**6.2**
Base Travel Time Benefits, $m NPV	20.1	18.6	54.6	50.5
Congested Time Benefits, $m NPV	20.5	10.4	55.6	28.4
Vehicle Operating Benefits, $m NPV	4.2	0.7	11.4	1.9
Public Transport Benefits, $m NPV	0.0	0.3	-0.1	0.8
Emissions Benefits, $m NPV	0.4	0.4	1.5	1.4
Total Project Benefits, $m NPV	**45.1**	**30.4**	**123.1**	**83.0**
Benefits Cost Ratio, BCR	**11.4**	**7.7**	**19.9**	**13.5**

Conclusion

Transport modelling indicates that providing HOV lanes on Hewletts Road can provide travel time savings for cars and trucks without notable impacts to buses, particularly in the T3 scenario. Economic benefits are significant compared with the anticipated cost. The risk in regard to the lane changing behaviour of vehicles in the PM peak eastbound direction is more prevalent in the T2 scenario and the risk of delays to buses is also slightly higher in this scenario. The T3 option has lower risk and a high BCR. Further design and investigation of the T3 option, including options to address the merging conflicts is recommended. If NZTA proceed with implementation, pre and post monitoring, to ascertain travel time outcomes (mode shift to higher occupancy vehicles and change in route choice) (15th Ave vs Hewletts Road) is recommended. Consultation and engagement with stakeholders and information provision to the public pre implementation will also be necessary.

1 Introduction

Following on from the completed Managed Lanes Study in Tauranga, a further study considering the specific conversion of the existing bus lanes on Hewletts Road to managed lanes has been undertaken.

Managed lanes are lanes in which individual, or a combination of, operating strategies are implemented to manage travel demand and system performance. The objective of the Hewletts Road Managed Lanes Study is to investigate the potential benefits and impacts of managed lanes along Hewletts Road in the short term with regard to vehicle travel time specifically (other considerations such as safety and operations are being considered by NZTA separately).

2 Optioneering

The eastbound bus lanes currently operate along Hewletts Road between Tōtara Street and Newton Street. The westbound bus lanes operate between Aerodrome Road and Tōtara Street.

Two potential options have been considered in this study:

1. Convert the existing bus lanes on Hewletts Road to T2, which permits cars with two or more occupants to use the lanes.
2. Convert the existing bus lanes on Hewletts Road to T3, which permits cars with three or more occupants to use the lanes.

3 Modelling Methodology

3.1 Background

Transport modelling using the Tauranga Transport Hybrid Model (TTHM) has been undertaken to understand the operational performance of the managed lane options.

The TTHM is a dynamic, i.e., time-sliced, hybrid mesoscopic/microscopic vehicle assignment model developed in AIMSUN. TTHM contains a more detailed representation of road lanes, e.g., merging, lane changing, time-dependent bus lanes, high occupancy vehicles (HOV) lanes, and more detailed intersection layouts.

The AM peak period is 6:30-9:30am and the PM peak period is 3:30-6:30pm. These were chosen to be consistent with other Tauranga AIMSUN models.

The model has been updated to include 2024 bus services on Hewletts Road. All options have been tested using a fixed demand from the Baseline Scenario[2].

To best replicate the implementation of managed lanes on Hewletts Road as a short-term project, the options are best compared with a do minimum, or existing conditions scenario, in the transport model.

At the time of writing, there is currently no 2024 / do minimum model scenario in the current version of the TTHM. An earlier version of the TTHM has a 2031 do minimum scenario, which has been used for this study

[2] The extent of the managed lanes considered in this study is a relatively small proportion of the network and of a typical journey. As such, the options are expected to have minimal impact on the shift from LOV to HOV. Therefore, for simplicity, no LOV to HOV mode shift has been assumed (fixed demand).

as a baseline. The 2031 do minimum scenario network assumptions have been reviewed and are considered appropriate. The Tauranga Transport Strategic Model (TTSM) has been used for the economic evaluation.

3.2 Subnetwork Model

There is a lot of variability in the TTHM due to the size of the network and the congested nature of the model, therefore creating a lot of 'noise' and making it difficult to compare localised options in the full model. As such, a microscopic subnetwork model was created from the TTHM to assess the impacts of managed lanes along Hewletts Road. The subnetwork encompasses Sulphur Point to the east and Bayfair to the west. The extent of the subnetwork is shown in **Figure 3-1.**

Figure 3-1: Subnetwork Extent

It should be noted that the model has been used as provided and no checks of the demand along Hewletts Road or level of congestion has been carried out.

3.3 Public Transport

The TTHM 2031 Do Minimum scenario assumes the public transport services outlined in the 2028 Transport System Plan (TSP). In order to assess the impact of the managed lanes in the short term, the 2024 bus services along Hewletts Road have been modelled instead. This equates to approximately 18 buses per hour in the AM peak and 16 buses in the PM peak.

No bus patronage or boarding data was available to validate the bus travel time. Based on our local knowledge of the corridor and our first hand experience in using the bus service along Hewletts Road, it is assumed that buses make one stop per hour at one of the three bus stops along Hewletts Road, with an average dwell time of 20 seconds.

3.4 HOV Assumptions

Table 3-1 presents the T2 and T3 vehicle percentages adopted for this study. These are based on previously collected vehicle occupancy surveys.

Table 3-1: HOV Assumptions

Vehicle Occupancy	Applicable proportion of light vehicles
2+	22%
3+	5%

4 Findings

4.1 Travel Time Routes

Travel times for each vehicle class have been extracted for the following routes:

- Eastbound and westbound along Hewletts Road, between Tasman Quay and Aerodrome Road (black route)
- Eastbound along State Highway 2 (SH2), from Sulphur Point interchange to Tasman Quay (red route)
- Westbound along SH2, from Bayfair to Aerodrome Road (purple route).

Figure 4-1 presents the travel time routes.

Figure 4-1: Travel Time Routes

Travel time results are provided below for the AM and PM peak periods as a weighted average across the 3-hour peak period. It should be noted that due to the relatively low bus sample size, there can be some small differences in bus travel time between model runs as a result of model variability. Bus travel time results should be interpreted holistically.

4.2 AM Peak

4.2.1 Hewletts Road, between Tasman Quay and Aerodrome Road

Figure 4-2 and **Figure 4-3** show the travel time results along Hewletts Road, between Tasman Quay and Aerodrome Road (black route), in the eastbound and westbound directions respectively.

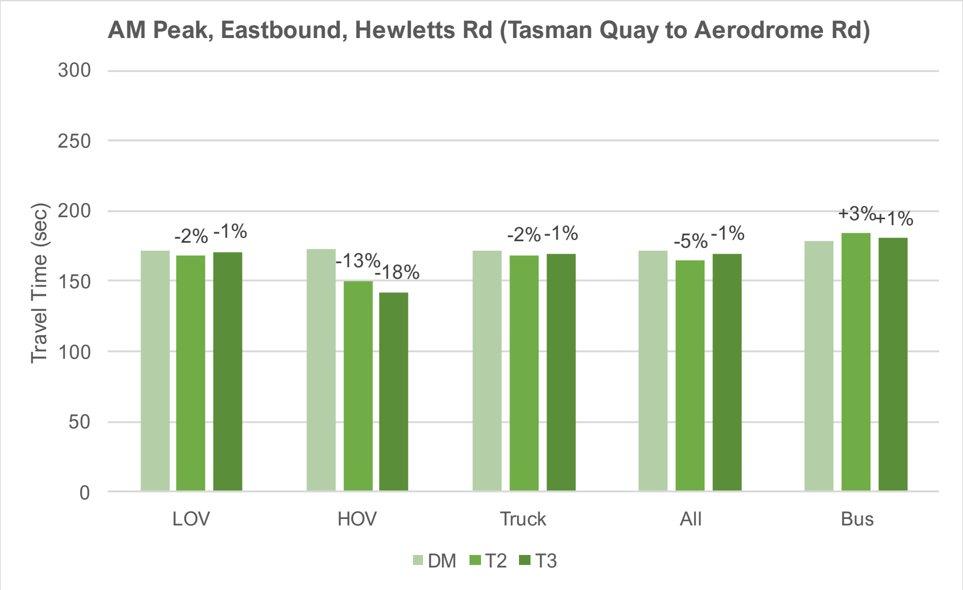


Figure 4-2: AM Peak, Eastbound, Hewletts Rd (Tasman Quay to Aerodrome Rd)

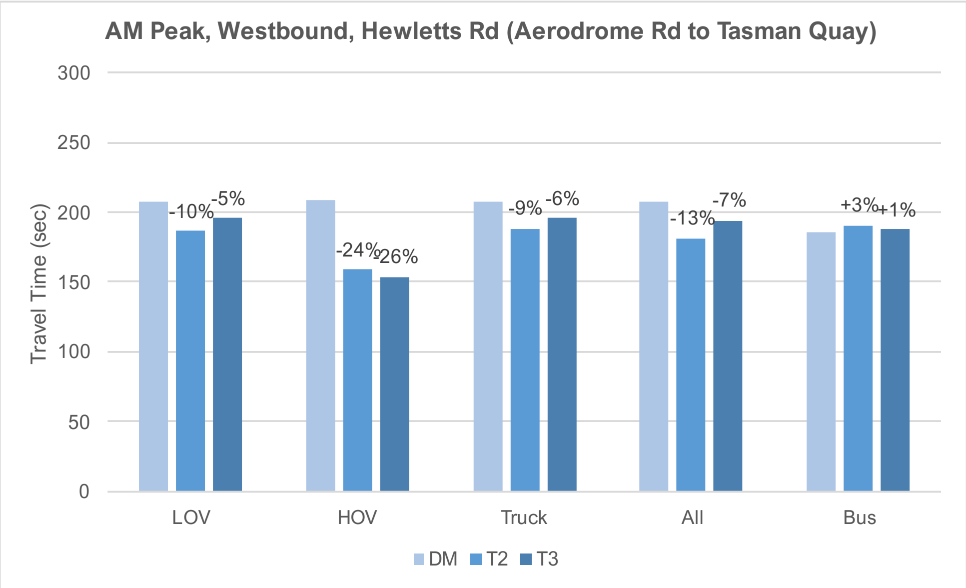


Figure 4-3: AM Peak, Westbound, Hewletts Rd (Aerodrome Rd to Tasman Quay)

Sensitivity: General

The modelling results show noticeable benefits to LOV, HOV and trucks in the westbound direction (peak direction) with travel time savings for all three vehicle classes compared to the Do Minimum scenario. Shifting HOV from the general traffic lane to the HOV lane improves the throughput for all vehicles along Hewletts Road. Both T2 and T3 scenarios show travel time savings for all vehicles but as expected, the T2 scenario shows a greater travel time saving compared to the T3 as more vehicles are able to use the HOV lane.

The impact on buses in both the T2 and T3 scenario are relatively minor with only 3% (5 seconds) and 1% (2 seconds) increase in bus travel time compared to the Do Minimum scenario for both directions. Furthermore, the HOV travel time along Hewletts Road is now noticeably faster than LOV, i.e., they used to have the same travel times for Do Minimum but HOVs are faster by 18 to 42 seconds in the T2/T3 scenarios.

In the eastbound direction (off-peak direction), the travel time savings are less significant as the corridor experiences less congestion, thereby reducing the relative benefits of the HOV lane.

4.2.2 SH2 EB (Sulphur Point to Tasman Quay) and SH2 WB (Bayfair to Aerodrome Road)

Figure 4-4 and **Figure 4-5** show the travel time results along SH2 in the eastbound (Sulphur Point to Tasman Quay, red route) and westbound (Bayfair to Aerodrome Road, purple route) direction respectively. There are no bus services that operate along SH2 westbound (from Bayfair to Aerodrome Road via SH2 flyover) as routes in this area use Links Ave, and therefore the options have no impact on bus travel times in this area.

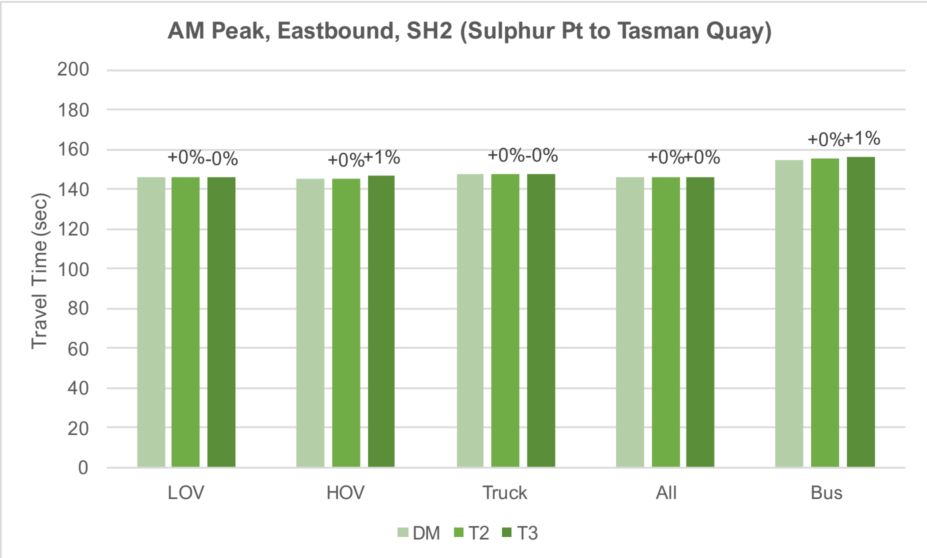


Figure 4-4: AM Peak, Eastbound, SH2 (Sulphur Pt to Tasman Quay)

It is noted in the above graph that HOV travel time is higher for T3 but this is just by 2 seconds. In addition, bus travel time is higher for T3 but should be noted that this is just by 1 second (both negligible).

Sensitivity: General

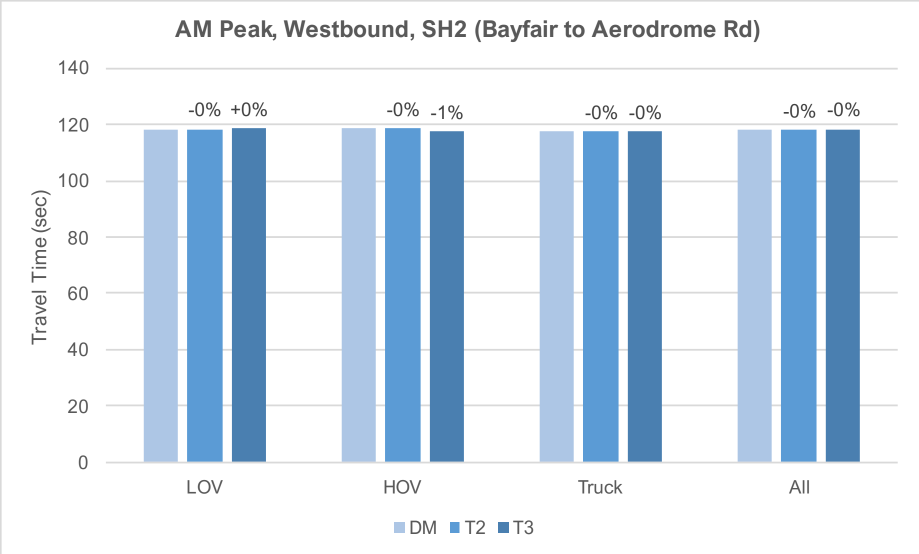


Figure 4-5: AM Peak, Westbound, SH2 (Bayfair to Aerodrome Rd)

In the AM peak, congestion along Hewletts Road (between Tasman Quay and Aerodrome Road) does not extend beyond the said section in the model and therefore there are minimal / no travel time savings along SH2 Eastbound (Sulphur Pt to Tasman Quay) or SH2 Westbound (Bayfair to Aerodrome Rd) compared to the Do Minimum scenario.

4.2.3 Westbound Full Route vs Hewletts Road

The AM Peak westbound (toward the CBD) travel time improvements for the full route (from Bayfair to Tasman Quay) was compared to the Hewletts Road section only (Tasman Quay and Aerodrome Road).

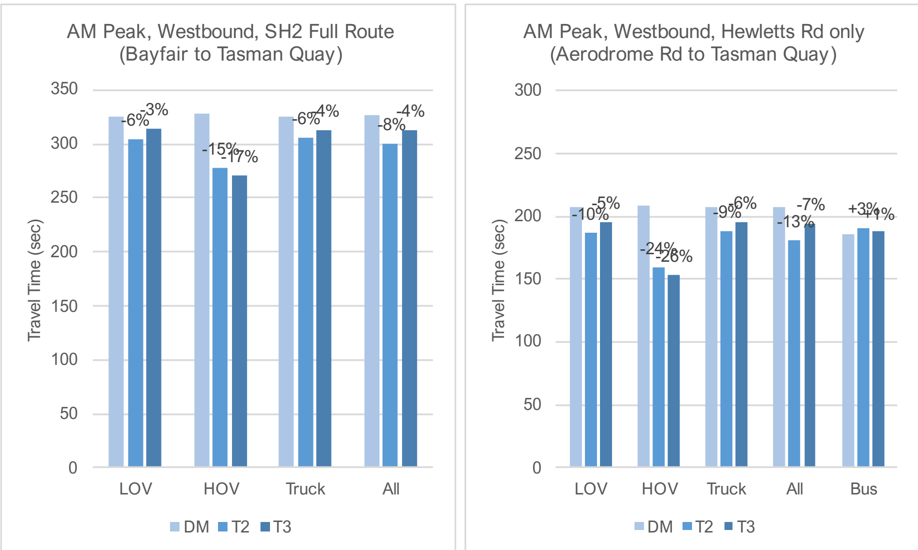


Figure 4-6: AM Peak, Westbound, Travel Time Comparisons

Figure 4-6 above shows that more improvements (higher percentage reductions) are observed in the Hewletts Road section when compared to the full route for all modes.

4.2.4 Summary

- The peak direction is westbound (to CBD).
- In the AM peak westbound (toward the CBD) on Hewletts Road (between Tasman Quay and Aerodrome Road), travel times show a saving for all vehicles (7-13% or 14-26 seconds). Eastbound (away from the CBD) travel times see less benefit (1-5% or 2-8 seconds) due to naturally lower congestion.
- The HOV travel time along Hewletts Road is noticeably faster by 18-42 seconds than LOV in the T2 and T3 scenarios.
- The impact on buses in both the T2 and T3 scenarios are relatively minor for both directions (1-3% or 2-5 seconds increase).
- In the westbound direction, more improvements are observed in the Hewletts Road section when compared to the full route for all modes.
- In the eastbound direction, the travel time savings are less significant as the corridor experiences less congestion.

4.3 PM Peak

4.3.1 Hewletts Road, between Tasman Quay and Aerodrome Road

Figure 4-7 and **Figure 4-8** show the travel time results along Hewletts Road, between Tasman Quay and Aerodrome Road (black route), in the eastbound and westbound directions respectively.

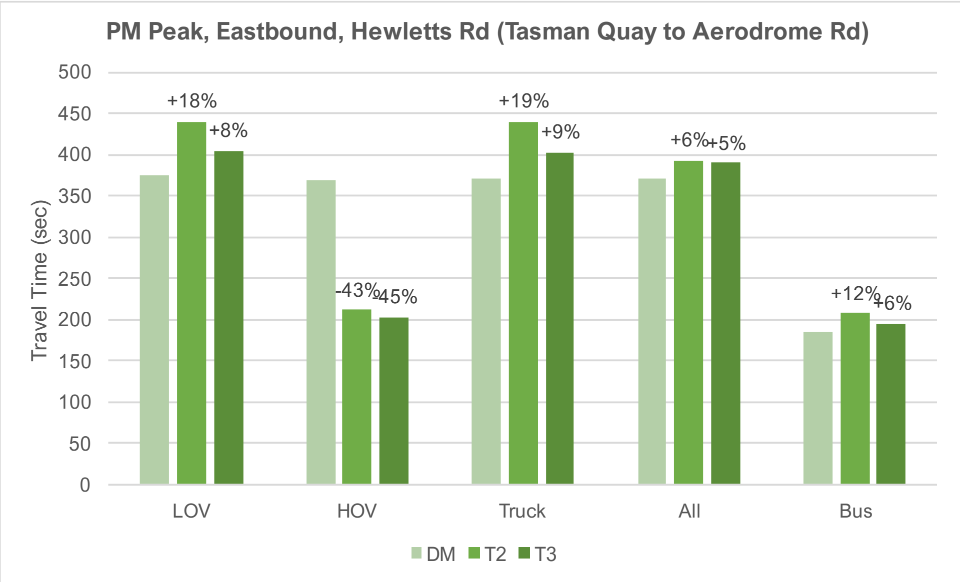


Figure 4-7: PM Peak, Eastbound, Hewletts Rd (Tasman Quay to Aerodrome Rd)

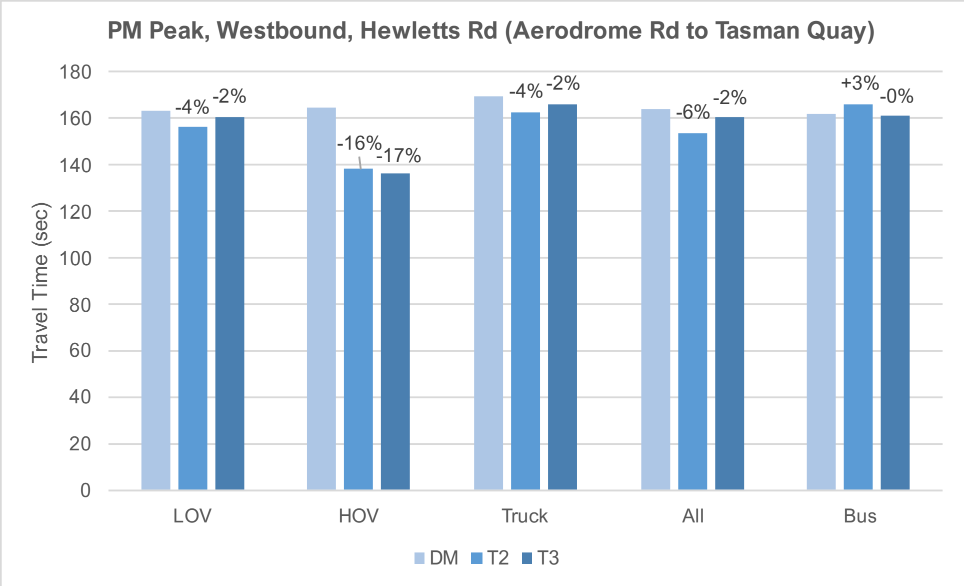


Figure 4-8: PM Peak, Westbound, Hewletts Rd (Aerodrome Rd to Tasman Quay)

The modelling results show that providing an HOV lane in the eastbound direction (peak direction) in the PM peak provides negative travel time outcomes (i.e., travel times increase) compared to the Do Minimum scenario. Whilst HOV vehicles do experience significant travel time savings, around 43% (157 seconds) and 45% (166 seconds) in the T2 and T3 scenario respectively, there is an increase in travel time to LOV and trucks despite shifting a proportion of traffic to the HOV lane.

In the westbound direction (off-peak direction) shown in **Figure 4-8**, there are some travel time savings observed for LOV, HOV and trucks. HOV vehicles are expected to experience around 16-17% (27-29 seconds) travel time savings compared to the Do Minimum for the T2 and T3 scenario respectively. The impact on buses is relatively minor with only 3% (5 seconds) increase in bus travel time compared to the Do Minimum scenario in the T2 scenario and no impact in the T3 scenario.

There is a high demand in the PM peak for eastbound vehicles accessing the SH2 flyover towards Bayfair. By converting the bus lane to HOV lane, HOV vehicles now need to cross two lanes after the Hewletts Road / Jean Batten Drive intersection to access the flyover. This lane changing and weaving behaviour creates a shockwave back along Hewletts Road, resulting in more congestion compared to the Do Minimum scenario. **Figure 4-9** shows an example of this happening in the model.

Sensitivity: General

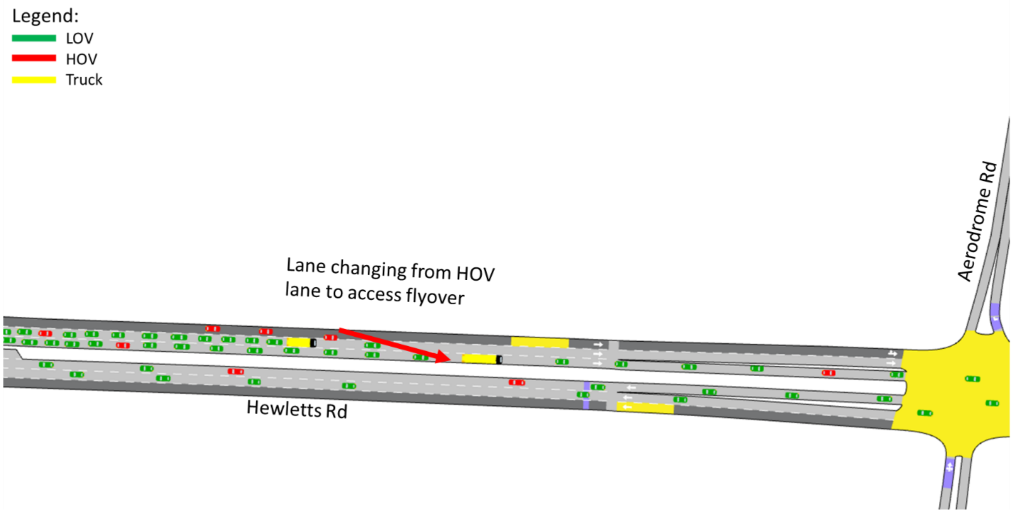


Figure 4-9: Lane changing in the PM peak

Due to the heavy congestion on Hewletts Road, HOV vehicles prefer to change lanes after the Hewletts Road / Jean Batten Drive intersection to bypass as much congestion as possible. **Figure 4-10** shows the number of changes on the western approach of Hewletts Road / Aerodrome Road where vehicles need to change lanes to get onto the flyover.

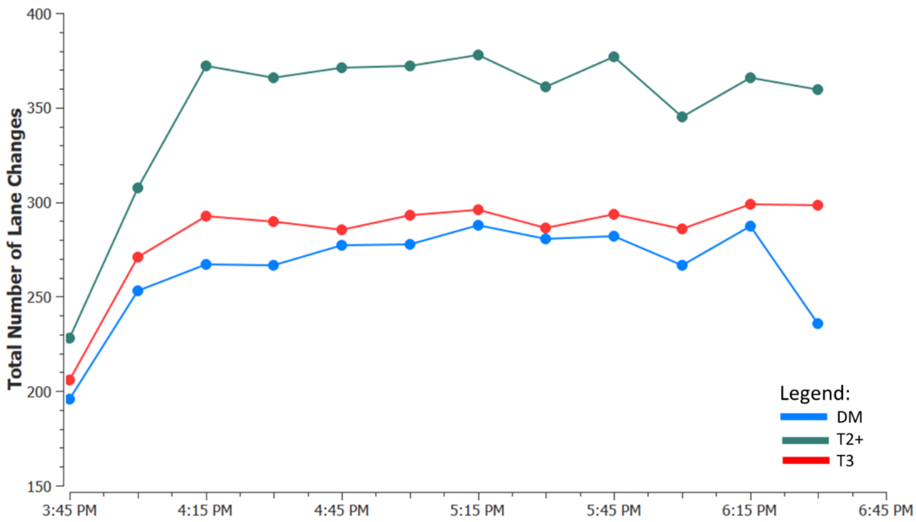


Figure 4-10: Lane Changing on the western approach of Hewletts Road / Aerodrome Road

Note that the above figure shows the total number of lane changes averaged in an hour.

This effect is most noticeable in the T2 scenario where there are more vehicles in the HOV lane.

It is understood that some weaving / lane changing is already occurring on site even without the HOV lane and it is likely that this would be exacerbated with the HOV lane.

The weaving issue could potentially be mitigated by providing HOV priority at the Hewletts Road / Jean Batten Drive signals to allow HOV a few seconds to pass the intersection and change lanes before general traffic is released. Although this has not been considered in any detail as part of the study.

4.3.2 SH2 EB (Sulphur Point to Tasman Quay) and SH2 WB (Bayfair to Aerodrome Road)

Figure 4-11 and **Figure 4-12** show the travel time results along SH2 in the eastbound (Sulphur Point to Tasman Quay, red route) and westbound (Bayfair to Aerodrome Road, purple route) direction respectively.

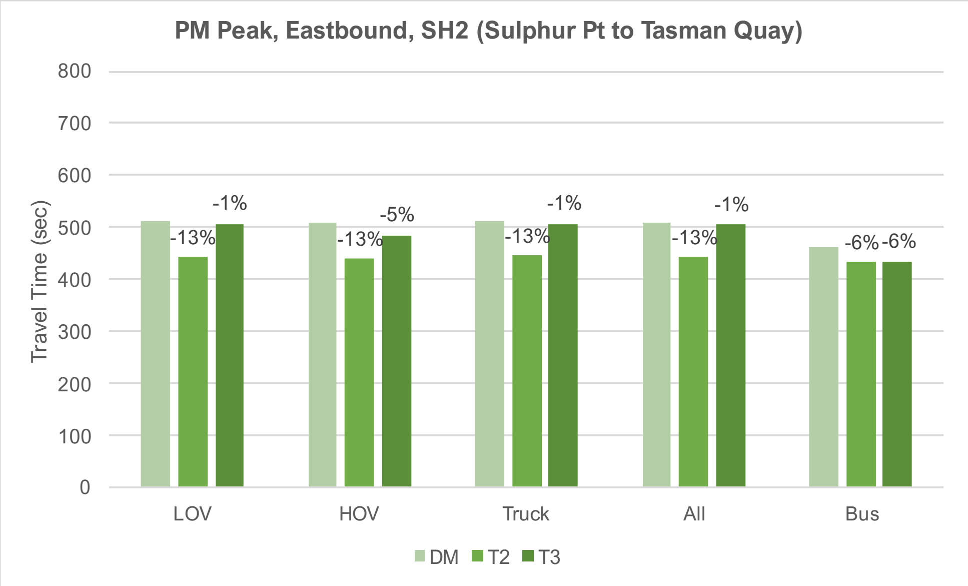


Figure 4-11: PM Peak, Eastbound, SH2 (Sulphur Pt to Tasman Quay)

In the PM peak, the model shows heavy congestion eastbound along Hewletts Road which regularly extends back to Sulphur Point. The provision of a T2 lane increases the throughput at the Hewletts Road / Tōtara Street intersection and therefore reduces the queueing along SH2. The modelling results show a 13% (67-68 seconds) reduction in travel time for LOV, HOV and Trucks and a 6% (26-27 seconds) reduction in travel time for buses compared to the Do Minimum scenario. In the T2 scenario, the key congestion constraint has shifted from the Hewletts Road / Tōtara Street intersection to the Hewletts Road / Jean Batten Drive intersection.

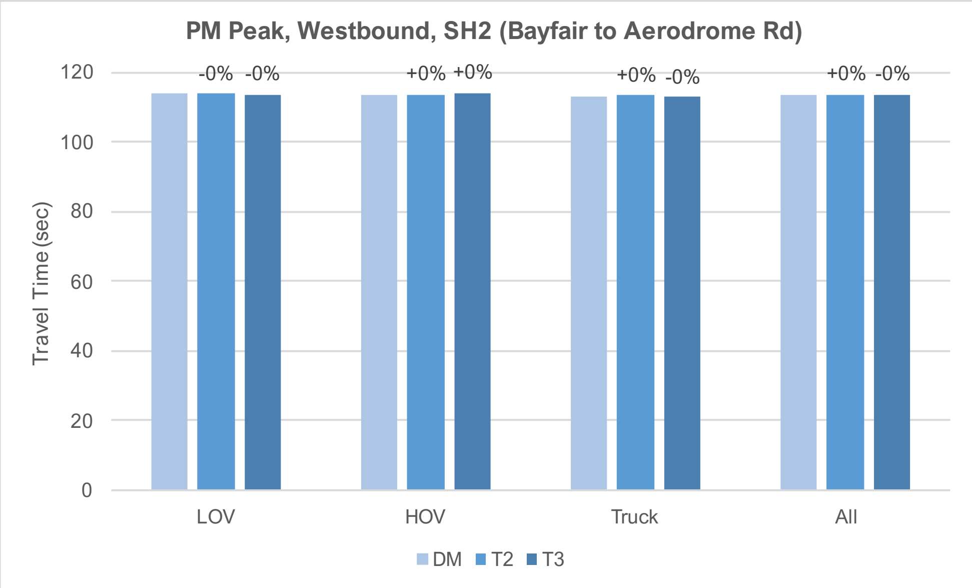


Figure 4-12: PM Peak, Westbound, SH2 (Bayfair to Aerodrome Rd)

In the PM peak, the congestion westbound along Hewletts Road is contained within the corridor and therefore, there are minimal / no travel time savings along SH2 between Bayfair Flyover and Hewletts Road compared to the Do Minimum scenario.

4.3.3 Summary

- The peak direction is eastbound (from CBD).
- During PM peak hour, eastbound traffic on Hewletts Road sees major congestion (backed up to Sulphur Point). T2 lane improves flow at the key intersection reducing queues on SH2 by 13% (67 seconds) for cars, trucks, and HOVs, with buses experiencing a 6% (27 seconds) improvement. However, the congestion hotspot moves further west in the T2 scenario.
- The model has shown that due to the heavy congestion on Hewletts Road eastbound, HOVs refer to change lanes after the Hewletts Road / Jean Batten Drive intersection to bypass as much congestion as possible. This could potentially be mitigated by providing HOV priority at the Hewletts Road / Jean Batten Drive signals. Further investigation of this behaviour is recommended.
- On SH2 eastbound (Sulphur Pt to Tasman Quay), travel time savings are observed for all modes in both T2 and T3 scenarios.
- A notable risk has been identified in regard to the need for vehicles to merge in the eastbound direction prior to the Hewletts Road flyover. The modelling indicates that the capacity of this merge is a constraint. The team has discussed potential mitigation such as a priority ‘head start’ for HOVs at the Jean Batten Drive intersection, but this has not been considered / evaluated further at this stage.

4.4 Conclusion

The graphs below show the travel time improvements for all modes, considering the peak direction in AM peak (westbound) and PM peak (eastbound).

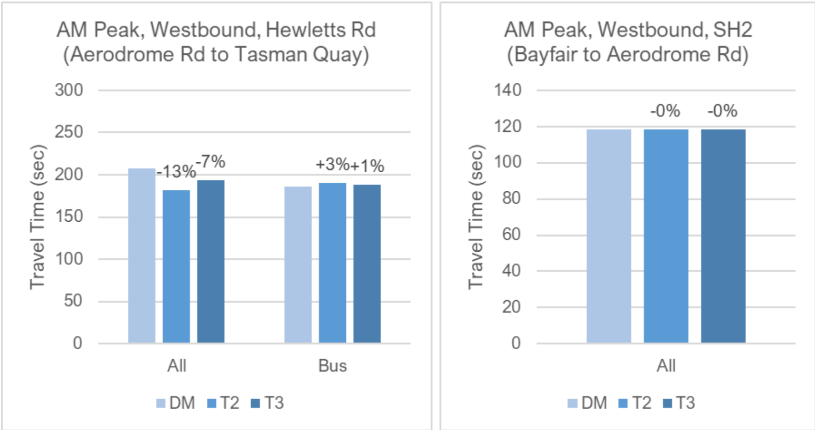


Figure 4-13: AM Peak, Westbound

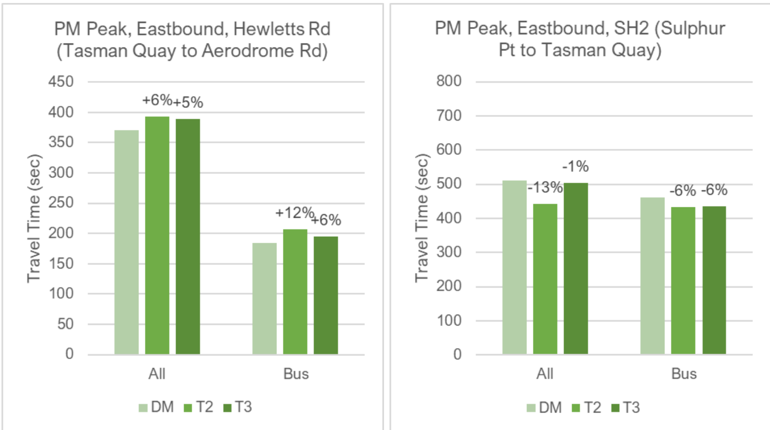


Figure 4-14: PM Peak, Eastbound

In the AM peak westbound, T2 lanes experience better travel time savings (13% or 26 seconds) for all modes when compared to T3 lanes. The increase in bus travel time is only minimal for T2 lanes (3% or 5 seconds). In the PM peak eastbound, Hewletts Road experiences an increase in travel time for T2 lanes all modes (6% or 22 seconds) but there are savings for the SH2 section (13% or 68 seconds). Notably buses also experience significant travel time savings in the SH2 section (6% or 27 seconds). However there is a risk in regard to the lane changing behaviour of vehicles in the PM peak eastbound direction that is more prevalent in the T2 scenario. It is recommended to look further into the effects of this behaviour.

5 Indicative Economic Analysis

An indicative economic analysis was carried out using the Tauranga Transport Strategic Model (TTSM) and approximate order cost estimates. TTSM is the preferred modelling tool to provide indicative economic analysis (over TTHM) because of its efficiency and ease in extracting comprehensive network-wide statistics, vehicle operating costs, and emissions data. The economic benefits are assessed using the NZTA Monetised Benefits and Cost Manual (MBCM), May 2024.

5.1 Assumptions

- Urban Arterial Road Category unit cost values
- Base Date: 1 July 2023
- Time Zero: 1 July 2024
- Discount Rate: 4% applied to all annual benefits and costs
- Construction Start Date: Late 2024, with a 1-year construction period for T2 and T3
- Traffic and PT Benefits: Derived from the TTSM's economic module using the 2035 scenario
- Analysis Period: 10 and 40 years to capture the benefits of infrastructure investment
- Emission Benefits: Assessed using the TTSM VEPM 6.3 model and MBCM values (middle shadow price values for CO_2)
- WEBs: Not included in this assessment

5.2 Benefits Expansion Factors

The expansion factors were adopted from the standard TTSM economic procedure, which are described below.

5.2.1 Annualization from Modelled Periods for Traffic Benefits

Annual benefits have been estimated through weighted factoring of the three modelled weekday periods (AM, Inter-peak and PM). The AM and PM peak models were used to represent the morning and evening peaks, while the inter-peak model was used to represent all other periods.

Average weekday and weekend traffic counts were processed for the whole region to develop the expansion factors in Tauranga. The resulting annualization factors are summarised in **Table 5-1**.

Table 5-1: Annualization Factors for Traffic

Period	Model Used	Equivalent Hours per day	Days per year	Factors
Weekday AM	AM	2	245	490
Weekday PM	PM	2	245	490
Weekday Interpeak	IP	7	245	1715
Weekday evening/night	IP	3.04	245	744.8
Weekend/holiday	IP	9.62	120	1154.4

5.2.2 Annualization from Modelled Periods for PT Benefits

PT annualization factors were estimated from the 2018 PT observed data. The resulting annualization factors are summarised in **Table 5-2**.

Table 5-2: Annualization Factors for PT

Period	Model Used	Equivalent Hours per day	Days per year	Factors
Weekday AM	AM	2	245	490
Weekday PM	PM	2.75	245	673.8
Weekday Interpeak/night	IP	7.139	245	1749
Weekend/holiday	IP	1.25	120	150

5.3 Project Costs

The construction and maintenance costs were provided by NZTA, as shown in **Table 5-3.**

Table 5-3: Project Costs

Component	T2	T3
Construction Cost	$2,500,000	$2,500,000
Yearly Maintenance Cost	$200,000	$200,000

5.4 Benefit Cost Ratio (BCR)

The 2035 baseline from the Managed Lane Study, which includes various infrastructure upgrades throughout Tauranga, has been used as the Do Minimum for the economic analysis. The T2 and T3 scenarios have then been modelled on top of the 2035 Managed Lanes Do Minimum scenario. The T2 and T3 scenarios have been tested using a fixed demand from the Baseline Scenario.

It is assumed that the Hewletts Road scheme would be delivered over the next 10 years. However, more refined staging, timeframes, modelling, and economic evaluation would be necessary to define an accurate BCR if the project requires a business case.

The TTHM model shows no travel time benefits during the PM peak hour. **Table 5-4** shows the indicative BCR results based on the TTSM model outputs for the AM Peak and Inter Peak hours for the analysis period of 10 years and 40 years.

Table 5-4: Economic Analysis Results

Analysis period	10 years		40 years	
Items	**T2**	**T3**	**T2**	**T3**
Construction Cost, $m	2.5	2.5	2.5	2.5
Total Costs (Construction and Maintenance Cost), $m NPV	**4.0**	**4.0**	**6.2**	**6.2**
Base Travel Time Benefits, $m NPV	20.1	18.6	54.6	50.5
Congested Time Benefits, $m NPV	20.5	10.4	55.6	28.4
Vehicle Operating Benefits, $m NPV	4.2	0.7	11.4	1.9
Public Transport Benefits, $m NPV	0.0	0.3	-0.1	0.8
Emissions Benefits, $m NPV	0.4	0.4	1.5	1.4
Total Project Benefits, $m NPV	**45.1**	**30.4**	**123.1**	**83.0**
Benefits Cost Ratio, BCR	**11.4**	**7.7**	**19.9**	**13.5**

Compared to the baseline scenario, both T2 and T3 improve conditions for all road users across the network. T2 has an added advantage with benefits valued at $14.7 million (10 years) and $40 million (40 years) more than T3, even though both have the same implementation cost. The Benefit-Cost Ratio (BCR) for 10 years is 11.4 for T2 and 7.7 for T3, making both options economically viable.

5.5 Sensitivity Tests

a. Sensitivity Test1: BCR results based on AM peak benefits

Due to uncertainty around the level of benefit that will be achieved in the interpeak period when volumes are lower and vehicle occupancy has not been surveyed, a sensitivity test was undertaken, including only AM peak hour benefits from TTSM for the analysis period of 10 years and 40 years, as shown in **Table 5-5**.

Table 5-5: Sensitivity Test 1 BCR Result

Analysis period	10 years		40 years	
Test	**T2**	**T3**	**T2**	**T3**
AM peak hour benefits only	4.0	3.2	7.0	5.7

b. Sensitivity Test 2: Congestion Benefits and BCR Results for with and without Off-peak benefits

A sensitivity analysis was also conducted to assess the influence of off-peak benefits on the total congestion time benefits, excluding the off-peak period factor for both 10-year and 40-year analysis periods. The resulting congestion benefits are presented in **Table 5-6**, while the corresponding Benefit-Cost Ratios (BCRs) with and without the off-peak factor are detailed in **Table 5-7**.

Table 5-6: Congestion Time Benefits ($m NPV)

Analysis period	10 years		40 years	
Test	**T2**	**T3**	**T2**	**T3**
with Off Peak Period Factor	20.5	10.4	55.6	28.4
without Off-peak Period Factor	17.8	9.4	48.4	25.5

Table 5-7: Sensitivity Test 2 BCR results

Analysis period	10 years		40 years	
Test	**T2**	**T3**	**T2**	**T3**
with Off Peak Period Factor	11.4	7.7	19.9	13.5
without Off-peak Period Factor	10.7	7.4	18.8	13.0

The results remain positive in all of the sensitivity test scenarios and it is expected the option would achieve a 'high' BCR (above 3).

6 Risks

The following notable risks have been identified

- In the T2 scenario, with approximately 22% of private vehicles able to use the HOV lanes, there is a higher risk of delays to buses. This could impact on the benefit that the existing bus lanes provide to bus users / attraction of the bus service. Implementing the T3 scenario, in which only around 5% of private cars are able to use the HOV lanes, would assist to mitigate this risk.
- The T2 scenario also has greater risk of congestion and safety impacts in regard to the merge approaching the Maunganui Road flyover, eastbound on Hewletts Road. This risk is also lower in the T3 scenario with fewer vehicles merging from the HOV lane to access the flyover. Implementing the T3 scenario would assist to mitigate this risk

- The proportion of users of the HOV lanes could differ from the volumes anticipated in this study which are based on available survey data. Conducting pre-implementation and post implementation monitoring of vehicle occupancy and travel times on Hewletts Road (and alternative routes such as SH29 / Turret Road and Totara Street) would assist to better understand actual demand, benefits and impacts.
- There is a risk that stakeholders and the public may not understand the objective, purpose and intended use of the HOV lanes i.e. why T3 lanes are recommended, why trucks / freight are not permitted to use the lanes but how these customers benefit due to fewer vehicles in the HOV lanes and when / how public customers can use the lanes etc. Carrying out stakeholder engagement and information provision to the public pre-implementation would assist to mitigate this risk.

7 Conclusions

The following key conclusions are summarised from the modelling and economic analysis.

- In the AM peak westbound (toward the CBD) Hewletts Road travel times for both options show a saving for all vehicles. The impact on buses in both the T2 and T3 scenario are relatively minor for both directions (1-3% or 2-5 seconds increase).
- During PM peak hour, Hewletts Road eastbound experiences an increase in travel time for T2 lanes all modes (6% or 22 seconds) but there are savings for the SH2 section (13% or 68 seconds). Notably buses also experience travel time savings in the SH2 section (6% or 27 seconds).
- A notable risk has been identified in regard to the need for vehicles to merge in the eastbound direction prior to the Hewletts Road flyover. The modelling indicates that the capacity of this merge is a constraint that is impacting the potential for travel time savings. The team has discussed potential mitigation, but this has not been considered / evaluated further at this stage. There is less risk of merging constraint under the T3 scenario as there are fewer vehicles changing lanes.
- An Indicative Benefit Cost Ratio (BCR) assessment has been undertaken for the T2 and T3 scenarios using the Tauranga Transport Strategic Model (TTSM). The Benefit-Cost Ratio (BCR) for 10 years is 11.4 for T2 and 7.7 for T3, making both options economically positive.
- Further design and investigation, including options to address the merging conflicts is recommended. If NZTA proceed with implementation, pre and post monitoring (to ascertain travel time outcomes, mode shift to higher occupancy vehicles and change in route choice (15th Ave vs Hewletts Road)) is also recommended.
- Consultation and engagement with stakeholders and the public will also be important to carry out prior to implementation to inform design and support operation of the HOV lanes.